Models and methods to analyse the interaction of evidence and policy in the first 100 days of the UK government's response to COVID-19.

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Abstract

Background

The COVID-19 pandemic is both a global health crisis, and a civic emergency for national governments, including the UK. With currently no vaccine and no treatment, there is no medical solution. Consequently, the questions for evidence and policy are complex, draw on multiple streams, and are about management rather than medicine. This working paper sets out models and methods for a forthcoming study to analyse the interaction of evidence and policy in the first 100 days of the UK government's response to COVID-19.

Models

Drawing on chaos theory and insights from the policy sciences, three models of evidence-based policy are discussed: a linear cipher model, a multiple streams model, and a melee model. The nonlinear melee model is adopted for the forthcoming study, in which multiple forms of evidence (science, economic, political, social) and actors interact in real time, and supposedly independent evidence streams concomitantly consider evidence from other streams, creating an apparently chaotic melee in which it is unclear where, how and by whom decisions originate or are made. This is normal, and much closer to how policy decisions emerge than the process

represented by rational, ideal-type, linear models.

Methods

Design: An analysis of evidence in and of the policy response to COVID-19 by the UK government for the 100 days from 1st February 2020 to 11th May 2020 will be undertaken.

Data: Three data sources will be accessed: papers from the Scientific Advisory Group for Emergencies (SAGE) and its feeder groups and committees; formal government statements, information and guidance; BBC News coverage of government press briefings and further documents and/or coverage snowballing from them.

Analysis: A thematic content analysis, pre-structured by the four evidence streams in the melee model, will be undertaken to identify critical incidents for a strict contemporaneous analysis using only information available at the time of the incident, and referring only to the contemporaneous context for the incident.

Assumptions: Illustrative critical incidents will be sufficient to provide evidence for the explanatory utility of the melee model. Comprehensive coverage of all incidents would unnecessarily super-saturate the analysis.

Keywords:

Evidence; policy; melee model; COVID-19

Introduction

Following 213 global deaths and 9,800 infections, on 30th January 2020 the World Health Organisation categorised COVID-19 as a Public Health Emergency of International Concern (PHEIC), and five weeks later, on 11th March, as a pandemic, at which point 118,000 cases and 4,291 deaths in 114 countries had been reported. The first cluster of COVID-19 cases were recorded in Wuhan, China on 21st December 2019, and the first death on 11th January 2020. In the UK, the first domestically contracted case was recorded on 28th February, and the first death on 5th March. By 11th May, when the UK government published its COVID-19 recovery strategy after six weeks of lockdown, there had been 223,060 cases and 32,065 deaths.

In response, the UK government had convened an extraordinary meeting of its New and Emerging Respiratory Virus Threats Advisory Group (NERVTAG) on 13th January 2020, and by the end of March a further 17 meetings had been held. Other parallel groups, the Scientific Pandemic Influenza Group on Modelling (SPI-M) and the Independent Scientific Pandemic Influenza Group on Behaviours (SPI-B), also met during this time. Each of these groups feeds their conclusions into the government's Scientific Advisory Group for Emergencies (SAGE) which, according to papers published on 29th May, had met 40 times up to and including 7th May 2020 to consider evidence and provide advice on the COVID-19 response. In parallel, the government's Civil Contingencies Committee, COBR (Cabinet Office Briefing Rooms), which is convened to handle matters of national emergency, and to which SAGE provides advice, considered COVID-19 for the first time on January 22nd under the chairpersonship of the

Secretary of State for Health, Matt Hancock. On 30th January, in parallel with the WHO declaring COVID-19 to be a PHEIC, the government raised the threat level of the virus to the health of the UK population from "low" to "moderate".

Six weeks later, on March 12th, the threat level was raised from "moderate" to "high", and the Prime Minister told the country, "I must level with you...more families, many more families, are going to lose loved ones before their time".

