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ARC West Midlands News Blog



Policy Makers Should Use Evidence, But What Should They Do In an Evidence Vacuum?

Richard Lilford, ARC WM Director

There are two points of view concerning the obligations of policy makers when there is no direct evidence to guide them:

1. It is wrong to take any action or intervene unless there is evidence to support your decision.
2. A lack of evidence is neutral; it neither allows a decision-maker to intervene, nor does it sanction non-intervention.

Which is correct? Writing in the *Lancet* recently, Feng, *et al.* advocate the use of face masks in public to prevent the spread of COVID-19.[1] They say it is an asymmetrical choice; unlikely to do harm and may do much good by preventing the spread of the disease from pre-symptomatic people to people who are unaffected.

The ARC WM Director sides with the 'lack of evidence is neutral' principle. In my opinion the argument that a policy maker should not intervene in the absence of direct evidence is flawed for a series of linked reasons:

1. The obligation to use evidence when it exists does not entail the requirement to fail to act when there is no such evidence.
2. Further, there is never a circumstance in which no relevant evidence is available. Granted, there may be no direct, comparative evidence, but this is not tantamount to no evidence at all.
3. There can be no automatic supposition that the expected value of a proposed intervention is less than that of the status quo. That is to say, the balance of benefits, harms and

costs may go either way when there is no incontrovertible comparative evidence. It is then a matter of judgment as to the relative probabilities of benefit and cost that must sit alongside values in determining the best course of action.

4. The theoretical basis for decisions under uncertainty derive from expected utility theory, which reconciles probability and values/preferences.[2][3] Under this axiomatic theory, probability refers to the decision maker's degree of belief.

Of course, nothing written above should be misinterpreted to imply either that good evidence should not inform decisions or that policy makers have no obligation to try to collect evidence to better inform future decisions. Indeed, the mandate to collect and use evidence is now enshrined in law in many states in the USA and was a manifesto commitment for the current UK government.

The US state of Oregon is well known for ground-breaking policies. Right back in 2003 it passed legislation requiring evidence-based procurement of clinical services in the field of addictions beginning 2005.[4] By 2011, 75% of addiction services commissioned by public money had to be evidence-based.[5] Likewise, nearby Washington state published a law in 2012 requiring policy makers to use empirically supported services for children's health and welfare.[6]

The British government has a tripartite structure for policy trials:

1. Funding universities to carry out policy trials to inform the government's programme.

A good example is The Work and Health Unit (WHU) trial of an intervention to encourage small- and medium-sized enterprises (SMEs) to do more to promote employee health and welfare.[7] The WHU have sponsored ARC WM faculty, supported by the West Midland Combined Authority and RAND Europe, to carry out a four arm cluster randomised trial of 100 SMEs.[8]

2. Funding external 'what works' centres, such as the Education Endowment Fund that was established in 2011 by The Sutton Trust with £125m funding from the Department for Education. This organisation has conducted a very large series of educational RCTs, in which England now leads of the world, as recently described in your news blog.[9]

3. In-house trials conducted by individual government departments.

I am a member of the Cabinet Office 'What works trial advice panel' that advises on in-house and externally commissioned trials whatworks.blog.gov.uk/trial-advice-panel/. HMRC has conducted the largest-ever RCT of self-assessment tax schemes, for example. The environment agency has recently conducted an RCT to tackle waste crime. I am currently part of a small group advising government departments on the design and evaluation of an intervention to help people who have recently become carers to adapt to their new circumstances without becoming depressed, and in some cases being able to continue to work.

4. Funding academic centres, such as DHSC policy research centres.

ARC West Midlands will continue to promote local and international studies to provide evidence for evidence-based policy. We like to work very closely with policy makers and service managers so that our work addresses their immediate needs. We like to think of ourselves

as pioneers in the fields of rapid response and opportunistic research, and can cite a number of on-going and recent examples, many covering the areas of public health and social care.

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With thanks to Emily Power for contributions.



The Times They Are a-Changin' Embracing Digital Technologies During COVID-19

Magdalena Skrybant, PPIE Lead

Outpatient Appointments: Stuck in a rut?

“The way we deliver care remains locked into the service model largely created when the NHS was founded in 1948.”

This statement, which appears in Chapter 5 of the [NHS Long Term Plan](#), might raise a few eyebrows, but although the NHS has embraced some great technological advances, in other ways my experiences as a patient could be considered broadly similar to the experiences of the first patients that walked the corridors of the first NHS hospitals. Take attending outpatient appointments, for example. Whilst I now receive appointment letters that have been produced through a

centralised booking system, I am reminded to attend through text message, and though my hospital notes are now digital, I, just like the first NHS patients, visit the hospital, see a nurse who confirms my name, date of birth and the first line of my address, have my weight checked, and then wait patiently in the corridors waiting for those words: *“The doctor will see you now.”*

The vision, as set out in the NHS Long Term Plan, is that patients should expect a ‘digital-first’ option. This would enable ‘richer, face-to-face consultations with clinicians where patients want or need it.’ Providing video consultations is one way of offering a ‘digital first’ option. Instead of visiting the hospital

to see the consultant, you could have the consultation from your home/workplace. It’s still a face-to-face interaction, although you wouldn’t need to attend in person.

Through the COVID-19 pandemic many of us have experienced connecting with others through video-conferencing software: it might be connecting grandparents and grandchildren through *FaceTime*; chatting with friends through *HouseParty*; or meeting with colleagues through *Zoom* or *Microsoft Teams* (with many other video conferencing tools available). Whilst we all may have experienced teething problems ‘learning to drive’ the new technologies, most of us have now learnt to embrace this new

way of communicating. Unlike telephone calls, it's so nice to see the other person and their reactions. I'm definitely a convert.

Video consultations in the NHS: a patient perspective

Although video consultations are currently on offer to some patients, this practice isn't widespread: it's something I have never personally been offered. I'm no expert in video consultations and there is already a large body of literature on the 'barriers and facilitators' to digital technologies in healthcare. However, if I draw on my personal experiences as a serial outpatient-appointment attender there are some definite positives to video consultations and some things that I think merit further consideration. I've listed these below:

Video consultations in the NHS: needs of the services

Whilst there are plenty of things that I would need to consider as a patient before agreeing to have a video consultation, I can only imagine the hurdles that need to be overcome before services can offer this 'digital first' option. In addition to the challenge of winning over hearts and minds to embrace this newfangled way of working, there are many practical and technical factors. I've listed a few below, but I'm sure you can think of others:

- Deciding which video-conferencing platform to go for.
- Providing support to patients to use the new software.

- Providing training to staff to use the software.

- Ensuring patient confidentiality.

COVID-19: needs must!

