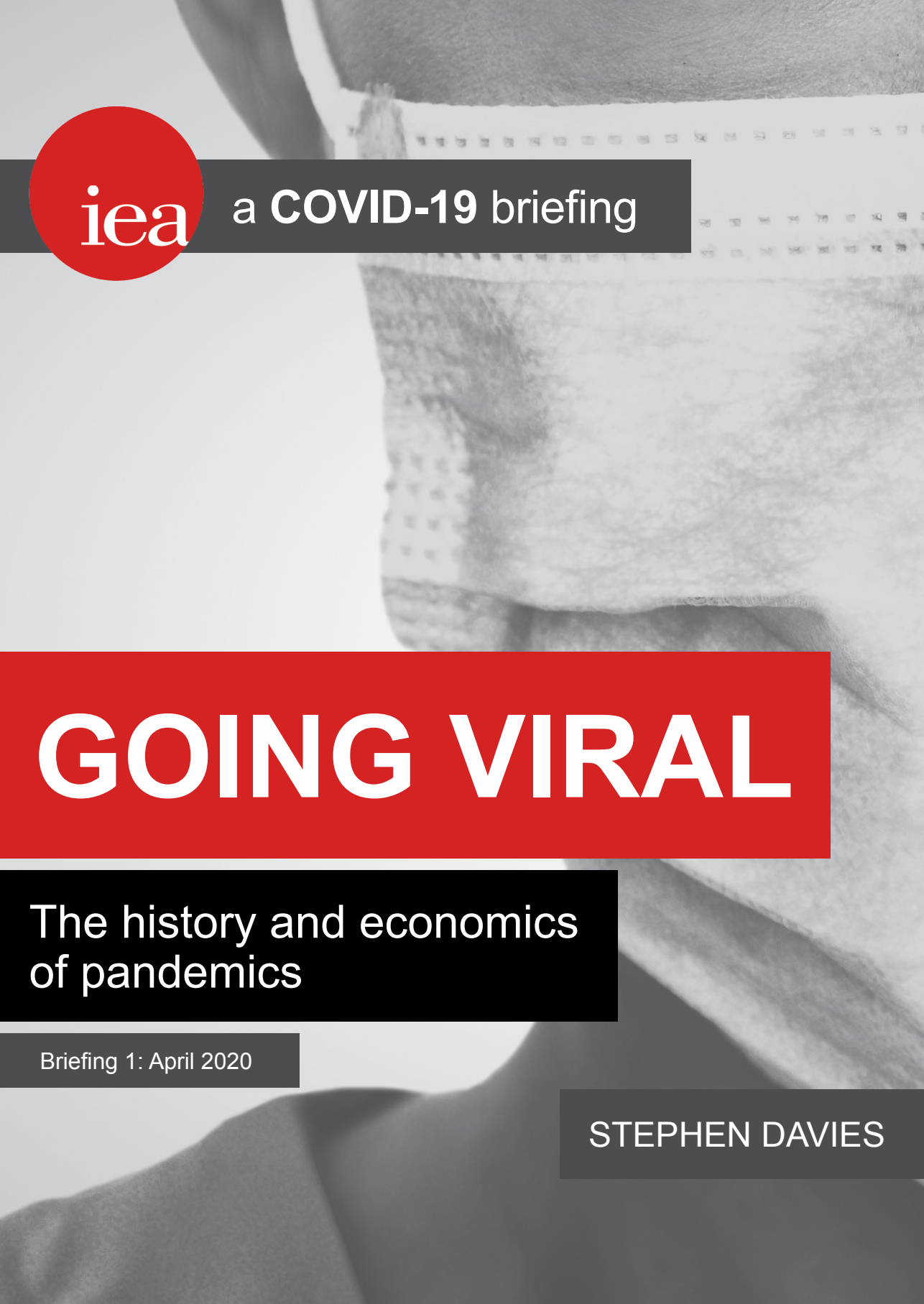

iea a COVID-19 briefing

GOING VIRAL

The history and economics of pandemics

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Summary

- Pandemics (a term with a precise and technical definition) are a recurring feature of human history.
- In the modern world, since the 1770s, we have had a series of pandemics, with a series of cholera ones in the nineteenth and early twentieth centuries, and a series of five influenza ones since 1890. Further back there have been truly massive pandemics that killed a significant part of the world's population. Even the milder modern ones have had significant effects.
- The Covid-19 virus has several features that mean it poses a more severe challenge than influenza pandemics such as those of 1957-8 or 1968-9 (although a repeat of one of them would be bad).
- In particular it threatens to cause a collapse of hospital systems through a high number of serious cases arising in a short period of time. It is this, rather than lethality, that has driven most of the response.
- Historical comparisons tell us a number of things about pandemics, which are also true in this case: they break out after prolonged periods of increasing economic integration; the initial foci are highly connected cities that are centres of trade and/or governance; the pattern is usually one of a series of waves, with the second one historically the most damaging; and they break out in physical or social locations where the human world abuts the natural (because of new pathogens developing in animals and then jumping to humans).
- Certain features of many contemporary societies mean that a pandemic is more likely now and will have wider and more damaging results, if not contained, than was the case 50-60 years ago: the degree of international integration and the scale and rapidity of travel makes it easier for the disease to spread and harder to track it (while also

creating more resources to deal with it); movements towards things such as just-in-time delivery and long supply chains have made the world economy more efficient but more fragile; a systematic change in the way health systems are run in most countries, combined with a movement of married women into the labour force, and a change in the way old people are cared for, have made the impact of an infectious disease much greater.

