

this week

NERVOUS SHOCK page 380 • **DATA TRANSPARENCY** page 382 • **PHE REPORT** page 386



ATTA KENARE/AFP/GETTY IMAGES

“Very real” risk of covid-19 resurgence

Lockdown measures may have averted 3.1 million deaths from covid-19 across 11 European countries, including 470 000 in the UK, a new modelling study indicates.

However, the researchers warn that Europe is very far from achieving herd immunity, as less than 4% of the population was infected with the virus up to 4 May, when lockdowns started to be lifted. The estimated proportion of the population infected varies from less than 1% in Norway, Germany, and Austria to 8% in Belgium.

Seth Flaxman, a study author from Imperial College London’s mathematics department, said, “We are very far from herd immunity. The risk of a second wave if all interventions are abandoned is very real.” He added, “We are only at the beginning of this epidemic, and claims that it’s all over can be firmly rejected.”

The research, published in *Nature*, estimated that between 12 million and 15 million people were infected in Austria, Belgium, the UK, Denmark, France, Germany, Italy, Norway, Spain, Sweden, and Switzerland up to the beginning of May.

Between 2 and 29 March European states began implementing non-pharmaceutical interventions to control the epidemic. These included social distancing, banning large

gatherings, closing schools, and stopping all but essential travel. The study says that as interventions were implemented in rapid succession in many countries it is difficult to disentangle the individual effect of each.

The model found that lockdown measures reduced the reproduction number (R value) to less than 1 in all the countries studied, ranging from a mean of 0.44 in Norway to 0.82 in Belgium. The average R value across the 11 countries was 0.66, an 82% reduction on the figure before lockdowns. Study author Samir Bhatt, from Imperial’s faculty of medicine, said, “Lockdown has had a really dramatic effect on reducing the rate of transmission. Without it there would have been many more deaths.”

A second study, also published in *Nature*, estimated that lockdown policies implemented in China, South Korea, Italy, Iran, France, and the US prevented or delayed around 530 million infections. The US researchers estimated that early rates of infection grew by 68% a day in Iran and an average of 38% a day across the other five countries. Using econometric modelling they found that lockdown measures substantially slowed this rate.

Jacqui Wise, London
Cite this as: *BMJ* 2020;369:m2294

Covid-19 infection rates in Iran increased by 68% a day until the country introduced lockdown measures

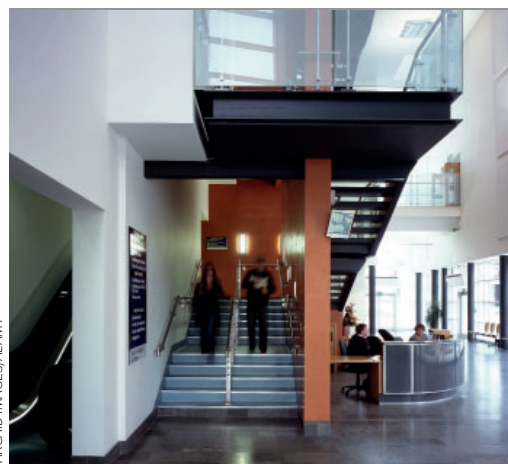
LATEST ONLINE

- Covid-19 test and trace system is not fit for purpose, says independent SAGE
- Man, aged 34, who doesn’t want to live with stoma should be allowed to die, says judge
- Beijing proposes draft law to ban criticism of traditional chinese medicine



SEVEN DAYS IN

Sisters can claim compensation for “nervous shock,” says judge



ARCAD/IMAGES/ALAMY

Two young sisters who saw their father collapse and die from a heart attack have been given the go ahead to claim compensation for psychiatric injuries from the NHS trust that failed to diagnose his coronary artery disease 14 months previously.

Saffron and Mya Paul's claim was struck out by a High Court master, a procedural judge who deals with issues before trial, but a High Court judge overturned that decision on appeal. Mr Justice Chamberlain dismissed suggestions that it could open the floodgates to more claims against the NHS for so called “nervous shock.”

Balbir Kaur Paul and her daughters sued Royal Wolverhampton Trust, alleging it was negligent in failing to diagnose Parminder Singh Paul's ischaemic heart disease and occlusive coronary artery atherosclerosis in November 2012, when he was admitted to New Cross Hospital (left) complaining of jaw and chest pain.

They claim that a coronary revascularisation would have prevented a heart attack in January 2014 when he was shopping with his daughters, then aged 12 and 9, and they would not have suffered the psychiatric injuries from witnessing his death. The trust argues it has no duty of care to the sisters.

Clare Dyer, *The BMJ* Cite this as: [BMJ 2020;369:m2262](#)

Vaccine

Social enterprise will deliver low cost vaccine

Imperial College London announced a new social enterprise, VacEquity Global Health (VGH), to bring its covid-19 vaccine to the world. For the UK and low income countries Imperial and VGH will waive royalties and will charge only modest cost-plus prices to sustain the enterprise's work, accelerate global distribution, and support new research. The enterprise is supported by Morningside Ventures, a private equity and venture capital investment company.

Racism

NHS blood unit is “systematically racist”

An independent investigation into the working conditions in a London unit of the NHS's blood and organ transplant division concluded that the department is “systematically racist” and “psychologically unsafe.” The investigation backed claims of ethnic minority employees that they had faced job discrimination and that white candidates were given posts ahead of better qualified black applicants. The report concluded that the unit was “toxic” and “dysfunctional.”

Inquiries

Petition for public inquiry gathers momentum

Leading scientists and medics called for an inquiry into issues that prevented the UK from responding effectively to covid-19, ahead of a possible second wave this winter. A letter to the *Guardian* newspaper signed by 27 experts, including *The BMJ*'s editor in chief, Fiona Godlee, warned that more patients would die this winter “unless we find quick, practical solutions to some of the structural problems that have made implementing an effective response so difficult.” These problems included the fragmentation of health and social care in England and the failure of Westminster to engage with local government and devolved nations, the letter said.

Virus's impact on ethnic minorities to be studied

The Equality and Human Rights Commission will analyse covid-19's effects on ethnic minorities, to develop evidence based recommendations for action to tackle entrenched racial inequalities. David Isaac (right), commission chair, said, “Now is a once

in a generation opportunity to tackle longstanding entrenched racial inequalities. We intend to use our statutory powers to address the loss of lives and livelihoods of people from different ethnic minorities.”

Global health

DRC faces new Ebola outbreak

The 22 month Ebola outbreak in North Kivu province in the eastern Democratic Republic of the Congo, which has claimed 2268 lives, will be officially over if no new cases appear by 25 June. But six new cases, including four deaths, have been reported 1000 km to the west, in Equateur province. The country of 89 million people has reported 3495 cases of covid-19, including 75 deaths. But health experts worry the measures holding back the coronavirus are hindering efforts against measles, which has killed 6600 people since DRC's epidemic began in January 2019.

WHO worried about antibiotic resistance

The number of countries contributing to WHO's Global Antimicrobial Resistance and Use Surveillance System has risen to 66 in 2020, up from 22 in 2018. But Tedros

Adhanom Ghebreyesus, WHO director general, said it was seeing “more clearly and more worryingly how fast we are losing critically important antimicrobial medicines.” The latest report found that the rate of resistance to ciprofloxacin varied from 8.4% to 92.9% with *E coli* and from 4.1% to 79.4% with *K pneumoniae*.

Breastfeeding

Support for mothers is Europe-wide problem

Only three of 18 European countries have a budget allocated



for implementing the WHO Global Strategy for Infant and Young Child Feeding to improve optimal feeding, an analysis found in the *International Breastfeeding Journal*. Turkey performed the best, followed by Croatia, Ukraine, and Portugal, with Austria last and the UK seventh. Breastfeeding duration is far below WHO recommendations, with an average of 8.7 months, and the International Code of Marketing of Breast-milk Substitutes is frequently violated.



MEDICINE

Face coverings

Use of masks on public transport to be enforced

Bus, coach, train, tram, ferry, and aircraft passengers will have to wear a face covering from 15 June to help reduce transmission, the government announced, to coincide with the next stage of easing restrictions. Transport operators will be able to refuse travel or issue penalty fines to people who fail to wear a face covering, similar to the rules on requiring a ticket for travel.

BMA criticises lack of consultation over masks

The BMA and organisations representing trusts raised concerns about the lack of consultation over a new government announcement that all hospital visitors and outpatients will need to wear face coverings and that hospital staff will need to wear surgical masks from 15 June. Rob Harwood, BMA Consultants Committee chair, said, "Given the lack of PPE supplies throughout the covid-19 pandemic, it is absolutely crucial that the government ensures there are enough supplies of facemasks for staff, and adequate provision of face coverings for outpatients and the public by 15 June."

Revalidation

GMC introduces greater flexibility

The GMC confirmed that doctors' revalidation submission dates had been put back by as much as 12 months because of the coronavirus pandemic. This means that doctors with a revalidation date from 17 March 2020 to 16 March 2021 can delay for as long as a year. Responsible officers can make a revalidation recommendation at any point up to a new revalidation date. The GMC also confirmed that a



missed appraisal as a result of the pandemic should not prevent a recommendation being made.

Care at home

Home based spirometry is rolled out in England

NHS England is giving patients aged 6 and over with cystic fibrosis a spirometer (below) to measure their lung capacity, as well as an app that allows them to



share this information with their doctor for remote monitoring. In a separate trial 150 patients with covid-19 will be given oximeters to use at

home and an app to allow doctors to check whether they need to be readmitted to hospital. If the service proves safe and beneficial for patients it could be rolled out nationally before the winter.

Public health

Lung symptoms improve with cleaner air

One in six people (16%) with lung conditions in the UK noticed that their symptoms improved as levels of air pollution have fallen with the covid-19 lockdown, a survey of 14 000 people by the British Lung Foundation has shown. The foundation and the Taskforce for Lung Health are calling on the government for a long term commitment to reducing air pollution in the UK, by adopting the World Health Organization's legal limits.

Cite this as: *BMJ* 2020;369:m2267

VACCINE

AstraZeneca has signed deals with the Serum Institute of India, the Coalition for Epidemic Preparedness Innovations, and Gavi the Vaccine Alliance to produce

1.3bn doses of its potential covid-19 vaccine, on top of the 1bn doses it's developing with Oxford University



WHAT'S THE DRESS CODE?