All this consideration takes time: fools rush in where angels fear to tread. Where patients are concerned, and their health and wellbeing is at stake, getting things wrong isn't an option. Services need to ensure that the quality of the patient-clinician interaction is the same as attending a physical appointment. It's also important to get things right first time: if the first attempt at video consulting doesn't work, will patients and clinicians have the patience and determination to persevere?

Pros

I will save money – I won't be spending money on traveling to hospital, or any parking charges.

I will save time – I won't need to travel to hospital, which includes factoring in time to find a parking space and booking into the appointment.

It will be more convenient – I could have the consultation from the comfort of my own home; I might even make myself a cup of tea!

It may be less disruptive – Having several autoimmune conditions is disruptive enough. Video consultations would allow me to have the meeting at work, making it less disruptive to my daily life.

Considerations

Will I have the right equipment? – What technology do I need (i.e. will my ancient phone/laptop support the technology?) // Will my internet connection be good enough to support the software?

Training – I am no IT expert, so can I get the technology to work and get support if things go wrong?

'Laying on of hands' – Whilst this might work well for conversations about my health, what if the doctor wants to examine me? How is that going to work?

Trust – I would be fairly comfortable with a consultant or nurse that I know well, but what if I've never met the person before? How important is a physical interaction in establishing a good relationship?

Monitoring – I usually get my bloods done at my appointments, along with other routine monitoring (blood pressure/weight). How will that be managed?

During the COVID-19 pandemic hospitals have not had the luxury of time to develop different ways of working. Staff have had to adapt quickly and find alternative ways of 'seeing' patients without them attending in person. Service providers have had to use 'digital first' options out of necessity (and necessity, as they say, is the mother of invention). Whilst some barriers may have taken weeks, months, even years to overcome in 'normal times', now teams in hospitals have come together and solutions have been found. In the case of video consultations, these are being offered to some patients, enabling them to receive the ongoing care they need to help them manage conditions.

No going back?

What we will all want to know is whether these changes will last? COVID-19 has forced many of us to make significant changes in our lives, and I've

read many articles in the media saying that it's unlikely that things will return to the way they were before. Surely, this is true for health and social care. Patients and clinicians are embracing new ways of interacting in these strange COVID-19 times, but are these forever-changes?

I'm in no doubt that having to make changes quickly without careful preparation will mean that clinicians and patients have experienced teething problems adapting to these new ways of working. I'm sure everyone would agree that the change could be better supported in other circumstances. But surely now that we've seen that barriers can be overcome very quickly, perhaps it leaves a door wide open to really explore the range of 'digital first' options and the technological possibilities available to us.

What's important now is evaluating our experiences. Both during and after the COVID-19 pandemic we need

to look at what has worked well, what hasn't worked well, and what aspects require further work to ensure that the NHS can deliver on its promises in the NHS Long Term Plan to offer a 'digital first' service for patients. And with the groundswell of support for the NHS that is evident during Thursday evenings, where communities unite in applauding NHS staff, we should capitalise on this support and work with patients to co-design health and care services.

As a Centre with a focus on service design and delivery, ARC WM is well-placed to evaluate digital technologies. Indeed, video consultations is just one area that researchers in our Research Methods and Rapid Response theme are focusing on. We hope this research will feed into the design of services, which will help the NHS design and deliver health services of the future.

Salt and Blood Pressure: Is the Link Causal?

Richard Lilford, ARC WM Director

High salt intake is associated with high blood pressure across individuals and populations. Also, short-term experiments show that high salt loads lead to hypertension that is reversible. Neither of these two observation types provide “game, set and match”, however. The short-term effects might be different to any long-term effects. Further, the observational studies may be subject to a lurking confounding variable. However, if long standing hypertension could be reversed by a low salt diet, then this would be news in itself, as well as further evidence for the salt theory of hypertension.

I therefore read the systematic review of randomised trials of reduction in dietary sodium by Huang and others in the BMJ with great interest.[1] They looked at no less than 133 randomised trials, including over 12,000 participants. The trials were all of high quality

What do they show? Reducing salt intake lowers blood pressure; there is a dose response effect. The longer the trial, the larger the reduction in blood pressure. The higher the blood pressure at baseline, the greater the reduction observed.

This is useful information for clinical practice and adds further evidence in favour of the salt hypothesis.

Reference:

1. Huang L, Trieu K, Yoshimura S, et al. [Effect of dose and duration of reduction in dietary sodium on blood pressure levels: systematic review and meta-analysis of randomised trials.](#) *BMJ.* 2020; **368**: m315.



Proportionate Review: Tales of the BEEM Trial

Theme 4: Maternity Services



Sara Kenyon, Professor in Evidence-Based Maternity Care

As researchers we accept that obtaining approvals and permissions to undertake studies is part of our working lives. The Health Research Authority (HRA) was set up in 2015 to “*make the UK a great place to do health research, to build confidence and participation in health research, and so improve the nation’s health*”. It brings together the assessment of legal compliance and ethical review of research in health and social care in England, and they work closely with the other countries in the UK to provide a UK-wide system. They provide guidance and tools to support decision-making.

We wonder if our recent experience over obtaining permissions for the BEEM trial will resonate with others. A few years ago the Maternity Theme for NIHR CLAHRC West Midlands worked with local community midwives to standardise the quality and content of their discussions with healthy, low-risk women about their place of birth options. We used COM-B theory [1] to underpin intervention

development and showed an improvement in community midwives’ knowledge and confidence with a package that consisted of a face-to-face update session and ongoing support from a fellow member of the community midwifery team.[2] We have since gone on to develop an e-Learning for Health session with the Royal College of Midwives, which is accessible by all midwives (e-lfh.org.uk/programmes/place-of-birth/).

In February 2019 we were approached by the Black Country Local Maternity System (LMS), who wanted to mandate this session for all of their community midwives. The LMS consists of four maternity hospitals, with nearly 20,000 births each year, and employing approximately 200 community midwives, thus it gave us an opportunity to more robustly evaluate the package.

After discussion with the Heads of Midwifery we agreed to undertake a cluster randomised

controlled trial, incorporating a modified Solomon design. This would explore whether a Place of Birth lead midwife, in addition to a mandated e-learning session, further improves the fact-based knowledge of community midwives on place of birth options for healthy, low-risk women. Knowledge is being assessed by a questionnaire consisting of eight

questions. The unit of randomisation will be the community midwifery team within each of the four participating NHS Trusts, stratifying within each to ensure that each Trust has the opportunity to have a Place of Birth lead midwife within a randomised number of teams, as these vary in number and size. The table below shows the study design.

