



The UK Government's COVID-19 Policy: What Does “Guided by the Science” Mean in Practice?

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UK government ministers state that their COVID-19 policy is “guided by the science.” In practice they mean “our scientists,” and initial UK government policy was highly consistent with that advice. Ministers formed strong relationships with key scientific advisors, relied on evidence from their Scientific Advisory Group for Emergencies (SAGE), and ignored or excluded many other sources. I explore two types of lesson from this experience. First, UK studies of interest groups help explain the politics of expert advice. They show that the minister-adviser relationship is conditional on the ways in which the UK government assigns status to particular sources of science advice, and the willingness of those advisers to follow the “rules of the game,” within a wider political and policymaking context. Second, documentary analysis of SAGE minutes and meeting papers, and analysis of oral evidence to key House of Commons committees, shows high consistency between SAGE advice and UK government policy in the run up to lockdown. Ministers relied on their advisers to define the policy problem and identify feasible solutions throughout this period, while their advisers supported government policy and the right of ministers to make it. This new experience reflects and reinforces longstanding evidence from policy community studies: some experts remain core insiders if they advise on policies that they do not necessarily support, while outsiders have the freedom to criticize the policy they were unable to influence.

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INTRODUCTION

The new Frontiers Research Topic “Politics of Expertise” series asks: when did 1) governments listen to experts, and 2) expert advice have a major impact on Covid-19 policy? In the case of the UK government, the official answer is: always. UK government ministers state rhetorically and frequently that their COVID-19 policy is based on scientific evidence. For example, Prime Minister Boris Johnson (2020a) argued that, “At all stages, we have been guided by the science, and we will do the right thing at the right time.” Health Secretary Matt Hancock (2020) described UK government policy design “driven by the science and guided by the expert recommendations of the four UK Chief Medical Officers and the Scientific Advisory Group for Emergencies.”

In practice, ministers seek very specific sources of expertise to inform policy (and boost the credibility of policymakers (Cairney, 2016a; Stevens, 2020; Weible et al., 2020). Guided by “the science” means “our scientists,” and usually a small group of government scientific advisors. Senior ministers formed close professional relationships with advisers including the UK government's Chief Scientific Adviser and chair of the Scientific Advisory Group for Emergencies (SAGE), Sir Patrick

Vallance, and Chief Medical Officer, Professor Chris Whitty. They also relied heavily on evidence from SAGE, particularly during the UK government's initial responses to COVID-19 (January–March, 2020). Both expert sources had a strong influence on how UK government ministers understood, addressed, and described COVID-19 policy before and during the UK's "lockdown" from late March 2020 (Cairney, 2020a; Cairney, 2021). Most other expert sources did not enjoy this impact.

I identify and connect two types of lesson from this experience. First, policy theories and empirical studies of interest groups and civil servants help explain the insider/outsider politics of expert advice. Theories describe the wider policymaking environment, which is difficult for most participants to understand, navigate, and influence. Then, they identify a logic to processing some policy within a "core executive" but most in "policy communities" out of the public spotlight. These theories help establish the conditions in which some actors have influence. In that context, interest group studies show that policymakers assign status to participants based on a group's resources, strategy, and support for government policy. Many groups pursue an "insider strategy" (Grant, 1989; Grant, 1995) and have something to offer government, which helps explain variation in insider status, from "core" to "peripheral" (Maloney et al., 1994). Many others are ignored because they pursue an ineffective insider strategy (Maloney et al., 1994: 30). Or, they are excluded if they adopt an outsider strategy to encourage the critical attention of an external audience. In each case, an insider strategy relates to following the "rules of the game" (Maloney et al., 1994: 33–4; Jordan and Maloney, 1997; Jordan and Cairney, 2013). Civil servants also need to navigate the formal and informal rules that govern their relationships with ministers and external actors.

These insights show that the minister-adviser relationship is conditional on how the UK government values particular sources of advice, the willingness of advisers to follow formal and informal rules, and the wider context of Westminster politics (in a liberal democracy) in which ministers combine evidence and values to make policy. They help explain the range of scientific expert experiences, from core insiders to outsiders. Relatively few have the opportunities, resources, networks, and skills to maintain core insider status in which they are consulted routinely and frequently by ministers. Some advisers follow the rules, are valued by ministers, and have the skills to maximize their influence. Most scientists appear to be relatively unaware of—or unwilling to follow—these rules, because they do not have enough experience of engagement, or prefer to act in accordance with their own profession's rules and principles of science advice (Cairney, 2016b; Topp et al., 2018).

Second, documentary analysis—of SAGE minutes and meeting papers, and oral evidence to House of Commons committees—helps provide an in-depth narrative of the pivotal role of core and specialist insiders. In the run up to a lockdown policy in March, ministers and SAGE advisers contributed to the same definition of COVID-19 as a policy problem, emphasizing long-term management to protect health service capacity and rejecting the elimination strategy proposed by some external

scientists. SAGE papers demonstrate the development of this narrative in the run up to lockdown. During this period, we can witness insider advisers flanking ministers to give them credibility in press briefings and supporting ministers even if their accounts differ in some respects. Further, advisers perform their defence of government policy—or at least the right of ministers to make it—while giving oral evidence to House of Commons committees. Throughout, the rules of the game help determine the limits to the ability of advisers to criticize policy without losing their status.

This UK government experience highlights a stark contrast between two forms of expert advice strategy: 1) retain core insider status to make sure that policymakers draw routinely on science advice, while accepting an inevitable gap between advice and policy; or, 2) perform the role of outsider to criticize policy energetically when it is not informed by science advice. Although in theory there may be some scope to pursue both aims, studies of policy communities suggest that an effective strategy to gain inclusion (securing the ear of power) requires participants to tailor their advice to their audience and not to complain in public about their lack of direct influence on policy. In contrast, if experts have the freedom to criticize policy ("speaking truth to power"), it indicates their lack of influence in the past rather than their potential influence in the future.

This understanding of science advisers helps to demonstrate that, contrary to much criticism by outsider advisers, ministers used science advice continuously to inform COVID-19 policy. Further, identifying the status and strategies of core and specialist insiders allows us to identify what it takes to encourage the high consistency between their advice and UK government COVID-19 policy.