The volunteers all work in their uniforms, a conscious move, Fielding says, to have the biggest impact and make staff feel like they're being served by fellow professionals.

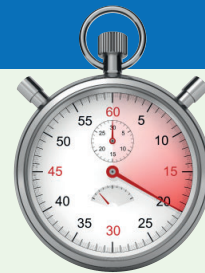
WHAT DO DOCTORS THINK?

They're rating the service first class, it seems. Surgical trainee Fi Lewis tweeted, "We absolutely love ours!" while rheumatology and obstetric medicine trainee Iona Thorne said, "It was fabulous."

Abi Rimmer, *The BMJ*

Cite this as: *BMJ* 2020;369:m2258

SIXTY SECONDS ON... WINGMAN LOUNGES



A PAL'S ROOM ONCE YOU'VE PULLED?

No, not quite. Project Wingman is a scheme providing first class style lounges in NHS hospitals, as a place for staff to take a break.

HOW DID IT LAUNCH?

The project is the brainchild of Dave Fielding, a BA pilot. Speaking at the Risky Business conference on 2 June, he said, "I wondered what I would do when I was grounded. I thought, pilots are good at organising things, so why not use the lounges in the NHS."

IS HE FLYING SOLO?

Not quite. The idea really got wings when easyJet captain Emma Henderson and clinical psychologist Robert Bor got involved. Bor suggested Fielding and his colleagues use their customer service skills to boost the morale of NHS staff.

HAS IT TAKEN OFF?

Definitely. There are now 50 lounges in NHS hospitals, staffed by more than 5000 volunteer crew from several airlines.

WHAT'S ON THE MENU?

The idea is simple: to provide NHS staff with a smile. "Staff come into the lounge, we make them a nice cup of tea in a nice environment, and we talk—and before they know it they've had 10-15 minutes without thinking about work," Fielding said.

SO, THEY'RE ON CLOUD 9?

That might be pushing it, but Fielding said the lounges have benefited staff. EasyJet's Jasmine Kamani, who leads a lounge in Barnet, north London, agreed, adding, "It's improved the atmosphere throughout the hospital. It's boosted morale—people are saying, 'We don't want you to leave.'"



NEWS ANALYSIS

“Nothing has changed since Tamiflu,” warn transparency experts

Last week’s retraction of two research papers has highlighted the continuing failure of researchers to share their data, reports **Jacqui Wise**

Two leading medical journals retracted research papers on covid-19 last week because the authors said they could “no longer vouch for the veracity of the primary data sources,” raising serious questions about data transparency and research integrity.

The episode shows that “no lessons have been learnt since Tamiflu,” said Tom Jefferson, an epidemiologist for the Nordic Cochrane Centre. Jefferson, along with *The BMJ*, campaigned for years for companies to release the clinical data for two globally stockpiled anti-influenza drugs, oseltamivir (Tamiflu) and zanamivir (Relenza).

“History is repeating itself,” he told *The BMJ*. “We warned people back in 2009 about these very same issues of guest authorship, reporting bias, and lack of transparency.”

On 22 May the *Lancet* published an observational study indicating that hospital patients with covid-19 treated with hydroxychloroquine and

Tom Jefferson, from the Nordic Cochrane Centre, says he warned researchers about standards in 2009

We are considering a variety of steps to prevent and detect potential fraud

Elizabeth Loder, *The BMJ*



chloroquine were at greater risk of dying and of ventricular arrhythmia than patients not given the drugs. The same authors published an article in the *New England Journal of Medicine* on 1 May that found that angiotensin converting enzyme (ACE) inhibitors and angiotensin receptor blockers were not associated with a higher risk of harm in patients with covid-19.

Data withheld

Both studies used data from a healthcare analytics company called Surgisphere. After several concerns were raised about the data’s veracity, the authors announced an independent third party peer review. But Surgisphere refused to transfer the full dataset and associated information, saying it would violate confidentiality requirements with clients, leading the authors to request the retraction of both studies.

The *Lancet* and *NEJM* are signatories to the Wellcome agreement on data sharing for covid-19 studies, which calls for research findings to be

openly accessible and to give clear statements regarding the availability of underlying data. But an open letter to the study authors and the *Lancet* editor, Richard Horton, pointed out that its paper had no statement on data and code sharing availability and no ethics review.

Robert Kiley, head of open research at Wellcome, said, “In the case of articles which contain private and sensitive information, the data availability statement should still indicate how the data could be accessed, typically by making a request to the appropriate data access committee. We encourage all publishers to require a data availability statement for all research articles and to make this a mandatory part of the submission process.”

Henry Drysdale, a clinical researcher with DataLab at Oxford University, who has focused on research integrity, says the Wellcome statement does still have merit as it articulates an idea of best practice and provides a standard to which medical journals can be held.

BMA urges plan to tackle backlog of non-covid treatments

The government urgently needs a plan to reduce the huge backlog of patients waiting for NHS treatments unrelated to covid-19, the BMA has said.

The call came as the BMA released the results of its survey of more than 8000 doctors. It found over half (3754 of 7238) were not very confident or not confident at all their department would be able to manage demand as services resume.

“The government must be honest with the public about the surge to come and start meaningful conversations with clinicians about how we can tackle the backlog,” said Chaand Nagpaul, BMA chair of council. “Covid-19 has brought the worst health crisis in a century. The NHS must not return to its previous perilous state.”

More than a quarter of the surveyed doctors (1966 of

7289) said they had not been consulted over how to manage the increase in demand.

Nagpaul said, “Resources were diverted to covid-19 efforts



P. MARAZZI/SPL

at the expense of other care. The impact on patients cannot be underestimated—with figures earlier this week showing more than two million people waiting for cancer care alone, with overall waiting lists projected to hit seven million by autumn.”

He added that the positive improvements made during the pandemic, such as reduced bureaucracy, and unnecessary regulation, and new ways of

“However, the statement focuses entirely on the sharing and dissemination of research and does not address information governance or research integrity standards. In the context of major concerns over the integrity of reporting and use of results for high profile covid trials, commitments to these standards are urgently needed,” he told *The BMJ*.

He believes that the concerns over the *Lancet* trial are not so much about the editorial process or reporting but about generating and collating data, with some querying the truthfulness of the data. “It’s possible that data sharing standards have been, to a greater or lesser extent, compromised through drives to produce and disseminate covid research quickly. However, it’s very difficult to say with so little information about the sources of data and data collection processes for these trials,” he said.

Deluge of research

The covid-19 pandemic has created an urgent need for scientific evidence to help politicians, doctors, researchers, and the public understand the evolving situation. This has resulted in a deluge of new research, much of it published without peer review on preprint servers. “There is a headlong rush to publish in an emergency, and that is toxic,” Jefferson said.

Tracey Brown, director of the charity Sense about Science, said, “The urgency of sharing emerging research and data on the covid-19 crisis has created huge dilemmas over quality. Rapid publication and early sharing of results is clearly warranted, but it

Putting your name to a data analysis when you’ve not seen the data is fraud, crisis or no crisis

Tracey Brown, Sense About Science

means the research community must also double down on communicating the status and reliability of results and their limitations.

“But some of the issues we are seeing are not new. Putting your name to a data analysis when you have not seen the data is research fraud, and always has been, crisis or no crisis.”

Elizabeth Loder, *The BMJ*’s head of research, acknowledged that it was difficult for peer reviewers or journal editors to detect deliberate, carefully orchestrated fabrication of data. “In the case of the Surgisphere database, there was a high level of interest in the papers because of the pandemic. This led to rapid identification and speedy retraction of the articles and underscores the value of having many people involved in evaluating and inspecting research both before and after it is published,” she said.

Loder says *The BMJ*’s open peer review process and its commitment to sharing data and the posting of signed peer review reports alongside published research papers allow for a level of public scrutiny that is valuable.

She added, “We are considering a variety of steps we could take to prevent and detect potential fraud. In addition to solutions at the level of individual journals, however, cooperation among journals and public policy initiatives may be needed.”

Jacqui Wise, London

Cite this as: *BMJ* 2020;369:m2279

Hydroxychloroquine doesn’t benefit covid hospital patients

Hydroxychloroquine does not reduce the risk of dying or improve outcomes among patients in hospital with covid-19, preliminary results from the UK RECOVERY trial have shown.

Announcing the results, Martin Landray, the study’s deputy chief investigator, said that the findings meant no more patients were being enrolled into the study’s hydroxychloroquine arm “with immediate effect.”

There was also no evidence that hydroxychloroquine affected length of stay in hospital or had any beneficial effects on other outcomes, or that it had any beneficial effects only in certain patient groups.

The RECOVERY trial began in March and is a dynamic trial assessing candidate treatments for covid-19 in patients in UK hospitals that has so far recruited more than 11 000 patients. The trialists were asked by the Medicines and Healthcare Products

The RECOVERY data show the death rate at 28 days was **25.7%** in covid-19 patients taking hydroxychloroquine and **23.5%** in patients provided with usual hospital care—hazard ratio 1.11 (95% confidence interval 0.98 to 1.26)

Regulatory Agency to look at the unblinded data in the hydroxychloroquine arm of the study after the retraction of a paper in the *Lancet* suggested the drug increased the risk of dying (see story left). A huge upsurge in hospital cases around a month ago meant the amount of data on hydroxychloroquine had increased and “the picture has changed,” said Landray, professor of medicine and epidemiology at the University of Oxford’s Nuffield Department of Population Health.

“There are hundreds of thousands, potentially millions, of patients around the world being treated with hydroxychloroquine,” he said. The RECOVERY results have “a significant importance for the way that patients are treated not only in the UK but around the world.”

Five other treatments continue to be assessed by the RECOVERY trial: lopinavir-ritonavir, low dose dexamethasone, azithromycin, tocilizumab, and convalescent plasma. Results on these are expected in early July.