	No. Teams	Pre-questionnaire	e-Learning Package	Place of Birth Lead	6-month questionnaire
ARM 1	7		✓		✓
ARM 2	6	✓	✓		✓
ARM 3	7		✓	✓	✓
ARM 4	7	✓	✓	✓	✓

We know that using a questionnaire before and after training is, in itself, likely to improve participants’ knowledge, so we have used a research design to account for this ‘pre-test sensitisation’.[3] In a ‘pure’ Solomon design some community midwives would have been excluded from completing the e-learning session, so the Solomon design has been modified to allow all teams to complete the session.[4]

Undertaking research with NHS staff does not require approval from the NHS Research Ethics Committee, as defined by the [HRA decision tool](#) for that purpose, but we do require peer review of the study as part of approval by the University of Birmingham (UoB) Ethical committee. This usually takes about eight weeks. As the study design was randomised we are required to have HRA approval, as well as approvals in each of the maternity units to undertake this work.

We co-designed the trial with community matrons from each maternity unit during the summer of 2019; developed a peer-reviewed protocol; and had University of Birmingham ethical permission in place by the middle of October 2019. Since then we have been battling with the HRA and the Research and Development Departments of local maternity units, with final

permissions still not in place as of March 2020.

We began with the HRA process in the autumn by completing the electronic application form – we are not alone in finding the guidance on the HRA website confusing.[5] There were numerous iterations of the application between research governance at UoB and the research team, and it was submitted following UoB ethical approval in early November 2019. While some elements of research permissions processes have set time-lines, once a project is submitted to HRA there is no specified time-frame for researchers to be made aware of the outcome and so we sat and waited. Early in 2020 the HRA were contacted and an apology received, followed eventually by a favourable outcome on 16th January – some ten weeks after submission.

Then begun our final hurdle, which required HRA approval to already be in place, and that is to obtain approval from each of the Research and Development departments of the participating hospitals. Initial exploration on the Trust websites as to who to contact in order to find out what documentation was required was only correct for two of the four Trusts. All of the contacts were sent a standard set of documents and all responded asking for different additional

information. Once again there is no time-frame for us to expect permissions to be in place. Some eight weeks after HRA approval, local permissions are now almost in place. However, the trial has been halted in consultation with clinicians due to the impact of COVID-19. The total time taken for these permissions to be obtained has been 18 weeks to date.

Others have found that this process to be time-consuming, frustrating and a cause of delays. [5] The excessive bureaucracy has created a new industry of people supporting the process and the delays have increased the costs. Petrova and Barclay recently described a 'low key' study that involved 89 professionals in order to approve it! [6] It seems to us that our desire to undertake this study using a randomised and more robust design (thus deeming it research) has caused this five month delay for what is, essentially, an evaluation of a mandated 15-20 minute e-learning session and completion of a short questionnaire to assess knowledge of community midwives. Luckily the heads of midwifery have been very patient and understanding, but that might not have been the case.

While we have not explicitly collected how long this has taken, considerable time and resources have been spent in this process. Some would say it is disproportionate for relatively low-risk trials of staff training to require the same level of detail and review as drug trials involving changes to clinical care and potential risk to participants. The HRA have acknowledged this, and additional templates are now available, but they don't account for this type of study design. In the instance of our BEEM trial our question is: is this proportionate review? Have the delays we have encountered protected the participants?

Solutions are complex in order to expedite change to simplify research approval processes. These might include the development of a broad range of templates so researchers are not forced to use unsuitable ones or duplicate effort; time-frames for the approvals process; systems of more proportionate review; improved information and training for researchers; and ideally more evidence of the cost to researchers (both in terms of time and money) of the current process. Others may have additional ideas. Comments please to S.Kenyon@bham.ac.uk.

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Dreaming of Early Retirement?

Peter Chilton, Research Fellow

For people entering their 60s thoughts may turn to the prospect of retirement, with dreams of spending more time travelling, in their garden, etc. Many might be tempted to take early retirement, if they are in a position to allow it. However, could there be a negative effect from an early and permanent loss of an individual's work life?

Kuhn and colleagues looked at the effect an early retirement could have on a person's mortality.[1] They were able to account for the possibility of earlier retirement being taken by people with poorer health (and thus a higher mortality risk), due to a policy change in the unemployment insurance system of Austria during the 1980s. This change allowed those in eligible regions of the country to retire three years earlier than those who were ineligible. The time-frame of the change also allowed the authors to follow individuals over many years.

Analysis of administrative data showed that eligible men retired, on average, 5.5 months earlier, while women retired 8.5 months earlier. The authors found that retiring one year early resulted in a 5.5% increase in the risk of premature death in men (i.e. before the age of 73), corresponding to a loss of 2.2 months of life, but there was no significant change in risk for women. It is unknown why this difference is seen, but the authors suggest a number of possibilities, including that women can cope better with major life events, have healthier lifestyle changes post-retirement, or that they do not suffer from a loss of social status to the same extent as men.

The authors posit a number of possible reasons for the increased risk, but none are conclusive. Of course, for some people, reducing life expectancy by a couple of months might be a fair trade-off to have three extra years to do whatever they want.

Reference:

1. Kuhn A, Staubli S, Wuellrich J-P, Zweimüller J. [Fatal attraction? Extended unemployment benefits, labor force exits, and mortality.](#) *J Public Econ.* 2019.

Community-Based Organisations in the Health Sector: A Corker of a Paper

Richard Lilford, ARC WM Director

I thank my colleague Joydeepa Darlong for drawing my attention to this important article,^[1] where Wilson, Lavis and Guta have tackled the ‘Tower of Babel’ that is community organisations involved in health. Their approach was to conduct a scoping literature review and use the findings to develop a classification or taxonomy for this type of intervention. Although they searched no less than 18 databases, they found only 186 articles that enabled them to identify characteristics of community-based organisations or networks. The most common issues were HIV, mental health, addictions and unspecified populations. The great majority of the literature came from high-income countries.

Community organisations involve local people in the planning and implementing of policies that affect them, and thus enable a key principle of the Declaration of Alma-Ata.^[2]

Five criteria have been proposed for a community organisation:

1. Organised to some degree.
2. Separate from government.
3. Non-profit distributing.
4. Self governing.
5. Voluntary, at least to some degree.

In around one-quarter of cases the methodology of the included articles was entirely theory-based; a further quarter were based on case studies; and the remaining half were based on qualitative methods or quantitative surveys.

This is a very useful study, and describes some of the important features that a community organisation may, or may not, have. I was rather surprised, however, to find that women’s groups, which have been widely used and evaluated for maternity care,^[3] did not make it on to the list. Likewise, there seems no mention of peer support in the community for conditions such as diabetes. I am the chief investigator on an NIHR study on leprosy, and there is absolutely no mention of the extensive networks of self-help groups that have come into existence for this condition around the world. In fact many of these groups have expanded to include other conditions and other severely marginalised people. Still less, is any mention of microeconomic interventions, many of which are relevant to health as well as social and wealth outcomes.

I guess all this adds to the evidence that community groups cover a very wide range of conditions and methods. It is perhaps more useful to articulate the principles that are involved in a particular case, rather than to use a portmanteau term such as ‘community group’ or ‘community network’.

