The covid-19 yearbook: world leaders edition

In times of crisis, great leaders step up. So, asks **Mun-Keat Looi**, how did the class of 2020 fare?

Most likely to misinform

Donald Trump, President of the United States
What to say about the man who first claimed covid-19 would "disappear," then blamed China, then withdrew from the WHO, then told citizens to inject bleach, repeatedly tried to discredit his own infectious diseases lead, and caught the virus himself only to continue to flaunt his refusal to adopt prevention measures? Trump has made the pandemic a partisan, political issue in the US, hampering public health efforts. Soon to be former president of the United States, to the relief of many.

Most likely to claim to be "world beating"

Boris Johnson, UK Prime Minister
The decision to lock down later than the rest of Europe left the UK with one of the highest death rates in the world. In November it became the first country in Europe to pass 50 000 deaths, although the NHS has coped admirably, and initial problems with PPE seem to have been ironed out. However, confusion over constantly changing rules, a struggling "world beating" test-and-trace system, and allegations of cronyism in key appointments and the awarding of contracts to private companies for pandemic services—not to mention overlooking the incident of Dominic Cummings's trip to Barnard Castle—have severely eroded public trust despite Johnson earning early sympathy after suffering a serious bout of covid-19.

Most likely to approve a vaccine

Vladimir Putin, President of Russia
Long carrying one of the biggest covid-19 caseloads, Russia's infections have soared throughout 2020, yet deaths per capita are relatively low, despite reports of a healthcare system struggling with ageing equipment and hospitals almost constantly near capacity. Putin put restrictions in relatively swiftly but refused to introduce a lockdown and is pinning hopes on his country's own vaccine development. He has spared no opportunity to laud Russia's progress and flabbergasted the world by approving one vaccine candidate before phase 3 trials had reported any results. He claimed it was safe because his own daughter had been administered it, though not yet himself.

Most likely to understand the science

Angela Merkel, Chancellor of Germany
One of the few world leaders with a scientific background, Merkel quickly grasped the situation when the novel coronavirus hit Europe. Germany's efficient public health system and clear communication with its state governors, as well as neighbouring countries, meant it has coped with alarming infection numbers[1] with a robust test-and-trace system and clear, effective prevention measures. Not everyone is happy, of course—protests by far-right anti-mask groups continue—but Merkel, together with Emmanuel Macron of France, have been prominent in steering Europe through what is still a highly turbulent time.

Most likely to impose a stringent lockdown

Xi Jinping, President of China
From original concern to almost full normality, China is both reprobate and role model to the world in how to handle an epidemic. Chinese officials have been accused of covering up initial signs of the infection, but they were quick to impose an unprecedented lockdown on the Wuhan region. It was stringent and perhaps unreplicable elsewhere, but Xi Jinping's decision, as well as zero tolerance follow-up measures (including invasive surveillance, mass testing of the entire Wuhan region, and clamping down on any cluster outbreaks), has meant China is one of the few countries in recovery (health-wise and economically) in the world.

Most likely to deny everything

Javier Bolsanaro, President of Brazil
A man who is at least consistent. Even when he himself caught the virus, Bolsanaro maintained his dismissal of it as "the little flu." His blatant disregard for masks, social distancing, or any kind of preventive measures led to clashes with, and the eventual dismissal of, two health ministers in the space of three months, and ran counter to regional governors' attempts to get the world's third largest outbreak under control. Brazil still suffers, particularly with an underfunded universal healthcare system,[2] but Bolsanaro remains defiant: "All of us are going to die someday... We must stop being a country of sissies," he said in November.

Most likely to eliminate the virus

Jacinda Ardern, Prime Minister of New Zealand
Universally lauded for being one of the few countries to achieve effective elimination of covid-19, some may argue that New Zealand's Ardern benefitted from a relatively remote and sparsely populated country, making closed borders and restrictions easier to enforce. But there's no doubt her decision to follow scientific advice and aim for the "zero COVID" strategy that other countries rejected as unachievable has allowed New Zealand to return to normal. Ardern's reassuring yet firm demeanour and swift action in response to subsequent cluster outbreaks have won admirers abroad and at home, helping her to an absolute majority in New Zealand's 2020 election.

Most likely to act first

Tsai Ing-Wen, President of Taiwan
If there's a leader who did everything right, it's Tsai. The first to take preventive action over SARS-CoV-2, she ordered health screenings for all flights from Wuhan from 31 December 2019 and in January mobilised the Central Epidemic Command Center to coordinate the response. She introduced travel restrictions, began quarantining high risk travellers, and limited the number of people allowed at gatherings. Aided by a robust healthcare system and universal health coverage, Taiwan has a strong track, trace, and isolate programme following lessons learned from the SARS epidemic in the early 2000s.[4] Tsai's government even produced its own masks, partnering with the country's private companies to keep stocks high and prices affordable for hospitals and the public, and donating 10 million to other countries at a time of global shortages and international division.

Most likely to give a clear and measured national address

Emmanuel Macron, President of France
Nationally broadcast addresses can be double-edged swords, but Emmanuel Macron has wielded them with some skill. They've proved crucial in communicating two strict but necessary lockdowns and numerous curfews and restrictions on French citizens, balancing his country's teetering economy, racial tensions, and the world's fifth biggest coronavirus burden. His leadership domestically as well as on the continent has earned him credit, but, as France's hospitals struggle with a second wave already worse than the first, he will need to offer more than reassurance in the months ahead.

Most likely to refuse to wear a mask

Andrés Manuel López Obrador, President of Mexico
"You know when I'm going to put on a mask? When there is no corruption," said López Obrador in July. He has repeatedly broken physical distancing guidelines and continued to travel even as Mexico rocketed up the caseload rankings over the summer. With austerity foremost on his agenda, he has kept testing and tracing at a minimum and forgone any mandatory national lockdown, instead focusing on an expansion of hospital beds. The result is one of the highest caseloads and mortality rates per capita in the world.

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Cite this as: *BMJ* 2020;371:m4728

ORIGINAL RESEARCH
A very introspective study

Estimating my equilibrium energy intake during lockdown

R A Lewis

Objective To estimate the daily dietary energy intake for me to maintain a constant body weight. How hard can it be?

