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Socially-distanced science: how British publics were imagined, modelled and marginalised in political and expert responses to the COVID-19 pandemic

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In early 2021, the United Kingdom (UK) had the highest per capita death rate from Covid-19 of any large country. Yet it had previously been ranked as one of the best prepared countries for a future pandemic. This gap between preparedness and performance has been the subject of intense debate, including as part of the UK Covid-19 Inquiry. In this paper, we contribute to this ongoing process of reflection by identifying the *imagined public(s)* within the UK's scientific advice system. Drawing on scholarship in Science and Technology Studies (STS) that critiques framings of a singular or homogeneous 'public', we review meeting minutes and media briefings to reveal two *imagined publics*, co-constructed by the UK's science advisors and policymakers in early 2020: first, a 'freedom-loving' public resistant to stringent policy interventions; and second, a public that was—in an echo of wartime rhetoric— 'all in it together'. These imagined publics reflect a series of framing assumptions that help to make sense of the UK's pandemic response. We focus particularly on the tensions between the homogeneous and multi-faceted imagined public, and the compound health and social inequalities that predated the pandemic but became starker and more visible as it unfolded. Our paper charts these tensions and demonstrates how these imagined publics went through stages of cohesion and fracture in the fraught early months of the pandemic. We conclude by considering the implications of this analysis for understanding the UK's response to Covid-19, and for the future of scientific advice and emergency preparedness. *Why does this matter?* Studies of scientific advice reveal that how scientists and decision makers imagine the public and their concerns affect the communication of scientific advice, and the construction and value placed on relevant knowledge. Advisory scientists frame their models and their advice in terms of what they regard as politically possible.

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Introduction

An index of 'global preparedness for the next pandemic' published at the start of 2019 classified the UK, USA, and other Western European countries as 'most prepared'[1]. With its world class bioscience capabilities, battle-hardened National Health Service, and sophisticated structures for scientific advice to government, the UK was, in the words of one policy adviser, 'the envy of the world' (quoted in Calvert and Arbuthnott, 2021).

Yet by the start of 2021, 10 months into the global Covid-19 pandemic, the UK was in the midst of a disastrous second wave and had the highest per capita death rate of any large country. An early parliamentary inquiry concluded that decisions made towards the start of the pandemic 'rank as one of the most important public health failures the United Kingdom has ever experienced' and noted that these failures had occurred 'despite the UK counting on some of the best expertise available anywhere in the world, and despite having an open, democratic system that allowed plentiful challenge' (House of Commons' Science and Technology Committee and Health and Social Care Committee, 2021, pp.32–33).

This gap between notional preparedness and actual performance has been the subject of intense debate (Lambert, 2020) and remains a central focus of the UK Covid-19 Inquiry, which aims to examine the pandemic response and learn lessons for the future[2]. As a case study of scientific advice during a crisis, for the UK as for many other countries, Covid-19 is unprecedented in its scale, duration and the high stakes of decisions that were justified as being 'led by the science' (Johnson, 2020a).

During the pandemic, advisers and scientific experts who normally operated backstage (Hilgartner, 2000) were thrust into the spotlight. The public, as well as being an audience for scientific advice, and policies based upon it, were vital to the delivery of any response. At the heart of the advisory process, therefore, was the question of how scientists and policymakers imagined that public (Rommetveit and Wynne, 2017).

Opening up scientific advice: an STS perspective. The Covid pandemic also shone a spotlight on processes of scientific advice that had previously been of niche interest within science and technology studies (STS). Alongside theorists such as Foucault (2020) and Latour (1987), who looked for the politics concealed behind scientific claims to neutrality and objectivity, STS researchers including Dorothy Nelkin (1975) and Sheila Jasanoff (1990) have explored how expertise marshalled in the service of public decisions is built on often-invisible social and political assumptions.

Analogous studies of expert advice have focused on the role of 'imagined publics', building on earlier ideas of how politicians in general (Schneider and Ingram, 1993) and nationalist politicians in particular have constructed 'imagined communities' (Anderson, 1983). In building or fine-tuning models for the complexities of real-world, fast-moving situations, experts often rely on assumptions about what Maranta et al. (2003) call the 'imagined lay person'. Marres (2005) describes how these actors are sometimes then organised into a single imagined construct: an 'anonymous, collective, virtual, somewhat mysterious creature we call public' (p.216).

As a result, advice and recommendations that prescribe, proscribe, or seek to influence public behaviours can reflect models of public attitudes that are unrealistic (Wynne, 1989). Those interested in the sociology and communication of science have long challenged notions of a singular 'public', highlighting instead the presence of multiple publics who may coalesce around particular interests while remaining plural and dynamic (Mohr et al., 2013).

In the UK, assumptions about expert advice and its relationship with the public were destabilised by earlier crises in the 1980s and 1990s. Most prominently, in response to the emergence of bovine spongiform encephalopathy (BSE, or 'mad cow disease' as it became known), and its human variant Creutzfeldt-Jakob Disease (vCJD), scientific advisors were pressured into reassuring a public they regarded as 'irrational and ill-informed' (Millstone and Van Zwanenberg, 2001). While the choreography of expertise in public was calm and patrician, large uncertainties lurked backstage (Hilgartner, 2000). It took a decade from when BSE was first detected for the government to admit that it was a cause of disease in humans. Policy failures around BSE sparked a public health crisis and also produced a form of 'civic dislocation' (Jasanoff, 1997), in which citizens and consumers lost faith in the institutions supposed to protect them. A central conclusion of the BSE Public Inquiry (2000) was that the public should be trusted to cope with uncertainty (Stilgoe et al., 2006).