And what are these principles?

First, seek to empower local people so that the facilitator or mentor of the group becomes increasingly redundant.

Second, create peer leaders to act as role models and peer educators.

Third, encourage local innovation and originality.

Fourth, if the intervention is largely health related, ensure that this is coupled to the health system.

Fifth, any organisation is political, so do the political work that is necessary to establish the community.

Sixth, and by extension of the previous point, engage not just the target population, but also the power structures that influence the community within which the target group is situated.

Seventh, ensure that the practical means for group activity are available; for example, if the group is highly dispersed, then consider information technology.

These are the main principles that I have found in the literature. I strongly encourage News Blog readers to add or subtract. However, based on my experience I would like to add two further requirements. First, If making an investment, do not withdraw the investment suddenly, but rather phase it out. Second, do not assume that the intervention to create a self-sustaining network will always work well. For example, a network may internalise bad habits and behaviour, just as it can promote good behaviour. An intervention targeted at one marginalised group may arouse resentment among others in the community. So always evaluate, preferably with an independent evaluator, and take a wide-angle lens when doing so.

References:

1. Wilson MG, Lavis JN, Guta A. [Community-based organizations in the health sector: A scoping review](#). *Health Res Policy Sys.* 2012; **10**: 36.
2. International Conference on Primary Health Care. [Declaration of Alma-Ata.](#) 1978.
3. Prost A, Colbourn T, Seward N, et al. [Women's groups practising participatory learning and action to improve maternal and newborn health in resource-limited settings: systematic review and meta-analysis](#). *Lancet.* 2013; **381**(9879): 1736-46.

ARC WM Quiz

Which animal is thought to have passaged COVID-19 from bats to humans?

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



Answer to our previous quiz: Wilhelm Röntgen discovered X-rays in November 1895 (also known as Röntgen rays) Congratulations to all those who answered correctly.

Explaining COVID-19 Statistics to Children

Celia Brown, Associate Professor of Quantitative Research

This blog is a mixture of information for parents, and information and activities for children (aged 8-13). Some activities have different versions for older (10-13) and younger (8-10) children, so please read it through and see which parts may work for your family. The idea is for you to go through this together, with parents explaining what I have written where

needed, then children doing the activities. I have purposefully not considered the risk of death related to COVID-19. Please consider the well-being of your family before talking to them about COVID-19 – this blog may not be suitable for all at this time. The answers can be found at the end of this PDF.

Introduction

Another day, another COVID-19 statistic in the news. This pandemic is affecting us all in many, many ways. Fortunately I do not have any serious problems, but as someone used to getting out-and-about every day, I am struggling with “lock-down” and I am sure I am not alone in having my mental health stretched to the limit. But as I tried to explain the risk of catching COVID-19

to my six-year old son (okay that’s not on the national curriculum but we must be allowed a little flexibility when home-schooling, surely?) and a prompt from our PPIE Lead Magdalena Skrybant, I thought finding a way of representing this risk to children would make a good blog.

How Many People in the UK have COVID-19?

As of April 16th 2020, there were a total of **103,093** confirmed cases of COVID-19 in the UK (Public Health England statistics). A “confirmed case” is where someone has had a positive test for COVID-19.

1. *For older children: why might this number of cases be an underestimate of the true number, and how could we find out the true number of cases in the UK?*

What Fraction of the UK Population Have COVID-19?

To work out what fraction of the UK population had COVID-19 on April 16th (or had had it by then) we also need to know how not only the number of confirmed cases, but also how many people there are in the UK. We can use the 2018 estimate of the **UK population of 67,780,000** from the virus-tracking website: virusncov.com.

To make the maths a little easier, let’s simplify things a bit by rounding down the number of **confirmed cases to 100,000**. This number of people would fill both Wembley stadium AND Colchester Community Football Stadium.



To work out the fraction of the UK population who have had a positive test (confirmed cases), we need to divide the number of confirmed cases by the UK population:

$$\frac{100,000}{67,780,000}$$

2a **For older children:** Can you simplify this fraction?

2b **For younger children:** Can you cross off as many 0s from this fraction as possible – but the number of 0s you cross off from the top **MUST** be the same as the number of 0s you cross off from the bottom.



Image: Jeremy Weate, 2011 (CC-BY 2.0)

What does this result mean? Out of every 6,778 people, 10 would be infected with COVID-19. This is equivalent to 10 people being infected from a full capacity crowd on Centre Court at Queen's Tennis Club in London.

We can also show this statistic as a proportion by **dividing 10 by 6,778**.

3. Can you do this on a calculator?

We can show this as a percentage by multiplying this result by 100.

4a **For older children:** Can you do this without a calculator? Hint: move the decimal point to the right, the same number of places as there are 0s in 100.

4b **For younger children:** Can you do this using a calculator?

This Seems a Very Low Number - What's All the Fuss About?

As a comparator, Cancer Research UK suggest that around 0.5% of the population will be diagnosed with cancer this year, just over 3 times the number of confirmed cases of COVID-19 by 16th April.

The problems are:

- A. The number of people each person will go onto infect. The World Health Organization say this could be as many as 3 people.
- B. The speed at which these new people get infected. This is around 5 days.
- C. The (unknown) number of people who have (or have had) COVID-19 but who haven't had a positive test, probably because they only

had mild symptoms. These people can still pass it on to others.

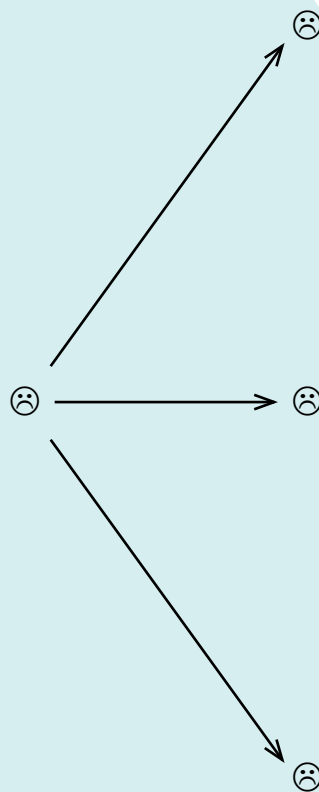
- D. The severity of the disease (how poorly it can make you).

Simple summary: We think that anyone who gets COVID-19 will pass it on to 3 other people in 5 days.

So if we start with 1 person infected with COVID-19 on day 0, by day 5, 4 will be infected (the original person, plus the 3 people that person infected).

5. Can you complete the diagram below to find how many people will be infected by the end of 15 days (just over two weeks)?

	Day 0	Day 5	Day 10	Day 15
Total people infected	1	$(3+1) = 4$		



There's quite a complicated formula to work this out for any given number of 5 day periods. The diagram hopefully gave you an indication of the speed at which the number of people infected would increase if no measures to stop COVID-19 spreading were put in place.