- The effects of pandemics are known from history and can be seen in outline in this case: a severe hit to the supply side of the economy (*not* the demand side initially) which will probably lead to a severe and U-shaped recession; innovations and changes in things such as consumption and working patterns that were already underway will be accelerated; a major debt crisis (which was in line to happen anyway, sooner or later) has been triggered along with a fall in the value of many assets; there may be higher inflation in a year to two years' time; there will be a significant pull-back from globalisation and supranational governance will come under serious strain; there will be extensive but complex social and psychological effects.
- The small comfort is that things could have been much worse. We should be aware that, on historical precedent, the pandemic will last for about 18 months (so to summer 2021); that there will be another pandemic at some point and for structural reasons this is more likely than was the case a number of decades ago. There are several steps that could be taken to mitigate future risks.

Introduction

Faced with the massive disruption that the Coronavirus has brought to economies and everyday life around the world, it is easy to think we are dealing with an unprecedented situation. In fact, pandemics are a recurring feature of the human experience and have happened many times in human history.

The Covid-19 pandemic is more severe in its effects than many recent ones but is moderate compared to the really major plagues that have sometimes afflicted civilisation. Looking at the history of previous pandemics can give us an idea of the likely impact of the current one - if we combine that historical perspective with contemporary medical, economic and political knowledge and understanding. It will also help us to understand why a pandemic with such a devastating impact happened now, and why its spread has taken the form and pattern that it has.

One point we should realise from study of both history and medical science is that this could easily have been much worse. It may seem hard to believe, but we have got off lightly compared with what might have befallen us. Moreover, there are features of our way of life and some of our economic systems that make outbreaks of this kind more likely, meaning that there will be other such outbreaks in the not-so-distant future, unless steps are taken to reduce the risk. The pandemic we are living through was warned of and foreseen by many people over the last two decades, even if not in the precise form it has taken, and we should learn from the fact that this risk was so clear and obvious and respond accordingly.

Definitions

What is a pandemic? Simply, it is a massive and geographically widespread outbreak of an epidemic infectious disease. An epidemic is, by definition, an outbreak of an infectious disease where each case initially gives rise to at least two new ones. This leads to exponential growth in the initial phase, because it means that the number of cases doubles in a given time (the length of that time depends on a number of factors such as the density of human population, the ease and speed of travel, and the actual infectiousness of the disease).

Exponential growth is something that the human mind finds hard to grasp (unlike linear or arithmetic growth). The point to realise is that in a process of exponential growth of that kind (where each case gives rise to two more, so that the number doubles at each step), half of the final total appears in the last step and three quarters in the last two, so with two steps left to go you are still only at a quarter of the total you will finally have. Clearly, in any epidemic this process does not continue indefinitely: after some time, the rate of increase (the steepness of the curve) declines and eventually it flattens out. This can be for natural reasons or because of measures taken to check the spread.

A pandemic is an outbreak of an epidemic that spreads to a large part of the planet's surface and population. Strictly speaking it should be truly global to qualify as a pandemic, but the term is also used for any epidemic that spreads to an area and population that is significantly larger than its initial point of origin and includes a significant part of the global population. Defining an outbreak as a pandemic is not about the medical severity of the illness – in fact most viral pandemics are actually quite mild for medical reasons (see below). It is the geographical extent that makes it one. In a pandemic you have an outbreak that is sufficiently widespread geographically, is produced by the same pathogen (disease causing organism or agent)

and has the same symptoms wherever it occurs, and which spreads in a continuous process within a limited time.

Pandemics – the historical record

Pandemics in this sense are a recurring feature of history. In the nineteenth century for example there were six cholera pandemics, affecting most parts of the settled world, which killed tens of millions of people on each occasion. Since the 1890s there have been many pandemics. In some cases (such as HIV/AIDS) there was an initial epidemic phase, after which the disease became an endemic one (it occurred regularly but without showing exponential growth). For purposes of comparison with Coronavirus it makes sense to look at the following sequence:

- 1889-1890 Russian Flu (1 million)
- 1894-1922 Third Plague Pandemic (10 million in India alone).
- 1918-1919 Spanish Flu (50 million) (fatality rate 0.5% to 13%)
- 1957-1958 Asian Flu (2–5 million)
- 1968-1969 Hong Kong Flu (1-4 million)
- 2009-2010 Swine Flu (0.5 million)

The figures given are global deaths unless otherwise indicated (Kilbourne 2006; Potter 2001). The most serious potentially was the Plague Pandemic but, fortunately for the rest of the world, this did not spread beyond Asia. The various flu pandemics varied significantly in severity, with Spanish Flu (which actually started in Kansas) the most severe and Swine Flu easily the mildest.

All of the flu pandemics had significant economic impacts, apart from the last one, and are estimated to have reduced global product by somewhere

between 1 and 2 per cent. (It is easy to forget right now just how serious a novel flu pandemic of the kind experienced in 1957–58 or 1968–69 would be). All of these were serious health emergencies when they happened and there are sound reasons for thinking that many of the world's health and economic systems have become less resilient over time, so that a pandemic similar to those of the 1950s or 1960s would have a bigger impact now than it did then.

However, these modern pandemics pale in comparison to the 'big three', which happened in the more distant past. The earliest was the so-called Antonine Plague, which raged through the Roman world and the Middle East between 165 and 180 AD, killing up to a third of the population in many areas and with an overall mortality rate of 25 per cent by most estimates - one of its probable victims was the co-Emperor at the time Lucius Verus (McNeill 1976). This plague almost certainly swept through the Chinese Han Empire at the same time and played a part in the collapse of that dynasty not long afterwards. We are not sure what illness this was, but it is thought to have been either smallpox or measles.

The second was the Plague of Justinian in 541–542 AD, followed by recurrent local outbreaks over the next two centuries, almost certainly bubonic plague. This originated in the East African savannah and was taken from the trade ports of the Swahili Coast via the Red Sea to Alexandria and Pelusium, whence it then spread to Constantinople in 542 and from there all around the Mediterranean. It seems to have killed up to 50 per cent of the population in the worst affected areas and depopulated most of the urban centres around the Mediterranean (Little 2006; Mordechai and Eisenberg 2019).

