

Turning a blind eye: Have policymakers ignored economists during the pandemic?

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Summary

- Throughout the Covid-19 crisis, governments have relied heavily on the advice of epidemiologists and health professionals.
- Unusually, the economics profession has been conspicuous by its low profile in the policy making process. In an IEA paper published in May 2020, I argued that economic advice was an absolutely essential input into successful policy making when dealing with Covid-19.
- This paper looks back and illustrates ways in which the insights of economics could have helped and would be essential in any future pandemic.
- The focus is on micro-economics, the behaviour of individuals. It is *not* about Covid-19 and the macro-economy, either in an assessment of the quantitative impact of the pandemic, or in terms of the appropriate macro policy response to it.
- The central insight of economics is that when the set of incentives which someone faces changes, the individual is likely to change his or her behaviour.
- There has been a conspicuous failure by governments to appreciate the importance of incentives throughout the pandemic.
- For example, test and trace has failed for many reasons. But a key one has been a lack of understanding of the incentives in a system involving self-isolating. This is particularly true for the lower paid. Further, in order to maximise the uptake of the vaccines, the government could simply pay everyone who gets vaccinated.
- Governments have also relied far too heavily on opinion polls on lockdown. These have consistently shown strong support for restrictions. But economists prefer to rely on preferences revealed by actions, not on preferences stated in surveys. These suggest less enthusiasm for lockdown, with regulations being widely evaded in practice.
- A key part of the economists' policy tool kit is cost-benefit analysis. Studies published using this, by distinguished economists, uniformly suggest that the costs of lockdown exceed the benefits.
- Throughout the crisis, public sector workers and bureaucrats have been portrayed in the media as working in a seemingly selfless way for the public interest. Some definitely have done so. Others – such as the teaching unions - illustrate the practical importance of what economists call 'public choice theory'. They have frequently acted in their own self-interest.

Introduction

Throughout the Covid-19 crisis, governments have relied heavily on the advice of epidemiologists and health professionals.

Unusually, the economics profession has been conspicuous by its low profile in the policy making process. In the UK, for example, the Scientific Advisory Group for Emergencies (SAGE) has been at the heart of government during the pandemic. On the main body and its various sub-committees, SAGE involves well over a hundred scientific experts.¹ Very few appear to be connected even in the most tenuous way with economics.

In a previous paper published in May 2020, I argued that this was a serious mistake (Ormerod 2020). Economic advice was an absolutely essential input into successful policy making when dealing with the pandemic. In part, this was due to a strange reluctance of the profession in the early months of the crisis to become actively involved (Lyons and Ormerod 2020). But there are now more signs of life from economists in this area.

The purpose of this short paper is to illustrate ways in which the insights of economics could have helped the response to Covid-19 and would be essential in any future pandemic.

To be clear, it is not the purpose here to discuss Covid-19 and the macro-economy, either in an assessment of the quantitative impact of the pandemic, or in terms of the appropriate macro policy response to it. A substantial amount has been written on this.

The focus is on micro-economics, on the behaviour of individuals.

As well as showing the power of economics, aspects of the crisis have revealed areas in which economics itself needs to develop further, and I discuss two of these towards the end of the paper.

The practical examples used to illustrate the economic principles are almost all drawn from the experience of the UK. But the same ideas and concepts will be found in the experiences of every Western country during the pandemic.

Economics and epidemiology

Economists and epidemiologists have traditionally had very little to say to each other. Both the academic and more practical, policy-oriented aspects of the two disciplines seemed to live in different worlds.

The Covid-19 crisis is beginning to generate an appreciation that a dialogue between the two would be beneficial to both. The most recent issue of the *Journal of Economic Perspectives*, for example, carries both an article explaining epidemiological models to economists (Avery et al. 2020) and a paper by an epidemiologist suggesting how economists could help the subject (Murray 2020).

The methodological approach of epidemiology is certainly something which should be of interest to economists. It is a useful addition to the tools in their kitbag.

As it happens, I have a longstanding interest in epidemiological models, using their analytical framework to develop a model of crime in the mid-2000s for the then Home Secretary (Ormerod et al. 2003) and featuring a range of results based on their approach in an economics book in 1998 (Ormerod 1998). Much more recently, Nobel Laureate Robert Shiller suggested that they could be helpful in understanding the role of narratives in economic fluctuations (Shiller 2017).

The pandemic has exposed a much more pressing need for epidemiologists to incorporate the insights of economics into their models. It is not just a matter of developing the range of useful and interesting methodologies available to scholars in a particular academic discipline. It has powerful policy implications.