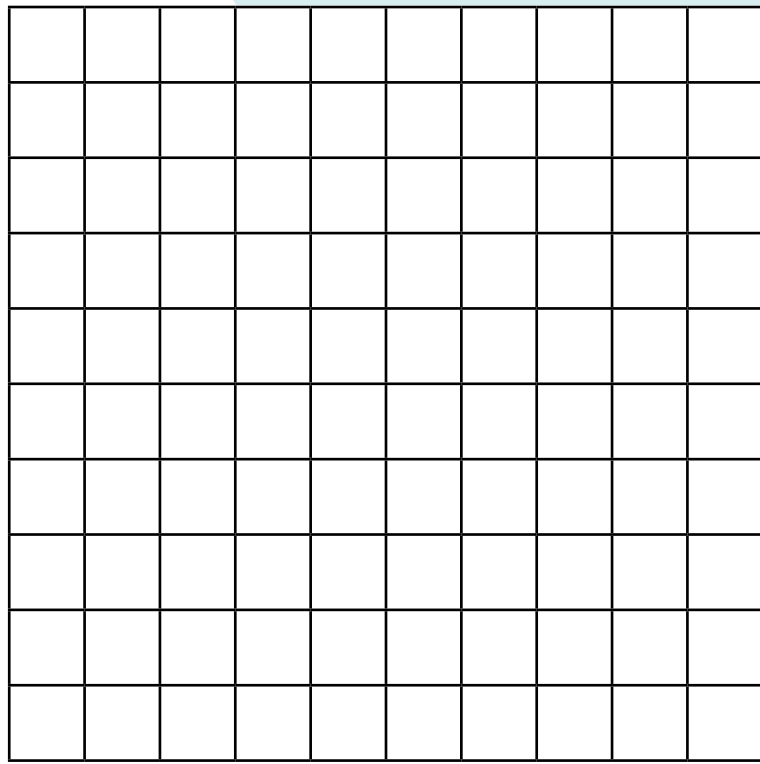
In fact, without any action, almost the entire nation of 67 million people would be infected by day 80 (which is why we are all at home and going out – where we can be in contact with others – as little as possible).

Now we need to think about how poorly COVID-19 can make you. Of **100 people infected**, around **80** would have mild symptoms, **15** would have severe symptoms and **5** would be in a “critical” condition, needing ventilation. Most people who get COVID-19 will recover fairly quickly without

any lasting impact on their health – and this applies to almost all children who are infected. The elderly, smokers and those with other health problems are more likely to be very poorly if they get COVID-19, which is why you may not be able to see your grandparents at the moment.

6a For older children: Can you draw a pie chart to show these data (by hand or using Excel)? Given 103,093 cases, how many would be mild, how many severe and how many critical?

6b For younger children: Can you colour in the correct number of squares of the diagram below to show each of these numbers? Use green for mild, orange for severe and red for critical.



The speed of spread of COVID-19, together with its severity, makes it easy to see how the NHS would quickly be unable to cope if nothing was being done. So I'm off to wash my hands, and perhaps you should too!



NIHR shared commitment to public involvement, participation and engagement during the COVID-19 pandemic: *Response from NIHR ARC WM*

Magdalena Skrybant, PPIE Lead

On 16th April 2020, the NIHR confirmed its commitment to Public Involvement, Engagement and Participation (PIE) during the COVID-19 pandemic. You can read the full statement [online](#). The new Director for the Public Voice, [Jeremy Taylor](#), stated:

“Health research should be a shared enterprise with patients, carers and communities. COVID-19 has not changed this. Indeed, the public contribution to research on the pandemic is vital. Let’s renew our commitment to partnership working.”

The Senior Leadership Team for NIHR have developed [eight Commitments](#), which are aligned to the [UK Standards for Public Involvement](#). The Commitments will help ensure that PIE is maintained and progressed during this period.

We at NIHR ARC WM share this commitment to maintain and progress PIE during this period. The examples below demonstrate how we are

doing this at this time. We will continue to work with our public contributors and the wider ARC WM community to shape not only how we maintain meaningful involvement, engagement and participation during these challenging times, but also how we encourage innovation and development.

Now, more than ever, we need to work in partnership with our local communities to ensure that we continue to improve the way health and social care is designed and delivered.

Our Commitment will be available on our ARC WM website and this will be a living document, which we will continue to develop.

If you would like further information about our approach to Public Involvement, Engagement and Participation, please contact our Public Involvement Lead, Magdalena Skrybant (m.t.skrybant@bham.ac.uk).

We will stay informed and keep contributors and colleagues informed – in a timely way – of developments across NIHR research (commissioning and programmes) that relate, or are relevant to, COVID-19 (UKPI Standards: Communication).



National COVID-19 research and opportunities

Our Public Involvement Lead, Magdalena Skrybant, has already circulated opportunities for involvement in national COVID-19 initiatives and will continue to share these as they become available through national networks. This includes the NIHR 'Be Part of Research' website, which has been updated in response to COVID-19.

ARC WM COVID-19 research

Through regular communications, public contributors in the ARC WM community will be sent information on how each Theme is working during COVID-19, including information on any COVID-19 projects.

Feedback will be provided to public contributors that are involved in COVID-19 related projects in a timely manner.

We will reach out to emerging COVID-19 and other research funding programmes and activities to offer support and help facilitate effective PIE, including helping to adapt methods and approaches where needed (UKPI Standards: Support & Learning).



ARC WM's Public Involvement Lead is the first point of contact for researchers wanting to involve/engage the public in research. The Public Involvement Lead will provide ongoing support to researchers with suggestions for how the public can be involved in shaping the research and discussing mechanisms for involvement, which are informed by discussions with public contributors in the ARC WM network.

Our Public Involvement Lead has sent communications (via email/post) to public contributors, and is also contacting them on an individual basis to identify preferred means of communication during this period, as well as to identify any barriers to involvement, engagement and participation and how these might be overcome.

We will involve the public and patients in planning ahead for how COVID-19 may affect work, to develop contingencies and to manage risks (UKPI Standards: Governance).



ARC WM has recently recruited public contributors to be either Community and Public Involvement Contributors (16 Advisors recruited) or members of the wider ARC WM community.

ARC WM's Public Involvement Lead will ensure that there is regular communication with our Contributors and keep them updated with developments in ARC WM.

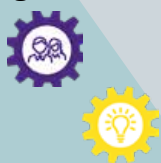
ARC WM Community and Public involvement contributors have received a letter from ARC WM Director, Richard Lilford. Throughout this period, ARC WM Contributors will receive a virtual induction to ARC WM, as well as each of the Themes, and a range of materials will be made available.

