Smart thinking, lockdown and Covid-19

Altman, Morris

Published in:
Journal of Behavioral Economics for Policy

Publication date:
2020

Document Version
Publisher's PDF, also known as Version of record

Citation for published version (APA):
Altman, M. (2020). Smart thinking, lockdown and Covid-19: Implications for public policy. *Journal of Behavioral Economics for Policy*, *4*(COVID-19 Special Issue), 23-33.

Smart thinking, lockdown and Covid-19: Implications for public policy

Morris Altman[1]*

Abstract
The response to Covid-19 has been overwhelmingly to lockdown much the world's economies in order to minimize death rates as well as the *immediate* negative effects of Covid-19. I argue that such policy is too often de-contextualized as it ignores policy externalities, assumes death rate calculations are appropriately accurate and, as well, assumes focusing on direct Covid-19 effects to maximize human welfare is appropriate. As a result of this approach, current policy can be misdirected, with highly negative effects on human welfare. Moreover, such policies can inadvertently result in not minimizing death rates (incorporating externalities) at all, especially in the long run. Such misdirected and sub-optimal policy is a product of policy makers using inappropriate mental models which are lacking in a number of key areas: the failure to take a more comprehensive macro perspective to address the virus; using bad heuristics or decision-making tools; relatedly not recognizing the differential effects of the virus; and adopting herding strategy (follow-the-leader) when developing policy. Improving the decision-making environment, inclusive of providing more comprehensive governance and improving mental models, could have lockdowns throughout the world thus yielding much higher levels of human welfare.

JEL Classification: B41; D00; D70; E70; I18

Keywords
Covid-19 — bounded rationality — herding — poor heuristics — lockdown — public policy

[1] *Professor of Behavioural and Institutional Economics and Co-operatives, and Dean, University of Dundee School of Business*
***Corresponding author**: maltman001@dundee.ac.uk

Introduction

This paper challenges the extreme nudging (Thaler & Sunstein, 2009) perspective that has dominated most national responses to the Covid-19 pandemic. It also challenges the acceptance of simple binary policy options that appear to have been proffered to the public in dealing with the Covid-19 virus: either lockdown the entire economy and more people live, or, effectively maintain the status quo and more people die. The latter ignores both the short- and long-term consequences and opportunity costs of shutting down the economy which will also sadly cost lives while destroying livelihoods and negatively impacting levels of socio-economic wellbeing. This type of extreme nudging, best captured by the lockdown strategy, implemented in the world's largest economies, ignores the possibility that a much less extreme response to mitigating the effects of the virus was and is possible. These would have lessened the overall long-term impact of Covid-19 on deaths and wellbeing.

Policy makers needed to adopt more holistic, nuanced, and methodologically pluralistic approaches to Covid-19 so as to effectively minimize the overall short- and long-term negative effects of the virus. Such policy approaches are articulated in this paper and represent one of its unique contributions. I further argue that more holistic and pluralistic approaches suggest that extreme measures should not have been taken or, at least, not continued as long as they were, in most cases. I also argue that amongst the reasons these extreme measures reigned supreme is the incompleteness of scientific information and/or the inadequate understandings of the limits of the scientific information made available to policy makers and leaders. These inadequacies resulted in decision-making herding (follow the leader) (Altman, 2012; Baddeley, 2013, 2018; Keynes, 1936). The herding effect was then reinforced by public shaming of those who deviated from the norm. Leaders ended up maintaining the status quo in order to preserve their personal credibility and status as decision-makers, at least in the short run.

The response to Covid-19, world-wide, has been to lockdown or shut down as much of the world's economies as possible in order to minimize death rates. These rates are calculated using the number of deaths divided by the number of those counted as having the virus. Counting who has the virus varies greatly across space and time (related to the number of people being tested) and is thus, more often than not, seriously flawed. Nevertheless, policy makers and many of their advisors are steadfastly focused on minimizing death rates and the *immediate* negative effects of Covid-19. It follows, therefore, that they implement policies so as to minimize measured deaths believed to be a direct or immediate result of Covid-19. I argue that such policy is de-contextualized, ignores policy

externalities, and assumes death rate calculations are adequate and remotely accurate. Current policy can be misdirected and can therefore have long and even short-term negative effects on human welfare and thus result in not actually minimizing death rates (incorporating externalities), especially in the long run. Such misdirected and sub-optimal policy is a product of policy makers using inappropriate mental models – where mental models are defined as the practical theoretical frameworks that individuals adopt to inform their decision-making (Altman, 2014; Denzau & North, 1994). These include not taking a broader macro perspective when addressing the virus, using bad heuristics or decision-making tools, and adopting herding strategy (follow-the-leader) when developing policy. Poor decision-making is reinforced by the reality of cognitive dissonance,[1] sunk cost fallacy[2], power relationships, as well as the inadequacy of voice and democratic governance (Hirschman, 1970). Improving the decision-making environment with improved mental models could have resulted in smarter policy which, in turn, should not have resulted in extreme economic lockdowns throughout the world with all of the socio-economic damage that this entails.

Simplistic approach to policy determination

The easiest and least costly policy in terms of psychological and economic costs in response to the Covid-19 challenge is to shut down the economy. This is a binary black or white approach to policy and is relatively simple to implement and articulate. This approach does not require much sophisticated socio-economic analysis to contextualize policies designed with the hope of minimizing death rates and determining other ways of minimizing the number of new Covid-19 cases. It also deflects from efforts to invest in the health sector infrastructure required to combat Covid-19, for example. This particular approach tends to focus on the short run: what is the impact of a policy within the next few weeks or months?

Implicitly assumed here is that the focus on the immediate direct effects of the virus has less negative downstream consequences or externalities than not locking down the economy, which it is argued would result in a net increase in death rates. Moreover, this approach pays little or no attention to the largely non-death consequences of the more extreme lockdown approach. This involves the impact of government-created depression on the socio-economic wellbeing of society at large, such as bankruptcies, unemployment, poverty, generational poverty, loss of human capital, suicide, spousal and child abuse. It also involves the longer-term consequences of disrupted supply chains on socio-economic wellbeing. Finally, the extreme lockdown approach implicitly assumes that there can't be a more intermediate nuanced way to deal with the Covid-19 pandemic that will minimize the negative impact on our socio-economic wellbeing, where the latter incorporates death rates.