¹ See 'List of participants of SAGE and related sub-groups' (<https://www.gov.uk/government/publications/scientific-advisory-group-for-emergencies-sage-coronavirus-covid-19-response-membership/list-of-participants-of-sage-and-related-sub-groups>).

We can consider as an example the prediction made in March by Professor Neil Ferguson and his team at Imperial College London. Without a lockdown, the forecast was that there would be 510,000 deaths in the UK due to Covid-19.

We can leave aside the fact that the model was developed to predict epidemics of flu, an altogether different disease.

The Imperial model at first sight appears very scientific. It contains no fewer than 940 parameters, according to a recent description in the top science journal *Nature* (Adam 2020). However, changing the values of almost all of these makes very little difference to the forecasts. In fact, the model is basically driven by only three variables (see Edeling et al. 2020).

Despite the veritable profusion of parameters and variables in the Imperial model, an essential element is missing. Namely that, when faced by a pandemic, people will modify their behaviour of their own accord. We observe such behavioural changes throughout world history. Yet the epidemiological model makes no allowance for this.

The same model was applied to Sweden, and similarly dire projections of mortality were made. On 15 April 2020, Gardner and colleagues stated that the model predictions indicated that 'at least 96,000 deaths would occur by 1 July without mitigation. Current policies reduce this number by approximately 15%' (Gardner et al. 2020: 4). Adjusted for population size, these numbers are similar to the Imperial forecast for the UK.

Sweden is a good test for the scientific validity of the model because, as is well known, there have been relatively few formal restrictions in the country.² Covid-related deaths in Sweden have been *far* lower than the model-based predictions suggested. By the middle of December 2020, there have only been 8,000, just one-tenth of the 80,000 which were forecast to be reached by the end of June.³

Incentives

The central insight of economics is, of course, that when the set of incentives which someone faces changes, the individual is likely to change his or her behaviour.

It may often be a challenging task to predict exactly how people will alter behaviour when incentives change. But they most certainly do respond. Faced with a pandemic and the risk of death or serious illness, behaviour changes.

This has been a feature throughout world history. To give just one out of a potentially huge number of examples, Benedict Gummer's excellent book on the Black Death of the mid-14th century shows how people's behaviour in the UK altered in response to this deadly threat (Gummer 2010).

Focusing back on Covid-19, a great deal of government policy during the crisis has involved regulation. Given a choice, economists usually prefer to use incentives. Altering the relative costs and benefits of an action is a well-established way to alter behaviour.

A major problem not just in the UK but in most Western countries has been that, to varying degrees, people have not complied sufficiently to test and trace regimes.

There are other reasons of course why such systems have not worked very well. But an important reason is the various incentives which have been in place.

Self-isolation is not simply a personal inconvenience. For many, it involves a loss of income. There are strong incentives therefore not to comply, which is indeed what has happened.

Not enough people have signed up in the first place to give the system a chance of being truly effective. And, even when notified, contacts have failed in large numbers to self-isolate.

² See, for example, this list of rules from the Swedish police: <https://polisen.se/aktuellt/nyheter/2020/mars/ytterligare-begransade-mojligheter-till-allmanna-sammankomster-och-tillstallningar>

³ I have estimated, using Sweden as a comparator, that the number of lives saved in the UK as a result of the initial lockdown was at most 20,000 (see Nyman and Ormerod 2020).

In the UK, at most a quarter actually do so for the full quarantine period, and some estimates which have emerged from SAGE suggest the figure could be as low as 10 per cent. Even those who test positive for the virus may not observe self-isolation. A Scottish MP, Margaret Ferrier, infamously travelled by train from London back to her Glasgow home despite knowing that she had tested positive.

In the early autumn, there was a sign that the government had begun to appreciate the role of incentives. A fine of up to £10,000 was introduced for people who failed to self-isolate when they ought to.

The size of the penalty seems large enough to deter people from going out and about when they should be staying at home. The case in favour of the policy seemed open and shut.

But the fine altered another incentive in the test and trace regime. The bigger the fine for breaking the rules, the less likely it would be that people will supply the correct contact information in the first place. This does not seem to have been grasped by the proponents of the idea.

There has been no formal study of which of these two incentives predominated. But given the very low compliance rates, it seems that the latter gave yet another boost to non-compliance.

As late as 2 November, a prominent health professional expressed surprise⁴ that, in the context of the poor performance of the British test and trace system, 'People don't answer their phones, people don't want to get a contact from an unknown number'. On the basis of anecdotal, but reliable, information given to me personally, a key reason for this has been a desire to avoid being told to self-isolate.