We will be flexible, and co-develop adaptive ways of working, which demonstrate understanding of – and are responsive to – the needs and concerns of individuals, groups and communities whilst respecting Government and institutional guidance (*UKPI Standards: Working Together*).



ARC WM's Public Involvement Lead will continue to work with researchers and public contributors to identify and develop appropriate and practical ways of working in the current situation. This includes using electronic communication, video conferencing platforms and mail or telephone communication.

We will identify and review support needs for adaptive ways of working (e.g. remote or digital) and work together to address these (*UKPI Standards: Inclusive Opportunities; Support & Learning*).



ARC WM's Public Involvement Lead will be responsible for gathering feedback from researchers and public contributors on the methods of communication from ARC WM and different ways of working.

Where relevant, support/guidance may be created and shared on alternative ways of working (e.g. how to use digital technologies). In particular, ARC WM's Public Involvement Lead will ensure that mechanisms for involvement are as inclusive as they can be.

Reporting what works and what doesn't work on the platform curated by the Research Design Service on alternative ways of conducting Public Involvement during COVID-19.

We will share skills, knowledge, ideas and resources freely and in a timely way to support effective PIE, and to help identify and address obstacles across the system (*UKPI Standards: Support & Learning*).



ARC WM's News Blog will serve as a platform for sharing and discussing the latest resources, either those developed by NIHR ARC WM or outside NIHR ARC WM, with the wider ARC WM community. Information will also be made available on the Public Involvement pages of the NIHR ARC WM website.

Any resources created by ARC WM relating to public involvement during COVID-19 will be uploaded to the NIHR Learning for Involvement website.

ARC WM's experiences of working with public contributors during COVID-19 will be uploaded on the shared resource curated by Research Design Service West Midlands, to share learnings/best practice on PIE during COVID-19.

Resources will also be shared through various communities, including the West Midland's regional network for Public Involvement, Public Involvement and Lay Accountability in Research (PILAR), and the network of ARC Public Involvement Leads. Being part of such communities is an effective way for sharing resources/best practice relating to public involvement in COVID-19.

We will ensure that patient and public contributors continue to be recognised and rewarded appropriately for their effort, and adapt how we do this together (*UKPI Standards: Impact; Working Together*).



ARC WM will uphold existing mechanisms for recognising public contributors for their input to research projects. This includes acknowledgements in reports, publications.

Public contributors will continue to be offered an honorarium for involvement and any out-of-pocket expenses will be reimbursed. Researchers in ARC WM will use the 'Opportunity for Involvement' template to ensure that, prior to undertaking an involvement activity, there is transparency about the nature of the involvement and expected commitment.

ARC WM's Public Involvement Lead will work with host institutions to ensure that, wherever possible, payment will be timely. If there are delays in processing payments, communication will be maintained with public contributors throughout.

We will agree appropriate contact plans (e.g. between public/patient contributors and Leads, or between Leads), to support each other's social contact and emotional wellbeing (*UKPI Standards: Governance; Communication*).



Public Contributors in ARC WM will receive regular communications from ARC WM. ARC WM's Public Contributors are encouraged to provide feedback on the frequency and content of notifications.

In all communications, it is clear that engagement/participation/involvement in NIHR ARC WM activities during this time is completely voluntary and that ARC WM appreciates that contributors may have competing demands on their time. Contributors

will have the opportunity to opt out of receiving communications during this period.

ARC WM's Public Involvement Lead will respond as soon as possible to public contributors and provide signposting to further information/support as appropriate.

Included in communications is information made available through host Universities/NIHR on health and wellbeing during COVID-19.

An Applied Health Research Insider's View of Healthcare Response to COVID-19

Paul Bird, ARC WM Head of Programme Delivery & WM-AHSN Knowledge Mobilisation Lead

Recently our ARC WM Director was relating to me an interview he had heard on the Today programme (BBC Radio 4) with former Prime Minister Tony Blair. Mr Blair made a range of points around the government response to the COVID-19 outbreak, but amongst these he made the point that in extraordinary circumstances such as this, the traditional silos of government departments were not fit for purpose. He suggested a more fluid arrangement was needed with greater cooperation between departments, or perhaps a specific Minister in charge of the COVID response.

This led me to reflect on changes within the University Hospitals Birmingham NHS Foundation Trust, the organisation to which I have returned in order help with their COVID-19 response, and which has afforded me a privileged insight in to their response. With perhaps seven days lag time to learn from the London experience of the outbreak, the Trust delivered a transformational shift in the model of care. Firstly, whilst still strategically working as a single organisation, the decision was made to move to a site-based model across the four hospitals (Queen Elizabeth Hospital Birmingham, Heartlands Hospital, Good Hope Hospital, and Solihull Hospital). To support this, a team of four Senior Responsible Clinicians were appointed to run each site 24 hours a day, seven days a week, with four senior operational managers to work alongside them (of which I am one at the Queen Elizabeth Hospital). So one immediate organisational assumption was that specialist leadership was required, but that this leadership could be across clinical specialties, rather than just within them, as had previously been the case.

Secondly, there was an immediate move to a 24/7 consultant-delivered model of care. This means that a resident consultant will take leadership across each of the six floors of the hospital, whereas previously out-of-hours cover was often provided by more junior grades and/or through non-resident on-call arrangements.

Thirdly, and necessitated by this move to floor-based working, is a more generalised approach to care in order to free up enough clinicians to deliver a resident 24/7 consultant-delivered model. For instance, the clinical consultant lead for a floor might be a colorectal surgeon, who would also be looking after patients from liver surgery, urology and general surgery. Specialist advice is, of course, still available through colleagues, but the consultant lead is responsible for the primary oversight of clinical care for these patients.

Fourth, linked both to the huge requirement for support in the Emergency Department and the Intensive Care Unit as a consequence of the outbreak, some clinicians have been temporarily redeployed to other specialties from those in which they routinely deliver care. This has also necessitated some 'acting down': clearly, however experienced a consultant is in any other area, they are unlikely to be able to operate at the same level in a new area. This breaking of traditional hierarchy has been fascinating to watch, with both great humility being shown by many of those doing so, and considerable zeal for the challenge of working in new areas and with new teams.

This transformational shift in hierarchy and silos of care has been embraced by the overwhelming majority of the clinical teams with the predominant attitude being “we can’t go back to the way we used to work”. Of course, in some ways the biggest organisational challenges still lie ahead: for instance how do you maintain the best elements of this new model and at the same time begin to re-introduce elements of specialist and standard care, such as surgery, whilst maintaining the flexibility to revert back to a full pandemic response model in the

case of a second peak or new outbreak? For applied health researchers there are a wealth of topics to explore around which of the changes endure, and which have the greatest impact in the short, medium and long term. As an ARC we hope to provide leadership on this, in turn rapidly disseminating our findings through partners, such as the West Midlands Academic Health Science Network, to shape future service transformation and pandemic response.

