

## Do Lockdowns Work? Evidence from the UK.

### Abstract

Policies are conjectures. They rest on theories about the causes of societal problems and further theories about how they may be resolved. Such conjectures are always fallible and even in rather modest reforms, the original hypotheses often fall short – vital preconditions are left unconsidered, unanticipated consequences arise. In complex policies, such as in national responses to the COVID-19 pandemic, the gap between policy expectations and public response is potentially vast. Before the arrival of the vaccination programme, UK virus management involved the launch of hundreds of interventions in an unprecedented exercise in social control, known collectively and colloquially as ‘lockdown’. The paper examines the fortunes of the underlying policy conjectures using a complex systems framework. It argues that the sheer complexity of package of interventions generated scores of emergent and unanticipated effects, requiring revision after revision to lockdown policy. In modern, open, highly connected societies the capacity for maintaining strict social control over a protracted period is severely limited. Lockdown has an in-built tendency to wax and wane in its effectiveness. Significant consequences follow for crisis management and for evidence-based policy.

**Key Words:** *COVID-19, complex systems, counterfactuals, realist synthesis, evidence-based policy*

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### Background

Across all nations, after a full year of struggle against the pandemic, there has been urgent stocktaking and considerable breast-beating about the management of the crisis. Was the response sufficient, did it come too late, was it allowed to relax, what mistakes were made, was the science followed? No doubt, lessons will be learned, inquiries will be mounted, faults will be identified, and fingers will be pointed at specific decisionmakers. This paper forgoes recrimination and concentrates on explanation, trying to decipher the common challenges that undermined the management and control of the virus.

The paper examines UK policy as the case study, though similar debates are ongoing across Europe on the persistent imprecision of virus control. There was a depressing communality. Most counties experienced a first upsurge in infections and death, which was quelled with an initial ‘lockdown’ – only for the virus to reassert itself. Thereafter, a succession of further lockdowns, curfews, closures and circuit breakers were applied with initial but not sustained success. Infection rates defied wave after wave, permutation after permutation, of interventions. A year on, the main prospects for virus control have shifted dramatically from population control to vaccination programmes. This abrupt change of emphasis has left an intriguing question unanswered – in the absence of a vaccine would it have been possible to suppress a national epidemic by social control measures?

Thinking about what has not happened but could have happened is the stuff of ‘counterfactual history’ (Evans, 2014). And despite the fact that such exercises in ‘altered pasts and alternative futures’ are sometimes dismissed as guesswork and speculation, this is the captivating question to be pursued here. What accounts for the relentless pattern of trial and error and trial and error that characterises virus containment policy in so many countries? And without the biological discoveries, would social suppression strategies, in the long run, have struggled to success?

I begin by acknowledging that the unprecedented ferocity of biological attack, the precipitous transmissibility of the virus, and its uncanny ability to mutate genetically. But for a year the battle against this virological enemy was conducted with what the UK Scientific Advisory Group for Emergencies (SAGE) elected to call ‘non-pharmaceutical interventions’ (NPIs). It is a term that fails to do justice to the enormity of the policy response to COVID-19. That response reaches down from macro-economic strategies to counteract mushrooming international debt, it sweeps onwards to comprehensive controls on every institution, organisation and service, and ends in draconian restrictions on all individual behavior and contact. In short, the policy response under consideration here consisted of an unparalleled exercise in social control and a sociological explanation is required to account for its fragility.

The thesis here is that the UK policy response has been undermined by its own complexity. Historically, public health policy has been driven by relatively simple, linear programme theories – if we introduce programme X will it produce outcome Y, if we improve water supply will it reduce diarrheal deaths, if we ban smoking in public places it will reduce tobacco related illness. Causal attribution is entirely different and exceedingly difficult in pandemic management, where X is a complex, adaptive, self-transformative system aimed at whole societies Y, which are themselves complex, adaptive and self-transformative systems.

There has been a significant ‘turn’ towards complexity and systems thinking across the social sciences in recent years (Williams, 2021) and this orientation features increasingly in policy analysis (Daviter, 2019), in implementation science (Braithwaite et al, 2018) and in the evaluation of national reforms (HM Treasury, 2020). The properties of complex systems have been dissected in detail (adaptation, emergence, unanticipated consequences, feedback loops, blockage points and structures, non-linearity, tipping points, path dependency, openness, self-transformation, etc.). Much of the discussion of these processes has been conducted in the abstract in methodological journals and it is important to convey that that these system dynamics are in fact routine features of all social change and all social policy.