This type of binary argument is illustrated in Figure 1, by line segment 0S. When the extent of economic openness is zero (extreme lockdown), there should be zero death rates. As the economy is increasingly more open the death rate initially increases quite rapidly and then eventually diminishes as the economy opens up to the extreme. This diagrammatic representation of arguments made by many experts and politicians should be interrogated by the evidence to determine if this hypothesis is actually correct.

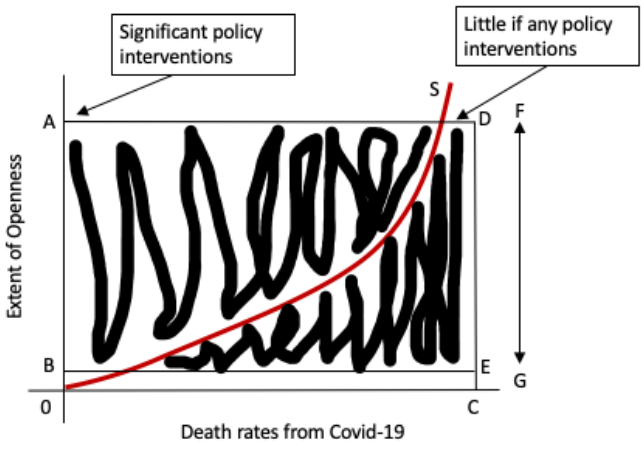

Figure 1. Lockdown, policy interventions and death rates.

Behavioural economics, as articulated by Herbert Simon (1978, 1987; Altman, 2012, 2017b, 2017c) and enriched by institutionalists, recommends a more refined empirically informed approach to policy in general. Fundamentally, all policy is informed by some sort of theory, either explicitly or deeply embedded in the mind of the decision-maker. This represents the policy maker's or analyst's mental model (Altman, 2014), effectively her or his way of thinking through particular issues or questions. Inappropriate mental models can result in serious errors in decision-making. Therefore, getting the mental model right is of critical importance. In the 'Simon' approach it is important that a model be empirically based; its assumptions must also be empirically rooted. And relatedly, the model should incorporate the particular institutional environment of the society whose problems it is designed to explain and address – in our case the Covid-19 pandemic. From this modelling approach the extreme policy approach of extreme lockdown should be seen as but one of many options which may include less drastic measures.

[1] In this case, cognitive dissonance occurs when an individual deviating from peer or societal norms causes psychological pain, which often leads to conformity to these norms and can contribute to herding behaviour.

[2] In this case, individuals will not change their behaviour given the past and invest in a particular behaviour even though it is recognized that their past behaviour might be wrong. The net psychological pain change is too great.

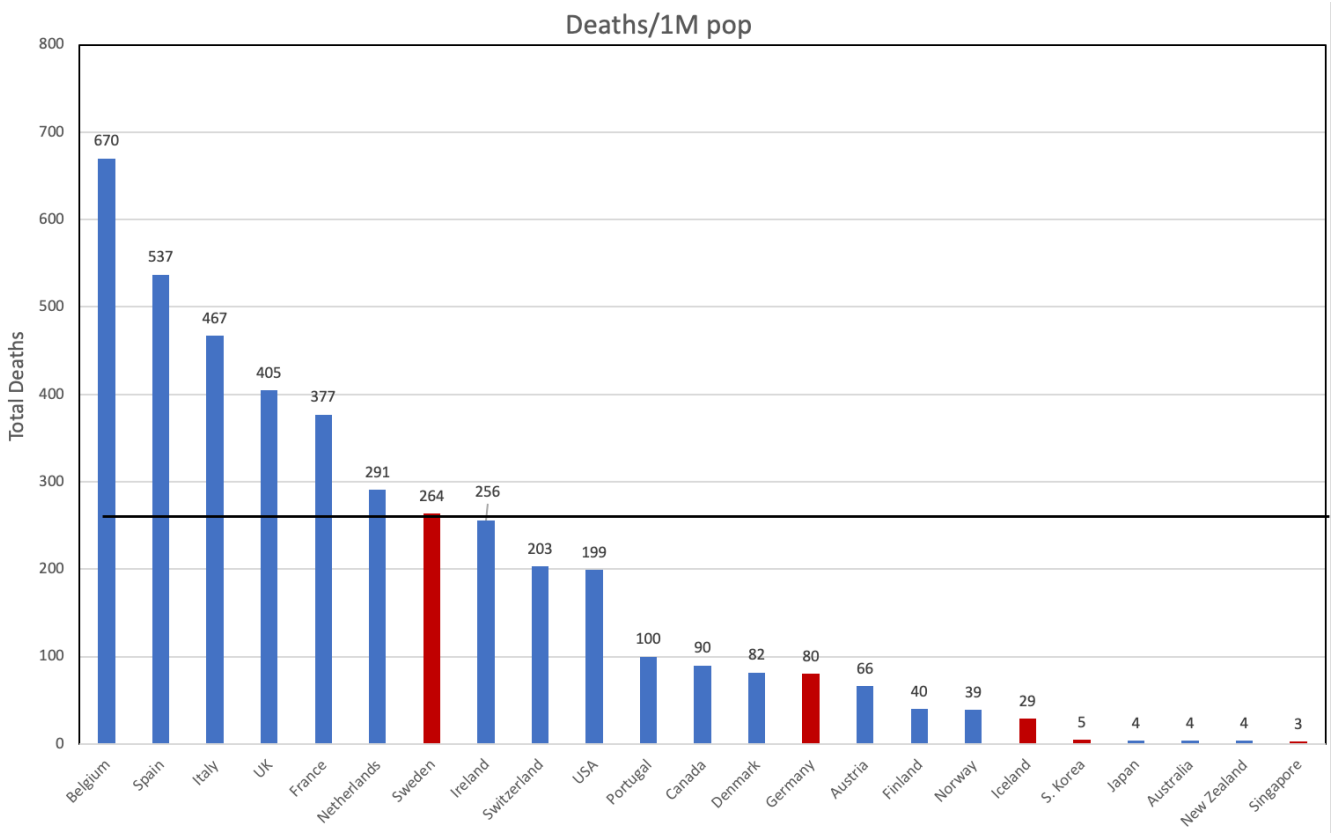

Figure 2. Derived from data in: Worldometer (2020).