Design Very introspective study.

Setting At home. In lockdown. (Except every Tuesday afternoon and Saturday morning, when I went for a run.)

Participants Me. n=1.

Main outcome measures My weight, measured each day.

Results Sleeping, I shed about a kilogram each night (1.07 (SD 0.25) kg). Running 5 km, I shed about half a kilogram (0.57 (0.15) kg). My daily equilibrium energy intake is about 10 000 kJ (10 286 (SD 201) kJ). Every kJ above (or below) 10 000 kJ adds (or subtracts) about 40 mg (35.4 mg, SD 3.2 mg).

Conclusions Body weight data show persistent variability, even when the screws of control are tightened and tightened.

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Cite this as: *BMJ* 2020;371:m4561
Find the full version with references at http://dx.doi.org/10.1136/bmj.m4561

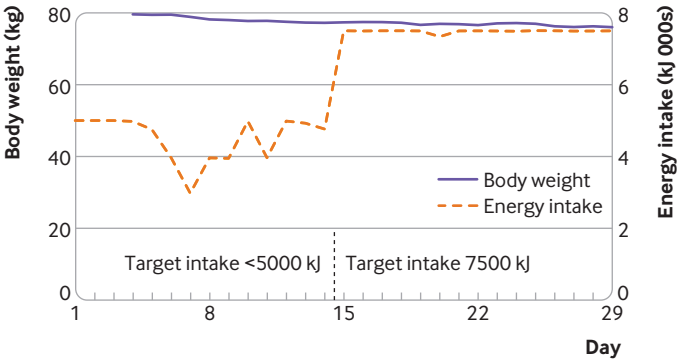

Fig 1 | Body weight and energy intake, beginning with a daily energy intake of <5000 kJ for 14 days, then jumping to approximately 7500 kJ for 15 days. Note that a greater than 50% step increase in intake produces a negligible proportional change in weight

Introduction: naive and kicking

Trust me, I'm a physicist. Not a physician. Mass and energy I know about. My research question was simple: what energy input do I need to maintain my mass (henceforth, "weight")? The answer should be simple to find. But there are more answers than questions when it comes to diet. I might need 7950 kJ or 10 878 kJ per day.[1-6] I wanted more precision than that; I'm a physicist. So, I turned to self-experimentation,[7] which may be worse than worthless[8].

Methods: a balancing act

Food supplies energy. Activity uses energy. If more energy is supplied than is used, then body weight goes up, and vice versa. My goal was to find the sweet spot (avoiding sweets) where energy in equals energy out. I knew there was more to it than that.

To measure the food energy content, a calorimeter was impractical.[9] Instead, I relied on the food packaging or, if unpackaged, the web.[6] I measured food portions on kitchen scales. Multiplying the energy density and mass gave the energy content. Three factors regulated my energy input. First, being in coronavirus disease 2019 (covid-19) isolation meant that unknown quantities of unknown foods—from working lunches, dinner parties, or restaurant meals[9 10]—were eschewed rather than chewed. The identity of every food was known, the amount of every food was audited. Secondly, the proportion of different foods was largely the same each day. Thus, even if the absolute energy content for one food was incorrect, that remained consistent across the study. Thirdly, energy intake was largely changed by varying the amounts of the same foods, not by introducing new foods.

Lockdown also meant that my activity was similar day to day. Each lockdown day was the same: wake, weigh, emails, breakfast, Zoom, elevenses, Zoom, lunch, Zoom, time for a little nap, Zoom, dinner, and so to bed. I weighed myself on bathroom scales. My reference weight was that measured in the morning, immediately after waking, undressing, and urinating.

Of course, energy balance studies have been pursued for a long time. As reported as long ago as 1897, A W Smith, a physicist, was locked in a "respiration chamber" 7 feet long, 4 feet wide, and 6 1/3 feet high for 12 days.[11] Now that's isolation.

WHAT IS ALREADY KNOWN ON THIS TOPIC

- People like me need to take in between 7000 and 11 000 kJ each day to maintain their body weight

WHAT THIS STUDY ADDS

- Determining maintenance energy intake is challenging, even during lockdown, when there are no work lunches, no skipped meals, no dinner parties, no restaurants, and the same old same old routine day in day out
- Step changes in dietary intake—even steep steps—are not reflected in step changes in body weight
- A simple model accounts for the data and allows an estimation of the equilibrium energy intake even in the face of substantial fluctuations in body weight hour by hour and day by day

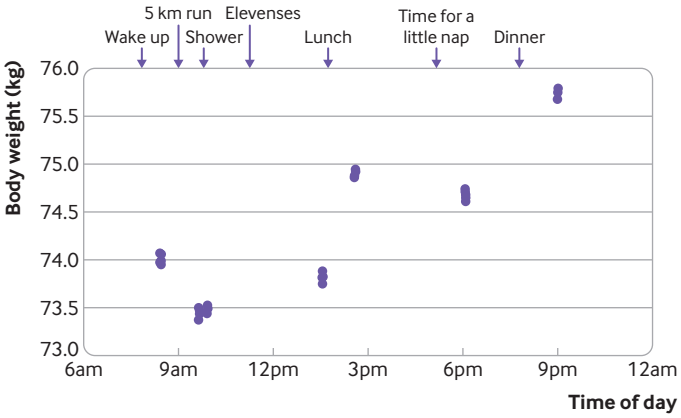

Fig 2 | Body weight measured across one day, with seven life events indicated. Five measurements were made on each occasion, demonstrating good scale reproducibility. Body weight fluctuated by more than 2 kg over the course of a single day