Accordingly, the paper now begins its central task, that of articulating these wayward system dynamics as they apply to crisis management of the UK coronavirus outbreak. Evidence is collected from a plurality of sources: the method utilised being a rapid and truncated version of ‘realist synthesis’ (Pawson, 2006). Accordingly, the ‘what works’ question is transformed in the expectation that the various elements of lockdown will have circumscribed impact – they will only work if implemented in particular ways, in particular communities, in particular respects, for particular durations, etc. Seven classic system dysfunctions are identified and for each I cite primary research evidence on how the underlying policy assumptions become destabilised. Note that in this abridged presentation I cover a mere handful of the countless possible examples of policy malfunctions. All illustrations refer deliberately to interventions mounted prior to the mass vaccination regime. Taken together, these perverse outcomes exemplify the remorseless challenge of complexity and so begin to explain the mixed and lurching pattern of success and failure of social containment policy across the UK (and in many other national regimes). Significant implications follow for pandemic management and for the science of evaluation. These are discussed in a conclusion and a coda.

## **Modes of Complexity**

### *1. Interaction and Emergence.*

The policy response, commonly referred to as ‘lockdown’, actually consists of a very large and ever-mutating bundle of interacting programmes (hand hygiene, protective equipment, closure of shops,

stadiums and schools, rules on social distancing and gatherings, restriction on travel, requirements to work from home, and many, many more). The impact of this medley of interventions is not simply additive but significantly interactive. Each intervention conditions the others, often in unanticipated ways. The combination of programmes generates emergent effects, which may complement each other but often reduce, compete with, or displace the intended effect.

#### *UK Examples.*

In the first wave of the virus, the high risk of hospital acquired infection (Heneghan et al 2020) and the urgent need for more hospital space to treat COVID patients led to a programme of discharging elderly patients to care homes. This strategy succeeded in its primary, numerical aim but failed to include a testing programme to accompany transfer and so displaced the problem causing a substantial surge in care home transmission. Thirty-three care home outbreaks in the first week of March 2020 turned into 793 by the end of the month (Gov.UK., 2020a). Increasing COVID space and services in hospitals also led to substantial shortfalls in routine and planned care. Cancer services were significantly affected with a growing backlog for referrals as well as delays and cancellations in first treatment (Macmillan Cancer Support, 2020).

A broad range of UK measures involved isolating individuals and encouraging them to remain at home. These interventions reduced virus transmission but generated a range of emergent effects, both positive and negative. For instance, the housebound population enabled a decrease in visits to overloaded family practitioners and to overstretched hospital A&E Centres (Health Foundation, 2020). Working from home also decreased pollution levels and traffic accidents/delays. Conversely, home isolation led to measurable and damaging increases in mental health problems, domestic abuse and educational disadvantage (Health Affairs, 2020).

Even superficially simple interventions generate unintended effects. Later in the UK policy cycle a programme called 'Eat Out to Help Out' subsidised bills to support restaurants struggling because of closure under wave 1 lockdown. The scheme cost £84m and on its final day it generated a 200% increase in diners over the previous year's figure (Hutton, 2020). Detractors claimed that the scheme amounted to subsidising the reintroduction of the virus. There is some evidence that areas with more participating restaurants saw a notable increase in infection clusters starting around one week after the scheme launched (Fetzer, 2020).

#### *2. The free rider problem.*

One trigger of growing resistance to lockdown stems from the activities of 'free-riders'. The term derives from an essay by Pareto (1935) who describes it as follows: 'If *all* individuals refrained from doing A, every individual as a member of the community would derive a certain advantage. But now if all individuals less *one* continue refraining from doing A, the community loss is very slight, whereas the one individual doing A makes a personal gain far greater than the loss that he incurs as a member of the community'. In the case of COVID-19, if one person ignores the lockdown, she/he gains from the collective effort, without having to make an individual contribution. The problem occurs when one becomes two and two becomes many. A sense of injustice amplifies if free riding becomes conspicuous and commonplace, generating a moral struggle between the 'concerned' and the 'unconcerned', which has a significant but once again unpredictable impact on the effectiveness of virus controls.

#### *UK Examples.*

The activities of free riders had a deleterious effect on UK public trust in the management of the epidemic. A longitudinal survey by Fancourt et al (2020) charts the changes in public trust in the government handling of the pandemic. Starting in May 2020 there was a steep decrease in confidence, which has never recovered. This date coincides with the discovery that Dominic Cummings, the PM's then senior advisor had broken lockdown rules with a 500-mile round trip to a family estate. The fact that such a high-profile official had abstained from collective responsibility ignited a torrent of media abuse – 'one rule for those in charge and one rule for everyone else'. Lockdown then encountered other prominent free riders including a SAGE mathematical modeller and Scotland's chief medical officer.