Two months later, the publication on 11th May of the COVID-19 recovery strategy, marked the first 100 days (since the raising of the UK threat level to moderate at the end of January) of the government's COVID-19 response. During this time there have been criticisms levelled by the media and the public, and by scientists and politicians, of the interaction between evidence and policy in this response, with many accusing the government of politicising science advice, and some accusing scientists of allowing themselves to be advised by government. Others have accused the government of privileging the health of the economy over the health of the nation. This paper sets out models and methods to consider these criticisms and to explore evidence in and of policy during the first 100 days of the UK COVID-19 response.

Models of Evidence and Policy

Largely as a reaction to the development of policy driven by ideology in the 1980s, and following the development of evidence-based medicine and evidence-based practice, the then UK government's intent to utilise an evidence-based policy (EBP) approach was set out in a White Paper published in 1999 (1). Since then, the expectation that policy will be evidence-based has been a feature of subsequent governments' stated

approaches to policy-making, although stated approaches have not always matched reality (2) (3).

Proponents of EBP argue that it brings an objectivity to government decision-making (4), particularly if it draws on *best evidence* such as randomised controlled trials and systematic reviews of evidence (5) (6). This suggests a linear cipher model (figure 1a) where scientific evidence leads, directly and unmoderated, to the development of policy. Critics have

argued, firstly, that randomised controlled trials are not sufficient, nor always appropriate, to undertake policy decisions (7), and secondly that such a linear model underestimates complexity and does not understand the multiple influences on the way policy is made, including that policy is political (8). This suggests a multiple streams model in which “the science” feeds into a political decision about policy alongside, for example, economic factors and public opinion (figure 1b).

However, an assumption of linearity remains in the multiple streams model (9), with evidence streams assumed to be independent of each other, and to independently feed into a subsequent political decision. Yet, policy domains are dynamic, human, and involve multiple relationships between constituent elements that interact, evolve and vary in their stability over time (10). Borrowing from chaos theory (11), feedback occurs across variables as multiple evidence streams interact and feed into each other in real time, resulting in wide and wild variations and an appearance of chaos and chaotic behaviours and decisions (12). This can be magnified by the urgency of the required response and the complexity of the problem (13).

There is also often an assumption that only “the science” counts as evidence, linked to ideas about hierarchies of evidence (14). Critics have argued that, despite EBP’s best intentions, ideology remains a factor in policy-making (15) (16), while others suggest that ideology cannot be separated from evidence (17) and that the production of evidence is an inherently value-driven process (18). A further view, drawing on the tradition of the policy sciences (19), which is concerned with evidence *in* and *of* policy – i.e., how evidence is used in the policy process, and evidence of how policy is developed (20) – suggests that a complete understanding of decisions is achieved only when all inputs to the policy process are considered (21) (22), and that all

inputs, including ideology, should be considered as evidence.

Together chaos theory and the policy sciences suggest a nonlinear melee model (figure 1c) in which multiple forms of evidence and actors interact in real time, and supposedly independent streams concomitantly consider evidence from other streams, and in which it is unclear where, how and by whom decisions originate or are made (8) (23). Furthermore, this is normal, and much closer to how policy decisions emerge than the process represented by rational, ideal-type, linear models (8) (10).

The four streams proposed for the melee model are: science evidence, economic evidence, political evidence and social evidence. Science evidence includes that within and without the formal structures of government science advice, incorporating all branches of science (e.g. medical, biological, mathematical, behavioural), and including contested science within and across those fields. Economic evidence includes a range of inputs, including the government's own analysis, analysis from formally 'independent' national agencies such as the Bank of England, the Office for Budget Responsibility and the National Audit Office, analyses from a range of independent think tanks and economists, as well as national and international data on, for example, employment rates, GDP, borrowing requirements and inflation.