Problems with the prevailing mental model: what death rate estimates reveal

With respect to the data used, reference is made to the death rate in terms of recorded deaths in relation to individuals identified as having the virus. But given that the latter represents the denominator of the death rate equation and depends on the percentage of the population tested for the virus, this calculation can be highly misleading. This is especially true when testing is not generalized and testing tends to be focused on those who have a higher probability of having contracted the Covid-19 virus. In this case, increasing testing reduces the measured death rates. The relatively more accurate death rate measure would be deaths per 1,000 or 1 million of the population, whether tested or not.

In this case, one must ask the question: are countries with more extreme lockdown policies the most effective in minimizing death rates? And, is it the case that countries with more moderate policies are generally characterized by increasing death rates? The Covid-19 crisis is ongoing and data are incomplete, but enough data are available to provide some preliminary answers to the above questions.[3] Death rate estimates are presented in Figure 2. The data presented are selective. One needs to bear in mind that some countries, especially where democratic governance is lacking, can more easily underreport deaths if it is to the advantage of the political elite to do so. Hence, the data presented here are for democratic countries. What is clear from the data is that Sweden, with a more libertarian approach to the Covid-19 virus and no lockdown of the economy, has a lower death rate than other countries that implemented extreme lockdown policies. On the other hand, Sweden's death rates are higher than some countries that have implemented more extreme lockdown policies. But then we have South Korea which has not adopted extreme lockdown policies but has amongst the lowest death rates from Covid-19 in the world. And, South Korea's low death rates are comparable with the death rates in New Zealand and Australia which have implemented more extreme lockdown policies, with New Zealand's being more extreme than Australia's. And, finally, we have Singapore with a less extreme lockdown policy than New Zealand (more akin to South Korea), with a death rate of 3 per 1 million comparable to South Korea's low death rate. Relatively libertarian Iceland has also done extremely well, amongst the best in our sample.

The direct deadly effects of Covid-19 continue but the data, incomplete as they are, suggest that there is no strong statistical relationship between extreme lockdown policies

[3] For some excellent summary statistics see, FT Visual and Data Journalism Team (2020).

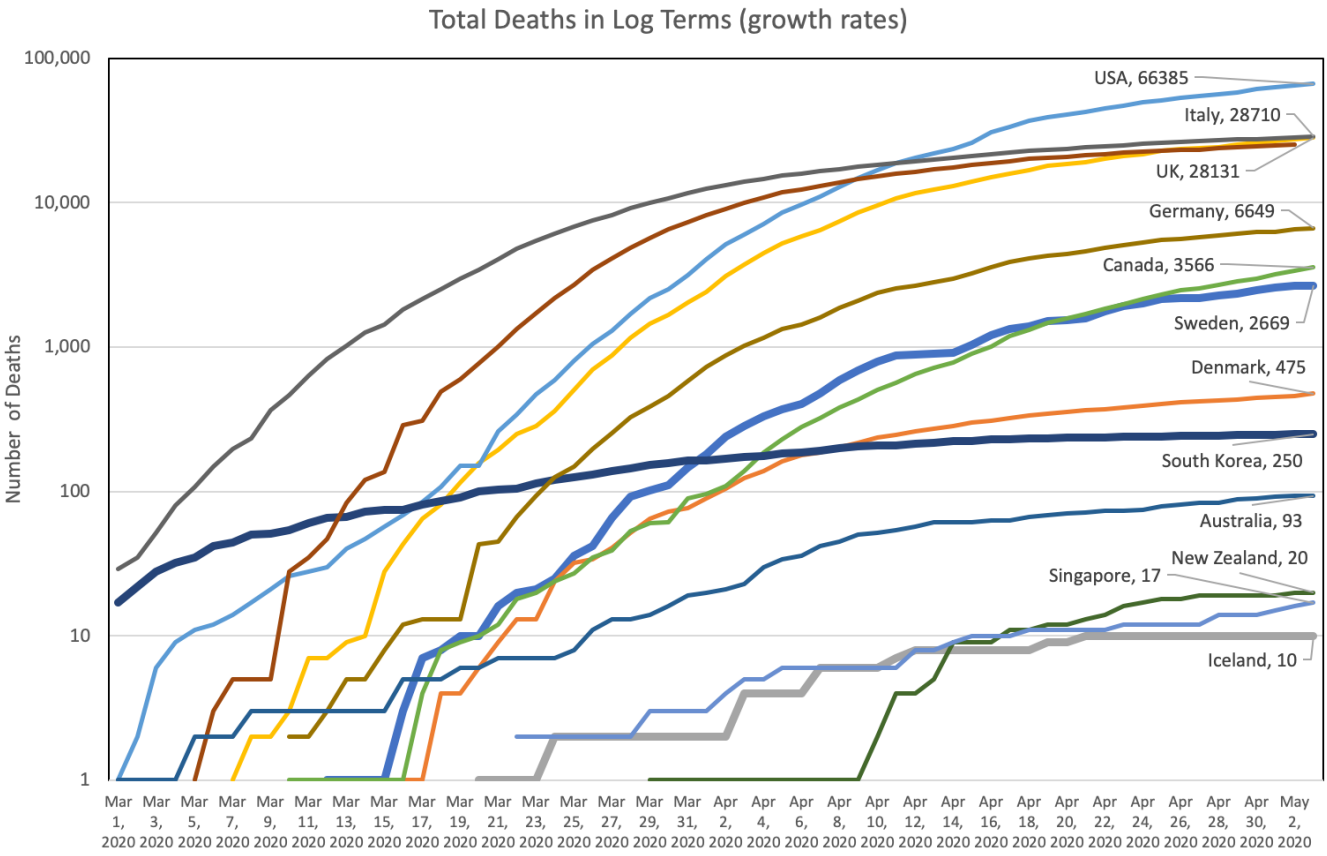

Figure 3. Derived from data in Roser, Ritchie, Ortiz-Ospina & Hasell (2020).

and the desired solution of relatively low Covid-19 related death rates. Simply, closing one's economy is not the cure or solution to minimizing death rates. On the other hand, simply having a minimalist lockdown policy is not necessarily correlated with the lowest of death rates. Sweden has done much better than many countries without locking down its economy. But other countries with much more restrictive policies, for example other Nordic countries, have lower death rates per million. However, what is of critical importance here is the fact that South Korea and Iceland (admittedly a very small country: 364,00), as well as Singapore (population 5.6 million) with minimalist lockdown policies, have amongst the lowest death rates. South Korea's population stands at around 52 million. And, it should be noted, countries with minimalist lockdown policies have all implemented credible policies to mitigate the effects of Covid-19. No successful country is doing nothing (Politico, 2020; Rolander, 2020).