METHODS AND SOURCES

The first half of this article is theory-informed and deductive. I synthesize key insights from policy theories and the study of insider/outsider interest groups and apply these categories to expert advisers. The second is inductive, drawing extensively on sources in the public record to provide an in-depth narrative of core and specialist insider advice and relate it to UK government COVID-19 policy (see also Cairney, 2020a). Overall, it adopts a theory-informed qualitative method (see Vromen, 2017). To prevent an overload of information, I provide a summary in this paper and connect it to a full account of these sources (70,000 words) in online annexes (described as Cairney, 2020c; Cairney, 2020d; Cairney, 2020e; Cairney, 2020f; Cairney, 2020g; Cairney, 2020h; Cairney, 2020i; Cairney, 2020j when I make direct reference to a particular source, and collated at <https://paulcairney.wordpress.com/covid-19/>). Sources include: 1) oral evidence to the House of Commons Health and Social Care committee, supplemented by transcripts of TV press conferences and radio interviews, to describe how key advisers performed their roles, and 2) the minutes and meeting papers of SAGE to track in detail the consistency between SAGE advice and UK government policy. The latter includes a relatively in-depth coverage of meetings from mid-March, as the period directly

before the UK lockdown from 23rd March. The main annex (Cairney 2020c) summarizes each set of minutes (marked as SAGE: date) and their meeting papers (date) from January-June 2020. As such, this paper's focus is limited to policymaking up to and during the UK government's first lockdown.

THE POLICYMAKING CONTEXT: WHO MAKES UK GOVERNMENT POLICY?

Policy theories suggest that policymaking is characterized by bounded rationality, in which policymakers can only pay attention to a tiny proportion of issues and information, and complexity, in which no single "center" of government has the power to determine policy outcomes (Simon, 1976; Baumgartner and Jones, 1993; Cairney et al., 2019b).

This insight challenges the popular idea—summed by terms such as "Westminster model" and "majoritarian democracy"—that British politics is run by a small number of powerful people making policy from the top down (Bevir and Rhodes, 1999; Lijphart, 1999: 2–3; Marsh et al., 2001; Richards and Smith 2002: 3–4; Blunkett and Richards, 2011). Rather, empirical studies suggest that political systems are too large and crowded to be manageable. Studies of policymaking environments suggest that power is spread across many levels and types of government, each with their own rules, networks, and ways to understand policy problems, while studies of complex systems identify policy outcomes that "emerge" in the absence of central government control (Cairney, 2012; Cairney, 2020b). A small group of elected policymakers may be responsible for UK government policy, but they operate in an environment of which they have limited knowledge or control.

These studies tell two stories of British politics. First, while the power and actions of ministers matter (particularly during a crisis requiring high coordination), the UK government's "core executive" describes a much larger network of people:

"The innermost centre of British central government consists of a complex web of institutions, networks and practices surrounding the PM, Cabinet, cabinet committees and their official counterparts, less formalized ministerial 'clubs' or meetings, bilateral negotiations, and interdepartmental committees. It also includes some major coordinating departments—chiefly, the Cabinet Office, the Treasury, the Foreign Office, the law officers, and the security and intelligence services" (Dunleavy and Rhodes, 1990; see also Rhodes, 1995: 17 on "cliques" and the "inner cabinet," and Rhodes, 2011: 213–19 on politically-appointed special advisors to ministers).

Second, there is an enduring logic of policy communities, operating at a lower level of government. The state is too large to manage, so governments break its component parts into sectors (such as health) and subsectors (such as healthcare). Ministers delegate responsibility for most subsectors to civil servants and

executive agencies. In turn, civil servants rely on interest groups and other actors (such as experts) to provide information and advice, and groups trade their resources for access to government. As a result, specialist communities process most policy out of the public spotlight, with limited ministerial involvement (Richardson and Jordan, 1979; Jordan and Maloney, 1997; Jordan and Cairney, 2013). Ministers influence the issues to which they pay attention, but they can only pay attention to a small number. This logic explains why the "British policy style" generally does not live up to its "majoritarian" image. As in most other West European political systems, British policymaking is characterized by a tendency to react to (rather than anticipate) policy problems and to encourage cooperation rather than top-down imposition (Jordan and Richardson, 1982: 84; Kriesi et al., 2006: 357–8; Adam and Kriesi, 2007: 140; Cairney and Widfeldt, 2015; Cairney, Ingold and Fischer, 2018; Cairney, 2019).

Consequently, British politics facilitates two very different policy styles:

1. A "government knows best" style is visible when senior ministers (aided by special advisors) pay sustained attention to a small number of salient issues. There is a high incentive to pursue an image of governing competence based on the fiction that ministers are in control of all government business.
2. A policy community style is more likely when ministers delegate responsibility. There is a higher incentive to seek consensus and bargaining to produce policy outcomes that many actors can support (Cairney, 2019).

Further, the drivers of those styles combine to produce continuous dilemmas within government, in which ministers juggle their need to appear to be in control, to defend their record in elections and to Parliament, with their need to pragmatic and share policymaking responsibility to get things done (Gains and Stoker, 2009; Hay, 2009; Matthews, 2016). Formal institutions are central to the official story, while the informal "rules of the game" facilitate policy behind the scenes. Both are essential to make sense of the idea of UK government policy "guided by the science," since: ministers only pay attention to a small proportion of science guided policy, and most potential advisors will struggle to navigate the "informal governance" of the UK political system if it operates so differently to its formal image (Ayres, 2020).

STATUS, STRATEGY, AND THE "RULES OF THE GAME"

In that context, UK studies of interest groups and policy communities help us understand how policy actors—such as experts - navigate political systems more or less effectively. Policymakers assign status to such participants based on:

1. Their beliefs and policy positions. Inclusion is more likely if groups support government policy or its definition of the policy problem (Jordan, 1990; Smith, 1990: 210).

2. The value they attach to a group's resources. Resources relate to factors such as a group's: size and ability to represent a wider population, profession, or industry; importance to the economy and society; policy-relevant knowledge; and, contribution to policy implementation (Maloney et al., 1994: 23).
3. A group's ability and willingness to follow the "rules of the game," which include
 - Define the policy problem in a way that limits participation (by setting narrow limits on what—and who—is policy relevant).
 - Keep discussions and debates in-house.
 - Be pragmatic, and present modest demands that do not involve major costs or challenge government policy.
 - Support the outcomes of decisions or avoid publicly criticizing the government's choices or competence.
 - Accept short-term losses in the hope of future chances to influence policy (Jordan and Maloney, 1997; McPherson and Raab, 1988; Grant, 1989: 21; Baumgartner and Jones, 1993: 6; Maloney et al., 1994: 34; Marsh and Smith, 2000: 6).