The worst pandemic in history to date was the third, the outbreak of bubonic plague usually known as the Black Death. This seems to have originated in Northern Burma and spread from there into China. Its first major outbreak was in Hubei province in 1323, after which it spread via the Silk Road trade routes right across Eurasia, reaching Europe and the Middle East in 1347 and then spreading until it reached Northern Europe and Morocco by 1350. It also spread via maritime routes into India and South-East Asia. The Black Death killed between 35 and 45 per cent of the population and reduced the population of Eurasia by at least 25 per cent in a matter of thirty to forty years (Benedictow 2018; Horrox 1994; Cantor 2001). These three disasters should put our current travails into perspective.

The challenge of Covid-19

Comparing the Coronavirus pandemic with these earlier ones, both the modern ones and the 'big three', helps us to understand both the form it has taken and why it has proved so much more challenging than the earlier flu pandemics (apart from the massive one of 1918-19). A key point in understanding pandemics or epidemics in general is that normally, at least for viral infections, infectiousness and severity are inversely correlated: the more infectious a viral illness is the less deadly it is, and the more deadly it is the less likely it is to cause a serious epidemic. You can sometimes have a viral pandemic that is both lethal and highly infectious (as in the second century), but this is very rare.

The reason for this is simple. If a pathogen makes you so ill that you are likely to die quickly or be unable to move then you will not have much opportunity to infect other people and so the illness will not spread so much. Conversely, if it causes mild symptoms that do not make you ill enough to interrupt your regular life, you will infect a lot of people. This is the ideal situation for a virus and so there is a natural selection pressure for viruses to evolve into milder forms. Bacterial infection is more often both severe and infectious, typically because the bacterium exists in a 'reservoir' such as polluted water (in the case of cholera) or infected animals such as rats (in the case of bubonic plague), from which it can re-infect humans even if they are dying too fast to infect many people themselves.

This inverse correlation is why SARS, produced by a virus related to Covid-19, was not as serious a health problem. Its high levels of lethality and serious symptoms meant that it was easy to identify and trace and did not spread rapidly enough to get a true pandemic going. Unfortunately, the Covid-19 virus has a truly bad combination of qualities. It is highly infectious (quite how much we still do not know, although early estimates give it an initial infection rate or R0 of 2.54, which is high) and so it spreads

rapidly if not checked. This means a large number of cases in a short time (a steep curve of infection) unless measures are taken to arrest or delay it. The evidence is that up to 80 per cent of all cases (probably less but again we are not yet certain) are asymptomatic – that is you can have the infection without showing symptoms at any time. It also has a relatively long incubation period in which people are infectious without showing symptoms. These things together mean that unless you can catch an outbreak right at the start it is very difficult to track and trace the passage of the virus through the population.

If that was all then we would be looking at a situation similar to Swine Flu, of a highly infectious but mild pandemic. Unfortunately, Covid-19 causes severe symptoms in at least 20 per cent of patients, with those symptoms being more severe than typical flu, and in about 5 per cent of all cases it causes severe respiratory problems that require significant medical intervention, such as hospitalisation. It causes death in somewhere between 0.3 and 1.0 per cent of all cases (again so far as we know at present). These are essentially moving targets as figures are constantly being adjusted in the light of fresh information.[1] This makes it anything from three to ten times more lethal than typical flu and puts it on a par with the Spanish Flu of 1918-19. It is also a novel virus that has only recently made the jump from an animal species (probably bats, via pangolins) to humans and has not caused any outbreaks before. This means that there is very little natural immunity in any population and the challenge of producing an effective vaccine, already steep, is even more difficult. This is probably the worst possible combination of characteristics for a pathogen in the present-day world.

The problem simply is this. The high levels of infectiousness and ease of transmission mean that the virus can spread very rapidly both within a population and geographically around the world. It is very hard to trace and control through checking and isolating all of the contacts of the initial few cases unless it is caught at a *very* early stage. Once established, the rapidity of spread, combined with the severity of symptoms in a significant minority of cases, means a large number of cases in a short time that require hospitalisation. The hospital system in an area with initial high penetration may be overwhelmed by sheer numbers. This will lead to forced triage and to many other patients dying from ‘normal’ conditions such as strokes and heart attacks who would otherwise have lived. We

1 See Worldometer for details: https://www.worldometers.info/coronavirus/

have seen this playing out in Lombardy. It is the pressure this combination of features puts on health services, rather than lethality per se (tragic as deaths are) that is the real challenge.

The only solution is to reduce the rate of infection spread so that each new case gives rise to at most one further new one, preferably less than one. This then raises the question of how to do it: should you go for severe quarantine measures (lockdowns) or should you go for milder measures, restricting some interaction but not going for full quarantine? The second course of action is in the short run less economically damaging (although one should not underestimate the impact of even mild social distancing measures if they are maintained for a long time, as they would have to be). It has the advantage of allowing the virus to spread through the population, which means that it takes less time to reach 'herd immunity' when enough of the population has had the infection, and so (we assume) becomes immune, for the chance of exponential spread to become impossible (most estimates are that this will require at least 60 per cent of the population to be infected, given what we know of the infectiousness of Covid-19).

The first course is economically very damaging, but it will get the spread under control more rapidly. Most governments in most countries have gone for this course because the calculation is that, given the qualities of the virus, the risk of having a collapse of the health system in at least some parts of the country is simply too great. The problem for the longer term however is that this may store up problems for later, when the controls are relaxed, because the majority of the population will not be immune and the spread will resume and accelerate again.

Comparisons and patterns

Looking at the history helps us to understand better how and why the pandemic has taken the form it has and why the combination of qualities described is so damaging in today's world. The spread of a pandemic and the damage that it causes arise from a combination of two sets of factors. The first is the medical features of the disease and the level and capacity of the medical knowledge and health system of the time. The second is the social and economic structure of the world at the time the pandemic happens, or of the parts of the world that it affects.