Latest News

Researchers from ARC WM Theme 6 recently published a [systematic review](#) looking at the risk of COVID-19 transmission to rescuers delivering treatment for cardiac arrest. This review has informed the International Liaison Committee on Resuscitation (ILCOR) treatment recommendations on COVID-19, which can be read at: ilcor.org/news/covid-19.



Recent Publications

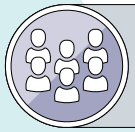
Couper K, Taylor-Phillips S, Grove A, Freeman K, Osokogu O, Court R, Mehrabian A, Morley P, Nolan JP, Soar J, Perkins GD. [COVID-19 in cardiac arrest and infection risk to rescuers: a systematic review](#). *Resuscitation*. 2020.

Humphries C, Jaganathan S, Panniyammakal J, Singh S, Dorairaj P, Price M, Gill P, Greenfield S, Lilford R, Manaseki-Holland S. [Investigating discharge communication for chronic disease patients in three hospitals in India](#). *PLoS One*. 2020; **15**(4): e0230438.

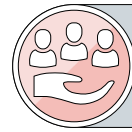
Ingram J, Thomson G, Johnson D, Clarke JL, Trickey H, Hoddinott P, Dombrowski SU, Jolly K, ABA Study Team. [Women’s and peer supporters’ experiences of an assets-based peer support intervention for increasing breastfeeding initiation and continuation: A qualitative study](#). *Health Expect*. 2020.

Knight T, Malyon A, Fritz Z, Subbe C, Cooksley T, Holland M, Lasserson D. [Advance care planning in patients referred to hospital for acute medical care: Results of a national day of care survey](#). *EClinicalMedicine*. 2020; **19**: 100245.

ARC WM Themes Update



7 Public Health



8 Social Care

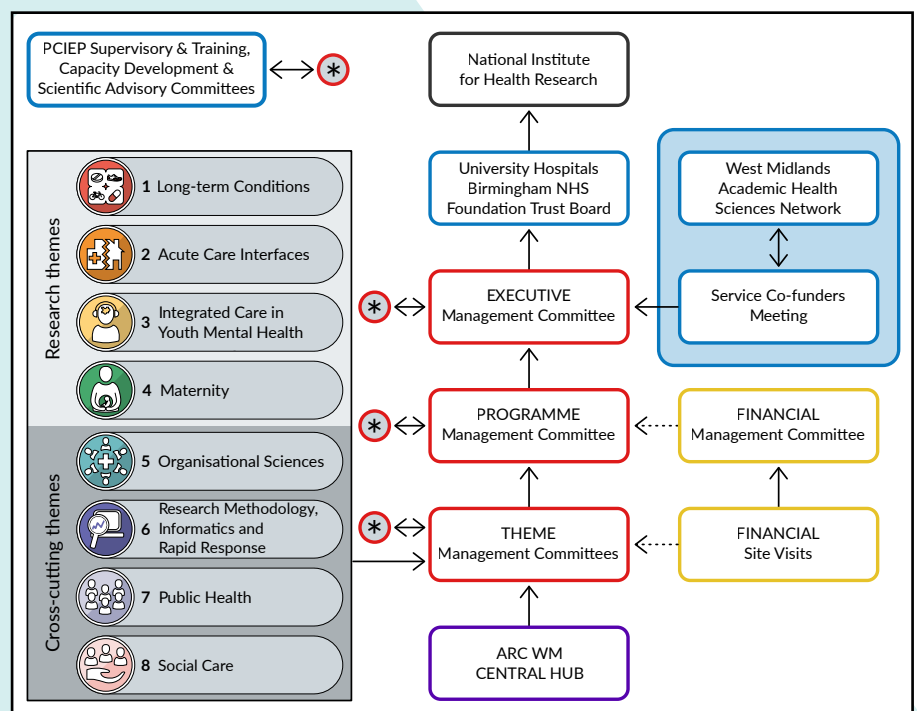
In our last News Blog we announced that the NIHR have approved the addition of two new cross-cutting Themes for **Public Health** (co-led by Prof Aileen Clarke and Prof Kate Jolly) and **Social Care** (led by Prof Robin Miller). This development has arisen from a number of factors that became apparent as we progressed through our first few months.

The first of these was the structure of the bid. We had originally designed Public Health and Social Care to permeate all our Themes, as this appeared to be the best way to represent our commitment to research focused in these areas. Upon review, NIHR suggested we take this further and give Public Health and Social Care more prominence in order to draw out the research potential. Accordingly, we asked Profs Clarke, Jolly and Miller to become our leads, amended our costs to provide more resource and included training capacity.

However, as the first few months of ARC WM passed, this structure began to

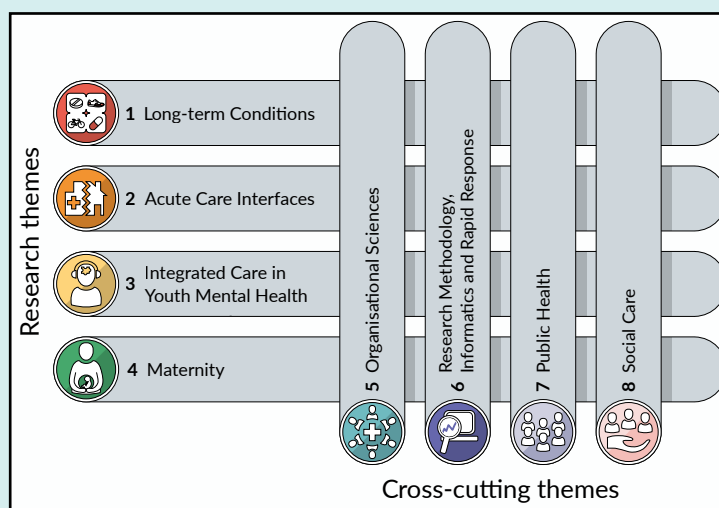
seem unwieldy. We had a considerable amount of activity taking place in Public Health and Social Care that could not adequately be expressed via any of the other Themes, yet there was no alternative available. This led to our second reason for making a change: Public Health and Social Care were taking off as research areas in their own right. Both were continuing to feed into projects across the Themes but, as found in the other cross-cutting Themes (Organisational Science and Methodology, Informatics and Rapid Response), they were also developing research ideas that required more focused exploration.

Our ARC WM Programme Management Committee meets every two months and by the second of these meetings in February 2020, the issues outlined above were beginning to impact on effective reporting of activities. The matter was discussed by the team and resulted in the unanimous agreement that Public Health and Social Care should be incorporated as cross-cutting Themes in their own right. NIHR agreed to our request and asked for the amendment to be included in a variation to contract. Thus the new Theme 7 (Public Health) and Theme 8 (Social Care) will become formalised in our structure and we will be able to report on their



activities independently, as well as noting their excellent work in the four substantive Themes of Long Term Conditions, Acute Care Interfaces, Youth Mental Health and Maternity.