After these high-profile incidents, the negative and lasting decline in public confidence was further exacerbated by crowds of anonymous free riders who gathered in parks and beaches in the early summer and at raves and house parties over the winter. But this brings us to a further disconcerting point about free riding as noted by Pareto. Let me put it carefully – it is not entirely irrational. The growing complacency of some young people incited both condemnation ('the covidiot') and empathy ('don't scapegoat the young') but, once again, it also cries out for explanation. That explanation lies in a phenomenon called 'risk normalisation', in which small risks become increasingly acceptable over time (Murphy, 2020). Despite year-long warnings of the savage consequences of COVID-19, most young people had no direct experience of the misery it could cause, many will have noted the limited and sporadic deterrence offered by police, and a few of them may have come across the official reports on the minute death and serious illness rates in their cohort (Bhopal et al, 2021). Putting these factors together should lead us to *expect* a significant level measure of lockdown failure.

### *3. Contextual Heterogeneity.*

Both the transmission potential of COVID-19 and the public capacity to respond fluctuate significantly from context to context. The variations are endless. Very young children, dementia sufferers, people with physical incapacities (and the drunk and disorderly) have little capacity to obey distancing rules. Transmission varies sharply from neighbourhood to neighbourhood according to local amenities, population density and housing stock. The socioeconomically disadvantaged and many ethnic minority groups have been disproportionately affected in terms of infection rates, hospital admissions and deaths. National lockdowns are rarely 'granular' or locally sensitive enough to attend to every high-risk group. Even more problematic from a programme theory perspective, however, is the process of 'reinforcement'. That is to say policies designed to control the virus may act redouble the burden. They may advantage already advantaged groups. They may disadvantage the disadvantaged.

#### *UK Examples.*

National policies struggle in the face of local complexity and this is demonstrated in the limited reach of the core interventions in respect of black and minority ethnic (BAME) communities. Prevalence, mortality, and shielding rates can be pinpointed minutely at the 'ward' level and these show the persistent toll of the virus on areas with high proportions of BAME residents (Otu et al, 2020). Local, 'soft intelligence' identifies why these communities fared badly – e.g., collapse of the local 'cash-in-hand' economy, significant exposure to 'fake news' media, cultural misunderstandings with providers and referral systems, stigma involved in using city-wide services, inter-generational conflict in households, social distancing problems with large families in small houses, curtailment of funeral and mourning services, and so on (West Yorkshire Care Partnership, 2020). Broad-brush, top-down national programming can never counter such deep and locally rooted influences. There are,

moreover, many other specific communities (retirement, student, rural, military, prison, etc.) with different but equally significant health beliefs and social mores that may hinder adherence to national policy. The same conclusion beckons – we should *expect* a degree of lockdown failure when dealing with such ‘micro-circuits of transmission’ (Manzo, 2020).

The longstanding socio-economic health gradient (Marmot et al, 2020) is amplified by job losses due to lockdown, with disproportionate effects on those least able to protect themselves from the virus. McKinsey & Company (2020) made an early estimate of unemployment risk as follows: ‘The proportion of jobs at risk in elementary occupations—which employed 3.3 million people in 2019 and include jobs such as cleaners, kitchen assistants, waiters, and bar staff—is around 44 percent. In contrast, the same number for professional occupations—such as computer programmers, project managers, and accountants—is around 5 percent’.

To make matters worse, job losses, are then followed by perverse reinforcement effects. People not working from home or furloughed have to apply for benefits or seek new jobs. The available vacancies are, of course heavily skewed under virus restrictions (BBC, 2020). Some new jobs service the virus control measures – swab testers, temperature takers, social distance facilitators. Some vacancies seek to replace workers burnt out by virus duties – opportunities in nursing and social care have never been higher. Some openings reflect changing consumer behaviour – warehouse pickers, and delivery drivers. The common denominator? All are ‘public facing’ and thus carry elevated risks from the virus.

#### *4. Implementation drift.*

COVID-19 containment policy throughout the world had been led, almost without exception, by central governments. Such a hierarchical approach suffers a standard problem known as implementation drift or policy discontinuity. Centralised approaches involve long implementation chains, with the initial plans being adapted as they pass through layers of regional and local governance and then onto managers and practitioners before finding their way to the public. Such adaptation is inevitable and may have positive or negative consequences. It may lead to operational improvement as when intensive care units in hospitals develop ‘learning circles’ on surge strategies to deal with the unprecedented number critical care patients. Conversely, drift becomes a problem when implementation chains fracture and evolve along different pathways, leading to rivalry and dissent between the stakeholders in different jurisdictions. Sometimes implementation drift is so severe it becomes implementation blockage and progress simply stalls.