But being proactive against Covid-19 is not the same thing as locking down the economy. What these data suggest is that an extreme lockdown policy is not a necessary condition to generate relatively low death rates. One can generate low death rates without severely damaging the economy. These data also suggest that variables not related to locking down the economy are critical to minimizing Covid-19 related deaths. If this is the case, then opening up the economy need not generate increasing death rates if appropriate conditions (which must be identified) are in place. Simply assuming that lockdowns are the panacea for Covid-19 because they minimize contact between individuals is problematic. This particular mental model (falsely) assumes away other methods of controlling Covid-19 that would not have produced such serious deleterious effects on the economy.

Related to current available data on death rates, it also clear that countries ranging from the more extreme to the least extreme lockdown policies are experiencing similar peaks to death rates (Figure 3). The growth rates of Covid-19 related deaths are diminishing, flattening out, approaching zero, in the countries selected for Figure 3 where the data are mapped out to a log scale to illustrate growth rates. Adopting less extreme policy does not appear to have prevented the growth in death rates from eventually collapsing, whilst more extreme policies do not appear to have shortened the time by when these death rates began to collapse. Locking down the economy does not appear to be a necessary condition for collapsing the growth of Covid-19 related death rates in 'good' time. This collapse in growth rates occurs in all of our sample countries irrespective of how severe or lax their lockdown policies are. But different countries peak at different levels in absolute terms (Figure 3).

The data do not support the dominant mental model, illustrated in Figure 1, that extreme lockdown is a necessary condition to minimize Covid-19 death rates. The hypothesis that the data do support, illustrated in Figure 1, is that limited lockdown policy is consistent with relatively low and relatively high death rates. This is given by line segment AD. Given limited lockdown, I would argue that what makes a difference is the type of policies implemented whilst keeping economies relatively open. As already mentioned, relatively open Sweden did better than extreme lockdown economies, but its death rate is relatively high. And, this points to the importance of policy. On the other hand, extreme lockdown policy is consistent with both high and low death rates as illustrated by line segment BE. This also points to the importance of policy as well. For example, the United Kingdom and New Zealand implemented relatively extreme lockdown policy, but New Zealand's death rate is extremely low and the United Kingdom's is one of the very highest in my sample. ADEB in Figure 1 illustrates the wide array of openness/death rate combinations that are possible. But what is of critical importance is that this modelling scenario holds out the possibility of low death rates with limited lockdown and high death rates and an extreme lockdown of the economy.

Options to control the immediate consequences of Covid-19

Given what we do know, it is important to note how relatively open economies, ones that have not been locked down, have been able to achieve relatively low death rates. There are other options to a complete lockdown. South Korean, for example, opted for an immediate co-ordinated approach across all levels of government and medical facilities, identifying vulnerable populations, providing ready supplies of hospital beds and medical supplies, transparency, and relatively large scale testing followed by case management of identified cases with contact tracing, and re-testing and mandated self-isolation of Covid-19 victims (with financial support for the latter), some school closures and restriction on large events. This took place in the context of a relatively well-funded health sector which allowed for the sector to properly treat Covid-19 patients. Social distancing rules were also put in place as well as well as recommendations for the wearing of, and then the distribution of, face masks – an already well established practice in Asian countries to mitigate the passing a virus to the person next to you – together with the availability of Personal Protective Equipment (PPE) for essential workers. Face masks were made available at no or low costs and the supply was co-ordinated by the government once it was clear that the private sector on its own could not equitably meet market demand. Of critical importance, however, was the co-ordinated and well-financed programme of case management, testing, contact tracing and self-isolation. This meant that there was no lockdown of the economy (Buchwald, 2020; Campbell, 2020; Fleming, 2020; OECD, 2020). Iceland's successful non-lockdown policy also heavily relied on radical testing, followed by case management of identified patients with contact tracing, and re-testing with mandated self-isolation of Covid-19 victims. Social distancing and the closure of some facilities were also mandated (LeMieux, 2020).

Similarly, Sweden's point of focus has been on identifying vulnerable populations, social distancing and self-isolation as well as on regulating event size and some (minimal) facility closures and event cancellations. There has been more focused (less expensive), as opposed to widespread, Covid-19 testing as compared to the testing approach adopting in South Korea and Iceland (radical testing is also the approach taken in relatively successful Singapore) (Townsend, 2020). Sweden has been less successful than South Korea in minimizing death rates, but more successful than many other economies locking down their economies. Its less aggressive approach to controlling the virus given the openness of its economy could have been a key cause of its relatively high death rate as compared to relatively open South Korea, for example.

The cost of lockdown, inclusive of the eventual loss of life, has not yet been considered. There are effective substitutes to locking down the economy. But these require taking a leadership role in facilitating the adoption of these substitutes. This can only take place in societies where leaders believe that these substitutes exist and are effective and viable – much depends on the mental models adopted by decision-makers and the information that they have available to them. South Korea, for example, having learnt from their SARS experience in 2003 and MERS in 2015, made available the required economic resources and put in place a governance structure to gain control over Covid-19 without locking down the economy (Cho, 2020). But Iceland, with no such prior experience, did the same.

An important question arises when such resources are not available. Some economies can potentially mobilise the required resources when required if these resources are not already in place. Yet, for other economies, those that are relatively poor, financial resources are not there. But in either case, to mobilise resources, decision-makers must accept that there are alternatives to lockdown and establish which alternatives best fit their economies at that time. This emphasizes the importance of mental models in formulating policies.

It is also important to understand that there are different levels of response to Covid-19 which are overall less costly financially. Policy makers can then think through these alternatives and their impact on death rates and the economy. These different levels of response could involve more emphasis on social distancing, the banning of larger gatherings, regulations on improvements to health, safety and cleanliness standards in places of work, sources of food supply and distribution, retail and wholesale outlets, gyms, etc., and more focused testing and contact tracing, as well as the more selective use of PPE where there are shortages. One concrete example concerns sanitary conditions in the domain of food

preparation and supply.[4] Recall, that the probable point of origin for the coronavirus appears to have been in the less than sanitary and unregulated Huanan seafood market in Wuhan.