One way of thinking about a pandemic is that it is an epidemic that is able to spread to the whole of an ecumene, a part of the planet that is economically integrated and has a complete division of labour. Today, and since at least the eighteenth century, that means almost the entire planet. If we look at the history, several things become apparent. Major pandemics with significant effects happen after a prolonged period of increased economic integration over a large part of the planet's surface, brought about by trade, exchange and the increased movement of goods, people and capital over longer distances. This is because these processes make the spread of an illness easier, because of more people (and other things like rats) moving and travelling for longer distances, and because they also lead to more urbanisation, which also makes the spread of disease easier because of increased density of population. Pandemics spread along major trade routes and routes of travel of all kinds (this therefore includes things like tourism, business travel and pilgrimages). We can see this clearly in all of the cases mentioned earlier, including the cholera pandemics.

In the first phase of a pandemic the outbreaks are focused on connected cities that are major trade hubs or centres of government. (That is not to say that all such cities are affected – some of them will be). Thus, in the Black Death it was cities such as Florence, Cairo and Paris that were

major centres in the initial outbreak in Western Eurasia. In the current one, highly connected cities such as New York, London, Paris, Madrid and Milan have all been significant centres. Historically, one response to this, particularly by the wealthy, has been to flee the cities for the countryside. This works in the short term but in the long run it makes things worse.

That is because of another feature of major epidemics and pandemics. They typically come not in a single surge but in a series of waves and troughs (Kilbourne 2006; McNeill 1976). Usually it is the second wave that is the biggest and the one that does the most damage. The second wave is usually more geographically dispersed and evenly spread than the first one, because the pathogen has been able to spread more widely and because of the flight response mentioned earlier. Most viral pandemics last for about two years (hence the dates on the list given earlier). Bacterial ones last longer, for about a decade, with subsequent outbreaks over a long period.

This suggests that the Coronavirus pandemic is going to be with us for about 18 to 24 months – it will not be over by Christmas, much less the summer. Whether we have a large second wave depends partly on features of the virus that we do not yet know - in particular, if it has seasonal variation in the way that flu does. If it does, we can expect it to decline in the summer before returning in force in the autumn. If it does not, we will escape that but have a sustained higher level of infection with a number (anything from three to six) of less prominent surges. The other thing that determines how severe any subsequent waves will be is the continued levels of measures to check the spread and the proportion of the population who have been infected and have acquired immunity. Both of these are of course unknown at present.

Finally, major pandemics appear in areas, geographical or social, where the human world butts up against the natural. This is because novel pathogens (which is what you need to have widespread diffusion and, sometimes, high mortality) typically arise from one jumping from animals to humans (Quammen 2012). We can see this both historically and more recently. Justinian's Plague originated - according to the strongest theory - in the rodent population of the African savannah, while the Black Death began among wildlife in either Northern Burma or Central Asia, before making the jump to rats and then humans. The Spanish Flu is now known to have started on a pig farm in Kansas and other recent outbreaks of infectious illness that did not end up as full blown pandemics, such as

SARS and Ebola, involved transmission from either domestic animals such as pigs and chickens or wild animals in habitats under pressure. This kind of scenario is particularly widespread today because of the way agriculture has developed in the last forty years.

The current pandemic – spread and impact

This helps us to understand what has happened with the spread this time. The pandemic began in China with transmission from bats to humans via pangolins, probably through 'wet markets' in exotic meats. The Chinese state did not realise quickly what was going on in Wuhan and then, when it did become obvious that a major outbreak was happening, initially sought to suppress information about it. When they were no longer able to do this, they withheld key information for some time and did not impose travel restrictions on movement in and out of China until the virus had escaped – a dereliction made more consequential because it happened at the time of Chinese New Year.

Following this the virus spread very rapidly along major international travel routes, in the same way that the Spanish Flu of 1918-19 did, but more rapidly with the spread taking days rather than months. This then produced clustered and concentrated outbreaks in highly connected city regions such as Milan and New York. The countries in East Asia such as Taiwan and South Korea actually benefitted from being geographically close to the original outbreak, because this meant that they got cases at a very early stage of the spread, before the virus had had the opportunity to start spreading back and forth via travel. They benefitted from this because they responded both immediately and early, and effectively, identifying initial cases and successfully tracking and isolating all of their contacts. This combination of luck and competence, and in particular the widespread use of testing and tracing, meant they have escaped lightly from this initial wave of the pandemic.

The Chinese government adopted a modern and milder version of the strategy employed by the Visconti in fourteenth century Milan, by rigidly

locking down Hubei province. (The Visconti nailed people into their houses and left them there until the epidemic had passed – this was ruthless but effective (see Horrox 1994)). By contrast governments in other parts of the world did not realise what was happening or respond soon enough to be able to check the spread at the early stage, not least because they were unable to test on a sufficiently large scale or with enough accuracy, and the result was that by as early as the end of February the virus had escaped from the bottle and the strategy used by East Asian countries was no longer available.

It is this that explains why, faced with a true pandemic in late February (because by that point the virus had spread to every continent and was spreading rapidly in a number of large densely populated areas) governments had to resort to the same kinds of measures employed by medieval authorities such as quarantine (itself an Italian word deriving from the response of authorities there to the Black Death).

Almost certainly the impact was greater this time than it would have been in, for example, the 1960s. To put it another way, a flu pandemic like the one of 1968-69, while less medically severe than the Covid-19 one, would still have had a much bigger effect than it did back then (Begley 2013). There are a number of studies done over the last ten years looking at the likely effects of a flu pandemic that indicate this (Wren-Lewis 2009; Jonung and Roeger 2006). Why though is this? It is because the society and economy of the world have changed in ways that magnify the effects of a major health emergency such as a serious epidemic.