The science and economic evidence streams are those most commonly understood to be legitimately associated with EBP (24), with a related assumption of some form of linear model: that a linear cipher model *should* operate, but that a multiple streams model *does* operate (25). This suggests that such assumptions acknowledge that there is a difference between ideal (the linear cipher model) and perceived reality (the multiple

streams model), but also that there is still a belief that there should be, and that there structurally and systemically is, a separation between each evidence stream, and between 'independent evidence' and political decision (26).

However, the melee model, drawing on chaos theory and the policy sciences, suggests that streams that are rarely regarded as legitimate sources of evidence in EBP should be regarded as such in order to understand the relationship between evidence and policy, as well as how decisions develop and emerge.

Consequently, political evidence is conceived within the melee model as including the specific personal ideologies and beliefs of key political figures, the more general ideology of political parties and related pressure groups, the views and influence of powerful lobby groups (e.g. political donors, business leaders), the relationship of current proposals to previous decisions, and current and previous public commitments and manifesto promises. While proponents of EBP may not consider this to be *legitimate* evidence (27), it is undoubtedly considered and given parity with science and economic evidence in the chaotic melee from which policy decisions emerge (18) (28). Conceptually and practically, therefore, it is evidence both in and of policy.

Finally, social evidence is included as comprising the wider consent that does or does not exist across society for policy decisions and outcomes, including the extent to which that consent is contested. It includes opinion polling, media coverage, social survey insights, and impactful anecdote. Aspects of social evidence can often be ephemeral, and shifts slow to occur. Decades of evolving tobacco control policy provide an

excellent example of how social evidence is a part of the policy melee (29).

Methods for Analysing Evidence and Policy in the first 100 days of the UK's COVID-19 response

Design

The primary research will focus on 100 days from 1st February 2020 to 11th May 2020, a period stretching from just after the UK government raised the COVID-19 alert level from “low” to “moderate” to the date on which it published its recovery plan. A critical policy sciences approach will be taken (20) to analyse evidence *in* and *of* the policy response to COVID-19 by the UK government during this period.

Data

Three data sources will be accessed:

- Minutes, information papers, consensus statements and other analyses and commentaries on evidence (comprising 193 separate documents) produced or considered by NERVTAG, SPI-M, SPI-B and/or SAGE up to and including 11th May 2020, and published by government on 14th February, 26th March, 5th May and 29th May 2020.
- Formal government statements, information and guidance related to its response to COVID-19 hosted on www.gov.uk, and issued up to and including 11th May 2020.
- BBC News coverage of (a) daily government press briefings on COVID-19 instituted on 16th March 2020 up to and including 11th May 2020; (b) COVID-19 related government press briefings prior to 16th March; (c) further documents and/or coverage referenced in, or snowballing from, (a) and (b).

Analysis

The data sources will be analysed via a pre-structured thematic content analysis (30), to identify critical incidents (31) (32). The theme structure will be provided by the four evidence streams shown in the melee model (figure 1c): scientific evidence, economic evidence, political evidence and social evidence. The data sources will be analysed for content relating to each of these evidence streams, and critical incidents will be identified as those occasions where two or more evidence streams overlap. A strict contemporaneous analysis of these critical incidents will be undertaken, using only information available at the time of the incident, and referring only to the contemporaneous context for the incident.

Assumptions

Critical incidents will be used to explore evidence in and of policy during the first 100 days of the UK government's COVID-19 response, and to illustrate that evidence and policy interact in a non-linear chaotic melee, from which it is unclear where, how and by whom decisions originate or are made. The underpinning assumption is that illustrative critical incidents of this melee will be sufficient to provide evidence for its existence, and that comprehensive coverage of all such incidents would super-saturate the analysis, and therefore will be superfluous (33).

Summary

This short working paper sets out models and methods to underpin a forthcoming study of the interaction of evidence and policy during the first 100 days of the UK government's COVID-19 response.

The study is currently in progress, and the full pre-print will be posted on SocRxiv and linked to this working paper.

Conflict of Interests

None declared.

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