From 2000 onwards, UK policy rhetoric about scientific advice reflected a shift away from paternalism, towards transparency and two-way engagement with the public (OST, 2000). Another influential parliamentary review from this period detected 'a new mood for dialogue' (House of Lords, 2000). Yet as Irwin (2006) concluded from his analysis of the UK response to another fin-de-siecle controversy—over genetically modified crops—political cultures rarely change quickly. New assumptions about the public sit uneasily alongside older paternalistic ones (Irwin, 2006). When the stakes are high and decisions are urgent, rather than acknowledging situations of 'post-normal science' (Funtowicz and Ravetz, 1993), the instinct of the UK scientific establishment has been to retreat to seeing the public as a passive target for 'expert reassurance rather than mutual exchange and engagement' (Barnett et al., 2012, p.47).[3]

Studies of scientific advice reveal that such imaginaries of the public affect more than the downstream communication of scientific advice; they also influence the construction of relevant knowledge upstream (Hinchliffe, 2001; Wilsdon and Willis, 2004). Scientific advisers frame their models and advice in terms of what they regard as politically possible. The construction of uncertainty as a function of what is at stake and what is seen as in the public interest, complicates the epistemic work of scientific advice (Yearley, 2000; Stilgoe, 2007).

Dynamic publics, compound inequalities. A one-dimensional imagination of 'the public' is further complicated by an ever-growing understanding of social inequalities as systemic, interconnected issues embedded into the fabric of our societies which are predictably exacerbated during times of crisis (Hill Collins, 2019). Research into these and other inequalities highlights the presence of multiple, dynamic *publics*, and underlines what is at stake when the diverse needs of public are overlooked, as became apparent at the height of the pandemic.

In the UK, a period of pre-pandemic austerity following the 2007 financial crisis, underfunding of public services, stagnating wages and rising living costs had left many households facing unmanageable debt (Fitzpatrick et al., 2018; Fitzpatrick et al., 2020). In particular, those from Black, Asian and Minority Ethnic backgrounds were more likely to experience in-work poverty and were over-represented in low-paid positions in sectors which were most affected by lockdown policies to limit the spread of Covid-19 (Barry, 2021). Analysis of the social determinants of health has also shown how a person's social position directly impacts their health outcomes (Marmot et al., 2010 p.10). For the decade leading up to the pandemic, despite progress in some areas, health inequalities continued to widen, alongside stalling

life expectancy (Marmot et al., 2020) which is reduced by up to 9.2 years for men and 7 years for women living in the most deprived areas of England, compared to the most affluent (Public Health England, 2017; MHCLG, 2019).

With evidence of such an uneven playing field going into the pandemic, the worsening of health and broader social outcomes for vulnerable communities seemed readily predictable from the earliest months of 2020 (Blundell et al., 2020; Kawachi, 2020). At the height of the first wave, national datasets began signalling that long-standing inequalities in health, employment and wealth, underpinned by factors such as disability, gender, social class and race were significantly impacting different social groups' experiences of—and ability to recover from—the unfolding crisis (Bambra et al., 2021; Morris et al., 2023; Shakespeare et al., 2021).

Research emerging in response to the pandemic has argued for moving away from a one-size-fits-all idea of the public and the limited policy options such framings engender, in favour of more nuanced conceptions of publics that include the often intersectional ways publics are positioned, and allows for greater emphasis on public expertise, which could prove vital for future response planning (Loewenson et al., 2021). Reimagining who publics might be, or their assumed behaviour in a crisis, has advanced the theoretical 'opening up' of the science-policy interface to consider how advice or policy making might adapt in response to this reframing of public needs (Green et al., 2022; Morris et al., 2023; Lancaster et al., 2020).

Methods

Focusing on a 3-month period, from 3rd March to 3rd June 2020, this paper questions how UK publics were imagined during the initial months of the Covid-19 pandemic.

We attempt to shed light on the question by reviewing: (1) publicly available meeting minutes of the UK's Scientific Advisory Group for Emergencies (SAGE), which served as the primary mechanism for organising scientific advice; (2) documents from subgroups, executive agencies, and prominent research institutions delivered to SAGE, including the Scientific Pandemic Influenza Group on Behaviours (SPI-B), the Ethnicity Subgroup and the COVID-19 Clinical Information Network (CO-CIN)[4]; and (3) transcripts from political speeches, media interviews and televised briefings during a period in which the Prime Minister or other senior ministers were daily joined by scientific advisers to provide updates on the spread and impacts of the pandemic, and to outline policy and public health measures in response.

Our analysis begins by reflecting on the previously all-consuming politics of Brexit and its impact on how publics were imagined, and how scientists in turn imagined the political possibilities of applying their models.

Drawing on studies of science advice and social inequality, which have previously highlighted tensions between public in practice, and ideas of the public as imagined by those in power, we then pay particular attention to the events of April 2020 when data evidencing the uneven and heterogeneous impacts of the pandemic came up against an imaginary of the 'unified' public which policymakers and advisors appeared keen to maintain.

Throughout, we reflect on the backstage tensions between technical advice and political decision-making (Hilgartner, 2000), which were most visible during those fraught early months, to consider the public performance of expertise witnessed throughout and its role in the construction and destabilising of relations between state, scientists and citizens. As Jasanoff et al. (2021, pp.24–25) remind us, in the 21st century, the terms of this social compact must be expanded to include 'explicit recognition of the delegation of epistemic authority…Who in a given political system is granted the authority to provide the knowledge and evidence used to make public decisions, and on what basis?'.

Amidst the large quantities of data made publicly available by the UK government as the crisis unfolded (Government Office for Science, 2020), in this paper we attempt to locate and examine initial framing assumptions which could help to explain wider aspects of the UK's pandemic response - in particular, conceptions of 'the public' that may have been used by experts and policymakers to frame their advice and response to an emergency situation.

Led by the science. At the start of the pandemic, governments in the UK and elsewhere had little available data on the spread of the disease. The virus was being passed asymptomatically and any limited testing capacity could not keep pace with its spread. Uncertainties in disease surveillance necessitated a reliance on theoretical modelling of the speed and advance of the pandemic (Taylor, 2020). This did not prevent UK Prime Minister (PM), Boris Johnson, from claiming with confidence, 'At all stages, we have been guided by the science, and we will do the right thing at the right time' (Johnson, 2020a). Downing Street press briefings at this stage also placed great emphasis on the phrase 'led by the science' (Prime Minister's Office, 2020).

Such rhetoric may in part have been designed to offset concerns that arose during the Brexit referendum campaign that the government had, in the words of one minister at the time, 'had enough of experts' (Clarke and Newman, 2017; Dommett and Pearce, 2019). However, as previous analyses have shown, using science to define the terms of a complex debate can narrow the definition of relevant issues and intensify, rather than ameliorate, resulting controversies (Pielke, 2007; Sarewitz, 2004).