During the month of November, the realisation that the costs of self-isolating for the required 14 days were a serious deterrent to compliance percolated to the very top of the government. This triggered a debate about whether it would be better to have a shorter period with higher compliance than the 14 days which the medical profession insisted upon for scientific reasons.⁵

An important reason for the relatively high death rate in the UK has of course been that the virus spread on a large scale into care homes during the major wave in March and April. This itself seems to have been the result of a response to incentives. We must wait for the findings of whatever public inquiry is ever commissioned into the Covid-19 crisis for a more authoritative pronouncement on the matter.

But health professionals had a strong incentive to make sure there were sufficient beds available in the NHS for new admissions for Covid-19. The example of Northern Italy in March, when the health system was overwhelmed, was fresh in people's minds. As a result, elderly patients with Covid-19, often caught in hospital after admission for a different reason, were knowingly sent back to their care homes.

The care homes themselves had a reputational incentive to avoid Covid-related deaths. This could have been given strong reinforcement by the government providing them with monetary incentives to keep homes virus free.

At the time of writing (end-November 2020), the cheering announcements of effective vaccines is still very recent. They do seem to offer real hope of solving the problem. The real issue is how to persuade enough people to come forward and be vaccinated.

There is clearly a section of the population, revealed on social media, which will never agree to it. Some believe it is a sinister plot by a tight knit cabal to control the world. The true believers in such ideas are probably relatively small in number. The problem will be if they succeed in undermining the science behind the strategy of vaccination.

Even so, there may be many who carry out a simple cost-benefit analysis for themselves. Virtually no-one under 40 in reasonable health, for example, has died of Covid-19. If the vaccine has unpleasant side effects, they may decide not to have it.

The idea being floated of a 'vaccine passport' might work, though it would immediately create a market in forgeries.

⁴ Dr Susan Hopkins, a public health expert and adviser to NHS Test and Trace, on BBC Breakfast.

⁵ The period in England was reduced to 10 days from 14 days on 14 December 2020 (<https://www.bbc.co.uk/news/health-55274147>).

Incentives could be put in place, rather than leaving it to individual self-interest. There are externalities involved. If I refuse to have a vaccination, I can infect others.

Some negative incentives seem obvious. For example, anyone who refuses the vaccine could be excluded from treatment if he or she caught the disease. Fines or even prison could be applied to vaccine refusers who are shown to have spread the virus. But such measures would create the wrong sort of climate.

The best incentives in the current circumstances are positive ones. People could be paid when they get vaccinated.

This could be a decent amount. Even £25 a time would amount to a drop in the ocean in the overall context of what has been spent on Covid-19. It would particularly motivate the poorer areas where ill health in general is a major problem.

Revealed preferences

The above section illustrates the importance of incentives and their impact on behaviour. Another central concept in economics is that of revealed preference, the subject of this section.

Economists attach relatively little value to surveys of opinion. This extends far beyond political opinion polls, though these serve to illustrate the point. In the 1980s, for example, survey after survey showed large majorities in favour of higher public spending financed by higher taxation. Yet the electorate consistently returned Mrs Thatcher to power when they had to make an actual decision.

Economists believe that it is only by their actions that people reveal what their preferences really are.

Faced with a hypothetical question, their answers are unreliable. We observe what they genuinely think by the decisions they make. The *Journal of Economic Perspectives* had a symposium on the question on one of its 2012 issues. The discussions are technical, but the top MIT econometrician Jerry Hausman summed it up neatly when he wrote, 'what people say is different to what they do' (Hausman 2012).

In early November, the UK government was persuaded to impose a second national lockdown partly on the basis of statistics supplied by Chris Whitty, the Chief Medical Officer, and Patrick Vallance, the Chief Scientist. Vallance and Whitty began the process in the middle of September. They flourished a chart on the television screens of the nation, projecting 50,000 new cases a day of Covid-19 by mid-October. The data on new cases is inherently unreliable, and different sources can and do give substantially different estimates. But on the basis of the data they used, the actual number was less than 20,000.

The duo followed this up shortly before lockdown with the now discredited claim that there could soon be 4,000 deaths a day from Covid-19 in the UK. At the time of writing, the maximum number registered in the current wave is in fact well under 1,000 (albeit in the context of the restrictions imposed).