Groups relate their strategies to those conditions. Many pursue an "insider strategy" by following the rules (Grant, 1989; Grant, 1995), to help build trust in their advice and convince policymakers that they need not seek it elsewhere (Jordan and Maloney, 1997: 570). This combination of strategy and resources helps explain variation in status (Maloney et al., 1994: 30–32):

1. Core insiders are "seen as important and relevant sources by policy makers over a broad policy area" and "are involved in bargaining/exchange based relationships with policy makers".
2. *Specialist insiders* "have a more specific interest in restricted policy areas but are seen by policy makers as a reliable and authoritative source of information".
3. Peripheral insiders are consulted as part of "trawling" or "cosmetic" exercises. Their "relevance to a topic is seen by civil servants to be marginal," and they fail to persuade their policymaker audience that they have something to offer.
4. Other groups are outsiders "by Ideology" when their goals will not be accommodated by government, or "by Choice" when their main goal is to maintain the support of their members or other audiences (public, media, parliamentary, or judicial) via highly-visible opposition to government (Maloney et al., 1994: 32).
5. Some groups vacillate between strategies or seek the benefits of both (May and Nugent, 1982: 7; Mayne et al., 2018), but success is not in their gift (Maloney et al., 1994: 33–4; Jordan and Maloney, 1997).

Further, studies of civil servants identify a similar focus on formal and informal rules. For example, (Hood, 2002: 320) describes a historic UK "public service bargain" in which civil servants pledged their "loyalty and competent service to the government of the day" in return for "job tenure" and "avoidance of public blame." Although

they may enjoy delegated responsibility to manage policy communities, they remain part of a hierarchy and anticipate the reactions of their ministers (Page and Jenkins, 2005). The rules of this bargain are largely-unwritten, vulnerable to "cheating" by participants (Hood, 2002: 320; 325), and negotiated in different ways over time and according to each actor. For example, (Hood and Lodge, 2006: 119) describe a "conversation" in which civil servants accept the need to try to deliver ministerial aims even if they consider the idea "not sensible," some ministers will welcome frank feedback, while "with others you know it is the end of your relationship." Further, (Rhodes, 2011: 189–99) describes the "rituals" (backed by an insider language) that represent unspoken rules on civil service conduct, such as to: use understatement and euphemism (or subtle humor) to question someone's competence, gossip in a way that is consistent with codes of secrecy, and avoid being openly angry in meetings. Encouraging outsiders to "speak truth to power" is not one of those rituals. Rather, crises prompt a "siege mentality; a tight team with a sense of purpose, even mission, that becomes cohesive to the point of being inward looking and stereotyping outsiders" (Rhodes, 2011: 275).

Understanding These Rules of the Game in Policymaking Environments

Overall, policy theories and empirical studies help explain the wider context for science advice. Policymaking takes place in a Westminster political system, liberal democracy, and complex policymaking environment over which no-one has control, producing the need to 1) tell a story of ministers in charge while 2) accepting the limits to individual and state powers. In that context, policy participants enjoy more success if they support this story, contribute to government policy, and follow "rules of the game".

However, these "rules of the game" are not easy to understand and follow. First, studies of institutions suggest that rules are generally difficult to identify, learn, or navigate, when they are informal or implicit and when implicit rules contradict the formal and written rules of organisations (Hall, 1986; Ostrom, 2007: 23; Lowndes, 2010: 73). Second, participants navigate a complex, fluid, and often-contradictory collection of rules. Policy community rules are nested within more general rules of Westminster political systems, and the rules for interest groups differ from those for civil servants (Cavanagh et al., 1995).

In other words, scientists seeking to influence policy can no more follow the rules than ministers follow the science. It takes a considerable investment of resources to learn how to interpret many rules in policy communities, connect them to rules on public service, and criticize policy in a way that produces impact rather than exclusion. As such, only some policy actors can navigate political systems to gain or retain their status in policy communities, while others struggle to understand how to engage.

MINISTERS GUIDED BY INSIDER SCIENTISTS

These insights help us to categorize expert advisers according to their formal or assigned status (such as civil servants, members of

advisory groups, or external actors) and strategies (such as insider or outsider strategies, based on willingness and ability to follow the rules of the game). We can identify broad categories of science advisors akin (but not identical) to core, specialist, peripheral insiders, and outsiders. We can use these categories to make sense of the UK government phrase “guided by the science”, which means “our scientists” recruited from categories 1 and 2 (core and specialist insiders).

1. Core Insiders: Senior Government Scientific Advisors

These participants are employed as civil servants in government departments or agencies, subject to statutory rules (described in The Civil Service Code) and the “public service bargain,” highly conscious of the informal rules guiding civil service conduct and engagement with ministers, and possessing the resources (such as expertise) and skills to retain ministerial trust. They are akin to core insiders, supplemented by a formal role that ensures their high status among ministers. For example, Foreign Secretary Dominic Raab emphasized their status on Radio Four's Today Program (16.10.20, 8.11.51 am-8.12.04 am). When asked to respond to an idea discussed by a key member of SAGE (Medley, discussed below), Raab replied: “I spoke to . . . the *Chief Medical Office* and *Chief Scientific Advisor*.” Further, ministers have relied publicly on advisers such as Deputy Chief Medical Officers (*Dr. Jenny Harries* and *Professor Jonathan Van-Tam*), and senior members of the government agency Public Health England (PHE) and quango NHS England to bolster public health messages (Kettell and Kerr, 2020).

However, core insider status is not a given. PHE provides an extreme example to the contrary. Until 2020, PHE fit the profile of a politically astute organization headed by pragmatic senior staff following the rules of the game (Boswell et al., 2019; Cairney et al., 2019a). In August 2020, the Health Secretary announced PHE's abolition and a new management team for its successor (Department of Health and Social Care, 2020; Selbie, 2020), a move described by most accounts as part of the “blame game” between ministers and advisers (e.g. FT Editorial Team, 2020). Nor do participants enjoy a smooth ride. For example, Vallance was allegedly “rebuked for arguing strongly in favor of imposing Covid lockdown restrictions earlier this year” (Kermani, 2020).