Rhetorical claims that decisions were 'led by the science' created multiple problems (Ball, 2020). First, there was the vexed question of which science: different bodies of knowledge from epidemiology, virology, clinical practice, economics, psychology and elsewhere seemed—at various points and on different questions—to point in different directions. Second, other sources of knowledge, practitioner experience, community and lay expertise were downplayed. Third, an emphasis on science suppressed value-laden debates that would later emerge as important; for example, political dilemmas concerning the relative weighting of economic activity, personal freedom, public health, overall wellbeing, and risks to different age groups. Fourth, the performative sequencing of science-then-policy created political incentives to wait for greater certainty rather than to act decisively in situations of uncertainty. Fifth, it enabled politicians to use scientists and scientific advisers as a convenient shield and sidestep more direct accountability for unpopular decisions.[5]

Finally, in pursuit of short-term gains, the convenient fiction of being 'led by the science' weakened and delegitimised aspects of science as an institution—reflecting a 'dangerous complicity' between scientific advisers and a government which was subsequently shown to have 'lied to the public, disregarded its own rules, handed out deals to friends, destroyed public trust, and been generally incompetent' (Ball, 2022). For critics of government policy, this framing made it easy to pick holes in aspects of the expert advice, and to focus criticisms on scientific advisers, rather than political decision makers.

Behind all of these concerns sits a more fundamental problem, familiar to scholars of science and technology studies. As decisions played out in the early stages of the pandemic, it became clear that the science was already following the politics.

New diseases are inherently uncertain. Even where there is existing or analogous evidence with which to inform decisions, it

is not clear how much of this is relevant, nor how to ensure accurate data collection. But describing this as a situation of 'ground zero empiricism', (Daston, 2021) could imply that politicians, who were quick to portray many features of the pandemic as unprecedented, have limited responsibility for their choices.[6] Rommetveit and Wynne (2017) explain how the public are often imagined by decision makers in ways that serve a 'technoscientific promise', such that options previously seen as impossible become possible, even as 'it becomes irrelevant to ask whether the promises turned out to be true.' And while scientific advisers may strive as intermediaries to separate evidence from politics, they also recognise that their role necessitates the two being mixed (Smallman, 2020a), as a form of 'collaborative co-construction' (Palmer et al., 2019, p.251).

Imagined constructions of the public were influential in shaping the scientific expertise that was brought to bear on the problem. There was a collective scientific and political project of knowing, framing, and reconciling potential policy responses. Options initially deemed impossible became unavoidable only a few months later. Other options were ruled out or, more precisely, never ruled in, because of imagined public opposition. As we describe below, scientists and politicians later admitted that the option of a lockdown was not even modelled, considered, or rejected as a possibility because it was regarded as unthinkable.

Imagined public 1: the freedom-loving public. On 23rd March 2020, PM Boris Johnson gave a televised address in which he announced a nationwide lockdown: 'from this evening I must give the British people a very simple instruction—you must stay at home' (Johnson, 2020b). Much attention has focused on the weeks leading up to this announcement, with critics arguing there was an unwarranted delay in the introduction of a lockdown (Evans, 2021). This decision was defended at the time by ministers and scientific advisers as rooted in evidence but later admitted having 'cost a lot of lives' (BBC News, 2020; Pearce, 2020).

Imaginaries of the public influenced which policy responses were deemed 'feasible', with a central assumption being that a lockdown, in the PM's words 'seems to go against the freedom-loving instincts of the British people' (Johnson, 2020c). Public statements from the time suggest that this assumption underpinned how both scientists and politicians understood the dilemma. The government won a significant parliamentary majority at the December 2019 election on a platform of 'Get Brexit Done', which itself rested on the 2016 referendum's promise to 'Take Back Control' from the European Union.

The success of the Leave campaign, which in government formed the core of Johnson's cabinet, rested on a view of the British public as betrayed by elites and experts, and celebrated "an imaginary past when 'we' were in control of our country, our borders, our economy, and our lives" (Clarke and Newman, 2017, p.112; Smallman, 2020b). The PM's enthusiasm to embark on this new chapter after four years of parliamentary wrangling was encapsulated in a speech on 3rd February 2020, imagining Britain as reinvigorating global networks of free trade and tackling protectionism through a return to past seafaring glories, reflected in the speech's setting at Greenwich's Old Royal Naval College:

"The mercantilists are everywhere, the protectionists are gaining ground… [T]his is the moment for us to think of our past and go up a gear again, to recapture the spirit of those seafaring ancestors immortalised above us whose exploits brought not just riches but something even more important than that… a global perspective" (Johnson, 2020d).

In this context, speaking 3 weeks before case numbers began to accelerate rapidly in Italy and elsewhere, Covid-19 was presented by the PM as an opportunity for the UK to forge this new post-Brexit role, by promoting free trade and resisting barriers to movement:

"[W]e are starting to hear some bizarre autarkic rhetoric, when barriers are going up, and when there is a risk that new diseases such as coronavirus will trigger a panic and a desire for market segregation that go beyond what is medically rational to the point of doing real and unnecessary economic damage, then at that moment humanity needs some government somewhere that is willing at least to make the case powerfully for freedom of exchange, some country ready to take off its Clark Kent spectacles and leap into the phone booth and emerge with its cloak flowing as the supercharged champion, of the right of the populations of the earth to buy and sell freely among each other. And here in Greenwich in the first week of February 2020, I can tell you in all humility that the UK is ready for that role." (Johnson, 2020d).

Johnson conjures a heady mix of rationality, heroism, and freedom, which, in contrast to the stringent lockdown implemented in Wuhan days earlier (Yuan et al., 2020), would see the British public defeating the virus while reaping the rewards of free trade. This vision of a patriotic return to past glories was cast as economically and morally beneficial to the public.