Ingrid Torjesen, London
Cite this as: *BMJ* 2020;369:m2263

These results have a significant importance for the way patients are treated in the UK and around the world Martin Landray, RECOVERY



The survey indicates that the expected rise in demand has already begun: over **40%** (3132 of 7269) of doctors said demand had increased significantly in the past week, and around **14%** (1003) said it had already exceeded pre-covid levels

working, including further use of video technology and remote working, must be retained.

The BMA set out how the government could tackle rising demand. This includes providing up-to-date data on waiting lists, the prevalence of certain conditions, and health inequalities. Ministers should

also give the NHS the resources it needs, as well as the capacity to meet long term demand, and it must “retain, support, and protect the valuable staff who have given their all in fighting the pandemic, prioritising their wellbeing and mental health.”

Elisabeth Mahase, *The BMJ*

Cite this as: *BMJ* 2020;369:m2238





DAVID L. RYAN/BOSTON GLOBE/GETTY IMAGES



THE BIG PICTURE

Hospital staff take the knee in Boston

Members of staff kneel during a vigil on the lawn of Brigham and Women's Hospital in Boston, Massachusetts, on 5 June as part of global Black Lives Matter protests against racial injustice and in memory of George Floyd, killed by the police in Minneapolis on 25 May.

Protests were also held in the UK, and a protester outside Downing Street (inset below) demanded effective protection against covid-19 and highlighted the disproportionately higher mortality rate from the virus among ethnic minority groups (see p 386).

In a statement issued in response to the global Black Lives Matter protests, the BMA said, "We stand in solidarity."

"Black lives should matter to every individual and every medical professional," the association added. "Racism breeds health inequalities impacting on our patients, it adversely affects our colleagues, and at its worst it kills, with black women five times more likely to die during childbirth than white women in the UK.

"These health inequalities are all too visible in the toll covid-19 is having on black, Asian, and minority ethnic communities in the UK. More than 90% of doctors who have died from the virus to date are from a BAME background. Unless the government engages in actions, not just words, the covid-19 pandemic will continue to disproportionately impact on BAME healthcare workers and the communities they serve."

Tom Moberly, *The BMJ*

Cite this as: *BMJ* 2020;369:m2278



NEWS ANALYSIS

“PHE review has failed ethnic minorities”

A government review promised to discover why covid-19 has a disproportionate effect on people from ethnic minorities, but advocacy groups say their input was ignored. **Gareth Iacobucci** reports



I was absolutely flabbergasted that there was not a single recommendation
Zubaida Haque, Runnymede Trust

Medical and race equality organisations have told *The BMJ* they are angry and frustrated that a review that set out to examine the disproportionate effect of covid-19 on people from ethnic minority groups produced no plan for protecting them from the disease.

The review by Public Health England, published on 2 June, promised to examine why people from ethnic minorities were more likely to contract and die from covid-19 and to make recommendations for “further action that should be taken to reduce disparities in risk and outcomes from covid-19 on the population.”

But, although it confirmed data showing that ethnic minorities were disproportionately affected (see box below), it did not suggest what could be done to reduce the disparities.

Accusations that the report was a whitewash grew after the *Health Service Journal* reported that an earlier draft had a section summarising responses from more than 1000 organisations and individuals, many of which suggested that discrimination was contributing to the increased risk from covid-19.

In a statement PHE insisted that nothing had been removed from the report, and the government has appointed the equalities minister,

Kemi Badenoch, to take forward the agenda and produce future recommendations.

But whether or not the report was diluted, several organisations that contributed to it told *The BMJ* that they felt badly let down by its content, which they said did not reflect their recommendations (see box right).

“Dismayed and angry”

Zubaida Haque, interim director of race equality at the Runnymede Trust, which was consulted for the report, told *The BMJ* that race equality groups were “dismayed and angry” with the final report. She said, “People are upset, angry, astonished, and appalled. It’s completely lacking in any plan of action on how to save lives.

“I was absolutely flabbergasted that there was not a single recommendation. At no point did they say ‘this review is part one.’ The impression was always that this would not only identify the factors that are likely to be contributing to higher risk of serious illness deaths in relation to covid-19 but find the answers.”

She added, “These communities have been living in fear. There’s a lot of people who are feeling very hurt, very confused, and very frightened, because there’s nothing worse than telling people, ‘Yes, it’s true that you are more likely to die,’ . . . and that that’s it.”

Haque, who is also a member of the independent SAGE group set up as an alternative to the government’s Scientific Advisory Group for Emergencies, said she was unhappy that only 11 of the review’s 89 pages focused on ethnicity, with the remainder looking at obesity, age, sex, and other factors. She said, “It was supposed to be a review about racial inequalities and covid-19. At no point did they say that only one eighth of the report would be on ethnicity.”

The fact that PHE’s analysis excluded variables that were likely to be contributory factors to the disproportionate effect on ethnic minorities, such as comorbidity and occupation, rendered the report “wholly inadequate,” Haque added.

“Damp squib”

Ramesh Mehta, chair of the British Association of Physicians of Indian Origin, agreed this was a major flaw in the “damp squib” of a report. “We were hoping it would give us an idea of why the problem is there, but all it has told us is what we already knew. They’ve come up with a very bland review that is not much use. It is a washout.”

The association was invited to discuss the issues with senior health leaders. But Mehta said, “So far we haven’t seen much impact of our presence or comments apart from the letter [asking NHS trusts to risk assess ethnic minority staff]. We expected our views to be represented.”

On Friday 5 June the BMA coordinated a meeting with representatives of 13 organisations representing ethnic minorities, medical staff from overseas, and religious groups to discuss the disproportionate impact of covid-19. Chaand Nagpaul, the BMA’s chair of council, said, “The PHE review failed to provide any answers as to why covid-19 is having such a catastrophic impact on BAME healthcare

KEY FINDINGS FROM PHE’S REVIEW

Black ethnic groups were most likely to have covid-19 diagnosed, with **486** diagnoses per 100 000 population among females and **649** in males. The lowest diagnosis rates were in white ethnic groups (**220** per 100 000 in females and **224** in males).

When compared with previous years, all cause mortality was almost **4** times higher than expected among black males for this period, almost **3** times higher in Asian males, and almost **2** times higher in white males

The risk of death among people of Bangladeshi ethnicity was twice that among people of white British ethnicity, while people of Chinese, Indian, Pakistani, other Asian, Caribbean, and other black ethnicity had a **10-50%** higher risk of death than white British people.



Protesters in Middlesbrough take a knee in support of George Floyd on 7 June

workers—and crucially offered no recommendations on how to protect them right now. The BMA, along with all of the organisations in attendance, is calling on the government to take urgent action to protect our BAME colleagues on the front line.”

“Lives are at risk”

The British International Doctors’ Association was one of the groups at the meeting. Chandra Kanneganti, its chairman, said that the association submitted five key recommendations to PHE, which were not reflected in the report. “The report is lacking actions to protect the healthcare workforce. Lives are at risk: we need action now,” he said.

Other groups that made recommendations included the Muslim Doctors Association, the NHS Religion Equality Advisory Group, and the Muslim Council of Britain.

Hina Shahid, a London GP and chair of the Muslim Doctors Association, said, “The failure to analyse systemic and structural factors, the exclusion of data on protected characteristics such as religion and disability as well as important insights that repeatedly highlighted the role of discrimination and disadvantage, and the lack of any practical recommendations are all deeply concerning and disappointing. “Colleagues, relatives, and friends have died. It makes us feel our lives and contributions to society don’t matter.”

Haque drew parallels between the lack of action to protect ethnic minority groups from covid-19 and the Black Lives Matter movement. “People

think it’s different, but it’s not different at all. The reason people have been distraught at the death of George Floyd is because black and ethnic minority lives are treated as though they are second rate, as if they matter less.

“All the data were showing that BAME people were much more vulnerable to covid-19. To produce a report that has no recommendations about how you’re going to save the lives of those who

are disproportionately dying is not only insensitive but essentially saying, ‘We think your life matters less.’ What else can you think? They have shown a complete disregard for people’s lives.”

PHE’s John Newton, who co-led the review, said, “There is a great deal of background and detailed information [in the report] we think will be helpful. What we would like to do is get a lot of discussion with the various groups involved.

“It is not easy to go directly from the analysis to recommendations, and we need to get the report widely disseminated and discussed before deciding what needs to be done, but clearly there are some fairly obvious conclusions that can be drawn.”

Badenoch said the government was taking the report seriously. The minister added, “It is clear much more needs to be done to understand the key drivers of the disparities identified and the relationships between risk factors. That is why I am taking this work forward, which will enable us to protect our communities from the impact of the coronavirus.”

Gareth Iacobucci, *The BMJ*
Cite this as: *BMJ* 2020;369:m2264



Much more needs to be done to understand the key drivers of the disparities
Kemi Badenoch, equalities minister

THE TEN RECOMMENDATIONS REPRESENTATIVE GROUPS HOPED TO SEE

1 IT SHOULD BE mandatory for NHS trusts to treat ethnic minority staff as “high risk and vulnerable” in regard to covid-19 (British International Doctors’ Association)

2 EMPLOYERS should urgently carry out stratified risk assessments so that healthcare workers are not unnecessarily put at risk (British Association of Physicians of Indian Origin, BIDA)

3 ETHNIC MINORITY staff should be redeployed away from covid-19 areas in hospitals wherever possible (BIDA), and staff who have retired and returned should not be asked to work in high risk clinical areas (BAPIO)

4 AN INQUIRY should be held into the deaths of healthcare workers (most of whom were from ethnic minorities) to help rebuild confidence in the system (BIDA)

5 DATA for covid-19 cases and deaths should be disaggregated to incorporate factors such as ethnicity, faith, profession, and wider socioeconomic risk factors (BAPIO, Muslim Doctors Association, Muslim Council of Britain)

6 RESEARCH should be carried out into ethnic disparities and outcomes related to covid-19 that reflect the lived experience of people from ethnic minorities (BAPIO)

7 THE GOVERNMENT should seek to understand why inequalities exist and how racism and structural discrimination affect different facets of people’s lives and how these effects have contributed to the disproportionate death rate in BAME communities (Muslim Council of Britain)

8 HEALTH AGENCIES should make a strong statement acknowledging the problems of racism and discrimination in the NHS and should have a clear action plan for how to tackle them and a commitment to implement change (Muslim Council of Britain)

9 NHS ENGLAND should look at changing the way in which ethnic minority staff are represented and included in decision making (Muslim Council of Britain)

10 PHE should expand the Workforce Race Equality Standard to assess the impact of racial inequalities on health outcomes (Muslim Council of Britain)



Ethnicity and covid-19

Public Health England's review of disparities in covid-19 is a serious missed opportunity

As deaths from covid-19 rose in the UK, it became clear that people with different backgrounds, but united by the label black, Asian, and minority ethnic (BAME), were being affected in numbers far beyond their share of the population. Public Health England (PHE) has undertaken a review documenting the scale of the problem.¹

Death rates in people known to have covid-19, after taking into account age, sex, deprivation, and region, were twice as high among those of a Bangladeshi background and 10-50% higher among other ethnic groups compared with white British people. All cause mortality was almost four times higher in black men and almost three times higher in Asian men than expected for this period based on deaths rates in 2014-18; the figure for white men was 1.7 times higher. Why? On that, the PHE report is conspicuously lacking.