2. Specialist Insiders: Advisors Recruited to Specific Government Advisory Bodies

The LSE GV314 Group (2018) describes advisory bodies as “on tap” (filling a government request) rather than “on top” (a vehicle for advisor influence). Participants are often employed by external organisations (such as Universities), not as subject to statutory rules or public service bargains, less aware of the informal rules in government, and they possess similar intellectual resources but fewer skills to retain status in government. Further, governments tend to control how these bodies operate, from how to portray their role to how they can share information.

This description applies more or less to expert contributors to SAGE [and specialist advisory groups such as NERVTAG and the

sub-groups SPI-M (Scientific Pandemic Influenza Group on Modeling) and SPI-B (behavioral public policy)]. It is described by the UK Government (2020): 1 as:

“The Scientific Advisory Group for Emergencies (SAGE) is responsible for providing Cabinet Office Briefing Room (COBR) meetings with coherent, coordinated advice and to interpret complex or uncertain scientific evidence in non-technical language. Typically, SAGE meets in advance of COBR and the Government's Chief Scientific Adviser (GCSA) subsequently represents SAGE at COBR. SAGE provides COBR with science advice at the UK level . . . SAGE's role is to provide unified scientific advice on all the key issues . . . This advice together with a descriptor of uncertainties is then passed onto government ministers. The advice is used by Ministers to allow them to make decisions and inform the government's response to the COVID-19 outbreak.”

The UK government (2020: 1) identifies the types of expertise on which it relies, describing “expertise from across the scientific spectrum” but prioritizing a bio-medical approach (“including epidemiologists, clinicians, therapeutics and vaccine expertise, public health experts, virologists, environmental scientists, data scientists, mathematical modellers and statisticians, genomic experts”) supplemented by behavioral social science. Further, government (and SAGE) statements try to assert boundaries between advice, strategy, and value judgement—and the UK government tried unsuccessfully to limit access to meeting papers - to set narrow limits on SAGE's role (see Alwan et al., 2020; Cairney, 2020d; Forman et al., 2020; Kupferschmidt, 2020; Nature Editorial, 2020).

Still, there are not completely hard-and-fast rules of SAGE adviser conduct. Rather, there is a large group of irregular attendees to SAGE (in meetings that can have 70 participants) and a small group of consistent attendees who are relatively known by ministers, visible in print, TV, and radio media, and asked to provide oral evidence by House of Commons committees. Examples of the latter include Professor Graham Medley, who chairs SPI-M, and Professor Neil Ferguson, who led the Imperial College COVID-19 Response Team (2020) that became so important to the UK government narrative (below). The smaller group appears sensitive to informal rules of the game when giving public statements (Ferguson lost his SAGE status after breaching other—social distancing—rules), but with more scope to express their opinions on COVID-19 policy if they describe them clearly as “personal views.” Participants of the larger group have more freedom to express personal dissenting views (while retaining ad hoc SAGE status) to reflect their relative independence and low threat.

3. Peripheral Insiders: Potential Advisors Seeking Inclusion

Peripheral insiders are employed externally, subject to the rules and principles of their own employers and professions, and aware of government rules if they have previous experience of engagement. Some use their previous experience in advisory

groups to establish a reputation based on an insider strategy. However, many do not have enough experience of engagement to learn the complex, unwritten, and ill-communicated rules of engagement with policymakers. Indeed, the literature on academic “impact” suggests that most researchers have minimal knowledge and experience of engaging with policymakers and are more likely to refer to the rules of their own profession (Oliver and Cairney, 2019; Cairney and Oliver, 2020).

4. Outsiders: Experts Trying to Influence Policy Externally

Outsiders are external to government, subject to the rules and principles of their own employers and professions, and appear to ignore (or be unaware of) informal government rules. They are more likely to act in accordance with more visible scientific rules to protect the reputation of scientific professions (relating to research methods, conduct, and ethics) and principles of science advice, such as transparency, visibility, responsibility, integrity, independence, and accountability (Cairney, 2016b). This approach is often summarized as “speaking truth to power,” particularly in fields such as public health where there is an informal tradition of “maverick” scientists criticizing the pace of policy change rather than fostering relationships or congratulating new initiatives (Cairney et al., 2019a). One aim, of groups such as Independent Sage (2020a) is to generate interest from external audiences to put pressure on governments to change course. Another is to encourage insider science advisors to follow scientific professional rules, such as on communicating uncertainty (Saltelli et al., 2020).

CONNECTING EXPERT STATUS TO UK GOVERNMENT COVID-19 POLICY: WHAT DOES IT MEAN IN PRACTICE TO BE GUIDED BY SCIENCE?

The following sections connect this focus on the relative status of expert participants to the manner and extent to which UK government ministers follow expert advice to inform policy (see also Boin et al., 2020 to compare the UK with other countries; and Salajan et al., 2020 to compare with previous epidemics). Although this influence is difficult to quantify, it is possible to establish qualitative distinctions between types of advice-following based on the crucial distinction between uncertainty and ambiguity.

1. Uncertainty: A lack of knowledge or a lack of confidence in one's knowledge. Examples include:
 - The scale of a policy problem, using the surveillance of cases and trends to estimate the likely incidence and rate of reproduction (R) of coronavirus.
 - The likely impact of policy interventions.
2. Ambiguity: The ability to entertain more than one understanding or interpretation of a policy problem, or lack of agreement on problem definition. Examples include:

- The urgency of a policy problem and need for state intervention.
- The extent to which policymakers should seek to eliminate or manage the virus.
- The most appropriate amount and timing of state intervention to achieve compliance.

This distinction helps us to identify a range of advice-seeking activity that could be described by the phrase “guided by the science,” from 1) seeking facts to help reduce uncertainty on the incidence of coronavirus (minimal guidance), to 2) following advice on how to define and try to solve the policy problem (toward maximal guidance). The former is relatively technical, generating evidence to reduce uncertainty about the size of the problem and possible effect of each intervention. The latter is relatively political, combining facts with values to reduce ambiguity about the problem's perceived urgency, the appropriate role of the state, and who should benefit most from state intervention.