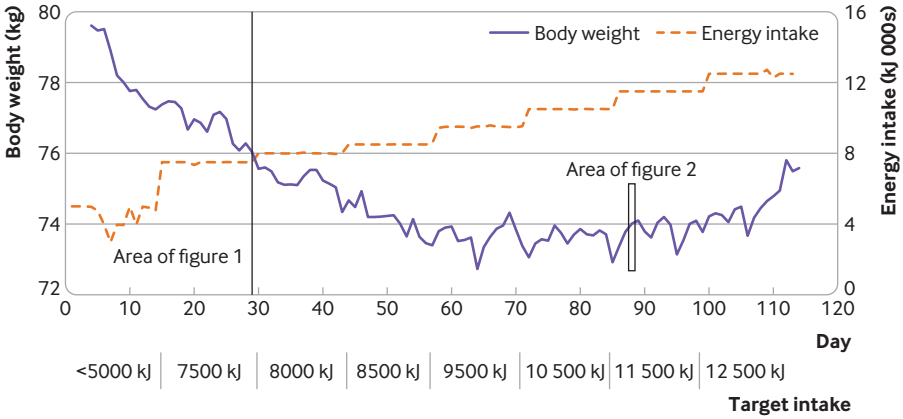

Fig 3 | Daily reference body weight measured first thing every morning over 16 weeks and daily energy intake over the same period

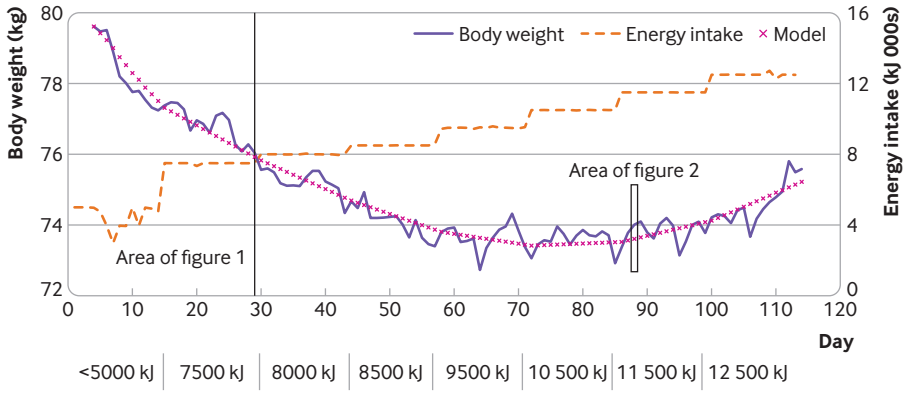

Fig 4 | Daily reference body weight measured first thing every morning over 16 weeks and daily energy intake over the same period with a model of 10 286 kJ equilibrium intake and ±35.38 mg per ±kJ superimposed

Results

Detailed data are in the supplementary table online; here I provide a descriptive narrative. Step 1 was to eat less[12] to lose weight.[13] I began below 5000 kJ per day. My weight dropped from 79.61 kg to 77.38 kg in 11 days. Yet the daily weight loss was not uniform. On three of the 11 days, my weight even increased.

Next, I increased energy intake, to slow weight loss and reach a steady weight. But I didn't want to overshoot and start gaining weight. So I tried 7500 kJ per day for a few days. There was little change in my weight (fig 1). I continued for a week. Still not much to see. So, I persisted for a second week. This was harder than I thought.

Amazing to me, a substantial proportional change in energy intake (>50%, from <5000 kJ to 7500 kJ) produced a negligible proportional change in weight (80 kg to 76 kg, 5%). Also surprising, the abrupt step in energy intake did not result in any discernible step change in weight. My weight kept drifting down.

I stepped up to 8000 kJ per day and stuck at that for two weeks. But the weight data seemed to be trending down still. So, I made another baby step to 8500 kJ. Still, my weight seemed to be dropping. Eight weeks with no answer. Time to take a bigger step: up to 9500 kJ for two weeks. My weight might be going up or going down or staying the same. Who knows? Then a fortnight at 10 500 kJ. Same.

I was getting desperate. I stepped up to 11 500 kJ. Why weren't the data clear as to whether I was losing or gaining weight? I tried weighing myself more often to see if this gave more systematic data.

On 6 June I weighed myself five times in quick succession at seven time points throughout the day (fig 2). The bathroom scale fluctuation was variable—probably related to life events. Across this particular day, my weight changed by more than 2 kg. Here is the challenge. I had not appreciated how big the intra-day fluctuations were relative to the inter-day change I was hoping to measure.

Eat. Run. Sleep. Repeat

These intra-day variations stimulated a closer look at some systematics. I found that my weight loss during a 5 km run averaged 0.57 (SD 0.15) kg. I found that the weight lost between going to sleep and waking up averaged 1.07 (0.25) kg.

Day after day, day after day: baked beans

What more could I do? I had been on a fixed energy intake, but I decided to have exactly the same food every day. This was tough. The baked beans, in particular, proved hard to swallow, day in, day out. My admiration grew for physicist A W Smith who managed 120 g of baked beans a day for 12 days straight.[11] Yet my weight data still fluctuated. Then, after a final fling at 12 500 kJ, I pulled the plug on the experiment, conceding defeat.

Discussion: retrospection

The daily data taken as a whole (fig 3) suggested that weight was lost at a daily energy intake of 7500 kJ and gained at 12 500 kJ—an equilibrium daily intake of (10 000±2 500) kJ. Is that all from 114 days of self-imposed, self-disciplined self-experimentation?

Weight, what about a mathematical model?[14-16] Being a physicist, I tried the simplest model I could conceive, with only two parameters: the daily equilibrium energy intake and the rate at which excessive energy intake adds weight. Weight and energy intake on one day then predict weight on the next day. The best fit to the data was for equilibrium intake of 10 286 kJ/day, within the range of reference values[1-6] and about what my spouse thought before the whole thing began. Body weight increased at 35.38 mg/kJ (fig 4), corresponding to an energy deficit per weight loss of 28 MJ/kg.[17]

Bonus

An extra apple a day[18] (148 kJ) will add about 5 g to my weight, or about 2 kg over a year. Were I not to eat at all, my weight would reduce by the product of 10 286 kJ and 35.38 mg/kJ, namely 364 g/day or about 2.5 kg/week. At the start I was about halfway between eating nothing at all and my equilibrium intake and so losing about 2.5 kg per fortnight (fig 1).

The limitations are pretty much those of a previous study.[19] Overall, I am happy, but would rather be 1.07 (SD 0.25) kg lighter. And so to bed.

Danse Macabre

Our present predicament should make us think more about death and how we die—but we probably won't, says **Paul Keeley**

In an age of social media outrage, it is hardly surprising that hospital staff dressed in full personal protective equipment, posting videos of themselves dancing along to a jaunty track on TikTok, Twitter, or Facebook might be the targets of digital ire. I'm torn.