#### *UK Examples*

Educational policy is devolved in the four UK nations (England, Scotland, Wales, Northern Island) and they approached ‘school closure’ in quite different ways. All agreed that provision should remain for vulnerable children and the children of key workers, but during the first lockdown 71% of English schools remained open, compared to 34% in Wales, 30% in Northern Ireland and just 24% in Scotland (Education Policy Institute, 2020). Further drift occurred *within* each jurisdiction. Provision in England was largely organised by individual schools and within the single locality different rules applied on eligibility to attend, opening hours, levels of staffing, non-attendance, safeguarding responsibilities and so on, with knock-on disparities in children’s learning (Catton et al, 2021). The implementation of the ‘same’ policy meanders to different outputs and outcomes.

The biggest casualty of implementation drift was the national Test and Trace programme. Notoriously, the government did not document the basis for the delivery model this programme until September 2020, long after the scheme had commenced (National Audit Office, 2020). The

scheme was initiated by the civil service, bolted together rapidly, then controlled by a portmanteau of private firms including Amazon, Royal Mail, Randox, Deloitte, Sodexo, Boots, G4S, Kuenhe & Nagel, Serco, Sitel, Astra Zeneca, and GSK. A catalogue of operational shortcomings followed. Example one - the government had assumed that each case transferred to the tracing system would provide 10 to 30 contacts (the actual number was 2.4). Example two – only 1 in 5 respondents who had symptoms of COVID-19 fully self-isolated, and only 1 in 10 respondents who had been notified they were a close contact of somebody testing positive went on to isolate for 14 days’ (National Audit Office, 2020). Low compliance might have been anticipated. Self-isolation is enormously challenging and ‘bending the rules’ may seem a rational response for people who perceive themselves as low risk and have dependents and significant economic responsibilities (ONS, 2021).

And then there is implementation blockage. The introduction of the UK managed quarantine system stalled and spluttered for many months through inability to co-ordinate the full end-to-end process from aircraft to hotel. Every aspect of the detainees’ lives had to be catered for. An Institute for Government report (2021a) details how rule after rule, protocol after protocol, responsibility after responsibility was disputed between reluctant providers. International travel is one policy domain not alleviated by the vaccine roll-out: the idea of ‘COVID status certification’ or ‘vaccine passports’ remains hobbled by safety, security, privacy and legal concerns (Institute for Government, 2021b).

#### *5. Ambiguities in Guidelines.*

COVID-19 policy imposes a mass of restrictions on normal behaviour. These restrictions are delivered in the form of guidance on which activities are permitted and which are restricted. Some ambiguity in these guidelines is inevitable, with unclear pronouncements introducing further diversity in the public response. The first uncertainty concerns the legal status of the guidance - what is law and what is merely advisory? The second opacity lies in ambiguities in the wording or phrasing of the guidance. An immense amount of effort goes into the drafting of regulations, sometimes running to scores of pages of text. But the public rarely encounter the bureaucratic texts and disparity in the everyday understanding of regulations triggers mixed levels of compliance. Guidelines cannot reach into every single aspect of human conduct. Ambiguities provide further opportunities for ‘bending the rules’ and go on to trigger uncertain and unpredictable outcomes.

#### *UK examples.*

Many government announcements blurred the distinction between law and guidance in the coronavirus regulations, creating potential confusion among the public and police. The key message in the original government documentation on lockdown read as follows: *‘What you can and cannot do during the national lockdown. You must stay at home. The single most important action we can take is to stay at home to protect the NHS and save lives. You should follow this guidance immediately. This is the law’*. Hickman (2021) points out that much of what is stated in the remainder of the document is basically public health advice. Many exceptions to the ‘law’ were permitted - shopping for essentials such as food and medicine; meeting support or childcare bubbles; children moving between separated parents; working where it is "unreasonable" to work from home; education, training, childcare, medical appointments and emergencies; moving to a new house, and daily exercise. Detailed advice was offered on what was expected each of these ‘reasonable exceptions’ but their intricacy constitutes another notable bar on compliance.