Silence

While the cause of these disparities is probably multifactorial, the silence concerning how structural inequalities may be fuelling this pandemic, and more importantly how these inequalities take root, is notable.

Some have suggested possible underlying genetic factors even though data show that all minority ethnic groups are disproportionately affected, many of which have distinctly different genetic ancestry. Some have focused on the role of pre-existing conditions such as diabetes, obesity,



All who value equity and justice are pushing for both immediate action and long term change

and hypertension. Yet the report fails to ask why these conditions are more common in many minority ethnic populations or to explore factors such as material deprivation that might explain them. Others have explored socioeconomic position, occupation, and housing conditions, but most have remained silent on the structural and institutional racism that determines these social factors and also leads to exclusionary health policies that reinforce existing inequalities.

PHE's report brought together a large amount of information but adds little to what was already known. Several commentators, including the leader of the Labour party, Keir Starmer, have criticised the report for failing to investigate the reasons behind the disparities it documents or make recommendations on how to address them.⁴ Given the urgent need for action, this report is a serious missed opportunity.

The government's announcements that "Professor Kevin Fenton, public health director for London will lead the review" and that the "disproportionate impact of covid-19 on black and minority ethnic groups highlights an important focus" were widely welcomed.⁵ Fenton has been a longstanding champion of diversity and anti-racism, and he views community and stakeholder engagement as a critical component

of public health. His name is absent from the published report, however,⁶ and ethnicity features only as a small subsection of a much broader report.

PHE said it received evidence from more than 1000 organisations and individuals but it failed to include their evidence in the final report.

Following widespread criticism, the government committed to a further review that will make recommendations. Other insights will come from organisations planning to make their own inquiries. The Equality and Human Rights Commission, for example, has announced that it will investigate the "long-standing, structural race inequality" brought into focus by the covid-19 pandemic.⁸

Systemic racism

The death of George Floyd in the US has been described as a "symptom of systemic racism."⁹ The Black Lives Matter protests sweeping across cities in the US, the UK, and elsewhere point to an anguish not just about police brutality but about the persistent and broad subjugation of marginalised communities by racist societal structures.

All who value equity and justice are pushing for both immediate action and long term change. Yet Kemi Badenoch, the UK's equalities minister, told parliament last week, "We are not taking action which is not warranted by the evidence,"¹⁰ ignoring that the evidence of ethnic inequality and its lethal effects is already plentiful.¹¹ Specific policy levers, such as suspending measures that constitute the hostile environment,¹² could be pulled to reduce the disparities now.

The inequity described but not explained in PHE's report must not be allowed to persist. The government must act to protect minority ethnic groups before we are hit by this pandemic's imminent second wave.

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ANALYSIS

Using socioeconomic to counter health disparities arising from the covid-19 pandemic

Principles and methods drawn from decades of work showing that lower socioeconomic status is associated with poorer health should guide efforts to monitor and mitigate the impact of the coronavirus argue **Geoffrey Anderson and colleagues**

Epidemiological models have predicted that without interventions to contain the spread of covid-19, countries would face an exponential increase in cases.¹ Although most of those cases will be mild, a meaningful minority of people would fall seriously ill, potentially overwhelming hospitals and resulting in a sharp increase in deaths.

These scenarios have led many countries to adopt measures aimed at “flattening the curve” to avoid a sudden spike in covid-19 cases. The strategies are predominantly based on reducing close contact between individuals to lower the chances of transmission. However, social distancing strategies could have profound effects on health through various mechanisms, including employment, social isolation, and effects on family relationships.² Furthermore, concern is growing that poor and vulnerable people will bear the brunt of both the virus and strategies to contain it.^{2,3} We urgently need to measure and mitigate differential effects of the pandemic on already marginalised populations.

Food insecurity and housing instability can predict future high use of healthcare services

KEY MESSAGES

- Early data suggest both the incidence and effect of covid-19 will be distributed unequally across those with different levels of material and social deprivation
- Strategies to contain covid-19 are greatly affecting key social determinants of health such as employment, social interaction, and family relationships
- People with complex needs, vulnerable populations, and marginalised groups are at increased risk from covid-19 and the health effects of containment strategies
- Timely, reliable data are needed to identify these individuals and ensure they are properly supported
- The socioeconomic disparities in health gradient provide an important framework to deepen understanding of, and mitigate, the health equity effects of covid-19



PRITYA SUNDARAM

We recommend that assessments of the covid-19 pandemic and measures to contain it be informed by well established principles and methods that consider the complex interplay between socioeconomic status and health disparities. Furthermore, we argue these principles can provide a framework⁴ to guide strategies to ease physical distancing measures and equitable policies to deal with the pandemic’s long term effects on health and society.

Socioeconomic status and health gradient

Years of research from many high income countries has shown that health is related to socioeconomic status in important and complex ways. The underlying principles for that research build on work done decades ago, mostly in England, that argued inequalities in health related to socioeconomic status are a consequence of inequalities in the social determinants of health.

These social determinants include material circumstances, the social environment, and psychological factors. These are in turn influenced by social position and context and shaped by a range of factors, including education, income, and ethnicity.⁵ Furthermore, these health inequities exist not only between the extremes of rich and poor but across every rung on the socioeconomic status ladder.

Marmot argues these differences are not primarily driven by income but have more to do with variations in social participation and ability to control life circumstances.⁶ This mechanism has been highlighted in more recent work by Case and Deaton in the US, who argue that loss of employment certainty and social opportunity are associated with sharp increases in deaths tied to despair, including suicides, and deaths related to alcohol and drug dependency in middle class, middle aged, non-Hispanic white people.⁷

Recent work in Canada has used constructs of socioeconomic risks such as food insecurity and housing instability to show how these can predict future high use of healthcare services.⁸ Scotland has moved to regular reporting of socioeconomic related health disparities using a sophisticated multifaceted deprivation index.⁹ Along with research and reporting within countries, studies have looked at socioeconomic related health disparities across countries.^{10,11}

Monitoring the effects of covid-19 policies

These studies highlight two key conceptual themes: first, socioeconomic status is multifaceted and should be measured as far more than just income; and, second, socioeconomic characteristics are consistently related to a range of outcomes including disease incidence, mortality, and healthcare use. Empirically, this relation often occurs as a gradient across socioeconomic groups and this has individual⁶⁻⁸ and community level⁹⁻¹¹ associations with health outcomes.

It is not difficult to imagine that the effects of material and social deprivation that disadvantage poor people generally (eg, lack of resources and social isolation) are also at play in the pandemic. Marginalised groups face special risks. They may be more likely to become infected because of cramped living conditions and the relative lack of resources to self-isolate and physically distance. They also have higher rates of many of the comorbidities that predict poor outcomes for those infected. Those monitoring outcomes of the pandemic and response should take into account both individual socioeconomic status and the social determinants of the communities in which individuals live.

This type of analysis is starting to appear, including a recent report from Canada that showed people living in marginalised neighbourhoods—as measured by ethnic concentration, residential instability, material deprivation, and income—are more likely to test positive for covid-19 and that each of these measures have different effects.¹² Ecological analyses such as these, using postcodes linked to small area data from census data or social surveys, are a powerful and efficient approach to socioeconomic status based analyses.

A key attribute of sound ecological analysis is creating local areas that reflect neighbourhoods in a true community sense. For example, Scotland uses 7000 areas that have been carefully crafted to capture neighbourhoods ranging from public housing estates to wealthy enclaves to cover a population of 5.45 million.⁹ Analysis based on individual level socioeconomic status data on covid-19 complications is also starting to appear. For example, a recent analysis by the UK Office for National Statistics of covid-19 death rates shows nearly fourfold higher mortality in unskilled and manual workers compared with professionals.¹³ These early analyses are showing the important and varied

nature of socioeconomic status disparities for this new threat to health.

A recent *BMJ* article on the effects of covid-19² containment measures suggests a socioeconomic status lens can identify important effects of pandemic responses, including from healthcare systems. The large and sudden effects of job loss and employment concerns combined with drastic changes in social and family context² raise the possibility of an increase in Case and Deaton's deaths of despair.⁷ These deaths were primarily but not uniquely observed in the US and are already being talked about as a potential epidemic within the pandemic in that country.¹⁴

Violence against others, such as domestic and child abuse, may also be important markers of the socioeconomic related effects of containment.³ Longer term material and social deprivation, combined with restricted access to services in an increasingly hard to access system, could affect healthcare use and outcomes in populations with complex health and social care needs, such as people who are old, frail, or have many chronic conditions or serious mental illness and addictions.¹⁵

In short, proper monitoring of covid-19 should examine the direct effects of the virus and the health effects of containment policies using comprehensive measures of material and social deprivation at both individual and ecological level. Multidimensional socioeconomic deprivation indices, derived from census data and population based surveys, should be used to support ecological analyses. These indices are most useful when mapped to geographical areas whose boundaries respect natural communities that are relatively homogeneous in terms of socioeconomic status. Postcode information routinely collected from healthcare encounters or vital statistics is typically used to map events in individuals to these geographical areas, with census data providing the denominator for calculating rates in terms of the components of the deprivation index for that area.