On the one hand I can see the benefit in maintaining morale in difficult times. On the other hand, I am aware that while loved ones are dying alone on wards because their relatives cannot be with them, it might be somewhat galling to see staff twerking around their clinical areas. I doubt staff motives are anything other than benign, but such videos could be considered crass.

Iconography of death

Dancing around death is nothing new. Many English parish churches were adorned with Danses Macabres, until they were whitewashed over during the protestant reformation. In these vivid wall paintings skeletons, representing death, cavorted with all the estates of society—popes, kings, bishops, lords, priests, and peasants—a reminder that death is the great leveller and we should prepare for it.

The modern iconography of death is somewhat different. On the front of the building until recently occupied by the Fulton County Department of Health and Wellness in Atlanta, Georgia, is a bas-relief by the sculptor, Julian Hoke Harris. The sculpture, called *Keeping Away Death*, shows a muscular man, bearing the Rod of Asclepius and thus an avatar of medicine, holding off skeletal death, robed and holding a scythe. The image is striking, but self-defeating. The ultimate cause of our success in prolonging life is contested. The epidemiologist and historian of medicine Thomas McKeown pointed out more than 50 years ago that the reductions in mortality asserted by medicine might be better claimed by improved nutrition, hygiene, and, only later, by superior physic. In the intervening years, clinical practice can claim more success in increases in longevity from the treatment of cancer, heart disease, and other chronic ailments. We can hold off death, but only for so long. In the process of doing so, we change the mode of death from the short infectious disease of most human history to the prolonged trajectory of degenerative illness and organ failure.

An opportunity in the middle of a drama

A plague, pestilence, or viral pandemic—call it what you please—we are in a drama that has brought illness—potentially life threatening illness, to the forefront and centre of our perception. As we distance ourselves from each other, as did the citizens of Italian city states quarantining themselves from the black death, it might be the moment to contemplate what it all means. As the shielding Israelites in Egypt stayed indoors while the angel of death passed over, we might consider from what we are being shielded.

Mark Taubert, a palliative care consultant, recently praised Albert Camus' novel, *The Plague*, as an exemplar of how we might find meaning from such an epidemic.[1] Camus' story is a propagandistic caricature of the noble atheist Dr Rieux who, in his battle to save his patients from illness, is pitted against the grotesque, moralising priest, Father Paneloux. Camus' view was that plague was not a modern way to die. I tend to disagree. Coronavirus is both a modern and ancient way to die. For most of human history, death that wasn't through war, violence, famine, and plague was through a rapid decline due to infectious disease (now largely curable) with a short illness.

We have an opportunity to consider our mortality—the closeness to death seen by many through this crisis should give us pause to relish life and value every day. Yet it also gives us a chance to examine the limits to medical care that we would want if we were to become acutely or gravely ill. What are the civilised limits we put to the interventions we are willing to accept when we are older and more infirm?

The aftermath

In the aftermath of the "Spanish flu" pandemic in 1918-19, the events of the outbreak were quickly consigned to oblivion. The death toll of the pandemic, at an estimated 50 million, far outstripped, at least numerically, the carnage of the first world war. Yet the subsequent events of the early 20th century—the depression (to which it was undoubtedly a contributory factor), the rise of fascism and Nazism in Europe, and Japanese militarism in the East leading to a second world war, left the pandemic largely forgotten. It did not become a subject of academic interest until nearly a century later, perhaps in the aftermath of further pandemics—severe acute respiratory syndrome, Middle East respiratory syndrome, and swine flu. The internet is both a blessing and a curse to memorialisation.

We are unlikely to forget this pandemic—given the electronic footprint it will have, but our attention span seems to have shortened as our use of social media increases. This recent brush with death's latest manifestation gives us a chance to think about how we deal with death and dying. The sad thing is, when things have settled, we will probably go back to ignoring our own mortality again.

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Cite this as: *BMJ* 2020;371:m4600

This article is dedicated to the memory of Professor John Cash, 1936-2020

EDITORIAL

Climate action: the best gift for global health

The health community mobilised against covid-19 and can mobilise again

December is a time for reflection, and there is much for us to process from 2020. The covid-19 pandemic proved to be an unprecedented global stress test for health systems—both revealing and exacerbating problematic areas. Disinformation and misinformation, mixed with a festering distrust of science, politicised age-old commonsense public health interventions.[1 2] When prevention failed, even the best functioning healthcare systems broke under the surge of covid-19 patients. While the rollout of vaccines will lessen the pandemic burden, climate change still threatens to disrupt our health systems further and erode decades of health gains.

This month is the fifth anniversary of the Paris agreement, and we are at the critical juncture of countries disclosing their efforts to meet commitments to cut emissions.[3] So far, the political will to implement policies that will avoid the most catastrophic health outcomes have failed to materialise; current policies place today's world, already 1.2°C warmer than in pre-industrial times, at up to 4°C warmer by 2100.[4 5]

Crop yields

The fragility of health and health systems in a 1.2°C warmer world is already apparent, though these effects are not felt equally. Heatwave exposure among older people reached a record high in 2019, the conditions for transmitting dengue, malaria, and diseases caused by *Vibrio* are growing more favourable, and the yield potentials of major crops continue to decline.[5] Yet only half of the countries surveyed have national climate and health plans, and two thirds of cities are concerned that climate change will overwhelm their public health infrastructure.[5]

After the events of 2020, many in health may find it hard to fathom tackling an existential crisis like climate change. Yet we are in the critical window for action[6] and without a 7.6% reduction in greenhouse gas emissions each year over the next five years the goal of keeping the global temperature rise below 1.5°C in 2100 is likely to be out of reach.[5 7] There are grounds for optimism, however, as the parallels and intersections with the covid-19 crisis have fostered advocacy for making climate action a critical part of pandemic recovery.[7-9] The health community is well positioned[10] to reinforce and amplify two key messages.