However, this process is not one way. Rather, advice-giving and advice-seeking form part of an iterative political process, in which insider experts are not only responding to requests for information but also following the rules of the game when tailoring their advice to ministers. Indeed, a recurrent theme below is that core and specialist insider advisors operated within the general confines of what might work in the UK political context (Cairney, 2020a). They considered: 1) technical feasibility, given the limits to state control (will it work as intended if implemented?), and 2) political feasibility, in a UK-style liberal democracy characterized by relatively low social regulation (will ministers and/or the public find the measures acceptable?). In other words, if they focus on what seems politically feasible for ministers to suggest to the public and anticipate policymaker concern about a shift toward imposition, (SAGE 25.2.20: 1), “maximal” influence relates to what seems politically feasible rather than the maximum possible policy change (or their preferred position).

UK GOVERNMENT POLICY WAS GUIDED BY CORE INSIDERS AND SAGE

In that context, the available evidence highlights the strong influence of core and specialist advice on the timing and substance of UK government policy. In particular, the following analysis of the crucial initial policy responses - from limited action in January and February to lockdown in late March—shows that UK government policy was largely consistent with SAGE evidence and advice. SAGE provided the main route for scientific information (to address uncertainty) and its advice underpinned how ministers defined the policy problem (to address ambiguity). Both factors had a major impact on the initial substance of policy and timing of lockdown (described in Cairney, 2020a).

Defining the Policy Problem: Manage for the Long Term, Avoid a Second Peak

The UK government rejected the idea—supported by some external experts - that immediate and profound suppressive measures could come close to eliminating the virus. Rather, they used terms such as “mitigation” rather than “suppression” to differentiate UK measures from those in China and warn against the latter’s unintended consequences (Atkinson et al., 2020: 5; Cairney, 2020e; Cairney, 2020h; Cairney, 2021). While the loose and inconsistent use of such terms (and “herd immunity”) in public caused some confusion on UK policy, we can sum up its definition of the policy problem in four main ways (see Cairney, 2020a; Cairney, 2021) and, each time, find SAGE influence or support.

First, in the absence of a vaccine and other resources (such as massive test-trace-isolate capacity), policy will involve suppressing transmission via social distancing and isolating people with COVID-19 to keep the reproduction number— R - below 1 (an R of one indicates, on average, each person infecting one other person). We need to reduce infection enough to avoid overwhelming health service capacity, and shield the people most vulnerable to COVID-19, to minimize deaths during at least one peak of infection:

- “Any combination of measures would slow but not halt an epidemic” (SAGE 25.2.20: 1).
- “Mitigations can be expected to change the shape of the epidemic curve or the timing of a first or second peak, but are not likely to reduce the overall number of total infections” (SAGE 27.2.20: 2).
- “The objective is to avoid critical cases exceeding NHS intensive care and other respiratory support bed capacity . . . advice on interventions should be based on what the NHS needs” (16.3.20: 1).

Second, we need to maintain suppression for a duration that is difficult to predict (subject to compliance levels that are difficult to monitor) and avoid the unintended consequences of suppression:

- Closing schools would create displacement problems (children going to older relatives), have an unequal impact on poorer families (loss of school meals, lost income, lower internet access, exacerbating isolation and mental ill health), and remove a major source of emotional support, health education, social services, and leadership (SPI-B Meeting paper 4.3.20b: 1–4).
- “Long periods of social isolation may have significant risks for vulnerable people . . . SAGE agreed that a balance needs to be struck between interventions that theoretically have significant impacts and interventions which the public can feasibly and safely adopt in sufficient numbers over long periods” (SAGE 10.3.20: 2)
- “Minimize potential harms from the interventions, including those arising from postponement of normal

services, mental ill health and reduced ability to exercise” (SAGE 26.3.20: 1–2).

Third, avoid the strong language of emergency (which might panic the public), and maintain public trust in the government by maintaining consistent and proportionate measures. Avoid 1) insufficient suppression measures and 2) excessive suppression measures with too-draconian enforcement, which could contribute to a second wave of the epidemic of the same magnitude as the first:

- The fewer cases that happen as a result of the policies enacted, the larger subsequent waves are expected to be when policies are lifted (SPI-M-O Meeting paper 25.3.20: 1).
- “SAGE was unanimous that measures seeking to completely suppress spread of Covid-19 will cause a second peak. SAGE advises that it is a near certainty that countries such as China, where heavy suppression is underway, will experience a second peak once measures are relaxed” (SAGE 13.3.20: 2).

Fourth, we need to transition safely from suppression measures to foster economic activity, a return to work and education, and reinstate the full use of non-COVID-19 NHS capacity.

Overall, statements by UK ministers and their core and specialist insider advisers were remarkably consistent and mutually reinforcing. Kettell and Kerr (2020) analysis of daily minister/advisor press briefings (16 March–16 May) describes this ministerial narrative: we are facing a deadly threat to national security which requires wartime unity and sacrifice, but we are ready to take whatever measures are necessary to tackle the crisis, and everything is going to plan, because we are “guided by the science”. Their advisors identified an epidemic that can only be managed rather than eliminated, prompting the need to: introduce measures gradually to bring the public with us, and avoid causing a second, larger wave of the epidemic when compliance levels diminish over time; while, protecting the economy and encouraging compliance in line with the principles of liberal democracy.

The Timing and Substance of Interventions Before and During Lockdown

Cairney (2020a: 11) identifies two initial phases of UK government policy. Until March, its approach was limited to “exhortation to modify behavior, coupled with the desire to maintain existing ways of social and economic life”. From 23rd March, it shifted to “direct regulation and imposition, coupled with an unprecedented collection of measures to address the social and economic consequences”. There is a general consensus that this shift came too late, and that the delay contributed to tens of thousands of avoidable excess deaths Cairney (2020a: 2). However, there are contrasting interpretations of the cause of the problem:

1. “Complacent” senior ministers, not taking COVID-19 meetings seriously, reluctant to follow scientific advice to lock down, and causing a 9-day delay after accepting the inevitable (Calvert et al., 2020a; Calvert et al., 2020b).
2. SAGE and senior adviser reluctance to recommend high and immediate suppression measures, exacerbated by inaccurate estimates of the rate of transmission (Freedman, 2020; Grey and MacAskill, 2020; Snowden, 2020; Taylor, 2020; Wickham, 2020; More or Less 1.7.20 cited in Cairney, 2020f).
3. Some accounts describe both as contributors to major delays (Atkinson et al., 2020: 4).