A related priority should be to look carefully at the data routinely collected at individual level for important outcomes that can be used to discern socioeconomic disparities. Those planning the response should be willing to invest in new forms of individual level data on socioeconomic status that can guide efforts to protect and support those at risk or those who have been disproportionately burdened.

Those monitoring pandemic outcomes should take into account the individual's socioeconomic status and the social determinants of their communities



Guide for exit strategies and social recovery

Leaders in socioeconomic health research have made a point of describing the policy implications of their work.⁵⁻⁷ Whitehead defined four categories that link the theory and measurement of socioeconomic status health inequities to different levels of policy: strengthening individuals, strengthening communities, improving living and working conditions, and macro-policies addressing the broader determinants of health.⁴ This classification should be used to inform strategies for exiting lockdown measures and guide investments to support social and economic recovery (box).

At the individual level, the concept of “immunity passports” has received considerable attention. Experts caution that the extent and duration of protection conferred by antibodies to SARS-CoV-2 is still unclear, but technical issues are far from the only concern about this idea. If antibodies are found to confer durable immunity, these tests could have immediate implications for who can (or cannot) resume in-person activities, generating a whole host of equity issues. Antibody tests could become a new gatekeeper to employment in congregate workplaces (typically paid hourly at lower levels) while salaried executives and professionals continue to work remotely regardless of immunity status. Another issue is whether antibody tests will be sold privately or offered as a publicly insured service. Policies on this front must be framed with careful attention to the potential exacerbation of existing socioeconomic disparities.

At the community level, there have been extensive discussions around options to develop



Using health-wealth gradients to guide strategies for covid-19 containment and social recovery

Policies aimed at individuals such as immunity passports should take into account the disparities in health benefits of being able to return to society across socioeconomic groups and be implemented with careful attention to both equitable access to testing and measures required to mitigate the socioeconomic differences in financial and social advantages accruing to those who are shown to be immune

Policies aimed at protecting communities through specific isolation strategies and contact tracing should be designed to protect the most vulnerable, such as residents of long term care facilities, homeless people, and marginalised ethnic groups

Policies on working conditions should mitigate differences in risk of infection by employment sector, and ensure those whose employment is central to economic recovery are provided with adequate protection and support in the workplace

Macro-policies aimed at broad mitigation of economic effects should include programmes that provide targeted support to those most affected and those who face greater obstacles in re-entering society (for example, people who are precariously employed, homeless, or have complex needs)

The socioeconomic lens can give policy makers useful guidance as they make investments to mitigate, in an equitable way, the longer term effects of covid-19

capacity for testing and contact tracing on a scale seen in countries such as South Korea, Hong Kong, and Singapore. Sustaining this capacity is particularly important to control spread as physical distancing restrictions are eased.

A socioeconomic status disparities lens would lead us to focus on protecting the most vulnerable members of our society, such as residents of nursing homes and long term care facilities,¹⁶ homeless people,¹⁷ and marginalised ethnic groups; it would also pay attention to systemic factors such as historical and ongoing racism.¹⁸ These groups seem to have slipped through the cracks in the initial response in many countries, and they merit special attention as the first wave of the covid-19 epidemic recedes and subsequent waves threaten.

Technology driven solutions such as digital contact tracing have been proposed in the context of both individual and community level policy responses. These digital tools raise equity concerns (eg, access, privacy, digital divide) across socioeconomic strata that must be taken into account as these are developed and implemented.¹⁹ Likewise, broad serosurveillance studies—important in shaping outbreak management and vaccination policy—must be designed so that marginalised populations are not excluded.

Working conditions are another area of great interest. In Canada, employees of food processing plants were deemed essential workers. Meat packing plants, in particular, involve unattractive work at close quarters,

pay low wages, and often are staffed by immigrants and people belonging to ethno-racial minorities. Major outbreaks of covid-19 have occurred in these facilities in both Canada and the US. Similar workplace outbreaks are likely to be seen globally as economic restrictions are lifted. As trades unions in the UK have warned,²⁰ guidelines for employers to keep employees safe are vague and monitoring procedures unclear. Clearly, congregate settings with common work areas such as factories create huge risks for workers; by contrast, white collar employers can erect partitions in offices, stagger hours, limit meeting sizes, and more readily maintain some of the working from home arrangements used during containment.

At a macro-level, many high income countries are introducing economic measures to offset financial difficulties faced by citizens because of the pandemic. Tactics vary, including subsidies to employers to prevent redundancies and direct payments to families to mitigate hardship. It is not clear, however, that these policies have been tailored to ensure support for those who are most precariously employed, or those with limited means or compromised immune systems.

More generally, as jurisdictions begin to ease containment measures and restore the functions of civil society, healthcare systems, and economic activities, it is easy to overlook the complex interactions between socioeconomic status and health. These interactions warrant special attention in the challenging months ahead.

Rebuilding fairly

The epidemic curve has provided an important framework for understanding and containing the spread of covid-19. We believe the socioeconomic-health disparities gradient provides an equally important framework—one that can deepen understanding of the differing health effects of covid-19 and containment strategies across socioeconomic groups.

Governments and population health researchers should collect detailed and meaningful data on the socioeconomic distribution of both the direct health effects of the pandemic and the indirect health, social, and economic effects resulting from covid-19 containment strategies. The socioeconomic lens can also provide policy makers with useful guidance as they develop and deploy strategies to exit containment and make investments to mitigate, in an equitable way, the longer term effects of this pandemic.

Covid-19 has made the world less healthy. Responses to it need not make the world less equitable. With careful attention to principles, methods, and policy ideas that come from over two decades of research and ideas, countries can better anticipate, mitigate, and redress the health and social effects of this pandemic—particularly on the most marginalised groups in society.

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Ethnic disparities in testing for covid -19

Programmes must ensure that “hard to reach” groups are no longer hardly reached

Until successful vaccination programmes are in place governments will be heavily reliant on widespread testing and contact tracing to reduce the reproduction number of SARS-CoV-2.¹ Meanwhile international evidence continues to emerge about ethnic disparities in covid-19 morbidity and mortality,^{2,3} echoing the unequal burdens of other global epidemics such as tuberculosis, hepatitis, and HIV.

At this crucial juncture, health and policy planners must ensure that access to and uptake of testing is equitable across all social and economic gradients. We support the recent call for immediate inclusion of social scientists, anthropologists, leaders of marginalised communities, and experts in local social determinants of health in health policy making for this pandemic⁴ so that sufficient access, trust, and cultural competence are built in to test, track, and trace programmes for covid-19.

Unequal uptake

Considerable international evidence exists on unequal uptake of medical testing and surveillance across health conditions—including assessment of cancer risk,⁵ antenatal screening,⁶ and HIV testing.^{7,8} The disparity is largely attributable to social determinants of health, coupled with mistrust of medical institutions among those in marginalised population groups. Without appropriate action, similar disparities may hamper the success of covid-19 testing interventions.

The UK government expanded its testing programme through use of self-administered swab kits, a strategy that should be informed by evidence on uptake of other self-sampling kits among target groups. For example, a 2018 study found that use of HIV self-sampling



SHUTTERSTOCK

People from ethnic minorities urgently need to be included at the heart of national and local health planning

kits among ethnic minority target populations in the UK was low compared with other groups.⁹

Our investigations among black African people in England and community health professionals revealed mistrust of self-sampling technologies.¹⁰ Such kits were reported to be overcomplicated, with written instructions that were inappropriate for those whose first language was not English; were perceived as being unsafe for postal transfer; and were regarded as unsuitable proxies for a sample handled by a health professional in a secure and sterile setting. Although some of our research participants thought that self-sampling was appropriate for them, most said they were unlikely to use such kits, with risks to privacy a key consideration.¹⁰

Health professionals often frame members of ethnic minority communities as “hard-to-reach.” However, it is more accurate to say these groups tend to be “hardly reached” by those who fail to understand the needs of marginalised people who are asked to send samples of bodily fluids to unknown others for processing. A sociopolitical context where the UK government continues to promote a hostile environment¹¹ for

“low skilled” migrants,¹² resulting in the wrongful denial of health services to thousands¹³ only makes things worse.

Given the disproportionate and devastating impact this pandemic has already had among our ethnic minority communities, such issues need to be immediately addressed in the rollout of covid-19 screening.

Much work needs to be done to ensure populations at risk are meaningfully prioritised for access to SARS-CoV-2 testing. Policy makers must build trustworthy surveillance programmes and give everyone the confidence that they can access healthcare equitably during the covid-19 pandemic.¹⁴

Bridging the gap

To help bridge this gap in trust, people from ethnic minorities and their community representatives urgently need to be included at the heart of national and local health planning.

Good planning will consider the need for tailored and multilingual communications, relevant support from trained health professionals, clarity about how samples and personal data are handled, and assurances about free access to emergency healthcare regardless of residency status or the NHS surcharge for migrants.

We urge policy makers to consider the potential harm that could arise from rushed and poorly executed testing programmes that exclude those groups at disproportionate risk of covid-19 morbidity and mortality. Planners at all levels should carefully consider the interdisciplinarity of their response teams, so that they are able to successfully confront the many challenges that social, economic, and cultural inequality can pose in responses to pandemics.

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Ethical road map through the pandemic

We must follow the ethics, not just the science

Already covid-19 has generated ethical questions about the prioritisation of treatment, protective equipment, and testing; the impact of covid-19 strategies on patients with other health conditions; the approaches taken to advance care planning and resuscitation decisions¹; and the crisis in care homes.

Ethical questions continue to multiply as the pandemic progresses and new evidence emerges, including how best to distribute any new vaccines and treatments; how best to respond to evidence that disease severity and mortality are substantially greater in ethnic minority populations²; how to prioritise patients for care as medical services re-open; how to manage assessment of immunity and its implications; and how the health system should be configured to manage any future peaks in cases.

The UK government repeatedly states that it is “following the science” by heeding the advice provided through the Scientific Advisory Group for Emergencies (SAGE). However, this implies that the science alone will tell us what to do. Not only does this rhetoric shift the responsibility for difficult decisions on to “the science”, it is also wrong. Science may provide evidence on which to base decisions, but our values will determine what we do with that evidence and how we select the evidence to use. It is disingenuous and misleading to imply that value-free science leads the way. Both science and policy are value laden.