Previous research into UK scientific advice suggests that this political backdrop is crucial for making sense of the challenges of producing relevant knowledge in the weeks prior to lockdown. 'Good advice' requires scientists to display particular qualities and characteristics (Doubleday and Wilsdon, 2012) and to adopt a collaborative rather than adversarial position towards 'the prevailing political climate' (Palmer et al., 2019). Far from being 'led by the science', the construction of policy-relevant knowledge is a process of understanding both the state of scientific evidence, and the values and assumptions of the government of the day. This understanding moves us a long way from noble notions of advisors 'speaking truth to power' (Ball, 2020; Michie et al., 2022). Rather, so-called 'evidence-based policymaking' has an inescapably political dimension which commentators and analysts should try to understand, rather than ignore or escape from (Strassheim and Kettunen, 2014).

It is not known whether the freedom-loving public imagined by the PM and his political team was subject to any challenge by scientific advisers, or whether it constituted a paradigmatic assumption that they felt they had to operate within (Obermeister, 2020). Public statements at the time suggest that scientific advisers adapted to this imagined notion of a freedom-loving public, newly liberated by the Brexit referendum. Stringent lockdown policies were not included among a range of non-pharmaceutical interventions modelled in February and early March 2020, with scientists assuming that they simply were not on the agenda (Grey and MacAskill, 2020).

Imagined fatigue. At the time, the justification provided by some scientific advisers for this omission was that the public would experience 'behavioural fatigue' if subjected to a prolonged lockdown. Speaking at a No. 10 press briefing on 9th March, Sir Chris Whitty, Chief Medical Officer, explained why he saw lockdown measures as premature: 'There is a risk that if we go too early, people will understandably get fatigued and it will be difficult to sustain this over time.'[7] Three days later, at another briefing, Sir Patrick Vallance, the Government Chief Scientific Adviser, expressed a similar view (Proctor, 2020).

The source of this 'junk behavioural science' and the reasons why it was given prominence over better-evidenced behavioural phenomena remain unclear (Goodall, 2020; Harvey, 2020; Sibony, 2020). The concept of 'fatigue' was never used by SAGE's behavioural science sub-committee, SPI–B. 'The word was never used in any of our committee reports,' Professor Susan Michie, a prominent SPI-B member, recalled later in an interview with *The Guardian*. 'It is just not a concept that exists in behavioural science….' (Conn et al., 2020). The same Guardian investigation reports that: 'One senior Whitehall source said Whitty himself was the main advocate of the 'fatigue' notion, based partly on his own experience of patients in medical practice who do not see drug prescriptions through to their completion'[8] (Conn et al., 2020).

Whatever the concept's origins, by viewing this episode through the lens of imagined publics, we can see how 'behavioural fatigue' functioned as an intuitively plausible justification for advice that corresponded with an imagined freedom-loving public; both strands of an emerging science of the possible.

This interpretation is reinforced by the public statements of Professor John Edmunds, one of the most influential epidemiologists on SAGE. On 13th March 2020, 10 days before lockdown was implemented, Edmunds' assessment of the policy options were clearly being shaped by concerns over behavioural fatigue. As he told Channel 4 News:

> "if we're going to ask people to take these measures, we don't want to do that before we have to, because they're going to have to do it for a very long time" (Channel 4 News, 2020a).

The assumption appears to be that the freedom-loving public could only be relied upon to comply for a short period, so the timing of lockdown should be optimised in order to reduce pressure on health services. Six weeks later—and a month into the UK lockdown—Edmunds reflected on what turned out to be a mistaken assumption:

> "It depends what you think is feasible and how long you think that people can stay in this situation for […] It was difficult to imagine just how easy the lockdown was […] that people actually would go along with it" (Channel 4 News, 2020b).

In an exchange with interviewer Cathy Newman about why lockdown modelling did not happen sooner, Edmunds insistently denied the possibility of an alternative, less freedom-loving, public:

> JE: "We weren't sure what levels of compliance with various social distance measures were possible. It hadn't been done in the UK or even in Europe up until Italy started going into lockdown around the beginning of March. I think that changed things. Up until that point, you'd seen very restrictive measures taking place in China and I think it was hard to imagine that we would do that here in the UK."
>
> CN: "Was that why you didn't model for lockdown until mid-March?"
>
> JE: "I don't think anyone looked at it. We all looked at a range of measures, some of which were very stringent. It was difficult to imagine that people would go along with the lockdown."
>
> CN: "So, if you had known how compliant the British public would be…"

> JE: "But we couldn't know that."
>
> CN: "But I'm just saying, if you had known, looking back now."
>
> JE: "We couldn't possibly know that. We'd never done this before."

Two points stand out from this exchange. First, the British and Chinese publics were imagined as incomparable, with British citizens either unwilling or incapable of complying with stay-at-home orders, in contrast to a more biddable Chinese public. This supports previous policy studies scholarship identifying how UK ministers and science advisors treated China's policy response as unfeasible in a liberal democracy (Cairney and Wellstead, 2021), with more distant echoes of epistemic orientalism, in which the West imagines itself as the democratic counterbalance to a 'despotic, backward and inferior other' (Zhang and Xu, 2020, p.215).

Second, that while this assumption proved wrong, Edmunds flatly denies that this could have been foreseen. This suggests that the idea of a freedom-loving public, given life during the EU referendum and renewed force in Johnson's Greenwich speech just a few weeks earlier, framed the epistemic context for at least some of the scientific advice provided to the government.

The point is not that an explicit assessment had to be made of the British public's likelihood to comply with lockdown—nor that there was time to undertake a formal study of this question in the midst of a fast-moving crisis. Rather, it illustrates how politicians and science advisers co-produced an imaginary of the public, justified by an intuitively plausible but scientifically unevidenced notion of behavioural fatigue that precluded and shaped the formal consideration of lockdown measures prior to 23rd March. In this way, the dance between science advisers and politicians appears to have led to science speaking only those 'truths' that were subservient to the power of a prevailing cultural imagination (Jasanoff, 2015, p.19).