While the SAGE minutes and meeting papers do not settle this debate, they show that delayed ministerial action (to oblige social distancing and isolation) and key choices—such as not to limit international travel or mandate face masks—are consistent with core and specialist insider advice (Cairney, 2020i). While the nature of this advice may reflect an imbalance of power toward ministers, it also reveals unusually high levels of SAGE uncertainty associated with a new and quickly-emerging crisis. It includes uncertainty regarding human-to-human transmission, the likely rate of transmission, what measures might delay or reduce the impact of the epidemic, and how much time there was to transition toward a series of isolation and social distancing measures.

In that context, as the following chronology suggests, ministerial inaction did not necessarily indicate ignoring advice from their scientists about when and how to intervene to regulate social behavior (see also Cairney, 2020g on using behavioral science to influence behavior). Rather, January and February highlight high uncertainty, while March highlights ongoing ministerial and adviser hesitancy. Indeed, the summary of each meeting in March shows that ministers were not falling behind their scientific advice.

January 2020

The first meeting was “precautionary” (discussing updates from NERVTAG) and “SAGE is unable to say at this stage whether it might be required to reconvene” (22.1.20: 2). Its description of WN-CoV (Wuhan Coronavirus), and statements such as “There is evidence of person-to-person transmission. It is unknown whether transmission is sustainable”, sum up profound uncertainty on what is to come (22.1.20: 1–2). It notes high uncertainty on how to identify cases, rates of infection, infectiousness in the absence of symptoms, and which previous experience (such as MERS) offers the most useful guidance. 6 days later, it estimates an R between two to three, doubling rate of 3–4 days, incubation period of around 5 days, 14-day window of infectivity, symptoms such as coughing and fever, and a respiratory transmission route (different from SARS and MERS) (28.1.20: 1).

February 2020

SAGE focused on what measures might delay the impact of the epidemic. It described travel restrictions from China as low value, since a 95% reduction would have to be draconian and only secure a one month delay, which might be better achieved with

other measures (3.2.20: 1–2). Multiple papers suggested that the evidence was so limited that they could draw “no meaningful conclusions . . . as to whether it is possible to achieve a delay of a month’ by using one or a combination of these measures: international travel restrictions, domestic travel restrictions, quarantine people coming from infected areas, close schools, close tertiary education, cancel large public events, contact tracing (at current capacity), voluntary home isolation, facemasks, hand washing. Further, some could undermine each other and have major societal costs (SPI-M-O, 3.2.20b: 1–4). For example, the “SPI-M-O: Consensus view on public gatherings” (11.2.20: 1) notes that stopping large outdoor events could prompt people to go to small indoor pubs. Throughout February, the minutes emphasize uncertainty:

- If there will be an epidemic outside of China (4.2.20: 2)
- If it spreads through “air conditioning systems” (4.2.20: 3)
- The spread from, and impact on, children and the impact of closing schools (4.2.20: 3; SPI-M-O, 10.2.20c: 1–2)
- The value of wearing face masks (on the assumption that droplets are more important than aerosol) (4.2.20: 3)

Its meeting papers emphasized a delay in accurate figures (SPI-M-O, 3.2.20a: 3), but its minutes suggest that:

“Surveillance measures, which commenced this week, will provide actionable data to inform HMG efforts to contain and mitigate spread of Covid-19” . . . PHE’s surveillance approach provides sufficient sensitivity to detect an outbreak in its early stages . . . increasing surveillance coverage beyond the current approach would not significantly improve our understanding of incidence” (SAGE 25.2.20: 1).

SAGE minutes (26.2.20) highlighted a reasonable worst case scenario as worrying as the Imperial College COVID-19 Response Team (2020) report that allegedly changed the UK Government’s mind on the 16th March (Cairney, 2020a: 7). Meeting paper 26.2.20a described the assumption of an 80% infection attack rate and 50% clinical attack rate (50% of the population would experience symptoms), underpinning the assumption of 3.6 million requiring hospital care of at least 8 days (11% of symptomatic), and 541,200 requiring ventilation (1.65% of symptomatic) for 16 days. While it lists excess deaths as unknown, its 1% infection mortality rate suggests 524,800 deaths in the absence of government action.

March 2020

SAGE focused initially on preparing for the peak of infection on the assumption that it had time to transition toward sustainable isolation and distancing measures. Minutes and meeting papers express caution about the limited evidence for intervention and the potential for unintended consequences. This approach began to change from mid-March (Meeting 15), and accelerate from Meetings 16–18, when it became clear that incidence and virus reproduction/transmission were larger than expected.

Meeting 12 (3.3.18) describes preparations to consolidate information on the epidemic and the likely relative effect of each intervention, while its meeting papers argue:

- “It is highly likely that there is sustained transmission of COVID-19 in the UK at present,” and a peak of infection “might be expected approximately 3–5 months after the establishment of widespread sustained transmission” (SPI-M Meeting paper 2.3.20: 1)
- Prepare the public while giving “clear and transparent reasons for different strategies” (SPI-B Meeting paper 3.2.20: 1–2)
- Combine different measures (e.g. school closure, self-isolation, household isolation, isolating over-65s) at the right time; “implementing a subset of measures would be ideal. Whilst this would have a more moderate impact it would be much less likely to result in a second wave” (Meeting paper 4.3.20a: 3).

Meeting 13 (5.3.20) describes staying in the “containment” phase (isolating people with positive tests at home or in hospital), introducing: a 12-week period of individual and household isolation measures in 1–2 weeks, on the assumption of 50% compliance; and a longer period of shielding over-65s 2 weeks later. It describes “no evidence to suggest that banning very large gatherings would reduce transmission”, while closing bars and restaurants “would have an effect, but would be very difficult to implement”, and “school closures would have smaller effects on the epidemic curve than other options” (5.3.20: 1). SPI-B Meeting paper (4.3.20b) expresses caution about limited evidence and reliance on expert opinion, while identifying:

- Potential displacement problems (e.g. school closures prompt people to congregate elsewhere, or be looked after by vulnerable older people, while parents to lose the chance to work)
- The visibility of groups not complying
- The unequal impact on poorer and single parent families of school closure
- How to reduce discontent about only isolating at-risk groups (the view that “explaining that members of the community are building some immunity will make this acceptable” is not unanimous) (4.3.20b: 2).