Why the effect is worse now (and would be even for flu)

The first of these is much higher levels of economic integration as measured by various indicators. In particular, most economic activity now rests upon much longer and more elaborate supply chains, with a much higher proportion of final or intermediate goods sourced from a considerable distance and often with multiple distant sources for various parts of the final product. There is also far less inventory and much greater use of just-in-time delivery and logistics for production processes of all kinds (i.e. not only in manufacturing and retail). There is also much greater dependence on a very small number of sources for a wide range of goods, with sometimes a few suppliers overwhelmingly dominant on a global basis (the most striking example of this was condoms, with 20 per cent of world supply coming from a single source in Malaysia[2]).

All of this is more economically efficient, which means greater output and wealth. That in turn means that societies have more resources to deal with shocks such as major epidemics. However, it also means that supply and production systems are much more vulnerable to disruption if hit by an event that is global in scope (such as a pandemic). There is a much higher degree of fragility and a lack of redundancy. Hence the impact of a disruptive event such as a pandemic is far greater.

Secondly, in the UK (and also many other developed countries) there is a far higher proportion of the adult population engaged in paid work outside the home than was the case before 1970. This is primarily due to married

2 'Global condom shortage looms as coronavirus shuts down production', *Guardian*, 27 March 2020 (https://www.theguardian.com/world/2020/mar/27/global-condom-shortage-coronavirus-shuts-down-production).

women with children entering the labour force in large numbers. This matters for responses to epidemics because it magnifies the economic impact of school closures. Wren-Lewis et al. (2009) found that closing schools would more than treble the economic impact of a flu pandemic because of its knock-on effect on economic activity, which it would not have had when large numbers of women were not in the labour force.

This is related to the third reason for a major epidemic now having greater effects, which is particularly relevant for Covid-19 because of its specific medical features. The UK, like all developed societies, now has far more old people, both absolutely and as a proportion of the population, than was the case in the 1960s or 1970s. Moreover, at that time far more old people were cared for at home by relatives, usually younger women. Today there is a much larger number of old people both absolutely and proportionally living in residential care of some kind. This matters because the Covid-19 virus clearly attacks the elderly much more severely at a higher frequency than is the case with younger age groups. (In that regard it is the exact opposite of Spanish Flu, which had a much higher death rate among younger and fitter people). Because there are more elderly people, who are also more spatially concentrated, there is both a higher number of serious cases and a much greater chance of spread because of larger numbers of old people being in close proximity. The staff caring for them are also exposed to a higher risk of infection and (because of not being residential) are more likely to then spread the virus, as are visitors. The way in which wealthy societies have come to care for the elderly exposes them at a higher rate and makes the consequences of that more extensive, than was the case decades ago.

There is also far more travel than fifty or sixty years ago, both within countries and across national borders but particularly long-distance travel deriving from both business and tourism. Again, this has brought great benefits. The problem when it is combined with a pandemic is twofold. Firstly, it means that the infection spreads much more rapidly than was the case fifty years ago. It does not make much difference to the geographical extent of the spread, as looking at Spanish Flu reveals, but it makes a massive difference to the speed. This makes it more difficult for governments to respond in a timely manner and means that they must take more extensive and severe action, because of the rapidly moving target they have to deal with. It means that once you are past the very initial phase of the spread it becomes much more difficult than used to be the case to track and locate cases and transmitters, which again means that unless

you are fortunate and effective enough to catch the process very early, you are driven back to dealing with an established outbreak by quarantine. Secondly, because travel of all kinds over long distances is now so important economically, the economic impact and knock-on effects of travel controls are much greater than would be the case fifty years ago.

The final big difference between today and say 1970 is the one that has forced so many governments to adopt strict quarantine and would make even a flu pandemic much more damaging than the ones we saw in the years before the 1970s. This is a structural lack of resilience and redundancy in modern healthcare systems around the world. This is not a matter of funding as far as developed countries are concerned, whether in the UK or anywhere else. (Less developed countries are another matter). In many countries hospital systems have been found or judged to be at high risk of being unable to cope with the surge in pressure caused by the distinctive features of Covid-19 infection. It is this that has driven so many to adopt the massively disruptive response of strict quarantine (lockdown).

Since the 1970s we have moved from a system with a larger number of beds, spread out geographically widely in a large number of small and medium sized hospitals, to one with far fewer beds that are used much more intensively (more procedures with much less time spent in hospital) and are concentrated in a smaller number of large hospitals. In the UK for example there were 9.3 beds per thousand head of population in 1970 compared with 3.1 in 2010 (Hawe, Yuen and Baillie 2011) (since when there has been further reduction). Again, this is economically more efficient, but it means there is very little redundancy or spare capacity (which is why the system is always under stress every winter). The system again is very fragile and has structural features that mean a pandemic or even a true national health emergency will have massively disruptive effects. Even a small rise in cases being admitted, if it leads to many beds being occupied for some time, will put the whole system under enormous stress. The concentrated nature of the provision means both far more travel and large foci for infection and the spread of the illness.

The effects of pandemics

So, for these reasons the Coronavirus epidemic is likely to have a massive and lasting impact. It is more harmful and disruptive than previous pandemics (as even a serious flu pandemic would now be) because several key systems are now more fragile. The lack of resilience in key systems, above all health services, combined with the way that other developments have made the spread of an epidemic illness more rapid and harder to control, means that governments have been driven to adopt measures that will have massive and lasting effects.

Again, history is the best guide to what these will be. The effects of a pandemic come from two roots. The first is the direct effect of the illness itself, the number of people it kills and the economic impact it has (for example, by killing merchants or disrupting trade and activity). The second is the response of society and rulers to the pandemic, and the effects that those responses have.