Imagined public 2: the uniform and united public. As the crisis worsened, existing inequalities were thrown into sharp relief. Missteps of government policy and an underfunded National Health Service combined to generate worse health outcomes for the clinically vulnerable, and for those made vulnerable by social and economic inequalities (Bambra et al., 2021; PHE, 2020a). At their peak, case and mortality rates were up to four times higher for minoritised ethnicities (PHE, 2020a p39) and up to 3.5 times higher for disabled people (Shakespeare et al., 2021). Although first visible in public health data, the exacerbation of social inequalities quickly rippled into interrelated domains including education, housing, employment, and policing (Blundell et al., 2020; Gallent and Madeddu, 2021; MOPAC, 2020).

SAGE minutes indicate April 2020 as when advisers began to explore these disparate experiences of the pandemic in detail. A rapid report from the COVID-19 Clinical Information Network (CO-CIN) 'Investigation into associations between ethnicity and outcome from COVID-19' surmised that

> "More deaths [we]re observed than expected in the Black ethnic group compared to the white ethnic group… "the number of deaths in the Asian and Other groups was not different to the White ethnic group" (CO-CIN, 2020).

These findings were followed by SAGE meeting twenty-six which further outlined the shape of the problem:

> "11. CO-CIN data are giving a signal that black people have a higher risk of being admitted to hospital and of death,

when adjusted for them having fewer comorbidities. CO-CIN data on this issue will become clearer in the coming weeks.

12. RCGP [Royal College of General Practitioners] data are producing a similar signal.

13. Investigation is also underway to understand why relatively more BME [Black and Minority Ethnic healthcare workers are dying.

14. PHE has identified a signal—from weak evidence—of South Asian communities disproportionately testing positive and experiencing severe symptoms, but not dying" (SAGE, 2020a).

Due to data privacy issues noted in the CO-CIN rapid-report, initial findings were not adjusted for 'the influence of confounding by factors such as multiple deprivations and socioeconomic status' (CO-CIN, 2020 p.1). However, links between poverty, deprivation and health are noted as an important area for further research in subsequent SAGE meetings and are highlighted shortly thereafter as a possible underlying cause for disproportionate Covid-19 figures within Minority Ethnic groups, alongside factors such as prior health conditions or exposure through employment.

"Further work is being carried out on ethnicity, deprivation and mortality including making use of multiple datasets to better understand socioeconomic and other factors. This is a high priority and the support of NHSX will be important." (SAGE, 2020b).

"An Asian ethnic background, particularly Indian, Pakistani or Bangladeshi, was found to be a significant independent risk factor for mortality even after adjusting for age and comorbidities. The age gap between white and BAME populations may be explained by…differences in social deprivation which is consistently higher in BAME populations." (Aala et al., 2020 for SAGE meeting twenty-nine (SAGE, 2020c)).

These crucial findings emerged during SAGE's initial period of opacity (Sample and Mason, 2020), and at a time when management of the pandemic appeared to be spiralling out of the government's control. Cases of Covid-19 in the community were rising exponentially, as were hospitalisations, including the PM himself, who was taken to an intensive care unit on 7th April 2020. Ministers deputising for the PM at Number 10's daily briefings were forced to make difficult announcements, including that the previously inconceivable lockdown would be extended by 'at least' 3 weeks (schools eventually reopened on 1st June 2020).

In these circumstances, the task of maintaining public order and stability was prioritised ahead of mitigating increasingly unequal pandemic outcomes by a government desperate to turn the tide of the crisis. But the public's unexpected compliance with lockdown measures meant that politicians and advisers had to abandon their imaginaries of the public as uncontrollable and reimagine them in ways that reflected the demands of this new phase of the crisis.

This new approach, as indicated in daily briefings during that time, involved an attempt to create a sense of public solidarity based around the idea that all citizens were committing to an equal sacrifice for the greater good. For example, on 7th April 2020, Foreign Secretary Dominic Raab said:

"Because you have a virus, which is totally indiscriminate. And we [must] follow all of us the guidance as carefully as possible. But it's a very dangerous virus. It's very contagious. And it just goes to show that no one is impervious to it." (Foreign and Commonwealth Office, 2020a).

The following day, Chancellor Rishi Sunak made similar points:

"The news about the PM reminds us how indiscriminate this disease is. This is a terrible virus that respects no boundaries of status, or geography, or vocation. But we are not facing it alone. We are all taking part in a collective national effort to protect the vulnerable and each other, to secure our public services and to save lives." (HM Treasury, 2020).

Claims to the virus' indiscriminate nature sat alongside repeated mentions of an imagined singular 'British people'—drawing on the powerful nation-building imagery conjured by the monarchy, and nostalgic echoes of a unified war-time Britain.

"So I want to reassure people, every arm of government is doing everything it possibly can to defeat the coronavirus and rise to the challenges that it presents us at home and abroad. Last night, Her Majesty the Queen reflected on the national spirit of unity and resolve that we're seeing in our country. As well as the collective effort, we need to tackle the disease" (Foreign and Commonwealth Office, 2020b).

Imagined solidarities. Efforts to build national solidarity in crisis, including the use of wartime or nationalistic metaphor are nothing new (Fitzgerald, 2021; Larson et al., 2005) but exploring them through the lens of imagined publics can offer fresh perspective on the assumptions shaping the UK's pandemic response. Like Anderson's (1983) 'imagined communities' described almost forty years earlier, this horizontal or uniform solidarity for which all publics must be willing to forego their freedoms and livelihoods, is invoked regardless of acute prevailing inequalities that should render such imaginings obviously false.

Analysis of this period reveals tensions between representations of the public as a uniform entity during the government's daily briefings, SAGE minutes which suggest that the pandemic's unequal impacts were significant, and should be investigated further as a matter of urgency, and questions from journalists which attempted to prompt ministers to engage with impacts on different publics, including the most vulnerable, as seen in further exchanges from April 2020:

Hannah Miller, ITV Granada: "Just on the furloughing and guidance around people with disabilities you accept that the guidance around social distancing for people with disabilities, perhaps needs to be looked at in a bit more detail."

Dominic Raab, Deputy PM: "Well, we can certainly take another look at it. But of course, it's the way it's applied that's really important with the flexibility and again, as I said, a sense of the fact that we're all in this together, we pull through this together."

(Foreign and Commonwealth Office, 2020c)

Sam Coates, Sky News: "Dominic Raab, Sky analysis has found that 70% of frontline health and social care staff who died from coronavirus were from a non-white a BAME [Black, Asian and Minority Ethnic] background. Now, people in that community are very worried. They know you're having a review because you've announced it but what specifically Can you say to help them is the

government on their side? What is your message for that community?"