The notion of ‘reasonable exceptions’ is a good example of a verbal ambiguity that is built into most guidelines. COVID restrictions extend to most walks of life and exemptions are always included. They are often so potentially compendious, however, that they have to be captured in stock caveats such

'essential activities', 'reasonable excuses', 'where necessary'. Knowing exactly where to 'draw the line' thus becomes problematic for officials and the public. This dilemma reached absurd proportions in what became known as the 'scotch-egg-wars'. During one period of restrictions in the UK people living under Tier 2 restrictions were allowed to drink in pubs, but only if they are also consumed a 'substantial meal'. Ministers were badgered on whether a scotch egg 'counts'? Some opined yay and some stated nay, and others felt that things were fine provided the order contained chips and salad.

The ambiguity of messaging becomes even more problematic when restrictions are turned on and off, and then on and off again. Analysis by The Telegraph (2020) showed that there were almost 200 rule changes by the end of Sept 2020. In particular, UK rules on the permitted number of people allowed in bubbles and outside meetings changed quite frequently and were met with high levels of public confusion (Fancourt, 2020). Schott (2020) provides a detailed study of 'graphic confusions' in UK Government's Covid-19 official communications. One example concerns a poster explaining the rules on meetings in which the public is permitted a choice: 'Your household can meet up with *one other household* indoors or outdoors' OR 'You can meet up in a group of up to *six people*, outdoors only'. Got that?

#### 6. Novelty and Routinisation effects.

Another class of temporal effects often noted in programme evaluation concerns the changing emotional attachment to interventions over their period of operation. There is a cyclical pattern. Policies often generate an initial surge of enthusiasm with the introduction of innovative ideas (the novelty effect). There is also some pride involved in being in at the beginning of a significant initiative (the showcasing effect). These sensations often dissipate over time as programme activities fade into the background (the routinisation effect). As time continues, programme expectations may become tiresome or even resented (the fatigue effect). Predicting the pace and rhythm of this self-transformation is challenging and rarely under the control of policy architects.

#### UK Examples

Novelty and showcasing effects are clear to see. The remarkable 'Clap for Carers' event in which neighbours stood on their doorsteps banging pots and pans every Thursday at 8 pm, represented a significant, if 'un-British', show of public affection for those battling against the virus. Some of the initial 'nudge interventions' such as the double rendition of 'Happy Birthday' while washing your hands or using funny elbow bumps also carried significant support. But, unsurprisingly, many of these first wave innovations were not sustained. Sunstein (2017), a founder of the behavioural insights approach, acknowledges that many nudges only have novelty and thus 'short-term' effects.

What of the medium and long term? There is some evidence of the routinisation effect, as when people seek to push back rather than withdraw under restrictions. This process is demonstrated in the significant differences in the numbers of children claiming exemptions in order to attend schools in the UK in the two periods of formal 'closure'. The Department for Education (GOV.UK, 2021) reported that 21% primary school pupils and 5% secondary school pupils went into school in Jan 2021. This compares with 4% of state primary school pupils and 1% from state secondaries who were in school during closures in the previous year.

Apple, Google and the Department for Transport all collect "mobility data". A BBC (2021a) summary shows that trains, buses, the Tube in London were used considerably more in later restrictions than during the first lockdown. In March and April 2020, car use dropped to about 35% of pre-pandemic levels and in the later Autumn lockdown, this reverts to 60% of pre-pandemic levels. Workplaces

also became noticeably busier in later closures, according to Google data, usage dropped by 66% in lockdown 1 versus 38% in lockdown 2.

Polling by the Scottish Government (2021) showed that in October/November 2020, a 'consistent level' of around four in ten parents of under-18s admitted to adapting Covid-19 guidance to suit their family needs. One example was that 19% agreed that 'It's okay for my child(ren) to go into their friend's house if I don't go in with them'. The main reasons provided by parents for adapting the guidance were - the mental health of their children (41%), followed by applying common sense (35%), to help improve their own mental health (30%) and to allow them to work (26%).

Whether such resistance can also be attributed to the final intervention phase of 'fatigue effects' is harder to discern. And here we come to dramatic disagreement. Behavioural scientist members of SAGE were sceptical, arguing that declines in adherence had other social causes (Mitchie et al, 2020). By contrast, the World Health Organisation released a long guidance document acknowledging that 'pandemic fatigue is an expected and natural response to a prolonged public health crisis' (WHO, 2020).

Fatigue, one suspects, lies in the mind of the perceiver. On which note – a little piece of individual testimony: 'Nearly 12 months since the country was first plunged into lockdown, this time round feels very different. We are weary, oh so weary, the kind of fatigue that hisses quietly in the background. Most of us disliked lockdown one and two, but at least with 2020's lockdowns, we had spring to look forward to and latterly Christmas – but of course the less said about that the better' (Alexander, 2021).