Another example is the rapid spread of the virus in care homes around the world where clusters erupted particularly in those homes where acute PPE shortages were experienced. It is estimated that up to 50 percent of the Covid-19 related deaths in Europe have occurred in care homes according to the World Health Organization (Booth, 2020). One does not have to lockdown the economy to address issues related to poorly regulated or maintained open markets and the lack of necessary personal protective equipment for health care providers (Booth, 2020). This approach also applies to opening up a lockdown economy. One should note that one failure in the Swedish approach was not paying enough attention to its care homes where a large percentage (about 45 percent) of its Covid-19 deaths occurred. This is contrast to what occurred in South Korea and Singapore, for example, where very few Covid-19 related death took place in care facilities. Overall, about 90 percent of Sweden's Convid-19 death were over 70. In the more extreme lockdown Belgium about 50 percent of the Covid-19 deaths took place in care homes (Observer Reporters, 2020; Orange, 2020). Simply paying more attention to care homes and the elderly would have slashed death rates. This has nothing to do with locking down the economy or spending large sums of money (Kwon, 2020; Lintern, 2020; Observer Reporters, 2020).

Once it is understood that a necessary condition to controlling Covid-19 is not a lockdown, substitutes to a lockdown become vitally important. Government can also more aggressively facilitate increasing the supply of critical shortages in goods and services such as in PPE and in testing and tracing equipment. And, this nuanced approach could and should then be placed in the context of the opportunity cost of lockdown when there are viable alternatives to lockdown. Extreme lockdown does have consequences which need to be modelled when formulating anti-Covid-19 policy. The assumption that locking down the economy is optimal and necessary is not supported by the evidence. And, this assumption, underlying much of current policy (and their mental model drivers) allows decision makers to make the simple choice of choosing lockdown as this appears to be the only rational choice available.

Some of the successful policies undertaken by the relatively successful open economies are highlighted in Table One. What is clear is that Sweden was less aggressive than other relatively open economies in tackling Covid-19. It was much more selective and voluntary in its approach and very much less focussed on care centres. This would help explain why Sweden's open economy policy was less successful than that of others. But its more libertarian approach (which still involved significant government intervention) proved to be more successful than the largely locking-down-the-economy approach of so many of its neighbours.

Problems with the prevailing mental model: going beyond immediate effects

The narrow focus on the immediate effects of Covid-19 on death rates, with a further focus of on locking down the economy as the key to gaining control over these direct effects, ignores both the longer-term consequences of lockdown on death rates and on overall socio-economic wellbeing. This is a critical flaw of the extreme lockdown policy, which implicitly assumes that the negative 'externalities' of such policy will be less than the economic and human costs of lockdown, even with respect to the immediate death rate.

This focus on lockdown also shifts attention from specific policies to address Covid-19. The experience in care homes, where many of the most vulnerable members of society reside, and the ever-growing number of Covid-19 related deaths that are now being 'discovered' in such homes in all countries which adopted extreme lockdown policies, is a case in point. This speaks to the failure of the initial focus on lockdown as the panacea to 'controlling the spread of the virus'. But the transmission of the virus in care homes in all cases, lockdown or not, has proven to be particularly deadly. Critics of the Swedish approach have been blaming the lack of lockdown for the high Covid-19 death rate in these homes (Orange, 2020). But clearly the care home experience in the UK, Europe, and North America refutes the veracity of this claim.

In this paper, I cannot estimate the possible additional costs of locking down the economy, we leave that to future research. But my point here is that it is important to model one's approach to minimizing the damage caused by Covid-19 by incorporating both the direct and indirect effects of the virus. Therefore, locking down the economy will have different consequences and costs than taking a more nuanced approach such as that adopted by South Korea and Iceland as well as in Singapore. Sweden, it bears repeating, had a much more laissez-faire approach, which was not as aggressive or sweeping as South Korea's. One's model should incorporate a longer-term time frame to determine the best (welfare maximizing) approach for government to take when tackling Covid-19 and when the locked down economies begin to open up.

Amongst the costs of lockdown is increasing unemployment. According to the International Labour Organization (2020) about 50 percent of the global workforce will lose their source of economic livelihood. Related to this, firms will go bankrupt, individuals will lose their homes, families will be impoverished, families will go hungry, family violence will increase, and mental breakdowns will increase. The World Bank (BBC, 2020) expected that 60 million people will be pushed into extreme poverty erasing the impressive gains to poverty alleviation that have taken place over the past few

[4] Sanitary conditions within the household is also critical to the reduction of death rates, increased life expectancy, and reduced morbidity, even when there are no pandemic viruses and even when controlling for income (Altman & Lamontagne, 2004).

Policy	Sweden	South Korea	Singapore	Iceland
Well-funded health care sector	Yes	Yes	Yes	Yes
Transparency of accurate information to all citizens	Yes	Yes	Yes	Yes
Selective Bans on international travel (some countries more severe than others)	Yes	Yes	Yes	Yes
Targeted support for the vulnerable population (including the elderly population)	Yes, but limited	Yes	Yes	Yes
Social distancing	Yes	Yes	Yes	Yes
Banning of large meetings/events	Yes	Yes	Yes	Yes
Care facilities focus	No	Yes	Yes	Yes
Selective closure of venues or institutions	Yes	Yes	Yes	Yes
Testing	Selective, but expanding	Yes	Yes	Yes
Contact tracing	Yes, more selective	Yes, extensive, more extreme	Yes, more extensive	Yes, more extensive
Wearing of facemasks	Selective	Yes	Yes	Yes
Personal Protective Equipment	Selective	Yes	Yes	Yes
Handwashing/no face touching info protocols	Yes	Yes	Yes	Yes
Isolation/self-isolation/quarantine	Largely voluntary	Yes	Yes	Yes
Socio-economic support for isolated population	Yes	Yes	Yes	Yes

Table 1. Anti-Covid-19 policies for open economies.

years. And, the negative impact of extreme lockdown policies hit the poor, middle income individuals, Gig economy employees, and SMEs, most of all. There is a highly inequalitarian impact of extreme lockdown policy that must be modelled and be given due analytical consideration. Of course, not all of these effects will last forever, much depends on government policy, but these longer-term effects of lockdown policy will reduce the wellbeing of billions of individuals globally.