Meeting 14 (10.3.20) states that the UK may have 5–10,000 cases and “10–14 weeks from the epidemic peak if no mitigations are introduced” (10.3.20: 2). It restates the focus on isolation first, followed by additional measures in April, and reemphasizes the need to transition to measures that are acceptable and sustainable for the long term:

“SAGE agreed that a balance needs to be struck between interventions that theoretically have significant impacts and interventions which the public can feasibly and safely adopt in sufficient numbers over long periods . . . the public will face considerable challenges in seeking to comply with these measures” (10.3.20: 2).

Meeting 15 (13.3.20: 1) describes “more cases in the UK than SAGE previously expected at this point, and we may therefore be further ahead on the epidemic curve.” Even so:

“There are no strong scientific grounds to hasten or delay implementation of either household isolation or social distancing of the elderly or the vulnerable in order to manage the epidemiological curve.”

It states that “household isolation and social distancing of the elderly and vulnerable should be implemented soon, provided they can be done well and equitably,” noting “there will be some minor gains from going early and potentially useful reinforcement of the importance of taking personal action if symptomatic” (13.3.20: 1) and “more intensive actions” will be required to maintain NHS capacity (13.3.20: 2).

On the 16th March, the UK Prime Minister Boris Johnson (2020b) describes an “emergency” (one week before declaring a UK-wide lockdown).

Meeting 16 (16.3.20) describes the possibility that there are 5–10,000 new cases in the UK, doubling every 5–6 days. Therefore, to stay within NHS capacity, “the advice from SAGE has changed regarding the speed of implementation of additional interventions. SAGE advises that there is clear evidence to support additional social distancing measures be introduced as soon as possible” (16.3.20: 1).

Meeting 17 (18.3.20) marks a major acceleration of plans, and a de-emphasis of the low-certainty/beware-the-unintended-consequences approach of previous meetings (on the assumption that it was now 2–4 weeks behind the highly visible Italian crisis that prompted its lockdown):

“Measures with the strongest support, in terms of effect, were closure of 1) schools, 2) places of leisure (restaurants, bars, entertainment and indoor public spaces) and 3) indoor workplaces. . . . Transport measures such as restricting public transport, taxis and private hire facilities would have minimal impact on reducing transmission” (18.3.20: 2).

Meeting 18 (23.3.20) states that the R is higher than expected (2.6–2.8), requiring “high rates of compliance for social distancing” to get it below one and stay under NHS capacity (23.3.20: 1). There is an urgent need for more community testing/surveillance (and to address the global shortage of test supplies). In the meantime, it needs a “clear rationale for prioritizing testing for patients and health workers” (23.3.20: 3) Closing UK borders “would have a negligible effect on spread” (23.3.20: 2).

The lockdown: *On the March 23, 2020, Johnson (2020c) declared: “From this evening I must give the British people a very simple instruction—you must stay at home.”* He announced measures to help limit the impact of coronavirus, including police powers to support public health, such as to disperse gatherings of more than two people, close events and shops, and limit outdoor exercise to once per day (Cairney, 2020a).

THE WIDER ROLE OF SCIENCE ADVICE: FROM CORE AND SPECIALIST INSIDERS TO PERIPHERAL INSIDERS AND OUTSIDERS

While initial UK government policy was largely consistent with core and specialist insider advice, many other potential advisers criticized its slow timing and low substance (Cairney, 2020a: 2). In other words, there were many peripheral insiders who were able to communicate their advice but enjoy minimal impact. Many wrote “we warned you” commentaries to express dissatisfaction with their low influence and to distance themselves from government policy (e.g. Ward, 2020).

Some responded by pursuing an outsider strategy. The most visible example is by Independent Sage (e.g. Independent Sage, 2020a; Independent Sage, 2020b), which uses a model of engagement that it recommends for SAGE (and it claimed some credit for the government's decision to reveal SAGE participants and papers, Inge, 2020). It also recommended - in vain - suppressive measures to eliminate rather than manage COVID-19, and is routinely critical of government policy and policymaking. Its main influence is on already supportive audiences. Its influence on policy is to contribute to a wider body of work to which the government already pays attention, such as in relation to race and ethnicity (Cairney, 2020i; Cairney, 2020j). Some of its members were (or still are) listed as SAGE participants, with the shift symbolizing their increasingly peripheral status and unwillingness to support government policy. This experience differs from that of (for example) the Royal Society, which engages externally but counts core/specialist insiders as members.

Overall, the four-category status of scientific experts helps describe and explain their relative influence in most cases. However, as you might expect in a complex and crowded policymaking environment, there are many examples of overlapping status and strategy, with some evidence of influence outside of the core and specialist insider groups.

First, for example, some specialist insiders are able to argue for different approaches without necessarily losing their status, although this practice was relatively uncommon in the lead up to lockdown (see Edmunds in Grey and MacAskill, 2020; Farrar in Trigg, 2020; and Calvert et al., 2020a; Calvert et al., 2020b).

Second, Professor Devi Sridhar has different status in relation to the UK (outsider) and Scottish governments (specialist insider). Like Independent Sage, Sridhar is a high profile critic of UK policy and policymaking, in relation to its general rejection of an elimination strategy and the specific conclusions of SAGE (Sridhar, 2020). However, she has specialist insider status in the Scottish Government and appears to follow insider rules when discussing its policy (Sridhar and Chen, 2020).