Values questions are being addressed primarily by professional organisations, although the UK government has independent advice, for example, from the Moral and Ethical Advisory Group.³⁻⁶ Despite such efforts to plot an ethical path, the current approach is piecemeal, confusing, and risks needless



Concerns are mounting about a lack of transparency around the ethical agenda underpinning decisions

duplication of effort. Concerns are mounting about a lack of transparency around the ethical agenda underpinning decisions, a lack of coordination, and the absence of clear national leadership.⁷⁻¹²

Ethical planning

As the UK prepares to emerge from lockdown, we urge our leaders to develop an ethical plan with at least the following three features.

First, there should be nationally led and coordinated development of transparent, publicly shared ethical guidance that can provide the basis for clear, consistent, and defensible decisions in all healthcare and policy settings across the country. Such guidance could then be tailored to specific contexts.⁹ Whatever its reach, guidance will require consultation with stakeholders with relevant expertise, including patients. Development processes must be transparent and the conclusions publicly accessible.

Second, ethics support structures should be formalised, coordinated, resourced, and embedded throughout the health and social care system to support the interpretation and application of national guidance. Ethics support can enhance the clarity, consistency, and defensibility of decisions and help share the substantial burden of urgent and complex decision making.

Ethics support services, such as clinical ethics committees, exist throughout the UK, although provision varies widely. The UK Clinical Ethics

Network has sought to help coordinate ethics support and has offered advice on setting up such services.³

However, the network is a charity, reliant on volunteers. A recent legislative proposal, drafted after several high profile legal cases, sought to increase “access to clinical ethics committees throughout NHS hospitals.”¹³ Covid-19 highlights the urgent need for more formal clinical ethics support embedded across the health and social care system, and not just in hospitals.

Third, research is required to inform the development of ethical policy and guidance, and the interpretation of both. The UK has abundant expertise in healthcare ethics, supported by organisations such as the Nuffield Council on Bioethics, the Wellcome Trust, and research councils. These organisations could coordinate to commission timely research to help answer the many remaining ethical questions about pandemic responses.

None of the above can succeed without the overt support of leaders from government, the NHS and social care, and Public Health England. In plotting the way through this pandemic, we need to follow the ethics, not just the science. Every institution and organisation involved in the response must follow ethical principles, uphold ethical standards, and be publicly accountable for the decisions they make.

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CORONAVIRUS

Too slow and fundamentally flawed: why test and trace is a weak and inequitable defence against covid-19

The long awaited programme is missing a vital aspect of successful contact tracing, public health experts warn, as well as being beset by delays—and it may widen health inequalities. **Richard Vize** reports

“I don’t believe the virus is under control, and I don’t believe that the system of surveillance we have at the present time is sufficient,” says Gabriel Scally, former regional public health director and a member of the Independent SAGE group of scientific advisers.

As lockdown restrictions are eased and businesses reopen, he is one of several public health experts worried that England’s ability to contain outbreaks of covid-19 is seriously compromised by weaknesses in the planning and operation of the government’s much anticipated “test and trace” programme.

Launched on 28 May, test and trace is now at the front line of efforts to prevent further outbreaks. But new infections are still high (an estimated 39 000 a week in private households in England from 26 April to 30 May 2020, in survey data released by the Office for National Statistics on 5 June), testing procedures are slow, and the tracing

system is flawed, public health experts tell *The BMJ*. They also raise concerns about how test and trace could widen health inequalities in populations most affected by the pandemic.

Scally says, “I think the situation is extraordinarily dangerous, and I don’t see any sign of the systematic, thorough, well resourced, and expert approach that is needed.”

Delays at every stage

One of the biggest challenges with test and trace is that delays inevitably hamper every stage: a symptomatic person organising and then receiving a test; the test reaching a laboratory and the laboratory analysing the sample; the test results getting to the contact, tracers, and councils; and follow-up action being taken (box 1).

Around three quarters of covid-19 swabs are analysed by the private sector led Lighthouse Labs set up in response to the pandemic, in Milton Keynes, Cheshire, and Glasgow. This

The chancellor Rishi Sunak (centre) visits a covid-19 testing lab at Leeds General Infirmary in March



includes home testing swabs sent in the post and samples taken at drive-in centres. Public Health England (PHE) and NHS hospital labs mainly handle swabs from patients and health and care workers.

NHS labs have well established logistics to collect samples from places such as care homes and to get them processed quickly, but the privately run Lighthouse Labs use complicated supply chains involving Amazon, Boots, and Royal Mail to transport samples over long distances.

Allan Wilson is president of the Institute of Biomedical Science, whose members include the scientists running the NHS pathology labs. He says, “We’ve always argued that the testing would be better done locally because the infrastructure exists already, so why invent another route? The government decided early on that the preference was to develop separate labs. I think it was a political rather than a clinical decision.”

Securing enough supplies to analyse the samples also remains a struggle. Labs analyse samples using precision built modules consisting of reagents, pipette tips, plastic tubes, and probes to detect viral RNA, which are plugged into

Box 1 | How test and trace works

Under test and trace, someone who experiences covid-19 symptoms must self-isolate for at least a week and organise a test, either by ordering a kit to be posted to their home or by booking a visit to a testing centre.

People testing positive will receive a text or email from the test and trace service with instructions on how to share details of where they have been and any close contacts they have made. Around 18 000 contact tracers will tell those contacts—by email, text, or phone—to self-isolate for 14 days.

Information on test results and contacts is held in the database of PHE’s Contact Tracing and Advisory Service.

The tracers are known as level 3. Level 2 consists of more experienced staff who help determine who is a contact and what action is required. Above them, at level 1, are the health protection experts in the PHE regional teams, whose numbers are being increased. They handle the most important cases, such as major outbreaks.

At least daily, PHE updates local authorities on the cases being handled by level 1 that require their involvement, such as an outbreak in a school.





DANNY LAWSON/PA

Box 2 | What is the Joint Biosecurity Centre?

A striking feature of the government's pandemic response has been setting up major infrastructure from scratch, including the Nightingale hospitals and the privately operated Lighthouse Labs and testing centres. The latest example is the Joint Biosecurity Centre.

The Institute for Government says that the Joint Biosecurity Centre will report to the Cabinet Office and will have two main jobs: providing independent, real time analysis locally and nationally about infection outbreaks; and advising the government on how to respond to infection spikes, such as by closing schools or workplaces in a particular area or imposing restrictions on an entire town or region.

The government has given some confused signals on the centre's state of readiness, with health secretary Matt Hancock admitting at the Downing Street briefing on 1 June that it "still formally needs to come into existence."

It's not clear how it relates to PHE, which is the repository for pandemic health data. One public health expert speculated unattributably that the centre could augment this disease data with information to identify local outbreaks, such as internet search terms and social media activity, adding, "There is a role for new data sources to do that kind of work, so it makes sense."

robotic testing platforms built by companies such as Roche. But, like a printer cartridge, you need the right module for a particular platform. With little manufacturing capacity for these modules, the UK depends on overseas supplies.

Testing capacity is gradually building up as more manufacturers begin producing modules for their own platforms and as other platforms are imported with modules already available (box 2).

Testing times

The prime minister, Boris Johnson, has promised that test results—except those from samples returned by post—will be turned around in 24 hours by the end of June, but anecdotal evidence suggests that two or three days is currently more typical.

At the health and social care select committee on 3 June, Dido Harding, head of the test and

trace programme, was unable to give data on what proportion of tests were turned around within 24 hours or what proportion of contacts of infected people had been contacted within 24 hours and asked to self-isolate. However, she said that over 90% of people waiting for test results had received them within 48 hours.

The committee chair, Jeremy Hunt, warned that a lack of data could "destroy confidence" in test and trace. He made clear his expectation that the total time from a person being tested to receiving a positive test, their contacts being submitted, and those contacts being asked to self-isolate should be only 48 hours.

Jeanelle de Gruchy, director of population health at Tameside Council and president of the Association of Directors of Public Health, says, "The system is currently struggling to get test results back to where they are needed, and we absolutely need to improve it. We are feeding back where it's not working."

Local problem solving

While this problem continues to dog the national testing programme, the Francis Crick Institute in London is already meeting the 24 hour target for the 1000 daily tests it carries out for University College London Hospitals and eight other north London hospitals, as well as care homes and ambulance crews.

Paul Nurse, the institute's Nobel prize winning director, says that the key is being local. He explains, "We're connected, and we solve problems locally. You've got to have the ability to solve problems which happen all the time, such as workflow.

"If you're in Milton Keynes receiving material from Sutton Coldfield or somewhere, that's a much more difficult problem to solve than when you're sitting just across the road and everybody knows each other. It's amazing how many times people are picking up the phone, and it just keeps it all working."

He believes that establishing the massive Lighthouse Labs wasn't properly thought through. "They haven't focused on turnaround time, and we know it's quite a few days,



I don't see the thorough, well resourced, expert approach needed

Gabriel Scally



Private labs were a political not a clinical decision

Allan Wilson



It's the poorest and most vulnerable who are exposed

Jeanelle de Gruchy

which is going to be very difficult in making tracing work,” says Nurse. “We could have had 30 labs like the Crick around the country for a fraction of the cost, and then the big labs could have learnt from those.”

However, de Gruchy is optimistic that the turnaround times for testing will be resolved, saying, “Our expectation is that these would improve immeasurably over time.”

The case for case finding

Meanwhile, the much hyped app is still not ready, a month after the health and social care secretary, Matt Hancock, launched a trial on the Isle of Wight. This was supposed to automate much of the contact tracing by using Bluetooth technology to identify close contacts of an infected person. The government is now expected to make further announcements “in the coming weeks,” says PHE.

However, the biggest problem with contact tracing in England is that “case finding” is currently not part of the government’s plans, says Dominic Harrison, public health director at Blackburn with Darwen Borough Council. “If you just do contact tracing from the first symptomatic case—what we call the index case—you do get the vast majority of people infected, but you don’t get them all,” he says. “With case finding you take a different approach by saying, ‘I’m going to test everybody potentially infected.’ So, if you had one kid infected you might want to test the whole class or even the whole school.”