More specifically, the negative economic consequences of extreme lockdown policy will include increasing deaths from this type of policy which, I've argued, are not necessary to effectively combat the Covid-19 pandemic. Deaths would be a product of suicide and mental health issues, poverty, alcohol and drug abuse, increasing mortality rates, and shortening individuals' expected life span, for example (Pell & Lesser, 2020). It is even possible that deaths resulting from extreme lockdown induced economic depression could exceed the death resulting from Covid-19 (about 260,000 as of May 6, 2020; this is expected to increase). For example, the United Nations warns that hundreds of thousands of children will die as a result of lockdown induced economic depressions (Nichols, 2020). The very real possibility that economic depression related deaths will be substantial needs to be carefully interrogated and estimated. The longer-term impact of lockdown policy must be carefully modelled and understood before adopting extreme lockdown policy which largely ignores the long-term consequences of such policy. But the point here is that such deaths can be largely avoided by adopting alternative existing methods of combatting Covid-19. These alternatives would minimize, in relative terms, the long-term negative effects on the economy and society at large.[5]

Why policy can take the wrong turn

Decision-makers and their advisors design policy with the information at hand; but they do so in the context with information being imperfect, asymmetric, and costly (Akerlof, 1970; see also H. Altman, 2020). Moreover, decision-makers and their advisors make use of this information based on their ability to process and understand the information afforded to them. These variables are central to Simon's notion of

[5]It is important to note how governments historically dealt with deadly pandemics. The Black Death or Bubonic Plague killed between 30 and 60 percent of Europe's population in the fourteenth century. Government was able to control this pandemic when it focused on identifying affected individuals and isolating them and by quarantining affected population cohorts (Mark 2020). The Spanish Flu, originating in the United States, killed between 50 and 100 million people between 1918 and 1920, with a world population of 2 billion. Currently about 330,000 have died from Covid-19 with a world population of 8 billion. The flu's death rate was cut by half in the USA when government closed schools, shops, and restaurants, regulated public transportation, mandated social distancing, banned public gatherings, and imposed targeted quarantines (Strochlic & Champine, 2020). A key to flattening the death rate curve was social distancing (Strochlic & Champine, 2020).

bounded rationality (1978, 1987). The mental models adopted play a critical role in locating, processing and understanding the information required to make policy recommendations and decisions. These models are built upon specific behavioural and institutional assumptions, typically not interrogated by decision-makers and their advisors. In the real world of bounded rationality, rational individuals can make poor decisions that can have seriously negative socio-economic effects. In effect, rational decision-makers and their advisors adopt decision-making shortcuts or heuristics (Gigerenzer, 2007; see also Kahneman, 2011), to make their decisions and provide their advice. These heuristics can be good or bad. The quality of decision-making is affected by the quality of mental models they employ which, in turn, affects the data searched for and analysed, and the questions asked. Bad or poor heuristics can yield errors in decision-making (Altman H., 2020; Altman M., 2017a, 2017b, 2017c).

Given the above, bad decisions can be triggered when more socially optimal decisions and policies, especially from a longer-term perspective, are more costly (in the short run) and difficult to operationalize. With regards to Covid-19, it is more complex and more difficult to implement and reinforce a strict regime – of social distancing, self-isolation, contact tracing and testing, and accessing and providing personal protective equipment (PPE), and emergency care for affected individuals – than it is to lock down the economy. This is especially true when experts and herd leaders celebrate lockdown as the optimal policy solution to most effectively dealing with the Covid-19 pandemic and pay little attention to the longer-term consequences of lockdown.

These errors (which can be rationally based) can be persistent and spread across decision-makers in a world of bounded rationality when the herding heuristic (follow the leader) is employed. And rational decision-makers will engage in herding when the decision-makers are themselves uncertain what the best-practice decisions and related policies might be and believe that others: experts, leaders, superiors, know better than they what the optimal course of action happens to be. This behaviour is quite common and exemplified by herd behaviour in financial markets. Such behaviour is reinforced when decision-makers have a vested interest in maintaining a decision or a policy stance once it is made (status quo bias), for fear of loss of pride, reputation or status, or fear of deviating from herd leaders, especially when these leaders are in positions of power. Maintaining error prone decisions is also most likely when the personal costs of so doing (given the psychological costs of changes one's course of action) are relatively low. Costs are largely borne by society at large.

I would argue that this basic modelling narrative helps to explain decision-making advice and policy during the Covid-19 pandemic. Where the dominant view was that extreme lockdown of the economy was the best course of action to minimize deaths, this perspective was adopted by policy advisers and decision-makers. Decisions had to be taken quickly and were made predicated upon what was believed to be the best course of action. However, the decision-making was skewed in the sense that alternative modelling scenarios appear not to have been carefully considered, especially where there were viable alternatives to lockdown strategies. This lack of consideration appears to be related to the costs of deviating from herd behaviour and also to the lack of voice provided to alternative perspectives on how best to minimize the overall and long-term costs of Covid-19.

Conclusion

Globally, locking down the economy has been the major tool adopted to combat Covid-19. This was, and is, a simple solution to a complex problem and, therefore, was a relatively easy choice to make given crisis circumstances within which decisions had to be taken. This was and is a case where decision-makers rationally adopted herd heuristics. I argue that this approach is an example of adopting inappropriate, error-prone, and highly damaging and even deadly heuristics (Altman, 2017b, 2017c; Altman H., 2020). The approach taken also was a binary one for many: either lockdown the economy or keep it open with little or no controls or regulations imposed. This binary and narrow approach represents the application of an inappropriate mental model or analytical framework generating serious errors in decision-making.

Although lockdown is an accepted mechanism to control or eliminate Covid-19, I argue that this approach is not supported even by a preliminary review of the evidence with respect to the desired outcome of minimizing deaths. The sample data that I present and review, all of which are in the public domain, strongly suggest that lockdown is not a necessary condition for effectively controlling Covid-19. Relatively open economies have done relatively well with regards to deaths per one million individuals. Most spectacularly, this is the case with South Korea, but with Iceland and Singapore as well. In Europe one can see Sweden is more successful than many locked down European economies, although not as successful as its more lockdown prone Nordic neighbours. But what is important to note is that these relatively open economies did not simply maintain the pre-Covid status quo, instead they implemented initiatives, with success, to address Covid-19. Current policy perspectives ignore the viable alternatives to lockdown.