The new ARC WM structure is represented in the accompanying diagrams.



Reader's Reply

Re: Radical Changes in Medical Education. *ARC WM News Blog*. 2020; **2**(3): 11-12.

The theory of online learning for pre-clinical studies is just about to undergo a natural experiment (albeit one with a big potential confounder). With moving all of term 3 material online, we can compare performance in exams between what was taught before this (face-to-face) and what was taught online, using previous years and/or question standards (pass marks) as a comparator (differences

in differences approach). Okay, the online material will never be optimal (as it wasn't designed to be taught that way), but it may be interesting. I also think it is essential to think about the social aspects of learning. My personal tutor group at Warwick support each other in their learning in many ways; support they would probably not give or receive in a full online setting. One potential reason for the BAME

attainment gap is their learning peer groups, so we know that the social aspects of learning do matter.

(I also think the anatomists would disagree with you, and I am sure that engagement with epi and stats is much better when we can deliver face-to-face with experiments and enthusiasm.)

-- Celia Brown, University of Warwick

Latest Funding Opportunities

COVID-19 Urgent Public Health Research is currently being prioritised and provided with government support to prioritise, coordinate and deliver these studies, regardless of funding source. More information can be found [online](#).

The NIHR have the following new funding opportunities available:

NIHR Academy:

- [Doctoral Fellowship Round 4](#).
- [Advanced Fellowship Round 4](#).

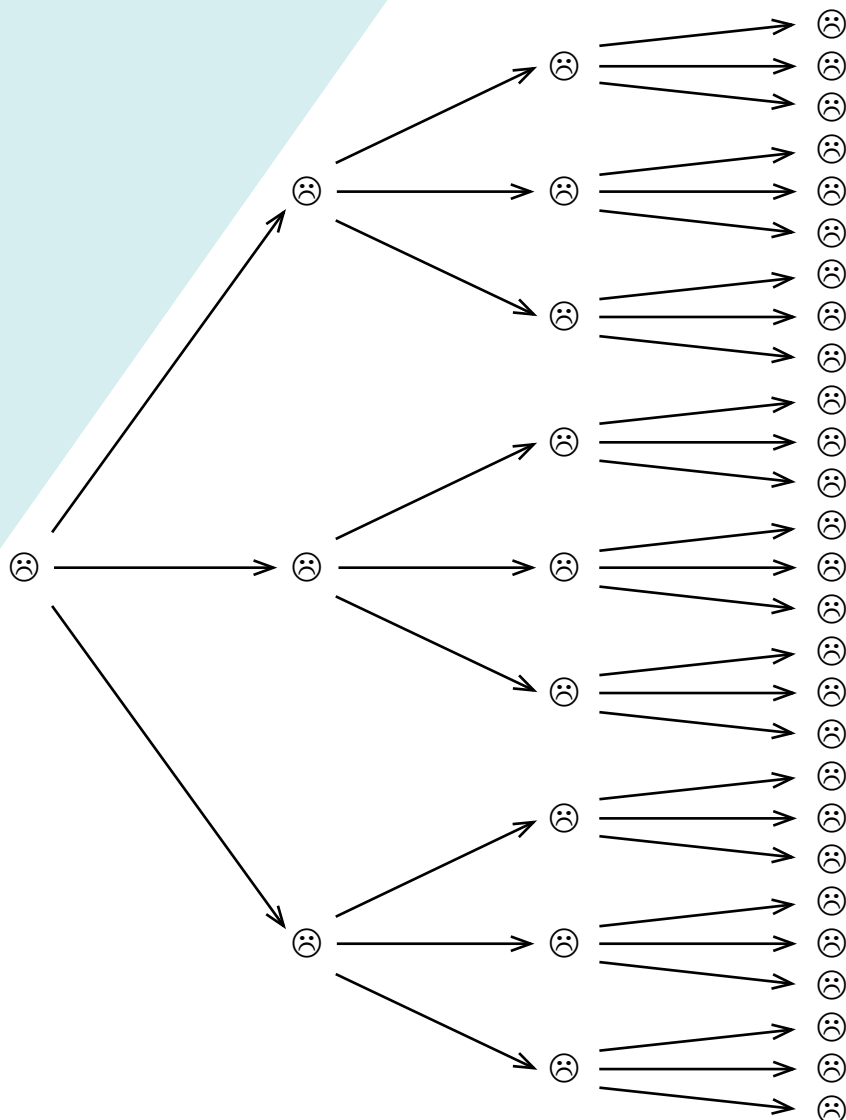
Policy Research Programme:

- [Translating Research into Policy \(TRiP\)](#).

Statistics Answers

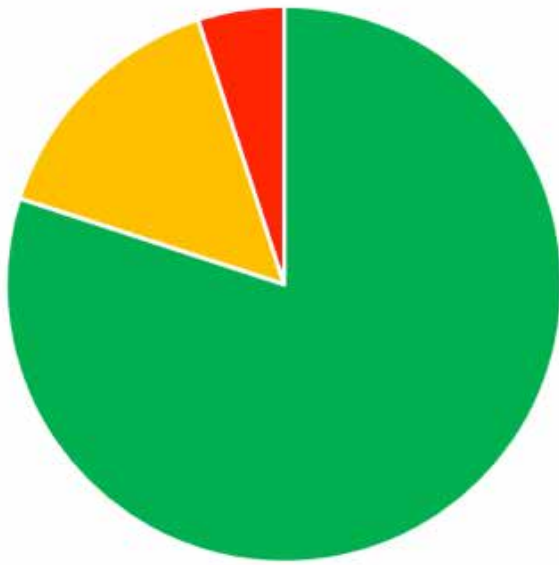
- The number of cases is likely to be an underestimate because the number of confirmed cases depends on the number of tests done and not everyone has been tested. We would only know the true number of cases if everyone in the country was tested in a single day: this would give us the point prevalence.
- $10/6,778$ (or $5/3,389$) – there are four 0s top and bottom which can be “cancelled”.
- 0.00148
- 0.148%. This means that around 0.15% of the population had a confirmed case of COVID-19 by 16th April.
- 40 people (for adults, you can also calculate this using the formula: $\sum_{i=1}^n 3^{i-1}$ where i is period number and n is total number of periods).

	Day 0	Day 5	Day 10	Day 15
Total people infected	1	$(3+1) = 4$	$(9+4) = 13$	$(13 + 27) = 40$



6. 82,474 mild cases, 15,464 severe cases and 5,145 critical cases, all to the nearest whole number (103,093 x 0.8, 0.15 and 0.05, respectively).

Pie chart to show severity of COVID-19 cases



- Mild (pie chart angle 288 degrees)
- Severe (pie chart angle 54 degrees)
- Critical (pie chart angle 18 degrees)