We might conjecture, as an aside, that the enthusiasm of Whitty and Vallance for strict lockdown policies may arise from an incentive which they have. Namely, to try and cover for what proved to be very poor advice which they gave at the start of the pandemic. Vallance, for example, stated that mass gatherings had little impact on the spread of the virus. As a result, both the Cheltenham race festival and a major Liverpool football game against Spanish opponents were allowed to go ahead. There is evidence that these could have been super-spreader events.

To return to the concept of revealed preference, the more recent predictions of doom and gloom by the two scientists fell on receptive ears. The political decision to bring back lockdown seems to have been bolstered by public opinion. Opinion poll after opinion poll apparently showed strong support not only for whatever lockdown measures were in place, but for them to be strengthened.

But the preference revealed by much of the British public is that they have had enough of lockdowns. They understand the need to change behaviour. Many of the over 70s are shielding effectively. Young people are beginning to grasp the implications of unrestrained mingling and are modifying their actions. As noted above, however, the rules on self-isolation are scarcely followed at all.

In Scotland, Nicola Sturgeon, who claimed in the summer that the country would be virus-free by the end of the year, not only brought in very tough measures in the highly populated areas but was obliged to intensify them with a special category Tier 4 of restrictions. Cases stubbornly refused to fall despite strict controls.

The inference is obvious. Despite what they said to the pollsters, many Scots were not actually following the regulations in practice. Their revealed preference was not to have a strict lockdown.

Wales, which like Scotland has its own government with devolved powers, is but the latest illustration of this point. Towards the end of October, Wales was placed in a 'short, sharp, fire-break' two-week lockdown to try and reduce its high infection rate. Some of the restrictions, such as cordoning off sections of supermarkets deemed to sell 'non-essential' items, were widely ridiculed.

The 7-day moving average daily new case rate did indeed fall from around 300 per 100,000 to well under 200. But within a month of lifting lockdown, it had risen even higher, to some 350 and now stands at well over 500. Indeed, some of the old mining areas in South Wales have rates in excess of 1,000.

On 10 December, speaking on BBC Breakfast, the Welsh First Minister, Mark Drakeford, laid the blame squarely on people in Wales:

Despite the strict rules we have here, fatigue, the sense of no hope for the future has meant that not everybody has been willing to abide by the restrictions that are still necessary. We have seen people having house parties, people inviting large numbers of people back to their own houses when that is absolutely not allowed within our rules.

Cost-benefit analysis

Yet another important tool in economics is that of cost-benefit analysis. It is widely used in evaluating policies by governments around the world.

The concept itself is very simple. When considering the potential impact of a policy, an assessment is made both of its expected costs and its expected benefits.

A sophisticated methodology has been developed around the idea. In the UK, for example, formal guidance on how to carry it out is set out in a publication of over 100 pages called the Green Book (HM Treasury 2020).

The National Institute for Health Care and Excellence (NICE) in the UK routinely uses the methodology of cost-benefit analysis to decide how to allocate resources within the National Health Service. It may seem rather macabre to many people. But there has to be some way of deciding how to allocate any given level of resources to the various claims which are made upon them.

As a simple illustration, imagine a purely hypothetical scenario. Two people suffer from a very rare disease from which they will die within a month. Only one dose of the cure exists and needs to be purchased. But it is guaranteed to save the life of whichever gets it. One of the patients is 100, and the other is an otherwise healthy 20-year-old. Who should get the medicine? For most, this choice would be obvious. But this is the quandary in its most basic and understandable form.

Of course, people in health systems have to make much more complex decisions on which drugs should be bought and how many people can get a particular treatment all the time. An additional complication even with the very simple illustration above, for example, is the cost of the drug. How much is it reasonable to pay to save the life of the 20-year-old? Beyond a certain cost, the regrettable decision would have to be made that neither life should be saved. The money would do more good being spent on treating entirely different people with different health problems.

To inform decisions such as this – which to stress again are made routinely in every health service in the West – health economists have developed the concept of 'quality-adjusted life years' (QALYs). Analysts consider how many of these QALYs would be saved were a given amount of money spent in a particular way.

Like many policy-oriented metrics developed by economists (GDP, for example), the concept of QALYs is not without its critics. But, again like GDP, it is a useful and practical tool. We need a way to determine whether it is worth spending the money available on a particular course of action, and the only way to do that is with a metric to measure benefits against costs.

Armed with the concept of QALYs, it is easy to see why estimates of the benefits of lockdown do not yield huge numbers. Many of those who have died from Covid-19 are very old — the average age of a coronavirus victim in the UK is over 80. Around 95 per cent of people who have died of Covid had an underlying health condition, so in many cases the quality of their remaining life was not high.