The current dominant view also tends to ignore the longer-term effects of lockdown related policies. Preliminary evidence suggest that lockdown policy will have significant negative impacts on socio-economic wellbeing, by increasing death rates, increasing poverty, deducing human capital, increasing mortality rates, and reducing life expectancy, causing significant bankruptcies and dramatically increasing government debt. These costs need to be brought into play when evaluating lockdown-based policy. And, given available alternatives, it does not appear that extreme lockdown is the optimal approach to addressing the Covid-19 pandemic. On the other hand, it is critical to understand that lockdown requires other significant policies to effectively minimize the deadly

impact of Covid-19. Once again, the choice is not a binary one. Overall, a broader and more nuanced decision-making perspective recognizes that there is no necessary trade-off between minimizing the short- and long-run effects of Covid-19 whilst keeping the economy open in the context of appropriate policy design that is in place and enforced.

To improve the decision-making process, it is critical to acknowledge how decisions tend to be made and are actually made given a world of bounded rationality. One of the lessons from how governments have developed and implemented policy is that all too often policy is based on very narrow and simplistic mental models, not clearly informed by the evidence. What is required are mechanisms in place to provide quality information and analysis to decision-makers as well as to the general public. This could minimize the adoption of inappropriate sub-optimal heuristics by decision-makers and even amongst their advisors. This can best take place in an environment of democratic governance. But this democratic framework must provide voice to experts from different perspectives without fear of retribution from thinking outside of the box. This type of democratic space is not a natural or inevitable by-product of democratic governance.

Acknowledgments

Many thanks to Hannah Altman and Louise Lamontagne for their very helpful comments and suggestions. Also, thanks to the referees and Michelle Baddeley for their helpful comments.

References

Akerlof, George (1970). The Market for 'Lemons': Quality, Uncertainty and the Market Mechanism, *Quarterly Journal of Economics, 84*: 488–500.

Altman, Hannah Josepha Rachel (2020). The behavioural economics of organisational inefficiency: The example of the New Zealand fitness industry. Master of Philosophy thesis, Queensland University of Technology. Accessed May 5, 2020 at: https://eprints.qut.edu.au/198038/.

Altman, Morris (2012). *Behavioral Economics for Dummies*. Wiley: Mississauga, Canada.

Altman, Morris (2014). Mental Models, Bargaining Power, and Institutional Change. Paper presented at *World Interdisciplinary Network for Institutional Research*, First International Conference, University of Greenwich, London, UK, September 11–14.

Altman, Morris (2017a). Policy Consequences of Multiple Equilibria and the Indeterminacy of Economic Outcomes in a Boundedly Rational World: Closing the System with Non-Economic Variables. *Forum for Social Economics, 64*: 234–251.

Altman, Morris (2017b). "Rational Inefficiency: Smart Thinking, Bounded Rationality, and the Scientific Basis for Economic Failure and Success", in Morris Altman (ed.), *Handbook of Behavioural Economics and Smart Decision-Making Rational Decision-Making within the Bounds of Reason*. Cheltenham, England: Edward Elgar.

Altman, Morris, editor (2017c). *Handbook of Behavioural Economics and Smart Decision-Making: Rational Decision-Making within the Bounds of Reason*. Cheltenham, England: Edward Elgar.

Altman, Morris & Lamontagne, Louise (2004). Gender, Human Capabilities and Culture Within the Household Economy: Different Path to Socio-Economic Well-Being? *International Journal of Socio-Economics, 31*: 325–364.

Baddeley, Michelle (2013). Herding, Social Influence and Expert Opinion. *Journal of Economic Methodology, 20*(1): 35–44.

Baddeley, Michelle (2018). *Copycats and Contrarians - Why We Follow Others, and When We Don't*. London/New Haven: Yale University Press.

BBC (2020). Coronavirus: World Bank Warns 60m at Risk of 'Extreme Poverty'. *BBC News*. Accessed May 20, 2020 at www.bbc.co.uk/news/business-52733706.

Booth, Robert (2020). Half of coronavirus deaths happen in care homes, data from EU suggests. *The Guardian*. Assessed May 4, 2020 at: www.theguardian.com/world/2020/apr/13/half-of-coronavirus-deaths-happen-in-care-homes-data-from-eu-suggests.

Buchwald, Elisabeth (2020). What we can learn from South Korea and Singapore's efforts to stop coronavirus (besides wearing face mask). *MarketWatch*. Accessed May 3, 2020 at: www.marketwatch.com/story/what-we-can-learn-from-south-korea-and-singapores-efforts-to-stop-coronavirus-in-addition-to-wearing-face-masks-2020-03-31.

Campbell, Charlie (2020). South Korea's Health Minister on How His Country Is Beating Coronavirus Without a Lockdown. *Time*. Assessed May 3, 2020 at: time.com/5830594/south-korea-covid19-coronavirus/.

Cho, Hael-Woi (2020). Effectiveness for the response to Covid-19: The MERS Outbreak Containment Procedures. *Osong Public Health and Research Perspectives, 1*: 1-2.

Denzau, A., & North, D. C. 1994. Shared Mental Models: Ideologies and Institutions. *Kyklos Fasc 1*: 3–31.

Fleming, Sean (2020). South Korea's Foreign Minister explains how the country contained COVID-19. *World Economic Forum*. Accessed May 3, 2020 at: www.weforum.org/agenda/2020/03/south-korea-covid-19-containment-testing/.

FT Visual and Data Journalism Team (2020). Coronavirus Tracked: The Latest Figures as Countries Fight to Contain the Pandemic. *Financial Times*. Accessed May 20, 2020 at www.ft.com/content/a26fbf7e-48f8-11ea-aeb3-955839e06441.

Gigerenzer, Gerd (2007). *Gut Feelings: The Intelligence of the Unconscious*. New York: Viking.

Hannan, Daniel (2020). *If Sweden succeeds, lockdowns will all have been for nothing*. Accessed April 26, 2020 at: www.telegraph.co.uk/news/2020/04/25/sweden-succeeds-lockdownswill-have-nothing/comments.