In this case, although both effects matter, it is the second that predominates. Right now, there will be many arguments saying that ‘everything will change’ or ‘nothing will be the same’. We should resist apocalyptic claims of this kind as history does not support them, even for extreme cases such as the Black Death. That does not mean though that there will be no effect, with things simply reverting to the way they were before.

A major pandemic such as this does have big effects and does come to mark a watershed or turning point. What it does not do is introduce something truly novel. Rather, it accelerates and magnifies trends and processes that were already under way, making them happen more rapidly and go further than would otherwise have been the case. It also brings a final stop to processes that were already exhausted or had reached a limit but makes that stop more sudden and abrupt than it would otherwise have

been. Finally, pandemics historically have often had significant psychological and cultural effects, but these are often complex and even contradictory.

Impacts: GDP effects

What then are the effects that we can already discern? The most obvious is the massive hit to GDP brought about not by the pandemic itself but the measures taken to control its spread. There is clearly going to be a massive fall in GDP in the two central quarters of this year, of a scale comparable to the Great Depression.

It is important to understand the nature of this slowdown and therefore of the government response to it, here and elsewhere. This is not a demand-led recession of the kind we have become familiar with since 1900. It is a supply-side-led slowdown of a kind that was normal and frequent in the pre-modern world (when such slowdowns were caused by events such as plagues, harvest failures and wars). In this case the government has deliberately shut down much of the supply side of the economy in order to slow down the spread of the virus. Any decline in demand is a secondary effect and consequence of that supply-side contraction, not the primary cause of any slowdown. It follows that using Keynesian language of sustaining demand is inappropriate – in fact you do not want people to be going out and buying things. That is not what the government has done and is trying to do. The aim of government action has been to keep the supply side of the economy in existence during this phase of induced economic shutdown so that it is still there when controls are relaxed. The aim is to preserve the institutions and contractual and human relations that make physical assets productive, by keeping firms, workforces and contractual and supplier relationships in existence.

Will these measures work? Right now we do not know, but it is the success or otherwise of these measures that will determine how long lasting the effects of this sudden economic stop are. If the supply side of the economy is preserved with not too much damage, then recovery will be strong and rapid (although with some permanent changes and shifts – see below).

If there has been lasting and severe damage, then the recovery will be much slower, as the supply side will have to be rebuilt and this will take time. In the first case we will have a V-shaped recession, in the second a U-shaped one.

The other currently unknowable factor is that of how long the controls will stay in place and how they will be relaxed. The rather gloomy prognostication we can make is this. As already noted, the pandemic is most likely to last for 18 months to two years. That means we will have either renewed outbreaks or a sustained higher than usual rate of infection throughout that kind of period. Even if the current very severe measures are relaxed - which they will have to be at some point because it is simply impossible to maintain them for over a year – some will remain in place. These will have a continuing effect on economic activity and the cumulative impact of milder controls is likely to be severe, even if not as bad as that of a near complete shutdown.

One dark possibility is that there will be a restored lockdown at some point in the future due to a resurgence of the virus, after the present one is relaxed. This would be very damaging, both through the disruption it would cause and the impact on consumer and business confidence. A prolonged period of milder social distancing and other controls will have an effect and will certainly depress investment until any uncertainty about possible future outbreaks or controls has been sufficiently alleviated. The most likely prognosis is a sharp decline followed by a more gradual rebound, so the U-shaped recession currently looks the more likely.

Impacts: innovations and accelerated change

At the same time, the creativity and adaptability of a market economy is going to be given full reign. This will both lead to genuine inventions and accelerate changes that were already underway. Governments should not try to stand in the way of these, other than to ease transitional costs.

One very likely result is an intensification of the pre-existing shift away from physical to online shopping. This will have major implications for not only the retail sector but also commercial property, with many rents vanishing. That sector is also likely to be hit by another accelerated trend which is towards home working for a significant part of the labour force. Interestingly the evidence suggests that while this can produce significant gains for employers (not least reduced fixed costs through needing less rented office space), the employees often do not like it and are keen to return to working with others in a workplace. They are likely to be disappointed and this will add to the pressure on commercial property, as firms downsize their office needs. Governments will have to make a difficult choice between trying to keep the supply side going while allowing this process of market-led adaptation to take place.

Impacts: a debt crisis

One thing that the pandemic will almost certainly do over its full course is to trigger a massive debt crisis and a significant revaluation of assets. Historically really big pandemics have led to sharp falls in the value of certain kinds of productive asset, which is why although the wealthy do better medically while the epidemic is raging, they are often badly hit by the longer-term economic consequences (simply because they have more to lose). This case is slightly different. The effects we are interested in are produced by the way steps taken by governments, combined with the epidemic itself and people's responses to it, have triggered something that was going to happen sooner or later anyway.

Even before news came from China that a serious epidemic had broken out there was increasing concern and alarm about the unrealistically elevated prices of many assets and the enormous amount of both private debt and instruments deriving their value from traded debt and assets, all pumped by the enormous increase in liquidity brought about by quantitative easing since 2008. To make things worse, the Coronavirus pandemic has coincided with a sharp fall in the price of oil, with oil in storage at close to maximum levels even before the fall in demand for oil brought about by the response to Covid-19, not to mention a price war between Russia and Saudi Arabia. The interruption in economic activity means that large amounts of debt will not be serviced, much less repaid. Governments have stepped in by making credit available to businesses but the problem is that this will have to be eventually written up on accounts as a liability, which will damage the balance sheets and creditworthiness of firms and make the recovery more difficult. In many sectors, notably retail, obligations will simply not be honoured, no matter what governments do.

There are also significant types of debt that are highly vulnerable. One is high-yield paper issued by shale oil companies in the US, with these firms going insolvent because of the low price of oil. Another is car loan debt, with many debtors either not rolling over the loans or defaulting (with the secured asset recorded at an unrealistic value). A lot of debt is going to become worthless or be reduced in value.