In contrast, the costs of lockdown are massive and impact everyone in the country. Just for starters, the UK Chancellor, Rishi Sunak, presented in November a plausible estimate of a loss of output in 2020 of over £200 billion — nearly £3,000 per man, woman and child in the UK. That is to say nothing of the economic impact of missed education, long-term unemployment, and negative mental health effects caused by lockdown policies.

The government resolutely refuses to crunch the numbers. But economists and medics working together have done it for them using the same approach that the NHS already relies on. The results are all in strong agreement. The costs of lockdowns considerably outweigh the benefits.

At the end of June, David Miles, a former member of the Monetary Policy Committee, produced a very detailed report showing that even if the first lockdown had saved 500,000 lives — the estimate of Professor Ferguson at Imperial and a figure Miles regarded as absurd — the costs of it were even greater than the value of the lives saved (Miles et al. 2020).

Miles summarised the work as follows:

There is a need to normalise how we view COVID because its costs and risks are comparable to other health problems (such as cancer, heart problems, diabetes) where governments have made resource decisions for decades. The lockdown is a public health policy and we have valued its impact using the tools that guide health care decisions in the UK public health system. The evidence suggests that the costs of continuing severe restrictions in the UK are large relative to likely benefits so that a substantial easing in general restrictions in favour of more targeted measures is warranted.

In September 2020 SAGE recommended to the UK government a two-week ‘circuit breaker’ lockdown. Rather surprisingly, they commissioned a former chief economist at the Department of Health, Barry McCormick, to carry out a cost-benefit analysis of the policy proposal.

Writing in the *Times* on 26 October 2020, McCormick showed that the lockdown policy failed to pass the standard public sector cost-benefit test. For example, the value of lives saved would have been £2.1 billion, and a major cost would have been a loss of national output of £7.3 billion.

Bob Rowthorn and Jan Maciejowski of Cambridge University analysed the first UK lockdown (Rowthorn and Maciejowski 2020). They concluded that a 10-week lockdown could only be justified if a value of £10 million were placed on the life of each victim of Covid-19.

Public choice economics

Throughout the crisis, the performance of many public institutions has arguably been poor. The spotlight has shone on bodies which had hitherto sheltered in seemingly virtuous nooks and crannies.

The most notorious is of course Public Health England (PHE). An anonymous government minister was attributed as saying early in the crisis, ‘We didn’t really know what PHE actually did, except from time to time they would put their head over the parapet and try and ban something like Coco Pops’.

In early spring 2020, NHS workers turned up to be tested at a huge PHE complex in South East London. The staff were all there, with no-one to test. But the health workers were turned away. They did not have a letter of appointment.

The Centre for Evidence Based Medicine at Oxford exposed the fact in the summer that, as far as PHE was concerned, nobody could ever recover from Covid-19. Once a person had been registered as having the virus, even if he or she were subsequently killed in, say, a car accident, PHE logged it as a Covid death.

In early autumn 2020, almost 16,000 cases went unreported because PHE was using a very old and outdated version of Excel. The maximum file size was breached. The error caused delays in tracking the contacts of people who tested positive.

An example outside the health sector is Ofqual. The Office of Qualifications and Examinations Regulation regulates qualifications, examinations and assessments in England.

In August each year, the results are announced of A-levels, the exams students take which decide the universities they are able to get into. This year, because of the pandemic, the exams were suspended.

University admission in England operates in two stages. The teachers predict a pupil's grades, and universities make offers conditional on these being obtained in the subsequent A-level exams.

The simplest way from the outset would have been to accept, as a unique one-off event, the predicted grades of teachers. That is all that the quango need have done. The problem of who to admit would have been devolved to the universities, who are the bodies with the ultimate incentive to admit students who can cope with their courses and not drop out.

It was, in the end, what happened. But not before Ofqual had tried to predict the grades themselves with an algorithm which became the target of ridicule, so prevalent were its apparent errors.

Staying with education, the teachers' unions made every conceivable effort to keep the schools closed throughout the summer. A huge list of demands was made, such as the need for extra staff, and I am not making this up, to wipe painting brushes clean which young children used in some of their lessons.

In the sections of the media which are widely read by teachers, they are now routinely presented as being 'weary', 'exhausted' and 'heroic'. Many teachers are dedicated and committed. Equally, however, there is a significant minority who have not acted as selfless professionals. Their preferences have been revealed to be to draw full pay and do no work, regardless of the consequences for children. Indeed, inequalities in educational attainment are thought to have widened markedly during the crisis.