A united global medical community can be the missing ingredient needed to catalyse action on climate change

Integrated approach

First, climate action is essential for successfully tackling the other pressing global challenges affecting health, such as poverty and universal health coverage.[11] Climate change underlies and exacerbates barriers for improving health, threatening to increasingly undermine health gains and widen inequalities.[12] Governments must take an integrated approach when tackling these problems, and health professionals need to amplify the wide ranging health benefits of acting holistically.[5]

Climate action, equity, health, and economic goals are dependent and reinforce one another.[5-13] Stimulus packages aimed at recovery from the pandemic offer a once in a generation opportunity to rapidly expand clean energy jobs and accelerate our transition to net zero economies.[7-9] Most of the world has failed to capitalise on this.[14]

The second key message is that moving away from fossil fuels has health benefits and economic dividends in the short and long term. Although climate action yields greater gains for children and future generations, people today will also benefit, especially vulnerable groups. Air pollution has the same root cause as climate change—the burning of fossil fuels.[15] Patients' symptoms and healthcare use will improve in the weeks to months after air pollution is reduced, and lives will be saved.[16] The pandemic lockdowns showed us just how quickly air pollution can improve.[15 17] Transitioning away from fossil fuels could prevent 3.6 million premature deaths a year from air pollution alone and save nations billions in healthcare costs.[5-18] Meanwhile, transitioning to more plant based diets and increasing physical activity through active transportation also bring near term health benefits.[13]

Long term, mitigating the health effects of climate change and minimising health system disruptions will improve health equity and benefit populations in profound ways that haven't yet been fully quantified[5 12] while also delivering evidence based economic dividends. For example, not exceeding 1.5°C of global warming could return $264tn-$610tn (£196tn-£450tn); in economic rewards by 2100.[7]

Yet data and science alone are not enough to motivate change.[19] The message, messenger, and method are critical components, and a global medical community united around climate change can be the missing ingredient needed to catalyse action.[10 20] Only 25% of a population is needed to change societal norms,[21] and behavioural and social scientists can serve as critical experts. Health professionals are trusted sources[20] that exist in every corner of the world to personalise the health benefits of climate interventions. These are powerful tools to combat politicisation and misinformation.[19]

Both the pandemic and climate change bind the world—and the health community—together in a common destiny. The health community must recognise this connectedness and harness its collective power. Together, we can galvanise the political will required to fill the prescription for better health and equity through climate action.

Cite this as: *BMJ* 2020;371:m4723
Find the full version with references at http://dx.doi.org/10.1136/bmj.m4723

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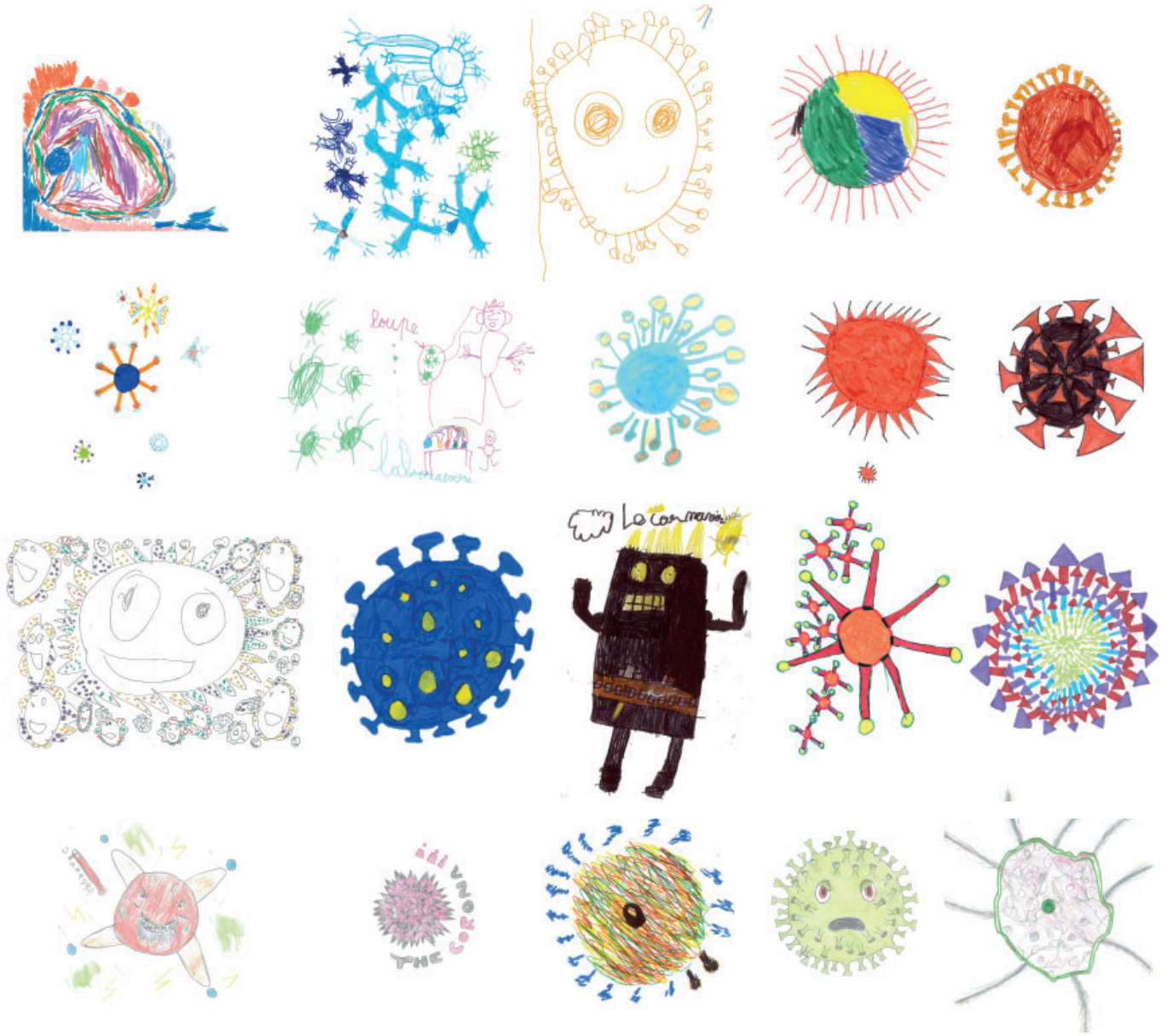
To each child their own coronavirus



In the ancient Indian parable of the blind men and an elephant, the shape of the animal is appreciated differently by six blind men who conceptualise it only by touching part of its body.[1] In a similar way, children may conceptualise severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in their own unique ways.