### *7. Exit strategies.*

A classic dilemma in policy evaluation concerns the sustainability of an intervention once it has ceased. Each COVID-19 intervention was time limited on the assumption that when sufficient control of the virus was achieved the particular restriction could be relaxed. The many and various suppression strategies were imposed and lifted at regular intervals. These transitions rarely involved the complete return to the *status quo ante*. Accordingly, more effort was often required in devising and implementing partial and prudent 'exit' strategies as compared to the immediate, draconian 'entry' of a full shutdown. 'Unlocking' is itself a complex, adaptive, self-transforming system. It suffers many of the same issues already identified – interaction of components, emergent effects, rule ambiguity, drift, heterogeneous effects, and free riders. This convoluted unwinding of most restrictions adds significantly to the problem of estimating their effects.

### *UK Examples.*

Closing schools, shops, theatres and so on was much simpler to implement than reopening them with capacity limitations, one-way systems, sanitising points, screening and booking systems. In lifting the first lockdown, Government advice (GOV.UK, 2020b) for retailers included: completing a COVID-19 risk assessment, cleaning more often, reminding customers and staff to wear face coverings, ensuring social distancing, improving ventilation, taking part in Test and Trace, turning away people with coronavirus symptoms, awareness of staff mental health needs. Additionally, some establishments were expected to keep records of all visitors, to reduce capacity, to manage queues, to erect barriers and screens to protect staff. These are onerous expectations, especially for small concerns that make up a large proportion of the commercial sector and levels of implementation are essentially unknown.

Indirect evidence may be gleaned from a Public Health England report (PHE, 2020) which uses contact tracing to establish where those infected with the virus had been in the week before they were tested. 'Visiting and working in supermarkets' recorded the highest weekly exposure setting of all locations, being experienced by 18.3% of people testing positive. Worries that some retailers were not implementing guidance led to the introduction of fines for infringements. It is questionable that these supplementary measures were effective, a National Police Chiefs' Council report (NPCC, 2021) reporting that in an 8-month period only 306 fixed penalty notices were issued to businesses in England. No data set can pinpoint exactly where people become infected, the point here is to reemphasise that the 'unlocking' of premises is an integral aspect of any 'lockdown' measure, making conjectures on their effectiveness even more precarious.

At the time of writing, and thanks to the vaccination programme, the final and 'irreversible' lifting of restrictions is being designed. As well as the practical problems noted above on how to implement unlocking in specific locations, there are intractable macro decisions to be made on which institutions should open first. Unsurprisingly, there are fundamental disagreements on the priorities in this respect (Nabarro, 2021). The most basic idea of complexity theory is the notion of emergence (#1 above), namely that interventions interact and may compete, limit and displace one another. And in respect of unlocking, political and economic interests fight against health considerations as never before. As a summary statement, I cannot improve on this conclusion from the Institute for Government report (2021c):

'When and how to start lifting lockdown will present the prime minister and his cabinet with some of the toughest choices they will ever have to make ... At the start of the crisis, what was good for public health was also probably in the economy's long-term interests. As we move into the next phase there is a balance ministers will need to manage – they will be walking a tightrope between the risks of another surge of infections and lasting harm to the economy, people's lives, livelihoods and prospects.'

The tightrope walking metaphor ends this discussion of the fluctuating dynamics of the UK suppression strategy. Note again that these seven scenarios constitute the tip of the complexity iceberg. Many other intricacies might have been cited. What are the consequences?

## **Conclusion**

The pandemic crisis has unleashed a thousand deliberations about what could and should have been done to control the virus. As all attention and all hopes turn to biological preparations, it is important to reflect back on the largest programme of public surveillance and social containment outside wartime. It has left us with the never-to-be-answered question of whether these suppression strategies would have worked left to their own devices. We can never know for certain how the UK might have fared without the advent of the vaccination programme. But there are some pointers ...

In the main body of the paper, I have attempted to illustrate the labyrinthine complexity of the mitigation strategies. The point was to show that what was done generated a muddle of contradictory forces, blocked opportunities, displaced effects, unacknowledged conditions, and unintended outcomes. Rather than seeing these as cockups or conspiracies I would argue that they were inevitable. It is what happens in complex, liberal democracies. It is what happens when single-minded objectives and simple-sounding rules are digested by a diverse population containing people who variously champion, support, comply, prevaricate, grow weary, seek exceptions, challenge, resist and undermine those rules ... and then continue to change their minds. It is what happens in

countries with compressed populations, mass transportation systems, vast commercial exchange, innumerable cultural gatherings, instant and endless interaction, open public debate, and extensive worldwide interconnectedness. It is what happened when control policy is centralised with little sensitivity to local intelligence on the elusive and all-important micro-circuits of transmission (Manzo, 2020). Complex systems are perfectly designed to achieve the outcomes that emerge. Modern social life is perfectly organised in ways that multiply the microcircuits of disease transmission.