Dominic Raab, Deputy PM: "Well, Sam, first of all on your first question on the BME or any other demographic breakdown, to the data I think I'm going to defer to Patrick, in terms of the analysis of that. But absolutely, we're on the side of anyone, frankly, this coronavirus doesn't discriminate, but we will want to follow very carefully any of the analysis of the data in the way you described."

(Foreign and Commonwealth Office, 2020d)

However, despite government's public calls for advisers to gather evidence on Covid-19 and ethnicity, and loudly proclaimed commitments to an evidence-based approach, when a recovering PM re-joined the daily briefings on 30th April there is no mention of this new data or evidence that it had informed the government's approach. Instead, Johnson again painted a picture of a united nation: not only in sacrifice, but in mourning and resolve:

"Across this country, therefore, families every day are continuing to lose loved ones before their time. We grieve for them and with them. But as we grieve we are strengthened in our resolve to defeat this virus…And the same can be said of the entire people of this country. Staying in enforced confinement. Not seeing family, not seeing friends or grandchildren. Worrying about their jobs and the future. And so my message to everyone again today is your effort and your sacrifice is working and has been proved to work." (Johnson, 2020e).

SAGE, previously keen to understand the impact of socio-economic and other factors on Covid risk and outcomes, also appeared to draw a line under the issue in their twenty-ninth meeting—reflected by the absence of any ethnicity data[9] in subsequent daily briefings

"CO-CIN analysis indicates that differences in admissions to ITU and mortality by ethnicity can be explained by comorbidities and are unlikely to be a result of management pathways in hospital." (SAGE, 2020c).

Evidence linking comorbidities, multi-morbidities and chronic conditions to socioeconomic inequalities is well documented (Pathirana and Jackson, 2018; Tinson, 2020), as is evidence that patients from Minority Ethnic backgrounds and deprived areas typically have unequal access to—and more negative experiences of—healthcare services, impacting overall health outcomes (Department of Health, 2009, Raleigh and Holmes, 2021). As such, rather than explaining away the disproportionate impacts of the pandemic on minoritised communities, this statement draws attention to additional dimensions of inequality experienced by many in relation to their health and appears to repeat a pattern found in many institutions, namely 'the pervasive tendency to medicalise social problems' (Nelkin and Tancredi, 1989).

Highlighting comorbidities in this way, without exploring the underlying causes for their high prevalence in Minority Ethnic populations, provided a convenient, if inadequate, explanation for unequal pandemic effects. It enabled government and science advisers to maintain a homogenising, scientised imaginary of the public in the short term and legitimised limited action over the longer term. For example, while the UK government created a succession of pithy slogans with which to communicate the latest public health advice, they failed to translate these into languages other than English, providing more than 800,000 UK citizens speaking little or no English with inadequate information for managing their own safety. (Evans, 2020).

Invisible inequalities. Critiques of government action, or inaction, may seem easy to leverage with the benefit of hindsight, as actions are judged based on what we now know about the unequal impacts of the pandemic. However, a close reading of April's events suggests that at the time, inequalities in relation to the pandemic and their implications for multiple vulnerable publics were readily knowable.

In particular, the paper by Aala et al., (2020) and work by CO-CIN presented to SAGE, revisit well known links between social inequalities, minoritised communities and public health. As such, maintaining the public performance of an imagined united and uniform public, even when questioned, rather than engaging with the increasing number of variously vulnerable *publics* appears like an attempt to obscure or de-prioritise inequalities being created and exacerbated by the virus.

On 10th May 2020, 7 weeks into the first lockdown, PM Johnson addressed the nation once more to deliver 'the shape of a plan' for a return to normality. His speech reflects a shift in the government's position on how the virus should be managed. We begin to see the public—previously framed as too libertarian and unwilling to lockdown; or as passive, predictable objects for scientific models—reimagined as agents of their own fate.

"You have shown the good sense to support those rules overwhelmingly. You have put up with all the hardships of that programme of social distancing. Because you understand that as things stand, and as the experience of every other country has shown, it's the only way to defeat the coronavirus…And so I know - you know that it would be madness. Now, to throw away that achievement by allowing a second spike, we must stay alert, we must continue to control the virus and save lives" (Johnson, 2020f).

"…it is thanks to your effort and sacrifice in stopping the spread of this disease that the death rate is coming down and hospital admissions are coming down…"

(Johnson, 2020f).

Here the imaginary of a uniform public persists, with no reference to inequalities or the vulnerable publics brought to the fore in April and sacrifice is again used to describe a notional collective experience. But as this narrative of unity becomes more tenuous in the face of mounting data, we also see the beginning of an alternative imaginary—that of an ideal 'pandemic citizen': one who is knowledgeable, compliant, and independent, with adherence likened to a form of enlightened common sense.

Such a framing provided the government with the opportunity to retreat to lower levels of involvement in the private choices of their citizens. Compared to earlier 'stay at home' messaging which required collective effort and support, asking citizens to 'stay alert' cannot be enforced through law or other state intervention. As such, the primary responsibility for managing the spread of the pandemic now falls on the shoulders of citizens, who are supposed to 'control the virus and save lives'[10].

By June 2020, a fuller picture of the pandemic's unequal impacts on different publics was finally made available through Public Health England's report on 'Disparities in the risk and outcomes of COVID-19'. It also found that people living in England's most deprived areas, many in the north, were up to 2.4 times more likely to contract and die from the virus (PHE, 2020a) and outlined seven recommendations to support Minority Ethnic communities during the pandemic and strengthen their resilience for the future (PHE, 2020b).

PHE's two-part disparities report signalled the final fracturing of the 'uniform and united public' imaginary that government ministers and scientific advisers had repeatedly used in previous

months. If they were to continue 'following the science', then these findings forced acceptance of what many from marginalised communities had been arguing since March: we were not all in this together, and we never had been. Familiar rumblings of 'us versus them' were made explicit as questions about who matters and who decides began to play out in public fora:

> Emily Morgan, ITV: "Given that we know that ethnic minorities are being disproportionately affected by covid‐19, shouldn't all ethnic minorities now be put in an at-risk category to protect them?"