Too often in public discourse, a contrast is made between self-interested companies and bureaucrats and regulators working in a seemingly selfless way for the public interest. Indeed, some of the bodies pilloried above were set up with the explicit aim of taking politics out of decision making in the relevant areas.

There is a long history of work in economics around the concept of what has come to be known as 'public choice' theory. The American economist James Buchanan perhaps did more than anyone to establish it as a standard and wide-ranging tool of economics, and he was awarded the Nobel Prize for this in 1986.

In essence, Buchanan believed that bureaucrats and politicians behave in the same self-interested way as everyone else. This does not mean that other motives are absent, but that rational self-interest is an important driver of behaviour. The Covid-19 crisis is replete with empirical examples of this theory.

Individual and collective rationality

The sections above illustrate the value of some of the most fundamental concepts and tools in economics. All economists will be familiar with them as part of their training and education. They have been part of the textbook for many years.

In this next section, I discuss a concept which is more at the frontiers of knowledge within economics. It is still an area in which new knowledge remains to be discovered. But it has played a crucial role during the Covid-19 crisis.

The fact that only a small percentage of people who ought to have self-isolated have in fact done so has been mentioned several times already. This illustrates a concept which is of great practical importance. Namely the conflict between individual and collective rationality.

For the individual, self-isolating for 14 days is certainly a nuisance. As already noted, there may be much more direct costs such as a loss of earnings. The costs of self-isolation are both tangible and borne by the individual.

The benefits are experienced more collectively. Certainly, if a person actually has the virus, there is a serious risk that others will become infected. As we have seen, there are examples of this. But if someone is contacted and told to self-isolate, the collective benefits the person generates, particularly if he or she exhibits no symptoms, are less obvious.

It is in the collective interest for those with the virus or who have been in contact with infected people to isolate. It may be in their individual interest not to do so.

The core model of economics neatly sidesteps this potential problem. Essentially, it sets up an idealised situation in which there is no conflict between individual and collective rationality. The task is then to discover what assumptions about behaviour are needed to be compatible with such an outcome.

It is a very challenging question and some of the early Nobel Prizes in economics were awarded for work in this area, known in the jargon as general equilibrium theory.⁶ Economists have certainly been aware of the potential conflict between individual and collective rationality for many years. Scientific papers in the area of what we might call 'high theory' have addressed the problem.⁷

The subject was given a new and more practical impetus in the work of Nobel Laureate Elinor Ostrom. Her 2009 Nobel lecture was entitled 'Beyond Markets and States: Polycentric Governance of Complex Economic Systems' (Ostrom 2009).

Her doctoral dissertation was on how farmers and others in Southern California solved the problem of water management in their local area. For individuals in favourable locations, it was rational to grab as much water as they could. But collectively, this was a bad outcome. Others would be short of water.

The key feature of Ostrom's work was to show that individuals were capable by their own actions of avoiding conflicts of individual and collective rationality. It was not necessary to have a heavy-handed regulator trying to impose a solution from above.

Like the Nobel Laureates before her, she basically worked out the assumptions which were needed for this to happen. An essential element is that those involved must have some feeling of being part of a group. Further, disruptive and self-serving behaviour should be speedily identified and punished, in ways which are seen to be fair within the group. People also need to feel a sense of ownership of any restrictions which are asked of them.

When Boris Johnson announced lockdown on 23 March, in effect the nation was the group. For a period, most people behaved with proper regard to others.

The subsequent maze of complex and seemingly contradictory diktats issued by health bureaucrats and politicians since then has arguably eroded trust. Some of the pronouncements have bordered on the farcical. The competition for the most ridiculous is steep. But the winner may well be Nicola Steedman, Scotland's deputy chief medical officer.

Towards the end of September, students at universities in the Glasgow region were effectively being held under house arrest in their halls of residence. According to Steedman, it was for their own good. The students were, according to her, at serious risk of dying from coronavirus.

We turn to the data to see how many people under 30 had died from Covid-19 in Scotland since the pandemic began through to the end of September. The number is in fact zero.⁸ Yet a senior health professional saw fit to warn students, almost all of whom were around the age of 20, that they were at risk of death.

There are many such examples, each of which fostered scepticism. Scepticism in turn brings reluctance to follow advice even when it is good. Ostrom-type solutions to the potential conflict of individual and collective rationality have been undermined by the very people who purport to be working in the interests of the public.

⁶ In particular to Kenneth Arrow in 1972 and Gerard Debreu in 1983. John von Neumann, one of the greatest pioneers in this area, died before the prize was instituted.