Let us now recap the counterfactual question. Let us imagine a world without AstraZeneca, Pfizer, Moderna, et al. I have painted a picture of a continuing, protracted and sometimes self-defeating struggle to combat a pandemic using lockdowns, controls, restrictions, regulations, and exhortations. After a full year of such measures in the UK we were left with grave doubts about their sustainability. It is quite possible to identify specific blunders in the UK response – the slow and complacent initial response, the care home crisis, scandals on the supply personal protective equipment, the woeful performance of Test and Trace, etc. These errors will no doubt take centre stage in future formal inquiries, media wrangles and scalp taking on the management of the pandemic. I fear that this emphasis on failures of leadership and implementation blunders may miss the point - the thesis here is that the core problem is system malfunction. COVID-19 generated a policy response that affected every sphere of social and institutional life. The result, depicted in the main body of the paper, was a frensy of sticking plasters. Each measure, often perfectly valid in its own terms, interacted with other measures, producing emergent effects that were not and could not have been entirely predicted.

Does it follow that lockdown failure inevitable? Some qualifications are in order. This is no place to begin comparative inquiry but at the time of writing the doleful picture of system failure receives some support. A BBC (2021b) survey dated 20/03/2021 concludes that most European countries, especially those with stalled vaccination programmes, are ‘once again extending lockdowns and introducing new measures’. And whilst the character and numbers of lockdowns and the rhythms of infections and deaths vary considerably from nation to nation, there are no notable instances of success. ‘Boot and reboot’ was the European norm. And on the other side of the coin, one notes that those nations that have more nearly succeeded in virus control by lockdown have rather distinctive political, geographic and population characteristics. Lockdown may well work in counties with authoritarian governments, compliant populations, and mass surveillance systems – though accessing uncensored evidence is difficult (Thompson and Ip, 2020). New Zealand’s famed exceptionalism also has distinctive roots: geographic isolation, easy and immediate border closure, a unitary system of government and a tiny population - the so-called ‘team of five million’ (Baker et al, 2020). But for the rest of us, lockdown impacts turned out to be partial, short-lived, and indeterminate.

### **Coda**

If the above analysis is correct, it raises a momentous question on the status and standing of evidence-based policy, and in these closing remarks I offer a distinctly brief and modest answer. In the heat of the pandemic, it was proclaimed endlessly that the UK response was ‘led by the science’ and that ‘data rather than dates’ would determine the choice and the timing of policy decisions. In the main body of the paper, however, I have attempted to show how the scientifically sanctioned evidence used to guide policy was frequently undermined by further evidence gleaned in tracking complex policy outcomes. A potential paradox lurks – which evidence, which data, which provider? Who is to be believed?

Whilst the day-to-day exchanges between advisory bodies and government are, of course, invisible to all but a handful of key insiders, there is unquestionable merit in the proposition that evidence from Scientific Advisory Group on Emergencies played a prominent role in the UK response (Clark, 2020). The public face of that response consisted of daily Downing Street briefings led by the Prime Minister and supported by the Government Chief Scientific Adviser (GCSA) and the Chief Medical Officer for England (CMO). Of the three, it was no surprise to learn which two had a grasp of the evidence. That evidence took the form of what GCSA and CMO claimed to be the ‘consensus view of where we are now’ (Clark, 2020) – the distillation emerging from SAGE committee meetings with a heavy representation of physicians, virologists, immunologists, microbiologists, mathematical modellers and epidemiologists (Thaker 2020).

But what of the evidence presented here? A glance at the references shows that it too is a distillation – compiled in this instance from investigations carried out by a wide variety of national and local government departments, quangos, financial watchdogs, research foundations and institutes, investigative journalist and perhaps most significantly by independent academics, representing disciplines such as policy evaluation, sociology, management and implementation science, and complexity and systems thinking.