Harrison insists that our ability to contain and suppress covid-19 hinges on putting case finding at the centre of the test and trace system. “If you look at the best contact tracing systems, they’re doing case finding,” he says, citing an example from South Korea, where an outbreak in a call centre in a tower block resulted in 1143 people being tested, of whom 97 were positive. Crucially, investigators identified asymptomatic carriers who would not have reported themselves under the English system.

Local intelligence

Scally emphasises the importance of building detailed local intelligence about outbreaks. “A particular concern has been the return to schools,” he says. “That should be dependent on the level of infection in a locale, and there is no way at present to provide people with that knowledge. Case finding is the first step.

“At the moment we are reliant on a limited exhortation to people to get in touch if you’ve got symptoms and [to] come forward for testing. It should be a much more dynamic case finding: not just looking at that individual but looking back at where they may have infected themselves—a full investigation of each case.” PHE stressed that contacts are questioned closely to determine whether they are exhibiting any symptoms and appropriate follow-up action taken. Testing of asymptomatic contacts has been considered but is not part of the guidance at this time.

But England’s ability to contain covid-19 will always be in doubt unless case finding is put at the heart of test and trace, says Harrison. “If we don’t do case finding we are going to leave one or two or three cases in an outbreak undiscovered, and they will just keep the transmission chain going,” he warns. “The risk is that, without case finding, the pandemic will have a very long tail and will never get to the endpoint. It will be around forever.”

In England the ability to carry out case finding is hampered in three ways: it’s not part of the test and trace programme; government cuts to council funding have inflicted sharp reductions in public health staff such as health visitors, as well as environmental health and trading standards officers (who work with businesses); and local public health directors have no control over testing facilities.

Harrison adds, “There is no capacity for me to say, ‘Here’s a load of asymptomatic people from a workplace that I would like you to test.’”

Disproportionate impact

This inability to direct testing resources is preventing public health teams from tackling one of the most insidious aspects of the pandemic in this



It will be difficult to make tracing work with a turnaround of a few days

Paul Nurse



Without case finding, the pandemic will never get to the end point

Dominic Harrison

country: the way it disproportionately hits deprived communities.

De Gruchy says, “We know it’s the poorest and most vulnerable in society who are exposed. They are living in houses of multiple occupation. They might find it difficult to socially distance at work in low paid jobs. They would find it difficult to self-isolate and might have insecure employment.”

Public health directors are therefore “alert to how any test and trace system widens health inequalities,” she explains: they are pushing for contract tracers to check whether people who are asked to self-isolate are receiving or need local government support, such as with getting food or medicine.

Harrison says, “We know from the Office for National Statistics survey that, if you’re in the wealthiest 10%, you have half as many deaths as the poorest 10%. So, there’s two risks here. One is that we massively increase the inequalities—economic and social—for the lowest income groups or that, because they find it much more difficult to comply with that guidance, they will perhaps not comply.

“I’m paid monthly a good salary, so if I get told to isolate there’s little cost to me. The guy that delivers pizza to my house, what’s he going to do? That’s a weakness in the whole system.

“If we get persistent levels of infection and transmission carrying on in certain postcode areas, or in certain occupational groups, we are never going to shut the virus down.”

Over the coming months several aspects of the test and trace programme will almost certainly improve. The contact tracers will become more proficient, the supply chain for testing kits will expand, the logistics for the Lighthouse Labs will speed up, and local public health teams will develop increasingly effective responses to local outbreaks. The app might even work.

But there’s a long way to go. Johnson claimed that a “world beating” test and trace system would be in place by 1 June—but Harrison concludes, “It’s clear we don’t have the capacity to deliver a world beating system at the moment, and if we don’t put a lot more resources in it’s going to take a very long time to get there.”

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How covid-19 is accelerating risk of drug resistance

Healthcare responses to the novel coronavirus pandemic may be hastening another long looming threat, writes **Jeremy Hsu**

The global threat of antimicrobial resistant bacteria and other superbugs is worsening as many patients admitted to hospital with covid-19 receive antibiotics to keep secondary bacterial infections in check.

“Since the emergence of covid-19, collected data have shown an increase in antibiotic use, even though most of the initial illnesses being treated have been from covid-19 viral infection,” says Dawn Sievert, senior science adviser for antibiotic resistance at the US Centers for Disease Control and Prevention (CDC).

“The resulting increased exposure to healthcare settings and invasive procedures, along with expanded antibiotic use, amplifies the opportunity for resistant pathogens to emerge and spread.”

Much remains unknown about how the pandemic is directly impacting overall levels of antimicrobial resistance (AMR), but a review of data from cases, mostly in Asia, found that more than 70% of patients received antimicrobial treatment despite less than 10%, on average, having bacterial or fungal coinfections.

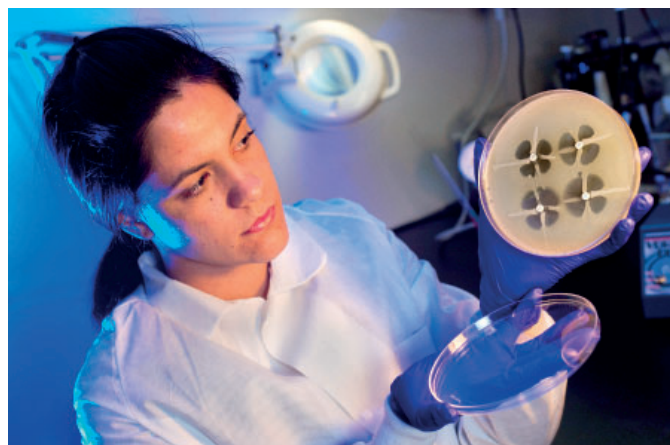
The same study also found frequent use of broad spectrum antibiotics—designed to kill a wide range of bacteria—that can spur AMR through overuse. Such findings give weight to researchers’ concerns that increased antibiotic use during the pandemic could increase the long term threat of AMR.

The World Health Organization discourages the use of antibiotics for mild cases of covid-19 while recommending antibiotic use for severe cases at increased risk of secondary bacterial infections and death. Hanan Balkhy, assistant director general for AMR at WHO, told *The BMJ* that early data on patients with covid-19 suggest only a minority have bacterial coinfections. “WHO continues to be concerned by the inappropriate use of antibiotics, particularly among patients with mild covid-19,” Balkhy says.

Recommended use

One factor likely encouraging increased antibiotic use is clinical uncertainty about covid-19 infections. Such uncertainty can be amplified by urgency when physicians treat critically ill patients whose lives hang in the balance. Some experts worry that the pandemic’s strain on healthcare systems may disrupt antibiotic stewardship programmes designed to help hospitals minimise the risk of AMR.

“There’s a lot of uncertainty about the disease process and the pathology of the infection,” says David Hyun, senior officer of the antibiotic resistance project at the Pew Charitable Trusts in Washington, DC. “When the clinician doesn’t have all the necessary information to understand truly what’s happening in the patient, it tends to drive more antibiotic use.”



During the first wave of covid-19 infections in New York City, physicians working at the Montefiore Health System hospitals in the Bronx were treating patients with “extreme symptoms and physiological parameters that resembled severe sepsis and shock,” says Priya Nori, medical director of the antimicrobial stewardship programme and outpatient parenteral antibiotic therapy programme. “We were not in a position to say definitively that patients did not have concurrent bacterial infections.”

Fortunately, the hospitals had ensured they would have enough antibiotics to handle the surge in cases. But the strain on resources and staff did impact the antibiotic stewardship programme that, like many others, is designed to help minimise the risk of antibiotic misuse leading to AMR. “We didn’t face shortages but weren’t able to monitor antibiotic use as well as we would have in pre-pandemic times,” Nori says.

Confusion and uncertainty

Since the first wave’s peak in New York City, Nori and her colleagues have reviewed their clinical data and noticed that a small percentage of patients did have both covid-19 and bacterial infections at the same time. That is not unexpected; critically ill patients are often intubated and in hospital for weeks, which can allow “the usual cast of characters in any hospital acquired infection” to make an appearance.

When the clinician doesn’t understand truly what’s happening, it tends to drive more antibiotic use

More ominously, the hospitals’ data also show a “slow and steady increase in multidrug resistance” among gram negative bacteria that “can be potentially deadly coinfections with covid-19,” Nori says.

Overprescribing trend

Inadequate covid-19 testing in the US and elsewhere can also increase clinical uncertainty. Before the pandemic, 60-70% of US adults diagnosed with acute bronchitis received antibiotic prescriptions despite the fact that bronchitis is overwhelmingly caused by viral infections. The overlap in symptoms between bronchitis and covid-19 infections could worsen that overprescribing trend, especially when covid-19 testing remains inaccessible, says Rita Mangione-Smith, vice president for research and healthcare innovation at Kaiser Permanente Washington, a provider of healthcare and health insurance in Washington state.

Another risk of antibiotic misuse comes from premature hype surrounding possible therapies for covid-19. Notably, some media reports and political leaders amplified the possible use of the antibiotic azithromycin in combination with the drug hydroxychloroquine, which likely contributed to shortages of both drugs despite the lack of clinical evidence for their effectiveness.

FEATURE

Risky Business: lessons from the pandemic

Clinical professionals are at the forefront of learning and innovation about, and sparked by, covid-19.

Mun-Keat Looi and Rebecca Coombes report from the first virtual Risky Business conference, held on 2 June



MICHAEL COOPER/PA

“If we keep having more inflammatory claims about antibiotics that may help, like azithromycin, then we’re going to have patients who come in demanding it as soon as they hear they have covid-19,” Mangione-Smith says.

The huge shift towards telehealth consultations during the pandemic could also exacerbate antibiotic overprescribing. “There was a recent paediatric study that demonstrated overprescribing is much more common in telehealth visits than in face-to-face visits,” Mangione-Smith says.

Many experts now fear the global effort to keep AMR in check could face a setback during the pandemic. Similarly, many emphasise the need to collect data on how healthcare responses to the pandemic may be affecting AMR. One example is a US Department of Defense study examining rates of secondary infections and antibiotic usage in patients with covid-19.