⁷ A well-known example, within economics at least, is Arrow's 'impossibility theorem' (Arrow 1950).

⁸ 'Coronavirus in Scotland: Virus could be deadly even for you, students told', The Times, 26 September 2020 (<https://www.thetimes.co.uk/edition/scotland/coronavirus-in-scotland-virus-could-be-deadly-even-for-you-students-told-w0xlvk85d>).

The limits to knowledge

The most challenging aspect of the Covid-19 crisis for economics is rooted in the very nature of the problem itself. The complexity and uncertainties of the environment in which the virus either spreads or is contained raise questions around the concept of optimal decision making, a fundamental part of economic theory.

The issue does not relate to the fact that much of the available information has been incomplete or otherwise imperfect. Economic theory can readily handle this concept within the framework of optimality.

Indeed, the health service itself illustrates how certain decisions, at least, improved as more information emerged, as it became less imperfect.

A key question for policy makers is not really how many people might get Covid-19. It is how many might die as a result. In the jargon, this is the case fatality rate (CFR), the probability of dying from the disease if you catch it.

In August, the Oxford Centre for Evidence Based Medicine showed that in the UK the CFR had fallen from 6 per cent to 1.5 per cent. In part this was of course due to the point discussed immediately above. The majority of infections had shifted to being amongst in the young, who are at essentially no risk themselves.

But the Oxford group showed that something even more important had gone on. The researchers analysed data from Germany, which is more detailed and specific in terms of ages than in the UK.

The results are striking. In the 60 to 79 age group, in the March/April period the CFR was 9 per cent. By July/August this had fallen to just 2 per cent. In the very vulnerable group of the over 80s, in March/April the CFR was a frightening 29 per cent. By July/August this was down to 11 per cent.

This suggests that fatality rates amongst those who actually had the virus fell sharply. Treatment improved as more information became available.

We can readily assume that the doctors treating Covid patients wanted to optimise the outcome and save as many lives as possible. At the start of the outbreak, mistakes were made because of imperfect information. As better information became available, survival rates increased.

The challenge to economics from the Covid-19 crisis is therefore not that of incomplete information. We can perhaps see it by asking a simple question. In March 2020, what was the optimal strategy, not just for the UK but for any Western government in the face of Covid-19?

There is a follow-on. Vaccines now give real hope that the virus can be contained. But if a new pandemic were to appear in future, what would the optimal strategy be?

'Optimal' means the best possible. It is not just a matter of the best possible strategy for containing the virus. Governments are judged on many aspects of their performance, sometimes wisely and other times not so. A large number of variables feed into this.

One of course is indeed the number of cases and deaths. Another is the impact on mental health, on family relationships, on child abuse and so on of lockdown policies. Yet another is the impact of any virus-related policy which is adopted on other aspects of physical health, on cancer patients, on delayed hip operations, on a lack of dentist services. And we always have looming the question of the impact on the economy, on living standards, on jobs.

Is it a good thing or not that the decline of traditional retail is accelerated as people switch to buying online? Will innovation be speeded up during a pandemic in a phase of Schumpeterian creative destruction as old firms fail and new ones emerge, or will a lack of cash deter companies from research and development?

Governments have the unenviable task of trying to deal with all of these, and even more, issues which arise from decisions they take to tackle a pandemic. They are operating in a situation which has many dimensions. How meaningful is it to imagine that they can in some sense 'optimise' in such circumstances, as standard economic theory would have them do?

A useful analogy is with the game of chess. In many ways, it is simple. There is a small number of unequivocal rules and these rules do not change over any relevant time scale. The object of the game is straightforward, namely to capture the opponent's King. Both players have complete information on the board throughout the game.

Of course, chess players carry out calculations and try to work out sequences of moves. We can think of this as the equivalent to government advisors trying to predict the future, whether it is the number of Covid-19 cases, the growth of the economy or whatever.

Strong players will do it better than weak ones. And models which are fit for purpose will do better in prediction than those which have not been properly validated.⁹ But in most positions in chess, the optimal, the best possible move is not known. This is the case even when modern computer programmes, far stronger than the human world champion, play the game.

Computers have in fact completely solved all possible positions involving only seven pieces. Even these in many cases involve lengthy sequences of several hundred moves,¹⁰ far beyond the ability of even the best human player to navigate successfully. But there are 32 pieces in chess. And the addition of each one beyond seven leads to a super-exponential rise in the number of possible permutations of moves.