It goes without saying that these ‘insider’ and ‘outsider’ perspectives call on different bodies of evidence but, more significantly, they carry rival understanding of the power and certainty of evidence. This relates to a schism recognised even in the pioneering days of evidence-based policy. Almost a half a century ago, David (1975) noted scathingly that science has a taste for qualified conclusions, ‘on the one hand this, and on the other hand that’, whilst policy makers are much more inclined to demand, ‘can somebody find me a one-armed scientist?’ There is a remarkable echo in the UK CMO’s comment to select committee hearing: ‘It is not very useful to Ministers or other decision makers to say, “There are 16 opinions. Here are all 16. Make up your mind.” Part of the process is to say in a unified way, “Here is the central view”’ (Clark, 2020).

How has this struggle played out in UK COVID policy making? Great caution can be seen in many background reports utilised and submitted by SAGE: graphical projections were surrounded by confidence intervals; the possibility of measurement error was acknowledged; the erratic predictions of the mathematical modellers were protected by labelling them ‘projections’ or ‘scenarios’; recording delays were acknowledged, tolerance was called for until ‘more data are collected’. This steadfast restraint even resulted in injury to the English language, as in the cunning SAGE plan to uncover and counter ‘reasonable worst case scenarios’ (surely a *contradictio in adjecto*). In the business of evidence compilation methodological assiduity is the norm.

Eventually, however, prudence has to be translated into policy and the broad contours of the SAGE advice have been charted earlier, namely that it consists of a vast series of recommendations on imposing and then relaxing different clusters of restrictions at different points in the evolution of the virus. I have argued that, because of complexity, there must be persistent imprecision in these recommendations. Each of the chosen measures was subject to frequent ad hoc adjustment and each package of measures unleashed unanticipated consequences, emergent properties, displaced effects, as described. In short, what officially sanctioned science has to offer is a large amount of guesswork – informed guesswork to be sure, but conjectures nonetheless that fall well short of certainty. Government then walks the tightrope in weaving that advice onwards into concrete policy. The inevitable result is ‘muddling through’ and the mixture of trial and error seen in the first year of crisis management.

By this stage, however, the policy die has been cast and it needs to be justified. Once interventions have been implemented, decision makers and the incorporated scientific elite shift subtly from caution to conviction. Alas, it has to be so – policy is conjectural but can never be portrayed as such. Guidance is thus presented as scientifically sanctioned and continues to be presented by chief scientists, so carrying the imprimatur of the elite institutions. In the heat of lockdown, the prime task in daily news briefing is to bolster decisions made. When challenged, the politico-scientific establishment resort to defensive tactics, providing post hoc justifications for outcome delay and policy setback. The measures are correct ... but need better explication, so spin doctors and behavioural scientists are despatched to redouble the advice by improving its ‘messaging’. The measures are correct ... but need more time to mature and the public is implored to keep faith, to maintain discipline, and to provide ‘one more push’ (out of respect for health service heroes). The measures are correct ... but hindered by recalcitrants, who need to be shamed and further menaced with fines and even jail terms.

Such circumlocutions are entirely consistent with a venerable political science literature arguing that commitment to beliefs renders inflexible the attitudes of policy actors (Montpetit, 2012). In this instance, under the terrifying responsibilities of crisis management, commitment grows amongst responsible actors (ministers and the SAGE top table) and creates a distance with those whose beliefs differ, most especially in this instance by isolating scientists with divergent interpretations on virus control. The flow of information between disputatious parties is cut and in so doing science is hobbled. Real science depends unashamedly on imaginative hypotheses and guesswork. Recall Popper (1992) – ‘we cannot know, we can only guess’. And, above all, science depends on organised scepticism (Merton, 1968). It does not depend on elite consensus and infallible evidence. Objectivity gathers in the social process, whereby independent groups of scientists compete and check and challenge each other’s interpretations (Campbell, 1988).

Without question the scientific community has laboured ferociously in the face of the pandemic but my charge is that politically incorporated science has feigned certitude in the face of complexity. Particular bodies of evidence have been preferred and others, including the considerable repertoire presented here, have been sidelined. The draconian restrictions carried out in the name of virus control have consequences that reach well beyond the expertise of infectious disease specialists and a plurality of perspectives is the only inroad into complexity. Future inquires will need to look very carefully at the composition of advisory committees, ensuring that programme conjectures are properly challenged before they turn into policy commitments.

It is important to ponder some ‘alternative futures’ for the conduct of expert committees in the form of minority reports, tribunal systems, open deliberations, adversarial courts, citizens’ assemblies and so on. For discussion of these I direct the reader to a paper by Moore and MacKenzie (2020). Practical details vary but the underlying principle is paramount: ‘Creating institutions that establish norms and expectations of legitimate disagreement as part of the process of forming and communicating expert advice would make it easier for experts to stay true to their expertise and harder for politicians to hide their judgments behind the science’.

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