Michael Craig, senior adviser for antibiotic resistance at the CDC, says they continue to receive data on both antibiotic usage and secondary infections from hospitals without any noticeable decline in reporting. WHO hopes its Global Antimicrobial Resistance and Use Surveillance System—with 91 countries and territories providing data—will yield results. “It will be interesting to see whether any change in profile occurred during the pandemic period, noting that this information can only be assessed and available when the pandemic has subsided,” says Balkhy.

Improved data collection

Researchers see a need for improved data collection that goes beyond “passive surveillance” triggered by microbiology laboratory samples coming back positive for drug resistant strains. “We need clinically focused surveillance systems linking risk factors, microbiology, treatment, cost, and outcomes,” says Gemma Buckland-Merrett, science and research lead on drug resistant infections at the Wellcome Trust.

Wellcome is currently backing the ACORN project—organised by Oxford University in the UK and Mahidol University in Thailand—to establish an active surveillance network for

AMR across low and middle income countries. The idea is to collect data in a way that better integrates clinical information about each patient’s health condition with the microbiology laboratory results. “We spent a lot of time thinking about what we need to know about the patient to make AMR data usable,” says Paul Turner, director of the Cambodia-Oxford Medical Research Unit at the Angkor Hospital for Children in Siem Reap, Cambodia.

The ACORN project is already underway at three hospitals in Cambodia, Laos, and Vietnam, which have escaped the worst of the coronavirus outbreaks so far. But the pandemic has slowed down plans to eventually deploy at more sites across Asia and Africa, with clinical and scientific resources being diverted to either mitigating the impact of the pandemic or planning for it.

The pandemic has also stalled deployment of a new genomic surveillance initiative for the national antimicrobial surveillance programme of Nigeria, Africa’s most populous country. Backed by the Nigeria Centre for Disease Control and the UK’s National Institute for Health Research, the effort was scheduled to start prospective genome sequencing this year but border closures have made it difficult to import all the necessary laboratory materials and finish setting up equipment, says Iruka Okeke, professor of pharmaceutical microbiology at the University of Ibadan in Nigeria. Similar problems have affected the rollout of a separate genomic surveillance effort aimed at quickly detecting the spread of AMR in rural areas.

On top of everything, Nigerian public officials currently have their hands full with both the local covid-19 outbreak and an ongoing Lassa fever outbreak. “The Nigeria Centre for Disease Control is committed to ensuring that other programmes, including AMR, are not compromised,” Okeke says, “But the reality is that emergencies will draw resources and the pinches will be felt pretty quickly when overall resources are few.”

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INEQUALITY AMPLIFIED

On the day that the government released the Fenton report on disparities in risk and outcomes of covid-19, Yvonne Coghill, director of NHS Workforce Race Equality Standard, gave the conference a stark account of the situation: a black man is 4.2 times more likely to die of covid-19 than a white man (a black woman is 4.3 times more likely); the first 10 healthcare workers to die of covid-19 were all from black and minority ethnic backgrounds; and by mid-May, of the 222 healthcare workers who had died of covid-19, 61% were from ethnic minority backgrounds.

Make no mistake, Coghill said, this is about race inequality. Matters of wealth, education, judiciary, housing, and health are all things that people from ethnic minority backgrounds cope with every day and such “microaggressions”—the consequences of “living in a society that is not built for you”—take a toll on psychological and physical health.

Coghill said the NHS needs a clear strategy for improvement for ethnic minority staff working in the pandemic: risk assessments, engagement, and a plan for rehabilitation and recovery. She applauded the NHS Health and Race Observatory newly created to look at these matters. All staff must be risk assessed regardless of background, she said, and all need access to proper PPE—no healthcare professionals working in intensive care have died of covid-19, so there is a clear point around personal protection.



Microaggressions are a result of living in a society not built for you

Yvonne Coghill



There has been “an immense mobilisation of staff” to cope with the pandemic



It's unlikely one drug will knock out coronavirus

Martin Landray



Without good surveillance, we'll only notice a flare up when a lot of cases appear in intensive care

Adam Kucharski

“We need to remember what we can do, not what we can't.”

The opening words from Matthew Shaw, chief executive of Great Ormond Street

Hospital, were in relation to the Nightingale hospitals—and captured the mood of the conference. Five months since the UK's first confirmed case of covid-19 and three since its lockdown began, the world is a different place. But among the chaos, exhaustion, and grief, there is much we have learnt and achieved.

No magic bullet

“It's unlikely there's one drug that will suddenly knock out coronavirus and everything will be back to normal,” Martin Landray, co-chief collaborator of the RECOVERY trial, the world's largest clinical trial of treatments for covid-19, said. “But even moderate effects, such as reducing the number of hospital patients dying by just a fifth, is a colossal improvement.”

The RECOVERY trial is a platform study, meaning it is considering several treatments within one trial. Starting in mid-March, there were just nine days between the first drafting of the protocol and recruitment of the first patients, including regulation and ethics provisions.

There are no drugs for covid-19 that have been shown to work, with the possible exception of remdesivir, Landray, a professor of medicine and epidemiology at the University of Oxford, pointed out. “The early data for remdesivir looks encouraging for reducing the time for hospital patients to improve and go home, but we still don't have any evidence that it reduces mortality,” he said.

In the UK the mortality of patients admitted to hospital is extremely high, at 20-25%. “One in every four to five patients admitted to hospital will not survive that admission and we need to focus, in the first instance, on treatments that will improve that,” he added.

If any one, or a combination, of the drugs under trial shows promise in reducing deaths, the gains will be significant. “In the US, there were roughly 25 000 deaths per week over the past few months,” Landray said. If you could reduce that by a fifth it would mean 5000 lives saved every week.

Poor surveillance equals risk

The scientific models used to predict how different situations might play out are only as good as the data available to inform them.

“We've been doing some work on estimating how much underreporting there was at the beginning of the pandemic,” said Adam Kucharski, a lecturer in mathematical modelling at the London School of Hygiene and Tropical Medicine. “If we look back at that period in mid-March, in a lot of European countries fewer than 5% of people who had symptoms were showing up in the data as cases. So, we're seeing a tiny fraction of what was going on.

“This is important because as we lift lockdown measures, if we don't have good surveillance to identify



OWEN HUMPHREYS/PA

infections we're only going to notice a flare up when a lot of cases start appearing in intensive care. That's something to be cautious about: globally, areas that have poor surveillance take much longer to spot that they have made a mistake."

In common with other European countries, the UK still has a high level of infection, he said, and we could expect to see this prevalence plateau for a long period of time. "A lot of countries across Europe that are lifting lockdown measures still have hundreds, if not thousands, of infections a day and even if the reproduction number doesn't go above one, cases will remain flat. That, however, is still thousands of infections and the health burden that goes along with that."

Immense mobilisation effort

"We initially thought covid-19 was a lung disease," said Nick Hart, joint clinical director at Guy's and St Thomas' NHS Foundation Trust, "but the patients came in sicker than we'd been led to believe." He emphasised that covid-19 is not a single disease—it's a complex multisystem inflammatory disease that attacks the brain, heart, lungs, and kidneys, and there is still much we don't yet know.

While the Nightingale hospitals grabbed the headlines, it's the practical innovations and personnel organisations that have kept the NHS functioning during the pandemic, he said. "It's not just where the beds go, but have we got enough oxygen, enough electricity?"

"There was an immense mobilisation of staff," he said. "By the time we reached peak we had 476 nurses deployed to intensive care. We had 243 doctors—consultants and junior doctors—trained to work alongside the intensive care team. You can say all that in about two minutes, but the actual amount of management that goes into expanding your bed base to that size is phenomenal."

Jim Down, consultant in anaesthesia and critical care at University College London Hospital, applauded the entirely new systems of working thrown together at speed to cope with the patient surge. These were based around teams—functional teams organised by task, for example to turn patients over or put in lines—drawn from all over his hospital. Learning, he said, has had to be rapid.

Rebecca Smith, senior sister in critical care at the Royal London Hospital, said that nurses have had to become "much more task oriented" to cope with

the workload. New coordinator roles to keep track of referrals and bed availability were developed, freeing up other nurses for valuable bedside time with patients.

Covid-19 "is not a straightforward thing to look after," Down said. For example, nursing ratios based on initial models soon turned out to be inappropriate and a huge risk for any second wave. "I don't think we can safely manage these patients at 1:6 (nurse to patient) ratios," he said, acknowledging there are not the resources to go back to the usual intensive care standard of 1:1.

Down spoke of compassion in the face of protocol and the "balance between risk and humanity." All families were given full personal protective equipment (PPE) and allowed to say goodbye to loved ones who were dying. In a time of shielding, isolation, and remote triage, "it's important to maintain some face-to-face time," said Down, as so many people are dying.

Such experiences take their toll. Though the medical response has been phenomenal, "staff are exhausted" and need support, Hart said.

Primary care forever changed

It was fair to say that the primary care model had not changed in decades, said Martin Marshall, chair of the Royal College of General Practitioners council. But it was propelled forward "dramatically" in just a few weeks in April. And, he said, such changes are more likely to stay the longer the pandemic continues and they form a new normal.

Marshall highlighted three ways in which general practice has changed forever: technology, administration, and public health. Before the pandemic a small number of practices used remote triage to direct patients to the most appropriate services—now 100% of practices do so. Before covid-19, 70-80% of consultations were face-to-face—that's now just 15-20%. There has been a massive increase in remote diagnostics and monitoring as well. Marshall did, however, point out that the systems most in use are still the "old tech" of phone calls and email.

He said there has been a 30% reduction in "bureaucracy" such as contracts and appraisals, to the relief of many in general practice. This has restored a system of "high trust, less checking" that he hopes will remain after covid-19 passes.

That trust is crucial in the role of GPs in the public health effort. GPs are a first contact for patients and act as a link between them and the public health network, thus supporting infection control. That must be maintained, Marshall said, while recognising that it may take away from standard care duties that only primary care can fulfil. We don't want to risk diluting what it is that GPs do best, including care for longer term "diseases that don't go away," such as cancer and childhood conditions.

Mun-Keat Looi, international features editor, *The BMJ*

Rebecca Coombes, head of news and views, *The BMJ*

The conference is free to watch at www.riskybusiness.events/lessons-from-covid-19-zoom-conference

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Patients came in sicker than we expected

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