> Professor John Newton, Director of Health Improvement at Public Health England: "Clearly outcomes are worse for people in Black and Minority ethnic groups, not because of their ethnicity, related to other factors… may be related to their occupation… one just has to be a little bit careful in doing that risk assessment…one has to look at the causes of increased risk which may be as much to do with other factors… we're urging people not to jump to conclusions and institute measures which are not really justified by the depth of the data so there's an element of caution in our results, as well as obviously pointing out these obvious inequalities." (HM Government Covid-19 Briefing, 2nd June, 2020).

This exchange further reveals how previously constructed imaginaries of togetherness became embedded in, and were continuing to shape, scientific advice. The evidence within the disparities reports was stark, and in its simplest terms indicated that certain groups beyond the medically vulnerable were also at increased risk. This was reinforced by the data presented from multiple sources on Covid-19 and ethnicity in April.

However, despite the rapid formation of at-risk groups earlier in the pandemic with limited evidence, and a long, well-publicised, history of health inequalities data to draw on, policymakers and scientific advisers such as Newton remained hesitant to act, or even to take this evidence at face value.

We cannot interpret motivations with certainty, but we suggest that government efforts to maintain the integrity of its constructed imaginary of a united and uniform public influenced this shift from 'following the science' to a more precautionary stance that legitimised inaction. As with the imagined freedom-loving public, instead of science 'leading' politics, there are signs of the prevailing political climate exerting powerful constraints on the interpretation of scientific knowledge.

Fatally complicit? In these cases, we see two versions of an imagined public co-constructed by policy makers and scientific advisers, despite contradictory or non-existent evidence.

While STS typically portrays imaginaries as deeply embedded, illusive visions of how we envision society ought to be (often shaped by a range of hidden biases) the UK case appears to point to a different conclusion. These assumptions have far-reaching consequences when held by decision-makers, particularly when shown to be out of kilter with the needs and wants of the publics that they govern.

Policymakers and scientific advisers possessed data that highlighted a diverse range of publics at increased risk from the virus, caused largely by pre-existing inequalities, but continued to present the public as united and uniform. Analysis of backstage meeting minutes, alongside ministers' and scientific advisers' public performances, suggests that how publics were imagined was not only the manifestation of ignorant or implicit assumptions but were deliberate constructions which proved to be resilient even in the face of contradictory empirical evidence.

The function of the united and uniform imaginary, we suggest, was to manufacture solidarity based on thin understandings of shared experience, in order to maintain public adherence to protracted lockdown enforcement. This raises questions about the nature of the relationship between scientific advisers—who repeatedly seemed unwilling or unable to 'speak truth to power' on behalf of the public—and Johnson's government, which continues to evade accountability for misrepresenting or ignoring evidence at critical stages in the pandemic. As Philip Ball notes: 'The usual narrative has been that Whitty, Vallance and others have tried doggedly to maintain an appearance of unity with politicians in order to avoid undermining public trust, or because they feel it is their duty, or both. Whatever the rationale, such an approach is not good enough: it means that scientists get sucked into a dysfunctional governance' (Ball, 2022).

As government messaging then shifted from collective to individual responsibility, the imaginary of the public as united and uniform may ultimately have exacerbated divisions within and between communities alongside widening inequalities. This dynamic is not unique to the UK: surveying the wider European landscape, Ivan Krastev observes as one of his 'paradoxes of the pandemic' that: 'Fear of the virus in the early stages of the pandemic inspired a state of national unity that many societies have not experienced in years, but in the longer term it will deepen existing social and political divides.' (Krastev, 2020).

This paradox has played out in the UK case. As the economic pressures of the pandemic intensified, government reticence to address sharp inequalities in people's lived experiences, and attempts to obscure these through an artificial unity, created a 'divided and exhausted' public, fractured along existing fault lines (Juan-Torres et al., 2020). This was exacerbated by mounting evidence through 2020 and 2021 that some politicians and senior officials had flouted their own lockdown rules (Weaver, 2020; BBC News, 2021).

Conclusion and lessons

Accounts of the early days of the pandemic in the UK regularly attempt to draw a line between failures of scientific advice and failures of political decision-making: assigning blame either to 'the science' for gaps in its knowledge, or to 'the politicians' for their failure to follow the science. Our retelling of a now familiar story recognises that such partitioning of science and politics is, in practice, untenable. For scientific advisers to 'speak truth to power' requires being listened to, which in turn implies framing scientific truths in terms that are palatable to decision-makers.

During the pandemic, this process could be observed through the subtle co-production of imagined publics between scientific advisers and politicians. These imagined publics helped to stabilise knowledge, and by extension social order. Just as politicians claimed to be 'led by science', so the science was simultaneously being led by the politics of the crisis, summarised here as the science of the possible (with respect to lockdowns), and the initial downplaying of inequalities (with respect to knowledge of the social determinants of health).

Our analysis reaffirms the challenging nature of bringing scientific advice to government, particularly in the midst of a high-stakes crisis like Covid-19. This is inevitably the territory of trade-offs and compromises. We suggest that this case offers two lessons: one that is familiar from existing STS work on scientific advice; another that has been less discussed.

First, there is evidence here of the common tendency to make assumptions about the needs, wants and values of 'the public' with little or no basis in evidence (Wynne, 2006). This knowledge was only 'unknowable' because no significant efforts were made to engage in meaningful ways with public concerns about Covid-

19 impacts and likely responses to different control measures. This was despite the Nuffield Council for Bioethics calling in April 2020 for more public engagement as 'a matter of fundamental democratic accountability' (Archard and Whittall, 2020) These would have revealed publics far more diverse than the homogenous group imagined to be resistant to stringent lockdowns, or uniformly susceptible to the disease. Pykett et al., (2022) highlight an important context for this misunderstanding: a dearth of social science and humanities expertise within the science advice bodies that shape decision-making. More diverse expertise and public engagement would have more quickly revealed that 'public opinion' is heterogeneous and multi-faceted in ways that cannot be reduced to percentages 'for' or 'against' (McGlacken and Hobson-West, 2022).