Although the infection is less severe in children (rare instances of multisystem inflammatory syndrome notwithstanding), young people have been at the forefront of policy makers' concerns. This year children have been denied access to school and have had delayed access to care. Moreover, lockdown restrictions have affected children both directly, and indirectly, through the impact these measures have had on parents and caregivers, leading to anxiety, symptoms of post-traumatic stress disorder, and even child abuse. The concurrent covid-19 "infodemic" has contributed to a climate of fear centred on the virus itself.

The walls of caves across the world are a reminder that drawing is one of the oldest forms of human expression. Drawing could put a face on SARS-CoV-2 and allow for a better grasp of the reality of the pandemic. Twenty children (12 girls and eight boys) aged between 4 and 14 years were asked to draw a coronavirus as they imagined it. Their drawings mostly show the familiar shape depicted on screens and publications: a circular virus particle with a crown of simple or mushroom-shaped spikes, colourful, sometimes happy, sometimes sad, but seldom evil.

Children, lacking drawing skill but free of the burden of academic knowledge, provide insight into the essence of things through feelings as well as their eyes. To each child their own coronavirus.

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Delphine Bernoux, doctor of medicine, Timone Enfant Hospital, Marseille
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Cite this as: *BMJ* 2020;371:m4578

BMJ OPINION Julie K Silver

Should her name begin with "Doctor"?

What we call ourselves, and how others refer to us, matters. This is perhaps nowhere more important than in a professional setting, where the use of titles or first names has the potential to bring up gender and equity issues.

A recent column in *The BMJ* by David Oliver on whether doctors should use their first names, started a lively debate in the rapid responses. Oliver wrote, "I work in an 800 bed hospital employing over 4000 people, yet everyone knows the chief executive and the chief operating officer as 'Steve' and 'Dom.'" Notably, these examples are men, so one might consider how the culture of using first names may be influenced by a cloak of privilege at the top. After all, women in the US and many other countries are often represented in top leadership positions at very low levels. For example, there are more men named John than there are women in many leadership positions.

A deep dive into the promotion of women in medicine by Richter and colleagues, studying more than 500 000 graduates from 134 US medical schools over 35 years, found that women in academic medical centres were less likely than men to be promoted to associate professor, full professor, or department chair. Alarmingly, they found no apparent improvement over time.

Inexorable zero

Since zero is a particularly powerful number, US courts have used the concept "inexorable zero," a true or near zero number, to assume discrimination. Meritocracy arguments tend to fall apart when there is an inexorable zero. After all, it is challenging for reasonable people to believe that there are essentially no qualified individuals from a particular group who could have been hired or promoted.

WILLETT

In the *Her Time Is Now* report, I used data from the Association of American Medical Colleges to show that in most specialties in the US both Black/African American and Hispanic/Latina women are at an inexorable zero level for full professors and deans. Minority women have entered medicine for decades, so zeros at the top cannot be explained by a lack of mature talent in the pipeline. Since thousands of reports have documented workforce disparities for women in medicine, subject matter experts tend to agree that gender bias (which is often combined with other forms of discrimination) is a more plausible explanation.

Importantly, much of the evidence base documents "macroinequities" with commonly used metrics such as compensation, promotion, publications, grant funding, and recognition awards. However, researchers have begun to focus on "microinequity" studies. This area of research is growing, and similar to microinequity research, studies tend to be quantitative and to analyse data to show differences in how men and women are treated. Clinical analogies include studies that focus on subtle symptoms of raised blood pressure or glycaemic markers—precursors to a future diagnosis of hypertension or diabetes, respectively.

Notably, both clinical and workforce equity "micro" studies focus on a pattern (rather than a one-time event). Dayal and colleagues, for example, analysed 33 456 direct observation resident evaluations in the US and Canada using Accreditation Council for Graduate Medical Education milestones and found the rate of attaining milestones was higher for male residents as they progressed in training across all subcompetencies. In other words, male physicians outperformed female physicians in 100% of the milestones, and in striking contrast women outperformed men in 0% of the milestones. Not surprisingly, a systematic review evaluating graduate medical education highlighted the issue of gender bias in evaluations.

Tipping the balance

Just as there are interventions to address subtle symptoms before they reach the threshold of disease, there are opportunities to prevent some microinequities. One randomised study focused on a well documented problem—women instructors tend to receive lower student ratings at all levels of higher education than male colleagues. The intervention was simple—students read an anti-bias statement before filling out their instructor's evaluation:

"Student evaluations play an important role in the review of faculty. Your opinions influence the review of instructors that takes place every year. Iowa State University recognizes that student evaluations of teaching are often influenced by students' unconscious and unintentional biases about the race and gender of the instructor. Women and instructors of color are systematically rated lower in their teaching evaluations than white men, even when there are no actual differences in the instruction or in what students have learned.

"As you fill out the course evaluation please keep this in mind and make an effort to resist stereotypes about professors. Focus on your opinions about the content of the course . . . and not unrelated matters (the instructor's appearance)."

The researchers found that students in the anti-bias language group gave significantly higher rankings of female instructors than those in the group that did not read the statement. There were no differences between groups for male instructors.

Consider the science

Oliver cited a landmark study by Files and colleagues in which the authors examined video recordings of lectures and found that women nearly always used the title "doctor" to introduce speakers (96% of the time) while the men who made introductions used it two thirds of the time (66%). When it came to men introducing men, they used formal titles 73% of the time—when introducing women this dropped to 49%.

Patricia Friedrich, a coauthor of the study, points out, "There is no logical, professional, or practical reason to use titles differently across genders."

The path to systemic gender bias and discrimination at the macro level is paved with microinequities that are increasingly documented in the literature. When considering whether her name should begin with "doctor" in professional settings, one thing we can all agree on is to consider the science as we tackle this important issue.