In the near future, governments will have to consider and probably enact significant measures of debt forgiveness, to avoid a disorderly liquidation and re-evaluation process. If handled correctly this could actually have significant benefits, not least in putting the global financial system on a sounder basis, but the short-term pain could be considerable.

Impacts: higher inflation?

One possible consequence could be an episode of much higher inflation than we have become accustomed to, at some point next year (this would of course affect how the problem of debt plays out). The liquidity being created by governments is, as said, mainly about preserving the supply side. However, once controls are lifted, it could express itself as released pent-up demand for goods and services. If the supply side is damaged it will take a while to meet that, and the result would be a burst of inflation. Certainly, current figures for bank deposits in the US indicate that broad money there is growing at an all-time record level for peacetime and that does imply that we should expect inflation later on in 2021 (Congdon 2020). What we cannot tell at present is how effective central banks and governments will be at removing any excess demand from the system and how far any deflationary pressures in the world economy will offset the pressure from more broad money.

Unfortunately, one effect we can already see is severe pressure on emerging markets and economies, with a massive flight of capital from them, mainly into the safe haven of the US dollar and US Treasuries. This will eventually be reversed but in the short term will do considerable damage and will raise the yield on their sovereign debt.

Impacts: a retreat from globalisation

The biggest and most long-lasting effect of the pandemic will almost certainly be the one that is least desirable and most damaging. This is a retreat from globalisation and economic integration and a rise in economic nationalism. Some of this is down to politics and emotional responses to the pandemic but some derives from things that should give economic liberals cause for reflection.

Historically pandemics have tended to arrest or reverse economic integration. They not only happen after prolonged periods of greater economic integration with more trade, exchange and movement over long distances, they have also often marked the end of such periods or at least the start of a prolonged pause in the globalisation process. One aspect of this is the way that pandemics often lead to increased particularism and xenophobia because of the way epidemics (which always come from 'somewhere else') are associated in the popular mind with the alien or foreign. This plays out in politics of course, and there is no reason sadly to think that this time will be any different. We will almost certainly see a resurgence of protectionism, much reshoring of production and shortening of supply chains, greater hostility to migration and an emphasis on domestic production of certain kinds of product – particularly food. Again, this is an intensification of a trend that was already under way.

One area of special note is that of international travel. Severe constraints on international travel will remain in place for some time, for good reason. Suppose you are New Zealand or South Korea and have successfully contained the epidemic through early and effective measures. The problem is that Covid-19 is still active and out there all over the world. If you allow free travel and entry then it is a racing certainty that the virus will re-enter your country and the process will start again.

The solution is to continue to have restraints on travel – one popular measure will probably be to require all visitors to undergo a two-week quarantine. This would prevent most tourism and business travel. The only alternative would be to insist that all those arriving had a valid certificate of immunity, and that is not possible now and will not be for some time. Moreover, many firms will have realised that expensive business travel is not as necessary as they thought, and in any case, they will be less able to afford it. The result will be a prolonged, possibly permanent, decline in business travel over long distances, as well as a decline in certain kinds of tourism (the cruise ship industry will almost certainly take a massive hit). This will have big knock-on implications for a range of other industries and activities. In Europe the key question is that of the area within which travel is allowed. If it is the EU and EEA as a whole then intra-European flights will recover rapidly, but if not then the outlook for many airlines is bleak.

Much of this retreat from globalisation will be led by politics but even more will come from the responses and actions of private firms and individuals. This should give economic liberals cause to reflect. In one sense we can think of the pandemic as a massive stress test for economic and social (and political) systems. What it has revealed is that many of our systems, whether it be the way health services are run or supply chains for consumer goods, are economically efficient but also fragile and brittle, and unable to cope with a shock of this kind. This is already leading private actors to reassess the balance of risk and to adjust things like their supply arrangements as a result. It should remind us that pure economic efficiency in the use of resources is not the only yardstick we should use - others, such as social stability and security, should also be taken into account. The question, as always, is that of where to make the trade-offs.

One important factor is the growing realisation among both private actors and governments that the chances of a major pandemic are much higher than previously imagined (there were repeated warnings to this effect from epidemiologists and others but these were ignored (for example Wolfe 2011)). If an event of this kind is a 1 per cent probability in any one year (a once in a century event) then you may not think it worthwhile changing the way you do things, but if you conclude it is something higher, such as a 5 per cent probability in any one year (a once in 20 years event), then it makes sense to change.

Impacts: psychological and cultural effects

The psychological and cultural effects of the Coronavirus pandemic are likely on historical evidence to be the most extensive but also the hardest to predict. One important element of this will be the way it is remembered. Because of modern media and the way governments have responded, it is likely to be remembered as a shared or collective experience, in the way that major wars are. This will be very different from the way the great pandemic of 1918-19 was remembered, which was largely as a private and familial event (Spinney 2018). This means the effect is likely to be considerable, although it is hard to foresee what forms it will take.

Historically major pandemics have had two contrasting consequences for culture and peoples' mindsets. The first is a revival of seriousness and an impatience with what comes to be seen as intellectual frivolity and self-indulgence. There is nothing like having death all around you for promoting a serious outlook on life. Historically this has often meant a revival of religious piety. More generally it means a concern with major issues and an emphasis on discipline and restraint. The second, contrasting, response is to adopt an attitude of hedonism, living for the day, and not resisting impulses and desires. Human nature being what it is, the two responses are often found in the same person.

One apparently paradoxical result will almost certainly be that indicators of severe psychological stress such as depression and suicide will decline while the emergency persists. This is what typically happens in times of war or natural disaster such as an epidemic. The best explanation is that life becomes more meaningful under extreme conditions, and that the shared experience creates a feeling of social bonding and reduces the feeling of social isolation and meaninglessness that many feel in modernity.