In practice, most of the time, rather than attempt a futile search for the best possible move, chess grandmasters use their skill and experience to make what they consider to be a reasonable one. They make moves which seem good and which avoid obvious loss.

Herbert Simon believed that in general people took decisions in the same way, not just in a game but in real life. Simon was an outstandingly brilliant polymath. He received the Nobel Prize in economics, its computer science equivalent, the Turing Award, and the American Psychology Association conferred its highest honour on him.

His article, 'A Behavioral Model of Rational Choice' (Simon 1955), is now one of the most highly cited economics papers of all time – and the number of times other people cite a paper is the key indicator of scientific success and influence. In the opening section, he wrote (*ibid.*: 99):

The task is to replace the global rationality of economic man with a kind of rationality that is compatible with the access to information and the computational capacities that are actually possessed by organisms, including man, in the kinds of environment in which such organisms exist.

Translating this into more everyday English, Simon argued that, as in chess, in most real-life situations it is not possible to know the best possible course of action. It is not a question of gathering more information or being cleverer in how we think about an issue. The complexity of the problem of trying to decide the best possible decision is too great for this to be feasible.

Simon did not reject economics. Agents, whether people, firms or governments, act with purpose and intent try to achieve good outcomes. But in most contexts, they use what he called 'heuristics', a jargon way of saying 'rules of thumb'.

When making decisions, agents experiment with different (simple) rules to guide their decisions until they find what seems to be a good one. They then use it until it stops giving good results.

F. A. Hayek held a position similar to that of Simon. He stressed throughout his work that there are inherent limits to knowledge which no amount of intellect or information can overcome. His 1974 Nobel lecture, for example, is titled 'The Pretence of Knowledge' (Hayek 1974).

In essence, the work of both Simon and Hayek stresses the need to recognise the highly tentative, uncertain and experimental nature of successful policymaking. It is an evolutionary process rather than one which can be optimised.

Good policy proceeds by trial and error, with failures abandoned quickly. Any system which is based upon central planning is unlikely to be able to work well along these lines.

⁹ Most of the epidemiological models used for prediction in the crisis did not allow for behavioural change as the pandemic unfolded. In this most basic sense, they were not fit for purpose.

¹⁰ Very few human games, starting with 32 pieces, go beyond 100 moves.

Some of the failures of Public Health England, for example, have already been noted above. Its very ability to collect accurate data on, say, the number of new cases has been brought into question. The app-based system developed by researchers at King's College, London,¹¹ for example, has consistently been able to present much more rapid and accurate information.

Throughout, the government has been reluctant to devolve resources and decisions to a local level. Certainly, some local authorities embody the central planning mentality even more than Whitehall. But local information about outbreaks is readily available and could be acted on much faster in a devolved system.

Further, different authorities would initially have tried different approaches. We would have had a natural experiment, as it were, into what sorts of things really worked. Successful tactics could then have been copied more widely.

Conclusion

The analysis of health and health-related issues is a standard part of academic economics. Like any scientific discipline, economics has a classification system to indicate where an article fits in the overall scheme of the subject. 'Health' has its own section, covering issues such as markets for health care, health behaviour, health and inequality, government policy, regulation and public health.

Economics is also used routinely in many areas of health policy. In particular, as noted above, it is used by official bodies (such as the National Institute for Health and Care Excellence in England) to help them decide how to allocate resources amongst competing health demands.

A notable feature of the Covid-19 crisis is that the insights of economics have been largely ignored by policy makers. Instead, they have relied on epidemiologists and health bureaucrats. If the only tool you have in your kit box is a hammer, everything looks like a nail. And the only tool which this group seems to have come up with is lockdown, a rather extreme form of regulation.

Lockdowns have their place in the set of appropriate policy responses to a new pandemic. In March, it would have required great courage by a politician in a democratic country to have resisted the pressure for lockdown. Indeed, Sweden was the only country to do so.

But economics offers a much richer picture of human behaviour than is implicit in the one-size-fits-all approach of lockdown. Time and again, the epidemiologists and bureaucrats have been confounded by how people have responded to the incentives placed before them.

This is certainly not to say that greater involvement of economics in Covid-19 policy would have solved all problems. But I have tried to show in this paper that the discipline of economics has much to contribute to a better understanding of both the framing of policy during a pandemic and the analysis of its consequences.

¹¹ See the Covid Symptom Study app developed by health science company ZOE (<https://covid.joinzoe.com/>) and in particular the post of 4 December 2020 (<https://covid.joinzoe.com/post/covid-power-of-citizen-science>).

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