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Editor's note: *The BMJ* style is to not use "Dr" and this was applied consistently in this article

Cite this as: *BMJ* 2020;371:m4754

ORIGINAL RESEARCH Pseudo-systematic review

It's Christmas time, but is now the time to act?

Nathan Ford,[1] Grania Brigden,[2] Tom Ellman,[3] Edward J Mills[4]

Objective To identify any medical or public health rationale for claims that the time to act is now.

Design Pseudo-systematic review.

Data sources PubMed.

Study selection Studies that included the claim "time is now" in the title, with or without exclamation marks. No language or date restriction was applied.

Results 512 articles were included for review. No relation was identified between time to act and disease burden, severity, or specialty. Claims that the time to act was Christmas were almost entirely without basis. A clustering of claims that it is time to act in the first quarter of the year suggested a possible association with New Year's resolutions.

Conclusions Now is as good a time as any.

WHAT IS ALREADY KNOWN ON THIS TOPIC

- Articles across specialties increasingly implore us that it is time to act

WHAT THIS STUDY ADDS

- The findings of this review suggest that someone, somewhere, thinks that the time to act is now

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Cite this as: *BMJ* 2020;371:m4143
Find the full version with references at http://dx.doi.org/10.1136/bmj.m4143

HANNA KUPREVICH / ALAMY

Introduction

> There is almost no such thing as ready. There is only now. And you may as well do it now. Generally speaking, now is as good a time as any
>
> *Hugh Laurie (AKA Dr Gregory House)*

The time to act is now! This is a commonly used clarion call in medical journals. It can be found in titles of editorials, commentaries, letters, and, occasionally, original research. During 2020 health systems around the world were stretched to breaking point managing the coronavirus disease 2019 (covid-19) pandemic. Nevertheless, we were told that the time is now to standardise sedation training,[1] differentiate service delivery,[2] certify cardiac anaesthetists,[3] address the mental health impact of climate change,[4] and end the HIV epidemic.[5]

Two articles claimed that the time is now to consider universal mask wearing to protect against covid-19 which, to be fair, was timeous.[6 7] Nevertheless, we are concerned about the potentially endless stream of demands placed on health professionals around the world to Act Now! without any obvious rationale, and little regard for competing priorities. Claims that the time is now have doubled in the past decade, from 26 articles published in 2010 to 52 in 2019 (figure). We suspect 2020 will be a bumper year.

Methods

We searched PubMed up to 30 September 2020 for studies that made the claim "time is now" in the title. We intended to search the grey literature via Google Scholar but after an initial screen yielded 6.6 million results we decided to omit this step.

It has been suggested that Christmas time is the season to be lazy.[9] We explored which disciplines considered the time to act was Christmas by tabulating articles published on the nearest day to Christmas from 2010 to 2019 (see table) and assessed the appropriateness of these claims through visual inspection of results and applying personal opinion.

We were unsure whether authors only wanted people to act now, or whether deferred action was also a desirable goal. We therefore undertook a sensitivity analysis that included the following statements: "the time to act is later" and "the time to act is in a bit." We carried out subgroup analyses to assess the use of question marks or exclamation marks to provide particular emphasis to the claim that time is of the essence.

The time to act is Christmas

Date of publication	When is it time to act?	Issue requiring Yuletide action
December 2019	Now	The opioid epidemic and psychiatry: the time for action is now[20]
December 2018	Now	Paid parental leave in radiology: the time is now[21]
December 2017	Now	Reducing radiation exposure from nuclear myocardial perfusion imaging: time to act is now[22]
December 2016	Now	Time is now: venous thromboembolism prophylaxis in blunt splenic injury[23]
December 2015	Now	Making physical activity counselling a priority in clinical practice: the time for action is now[24]
December 2014	Now	Understanding the risk of donor-derived infections in paediatric transplantation: the time is now[25]
December 2013	Now	The time is now to fix SGR[26]
December 2012	Now!	Interprofessional Education (IPE) Activity among health sciences students at Sultan Qaboos University: the time is now![27]
December 2011	Now	End-of-life care: the time for a meaningful discussion is now[28]
December 2010	Now!	Alcohol and the elderly: the time to act is now![29]

Results: is now the time?

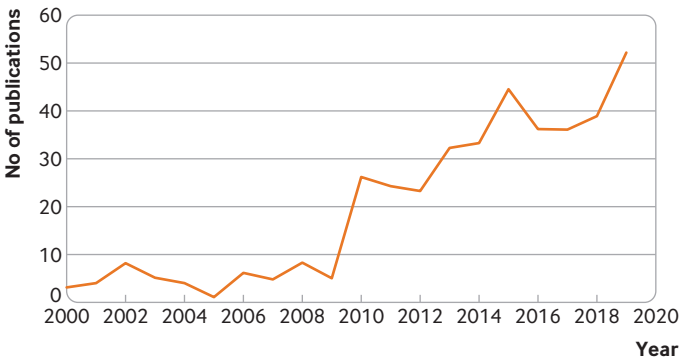
Our initial search yielded 595 titles, of which 512 studies were included for review. On screening of the abstracts we noted that only 16 articles (3%) could be considered related to research, suggesting that claims that the *time is now* are rarely empirically derived. Of 46 articles claiming the *time is now* during 2020, only three called for action against the ongoing pandemic—one about serosurveys[10] and two about masks.[6 7] The rest either made reference to the pandemic opportunistically to promote a perennial concern, or didn't refer to it at all.

We included studies that used exclamation marks, even though most style guides agree that they should never be used.[17] We found 50 studies that used an exclamation mark, presumably because stating that *the time to act is now* was considered insufficient to express urgency. Examples include: Colorectal cancer screening (The time is now!),[8] Collaboration between nurses and doctors (The Time is Now!),[18] and Next-generation molecular genetic diagnostics in nephrology (the time is now!).[19] Thankfully, no studies were identified that used multiple exclamation marks.

The time to act is Christmas

We undertook a subgroup analysis to determine the Yuletide relevance of eligible studies published at Christmas over the past decade (table). Of these, only one paper—Alcohol and the elderly: the time to act is now!—could be considered to have some relevance to Christmas. The rest could have been published at any time of year.

In 2019, 49 published articles instructed that it was time to act, with a clustering of articles in the first three months of the year (19 articles, versus 10 articles for other quarters). While differences are not statistically significant, this upsurge in the first quarter of the year could be associated with New Year's resolutions.