Third, Professor Trish Greenhalgh (2020a); Greenhalgh (2020b) has been publicly critical of the UK government (operating on the notional peripheral insider/outsider boundary) and SAGE's reluctance to recommend a “precautionary” approach to wearing face masks, but also

played a leading role in synthesizing the evidence that contributed to one of the most important UK government policy changes. Previously, advisory bodies had emphasized limited evidence of a clear benefit to the wearer, and worried that public mask use would reduce the supply to healthcare professionals and generate a false sense of security. Even by April (Greenhalgh et al., 2020 was published on the ninth), “NERVTAG concluded that the increased use of masks would have minimal effect” on general population infection (SAGE 7.4.20: 1), while the WHO described limited evidence that facemasks are beneficial for community use (SAGE 9.4.20). Still, general use could have small positive effect, particularly in “enclosed environments with poor ventilation, and around vulnerable people” (14.4.20: 2) and “on balance, there is enough evidence to support recommendation of community use of cloth face masks, for short periods in enclosed spaces where social distancing is not possible,” as long as people know that it is no substitute for social distancing and handwashing (SAGE 21.4.20). This reluctance to make a strong recommendation, coupled with external pressure to change tack, prompted weak UK government advice on their public use, followed by the legal obligation for users of public transport and visitors to hospitals to use them (15.6.20), extending to shop visitors (24.7.20). The initial exhortation “if you can, you should also wear a face covering in other enclosed public spaces where social distancing isn't possible,” was replaced with “you must wear a face covering by law, unless you are exempt” by September (Atkinson et al., 2020: 4; Cabinet Office, 2020a; Cabinet Office, 2020b).

Fourth, UK commentators (and critics of the UK government in particular) highlight the disproportionate influence of a small number of academics whose views—against the necessity of lockdowns - are consistent with those of ministers (although they largely focus on post-lockdown developments: see Science Media Centre, 2020; Calvert et al., 2020c; and the “Great Barrington Declaration”).

Still, the general picture suggests that only core and specialist insiders had a continuous presence and consistent influence on UK government thinking, surrounded by a larger number of experts contributing to media and public debates. The latter provided a forum to identify the mistakes in government that contributed to unusually high levels of excess deaths. They include a focus on inaccurate SAGE data before lockdown; problems with the capacity for testing in the community; problems in expanding the test, trace, and isolate system (crucial to an exit-from-lockdown strategy); insufficient personal protective equipment (PPE) for health and social care staff; and, the movement of people from hospitals to care homes without testing (Cairney, 2020a: 2; Cairney, 2020f; Yates, 2020; see also Atkinson et al., 2020: 2 on poor communication to the NHS and poor contingency planning).

Many of these examples contributed to external criticism of the “groupthink” in government's advisory system, suggesting that core and specialist insiders were unable or unwilling to gather information from a wider network of peripheral insider scientists. In that context, Vallance's oral evidence to the Health and Social Care committee presented the opposite view (17.3.20: q96):

“If you thought SAGE and the way SAGE works was a cosy consensus of agreeing scientists, you would be very mistaken. It is a lively, robust discussion, with multiple inputs. We do not try to get everybody saying exactly the same thing.”

CONCLUSION

The UK political system contains a small number of key ministers operating within a “core executive,” but overseeing a policymaking environment over which they have limited knowledge and control. They influence heavily the small number of issues to which they pay sustained attention, but without the ability to control policy outcomes (at least in accordance with the Westminster model image that they seek to live up to). They attempt to set the terms of debate, narrow the search for scientific information, and associate policy with particular advisors, often to give government choices more authority and take the heat off ministers.

In that context, when UK government ministers describe being “guided by the science” they mean “our scientists”. They rely on a small group of science advisors employed as insiders loyal to government and possessing the skills and networks to retain core insider status. These advisors perform particular roles, such as to flank ministers in press briefings, ready to give credibility to each meeting, and support the image of governing competence of each minister. Or, they perform a defence of the government line while giving oral evidence to House of Commons committees. Chief advisors remain relatively trusted and visible scientists while they follow the rules. They are joined by a larger group of specialist insiders recruited on an ad hoc basis to perform specific (often influential) roles in advisory groups such as SAGE. Formal rules are less applicable to SAGE participants, whose status may rely partly on their apparent independence from government. Still, the behavior of a core group of SAGE participants suggests that they are cognisant of the boundaries between sharing personal views and criticizing government policy from the side-lines.

They are surrounded by a much larger number of peripheral-insider researchers pursuing ineffectual insider strategies (at least in the short term), and outsiders by ideology or choice, seeking to influence government policy by generating support from external audiences. Some have an impact on policy trajectory, particularly when at the forefront of synthesizing new policy relevant evidence. Most remain on the side-lines, unsure how to navigate a complex policymaking environment, unable or unwilling to do what it takes to gain access, and destined to perform the role of an external critic “speaking truth” to audiences outside of government.

These conditions for inclusion, and categories of insider and outsider experts, help explain the initial trajectory of UK government COVID-19 policy in 2020. Ministers and their closest advisors described the policy problem in a complementary way, relating it to the normative limits to state control in a liberal democracy and the practical limits to state intervention given their limited resources to control policy

outcomes. Both emphasized the need to balance public health intervention with respect for population wellbeing and individual freedom, protect health service capacity and vulnerable people, introduce measures gradually to avoid causing a second larger wave of the epidemic, and transition from suppression measures to foster the return of normal social, economic, and public service activity.

Government policy reflected this problem definition and routine SAGE advice. In January and February, ministers paid relatively low attention while SAGE reported initially low concern followed by new work on gradual measures. Both contributed to a policy characterized by exhortation rather than imposition. From March, ministerial attention and SAGE concern accelerated rapidly, but both expressed caution about a too quick and severe lockdown before shifting quickly by March 23rd. In each case, insider advisers contributed to a government narrative and ministers’ stories relied on insider science advice. In each case, peripheral insiders and outsiders had low influence on this problem definition and policy trajectory.

While these conclusions emerge from early UK government experiences, they also indicate some general features of policymaking. First, science advice does not contribute to a model of “evidence-based policymaking” or “policy learning” envisioned by many scientists (Cairney, 2016a; Dunlop et al., 2018). Rather, the production and use of evidence is part of a political process in which the status, power, and strategies of participants can matter more than “the evidence”. Consequently, second, scientists often face a stark choice: to “speak truth to power” to politicians to satisfy the rules and norms of their own professions, or to follow the “rules of the game” within government if they seek to inform government policy. Third, learning these rules is easier said than done (since they vary according to policymaking venue or sector), and following them does not guarantee success. Still, it is more useful to learn how policymaking actually works, and how policy actors engage successfully, than to simply bemoan the gap between the production and use of scientific evidence.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary files, further inquiries can be directed to the corresponding author.

AUTHOR CONTRIBUTIONS

The author confirms being the sole contributor of this work and has approved it for publication.

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Conflict of Interest: The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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