Henley, Jon (2020). Sweden queries basis of lockdowns as Germany keeps its guard up. *The Guardian*. Accessed April 26, 2020 at: www.theguardian.com/world/2020/apr/24/sweden-queries-basis-of-lockdowns-as-germany-keeps-its-guard-up.

Hirschman, Albert O. (1970). *Exit, Voice, and Loyalty: Responses to Decline in Firms, Organizations, and States*. Cambridge, MA: Harvard University Press.

International Labour Organization (2020). As job losses escalate, nearly half of global workforce at risk of losing livelihoods. *International Labour Organization*. Accessed May 4, 2020 at: www.ilo.org/global/about-the-ilo/newsroom/news/WCMS_743036/lang–en/index.htm.

Kahneman, Daniel (2011). *Thinking, Fast and Slow*. New York: Farrar, Straus and Giroux.

Keynes, John Maynard (1936) [2007]. *The General Theory of Employment, Interest and Money*. London: Macmillan.

Kwon, Soonman (2020). Covid-19: Lessons from South Korea. *Health Systems Global*. Accessed May 17, 2020 at: https://www.healthsystemsglobal.org/blog/406/COVID-19-Lessons-from-South-Korea.html.

Lintern, Shaun (2020). Coronavirus: Global Experts Tell MPs How They Avoided UK's Care Home Crisis. *Independent*. Accessed May 17, 2020 at: www.independent.co.uk/news/health/coronavirus-uk-care-homes-mps-hospitals-deaths-a9522006.html.

LeMieux, Julianna (2020). Iceland's Aggressive Covid-19 Tested Helped Curb Outbreak. *GEN: Genetic Engineering and Biotechnology News*. Accessed May 4, 2020 at: www.genengnews.com/news/icelands-aggressive-covid-19-testing-helped-curb-outbreak/.

Mark, Joshua J. (2020). Medieval Cures for the Black Death. emphAncient History Encyclopedia. Accessed May 7, 2020 at: www.ancient.eu/article/1540/medieval-cures-for-the-black-death/.

Meunier, Thomas A. J. (2020). Full lockdown policies in Western Europe countries have no evident impacts on the COVID-19 epidemic. *MedRxiv*. Accessed May 1, 2020 at www.medrxiv.org/content/10.1101/2020.04.24.20078717v1.full.pdf.

Observer Reporters (2020). Across the World, Figures Reveal Horrific Toll of Care Home Deaths. *The Guardian*. Accessed May 17, 2020 at www.theguardian.com/world/2020/may/16/across-the-world-figures-reveal-horrific-covid-19-toll-of-care-home-deaths.

OECD (2020). Testing for COVID-19: A way to lift confinement restrictions. Accessed May 2, 2020 at read.oecd-ilibrary.org/view/?ref=129_129658-l62d7lr66u&title=Testing-for-COVID-19-A-way-to-lift-confinement-restrictions.

Orange, Richard (2020). Anger in Sweden as Elderly Pay Price for Coronavirus Strategy. *The Guardian*. Accessed May 17, 2020 at www.theguardian.com/world/2020/apr/19/anger-in-sweden-as-elderly-pay-price-for-coronavirus-strategy.

Nichols, Michelle (2020). U.N. warns economic downturn could kill hundreds of thousands of children in 2020. *Reuters*. Accessed May 4, 2020 at: www.reuters.com/article/us-health-coronavirus-children-un/u-n-warns-economic-downturn-could-kill-hundreds-of-thousands-of-children-in-2020-idUSKBN21Y2X7.

Pell, M. B., & Benjamin Lesser (2020). Special Report - How the COVID-19 lockdown will take its own toll on health. *Reuters*. Accessed May 4, 2020 at: uk.reuters.com/article/uk-health-coronavirus-usa-cost-special-r/special-report-how-the-covid-19-lockdown-will-take-its-own-toll-on-health-idUKKBN21L21K.

Politico (2020). Europe's coronavirus lockdown measures compared. *Politico*. Assessed May 3, 2020 at: www.politico.eu/article/europes-coronavirus-lockdown-measures-compared/.

Potter, Christina (2020). Lessons from Iceland. *Outbreak Observatory*. Assessed May 17, 2020 at: www.outbreakobservatory.org/outbreakthursday-1/4/16/2020/the-success-of-iceland.

Rolander, Niclas (2020). Sweden Says Controversial Virus Strategy Proving Effective. *Bloomberg*. Assessed May 4, 2020 at: www.bloomberg.com/news/articles/2020-04-19/sweden-says-controversial-covid-19-strategy-is-proving-effective.

Roser, Max, Hannah Ritchie, Esteban Ortiz-Ospina & Joe Hasell (2020). Coronavirus Pandemic (COVID-19). Published online at *OurWorldInData.org*. Assessed May 3, 2020 at: ourworldindata.org/coronavirus.

Simon, H. A. (1978). Rationality as a Process and as a Product of Thought. *American Economic Review, 70*: 1–16.

Simon, H. A. (1987). "Behavioral Economics", in J. Eatwell, M. Millgate, & P. Newman, eds., *The New Palgrave: A Dictionary of Economics*. London: Macmillan.

Sternlicht, Alexandra (2020). South Korea's Widespread Testing and Contact Tracing Lead to First Day with No New Cases. *Forbes*. Assessed May 19, 2020 at: www.forbes.com/sites/alexandrasternlicht/2020/04/30/south-koreas-widespread-testing-and-contact-tracing-lead-to-first-day-with-no-new-cases/.

Strochlic, Nina, & Riley D. Champine (2020). How some Cities 'Flattened the Curve' During the 1918 Flu Pandemic. *National Geographic*. Accessed May 20, 2020 at www.nationalgeographic.com/history/2020/03/how-cities-flattened-curve-1918-spanish-flu-pandemic-coronavirus/.

Thaler, Richard H., & Cass R. Sunstein (2009). *Nudge: Improving Decisions About Health, Wealth, and Happiness*. New York: Penguin Books.

Townsend, Adam (2020). Sweden and Singapore: The Covid-19 'Soft' Approach vs. Techno-Surveillance. *MedicineNet*. Assessed May 4, 2020 at: www.medicinenet.com/script/main/art.asp?articlekey=230288.

Worldometer (2020). *Reported Cases and Deaths by Country, Territory, or Conveyance*. Worldometers. Assessed May 2, 2020 at: www.worldometers.info/coronavirus/.