Time is increasingly Now. Claims made in the past 20 years. Data from PubMed

Let's wait a bit

We were unable to find any studies that claimed "the time to act is later" or "the time to act is after a nap," or "let's wait a bit." One study used the words "to do it now or later" in the title, but this discussed the neural correlates of procrastinations and was possibly the only study to ever have meaningfully used the *time is now* construct.[31]

Discussion

The findings of our review suggest that it is always time to act. An important limitation of our review is that we did not assess whether appeals to act now changed behaviour, including the behaviour of the authors making the claim. Editorials, while potentially powerful motivating materials, are hardly matched by basic efforts to actually conduct the advocated approach.

The claim that *the time is now!* is rarely found in corrections—for example, when authors have had second thoughts about when to act. It is also never found in obituaries. No link is seen between whether the topic in question really does deserve action today, as opposed to yesterday or tomorrow. Our study was limited to claims made in the title. We suspect that if we broadened our search to include, for example, the last line of study conclusions, many more examples would have been found. We doubt, however, that any of them would have a stronger basis for their claim.

If it is always time to act, this led us to wonder why the complacency? A rapid search found 40 articles with the words "No room for complacency" in the title. This could be an interesting question for future Christmas research in *The BMJ*.

The sound of medicine

Hospitals are noisy and stressful places, and noise can induce anxiety. **James Weaver** considers whether more can be done to improve soundscapes in hospitals

My working day involves researching how acoustics affect a musician's performance and thinking about the intelligibility of sound. I became interested in this through my part time role as a musician. I went from playing in the back rooms and basements of pubs to large venues almost overnight. I became aware that my performance changed based on the natural acoustics of the space. This interest led me to my current doctorate, in which I use computational methods to analyse how different reverberation conditions impact on musical performance and expressivity.

In November 2019 my wife, Annabell, died from metastatic melanoma at St Bartholomew's Hospital. I spent many days and nights in hospital with her, waiting in foyers surrounded by random bleeps and multiple conversations, and being on wards where, in the quiet of the night, alarms sounded until someone attended to them. Somewhat ironically, my research involving intelligibility of sound coincided with Annabell progressively losing her hearing. She became profoundly deaf and subsequently used hearing aids and finally a cochlear implant.

Soundscape of a ward

Noise can be a pleasurable, comforting thing. As anyone who has experienced an anechoic (or even semi-anechoic) condition will attest, the absence of any noise is unpleasant. In contrast, too much noise, particularly in a situation where one needs to discuss complex matters, or simply recuperate, can have a negative impact.[1-3] This is a difficult balance in a hospital setting.

Sound and noise became all encompassing for Annabell, and me. We constantly battled against her diminishing hearing, especially in the hospital environment where communication is a key part of the patient experience. In the time between her complete loss of hearing and having her cochlear implant activated, something Annabell found particularly challenging was the speed and complexity of information delivered to us, which, as an understatement, is difficult to understand when you can't hear. Annabell was a skilled lip reader, but consultations became emotionally and physically draining.

After her implant she was better able to handle this situation, but it could still be problematic as ambient noise can occlude speech—something she also found with hearing aids. This led me to realise the importance of the soundscape in a hospital and how important this is when designing facilities and spaces for patients. It also got me thinking about practical solutions.

The soundscape is the ordered (musical) and non-ordered sounds of the environment. Features of the soundscape can be divided into keynotes, signals, and soundmarks. In a hospital these could be the following: a keynote, that pervasive sound which anchors the auditory landscape might be the low level hum of equipment being used; the signal, a foreground sound that requires attention would be an alarm sound coming from a finished intravenous line, or from a patient bed; and the soundmark is a sound that might be unique to that environment—on a ward it could be the particular noise of a machine or type of interaction.

Quiet spaces to discuss sensitive issues should feature diffusing material, such as carpet or soft furnishings

Optimising the environment

A person on a ward might have their own variations on this, and if you are in this setting, I would encourage you to take a minute and consider it. The soundscape of a ward can be a stressor to patients and their families: for example, the natural night time quiet of a ward punctuated by an avoidable alarm, or a key moment in an important discussion disrupted by a parallel conversation.

Hospitals are usually large buildings and sound is affected by the size of a room and can have a long reverberation time. This measurement looks at the decay of a sound from its original source. Think of, say, a large religious venue, the sound of music or a call to prayer reverberates through the room with a long tail of volume, whereas the same sound in your own home would take less time. In a ward setting the sound of an alarm, at a necessarily loud volume, would potentially have a long decay and begin merging with other sounds to create a cacophony.

This isn't solely dependent on the size of the room but also the surfaces and other factors that can diffuse (and, of course, increase) sound. Rooms designed to be easily cleaned will likely have strong reflective surfaces for sound, but carpeting and soft furnishings would diffuse it. And, of course, the larger the space, the longer the reverberation time and the likelihood of larger surfaces that would reflect sound.

Hospitals such as the Nightingales which are built in large facilities can be particularly problematic. Long reverberation times and loud and cluttered soundscapes are distressing for patients and families and also present difficulties for doctor-patient communication and conversations between health professionals. Factor in the use of personal protective equipment and communication is challenging, particularly for those with hearing loss.

Annabell and I discussed different tactics that could help make her experience better. As hearing loss is a hidden disability it can be difficult to detect unless declared. Annabell became so adept at lip reading that sometimes people didn't realise she was deaf and her hearing loss wasn't always fully documented, so doctors or nursing staff would launch into a conversation at speed, facing their computer, and possibly in a space with large amounts of background noise.

It would have been helpful if we had had access to quiet spaces to discuss sensitive matters. These should feature some diffusing material, such as carpet or soft furnishings, or have acoustic treatments such as wall or ceiling panels; these can make a huge difference to the listening experience. Some alarms are essential for patient safety, but research is needed into their necessity and whether any could be rationed or vibrating devices be substituted without compromising patient safety.

Mitigation of these pervasive sounds coupled with increased acoustic treatment and awareness of the problem would make a better environment for both patients and staff.

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Cite this as: *BMJ* 2020;371:m4682