Second, we highlight the dimensions of these imagined publics based on existing inequalities, particularly those linked to race and ethnicity less discussed in relation to scientific advice. Assumptions of a freedom-loving public rested upon a Brexit-enhanced view of UK exceptionalism which saw lessons from China, or elsewhere as largely irrelevant to the UK. Only when lockdown policies were introduced in Italy were they included on the agenda for scientific advice. Later, the assumption of a united and uniform public required pre-existing evidence of health inequalities to be overlooked, and emerging evidence of increased vulnerabilities among some ethnic groups to be treated as too uncertain to justify policy change. Both versions of the imagined public created barriers to the utilisation of scientific and social scientific evidence about the health of those most vulnerable to the virus and its potential longer-term effects.

There are, we suggest, uncomfortable parallels between the imagined publics of Covid-19 and examples in other contexts of what Mills (2007) describes as 'white ignorance': ingrained conceptions of racialised difference (reflected in how relevant evidence from China and other global majority countries was ignored) or colour blindness (reflected in the downplaying of existing health inequalities which disproportionately impact ethnic minority groups) that inhibit a more nuanced and accurate perception of the problem at hand (Mills, 2007; 2015).

These problems have deep, historical, cultural, and institutional roots. But this should not preclude attempts to address them at a variety of scales (Ballo and Pearce, 2022). Within the domain of scientific advice, our analysis suggests two issues requiring attention: the recruitment and diversity of scientific advisers; and how consensus is reached within advisory bodies (Pearce, 2020).

While the recruitment of the UK Government Chief Scientific Adviser goes through a formal process–albeit one that has seen the role since its creation in 1964 occupied by a rotating cast of white male scientists, until the recent appointment of Professor Dame Angela McLean (Doubleday and Wilsdon, 2013, p.7)—the processes for recruiting advisers to SAGE and other structures are more opaque. Greater transparency would help to improve the diversity of advisory bodies, making it more likely that narrow or inappropriate assumptions are challenged. There also needs to be more critical reflection on how committees reach consensus, and how and when evidence is judged robust enough to be included in scientific advice (Lancaster et al., 2020; Leach et al., 2021; Michie et al., 2022). Such measures would go some way to ensuring greater diversity, pluralism, and public accountability within the science advisory system.

We noted earlier that painfully acquired insights from earlier controversies included the importance of transparency, the need for experts to engage with diverse publics, and the need to trust those publics to manage uncertainty. As the UK's scientific advisory system braces itself for the outcome of a formal public inquiry into Covid-19, it could do worse than begin by reminding itself what it already knew but forgot in the heat and urgency of a crisis.

Data availability

Notes

1 The 2019 report from the Global Health Security Index in which the USA and UK are ranked 1st and 2nd overall for preparedness https://ghsindex.org/wp-content/uploads/2021/11/2019-Global-Health-Security-Index.pdf.

2 The UK Covid inquiry website: https://covid19.public-inquiry.uk/.

3 This period also saw changes to the governance of the research system, with university researchers in the UK and elsewhere under growing pressure from governments to demonstrate the impacts and relevance of their work for business, policymakers and society (Gibbons et al., 1994; Warry, 2006). Funding and evaluation instruments such as the Research Assessment Exercise (RAE) (which later evolved into the Research Excellence Framework, or REF), were reformed to incentivise and reward impacts, and to increase the quality, value and relevance of university research (Stern, 2019; Cairney and Kwiatowski, 2017; Oancea, 2019).

4 For a full list of SAGE subgroups and membership see: https://www.gov.uk/government/publications/scientific-advisory-group-for-emergencies-sage-coronavirus-covid-19-response-membership/list-of-participants-of-sage-and-related-sub-groups.

5 For example, some journalists dubbed the Government Chief Scientific Adviser and Chief Medical Officer 'Glum and Glummer' because of their pessimistic presentations (Deacon, 2020), while influential epidemiologist Neil Ferguson became known as 'Professor Lockdown' (Bostock, 2020).

6 Looking back on the early stages of the pandemic, it is easy to point to scientific errors. For example, on the crucial question of whether Covid-19 was airborne, the certainty of the World Health Organisation, which tweeted 'FACT: #COVID19 is NOT airborne' (Greenhalgh et al., 2021; World Health Organization, 2020) is embarrassing, with the benefit of hindsight. But such false certainty should not be seen purely as an epistemic miscalculation; it was also an attempt to reassure a public imagined as prone to panic and alarm. There was a particular concern that the public would stockpile masks, depriving healthcare workers of vital supplies (Tufekci, 2020). Other early arguments against encouraging mask-wearing were first, that people would wear them incorrectly, making them feel safer and likely to take fewer precautions in other ways; and second, that people would touch their faces more as a result, spreading infection. Neither of these assumptions proved correct, but widespread mask-wearing only became a practicable policy in the UK later in the year.

7 See footage of the No. 10 press briefing from 9th March 2020 here: https://www.youtube.com/watch?v=Yc1alOEjDVA.

8 The source's claim was corroborated in evidence to the UK Covid-19 Inquiry, where Whitty described behavioural fatigue as his most prominent communications error: https://covid19.public-inquiry.uk/wp-content/uploads/2023/11/23180915/C-19-Inquiry-22-November-2023-Module-2-Day-24-Revised.pdf.

9 We acknowledge that although inequalities based on race and ethnicity have been prominent in discussions of Covid-19, communities based on age, gender, sex, and disability, and those living at the intersections of marginalised identities, have experienced, and continue to experience significant inequalities which have been exacerbated by the pandemic (Courtenay and Perera, 2020; Martin et al., 2022).

10 The Independent later reported that scientific advisors were not consulted on, nor did they agree with the updated slogan, going as far as to say that it " goes against several principles we've rehearsed many times in our advice to Sage and the Government." https://www.independent.co.uk/news/uk/scientists-boris-johnson-susan-michie-covid-people-b2432024.html.

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Ethical approval

Ethical approval was not required as the article does not contain any studies with human participants performed by any of the authors.

Informed consent

Informed consent was not required as the article does not contain any studies with human participants performed by any of the authors.

Additional information

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