(Crime also declines during such times). However, precedent suggests that there will be a sharp rise in things like suicide, anti-social behaviour and psychological stress such as depression and anxiety once the crisis is seen to be over – it may be that that is when the pressure actually takes its toll.

It could be worse

The final big conclusion we should draw from the history, both recent and longer term, is a very sobering one. This is bad enough, but it could have been much, much worse. We are fortunate that this is a viral pandemic because they typically only last for about two years. One reason for that is that nowadays that is about the time it takes to develop and roll out an effective and safe vaccine. Another is that the natural selection pressures on a virus that is infectious will push it in the direction of becoming milder in its effects over about that time. Two years is also about the time it takes for the population to develop herd immunity.

The real nightmare would be a bacterial pandemic, because these can have much higher fatality rates and can last for longer, and people do not develop immunity in the way that they do with viral infections. The worst version of that nightmare would be a bacterial pathogen that was resistant to antibiotics, because of the increasingly acute problem of broad-spectrum antibiotic resistance in bacteria.

We could also have had a viral pandemic that was more severe in its effects and nearly did just a few years ago with the outbreak of Ebola in West Africa. This was very deadly and therefore easier to contain because it did not spread so rapidly or extensively, but on the other side there was a reservoir for recurring infection in the shape of the types of fruit bat that the virus could live in, which were found right across the tropical zone of the old world. Fortunately, the virus was contained in West Africa, mainly because the Nigerian government in a massive effort succeeded in stopping it getting into Lagos, from where it would have spread widely (Osmin 2019).

Looking forward - lowering risks and increasing resilience

The reality is that certain prominent features of the way we live now increase the probability of a major pandemic such as the one we are now experiencing. Some, such as the higher levels of travel and economic integration, make the rapid spread of a disease easier and more difficult to manage, but at the same time lead to greater wealth and exchange of ideas and innovation that will help humanity to overcome that danger. In some cases, the evidence is that people have misjudged risks and gone too far down a route that has made systems of all kinds more fragile and less resilient. Here there is a need for serious thinking about how far to change and in which ways.

There are some instances though where the evidence is clear that aspects of the way we now live are simply too dangerous (as well as being undesirable for other reasons). The big one is the nature of contemporary intensive farming, particularly but not exclusively livestock farming. Intensive animal husbandry provides an almost perfect environment for the development of novel pathogens and their transmission. In many parts of the world the spread of farming (actually often not intensive, which is a different problem) means increasingly severe pressure on wildlife habitats and an elevated risk of pathogens moving from wild species to domesticated ones or directly to humans (Quammen 2012). The point is that we need to reduce these risks and to realise that sooner or later there will be another pandemic, which the world should be better prepared for.

It is relatively simple to identify things that can and should be done. Improving the process by which both diagnostic tests and vaccines are developed and produced - and eliminating much of the unnecessary regulation that slows both down - should be a priority. There should also

be even more work than is already happening on alternatives to antibiotics as the means for treating bacterial infections, to head off both the nightmare prospect mentioned above and the equally terrifying prospect of the end of much modern medicine and surgery. Another measure should be encouraging the move away from farming, both traditional and intensive, through a move to technologies such as cultured meat and flours (which eliminates the need for much arable farming). This would have massive benefits of other kinds. A third should be to rethink the way that healthcare provision is organised so that systems are not so vulnerable and brittle (this is an argument that transcends disagreement over how to fund such systems; it is a different issue basically). Finally, people in many countries should think carefully about both the balance between work and the home and the way that the old are treated and cared for.

References

Begley, S. (2013) Flu-conomics: The next pandemic could trigger global recession. *Reuters Health News*, 21 January.

Benedictow, O. J. (2018) *The Black Death 1346 – 1353: The Complete History*. Martlesham, Suffolk: Boydell.

Cantor, N. F. (2001) *In the Wake of the Plague: The Black Death and the World It Made*. New York: Free Press.

Congdon, T. (2020) Email circular, 15 April. Buckingham: Institute of International Monetary Research.

Hawe, E., Yuen, P. and Baillie, P. (2011) *OHE Guide to UK Health and Healthcare Statistics.* London: Office of Health Economics (https://www.ohe.org/system/files/private/publications/356%20-%202011_OHE_Guide_Hawe.pdf).

Horrox, R. (1994) *The Black Death*. Manchester University Press.

Jonung, L. and Roeger, W. (2006) The macroeconomic effects of a pandemic in Europe – A model-based assessment. Brussels: European Commission (https://ec.europa.eu/economy_finance/publications/pages/publication708_en.pdf).

Kilbourne, E. D. (2006) Influenza pandemics of the twentieth century. *Emerging Infectious Diseases* 12(1): 9–14.

Little, L. K. (ed.) (2006) *Plague and the End of Antiquity: The Pandemic of 541–750*. Cambridge University Press

McNeill, W. H. (1976) *Plagues and Peoples*. New York: Doubleday.

Mordechai, L. and Eisenberg, M. (2019) Rejecting Catastrophe: The case of the Justinianic Plague. *Past and Present* 244(1): 3-50.

Osmin, A. et al. (2019) Western African Ebola virus epidemic. *WikiJournal of Medicine* 6(1): 1-34.

Potter, C. W. (2001) A history of influenza. *Journal of Applied Microbiology* 91(4)**:** 572–9.

Quammen, D. (2012) *Spillover: Animal Infections and the Next Human Pandemic.* New York: Vintage.

Spinney, L. (2018) *Pale Rider: The Spanish Flu of 1918 and How it Changed the World*. New York: Vintage.

Wolfe, N. (2011) *The Viral Storm: The Dawn of a New Pandemic Age*. London: Penguin.

Wren-Lewis, S., Keogh-Brown, M., Edmunds, W. J., Beutels, P. and Smith, R. D. (2009) The Possible Macroeconomic Impact on the UK of an Influenza Pandemic. University of Oxford, Department of Economics Discussion Paper 431.

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