Efficacy of Lockdowns against Covid-19: A Literature Review

Definition

"Lockdown" means "shelter in place" or "stay at home", often together with closure of business premises. Lockdown does NOT subsume social distancing, which may be implemented independently of lockdown.

Studies Sought

Interest is confined to studies based on real-world Covid data (whether infections, hospitalisations, deaths, or other Covid severity data) addressing the effect/efficacy of lockdowns. Purely mathematical model predictions unconstrained by real world data were excluded (though this does not exclude the use of mathematical models in performing the analysis of real-world data – inevitably most studies do so in some form).

Summary Table Column Definitions

Method

Timeline = studies identifying reductions in a disease signal (cases, deaths, etc) which coincides with introduction of lockdown, after allowing for appropriate delay

Regression = regression fitting of outcome data to identify contributing variables

MM = mathematical model or mechanistic model constrained by real world data

CSC = Cohort Study against a Control group.

OSM = Other Statistical Methods

MA(n) = Meta-Analysis (number of studies used)

CB = Cost-Benefit analysis

Informal = inferences made by comparison of countries or other informal means

Refute: An entry indicates that a reference is a refutation of the case promoted by the specified Ref number.

Date: Month/Year of publication of study

Outcome

- Eff = study indicates the lockdown was efficacious
- Not Eff = study indicates the lockdown was not efficacious
- See note /footnote = I was unable to classify the study as indicating efficacy or lack of efficacy for a variety of reasons clarified in the Note or footnote.
- CB = Cost-benefit analysis indicates net benefit
- Not CB = Cost-benefit analysis indicates net cost

Searches

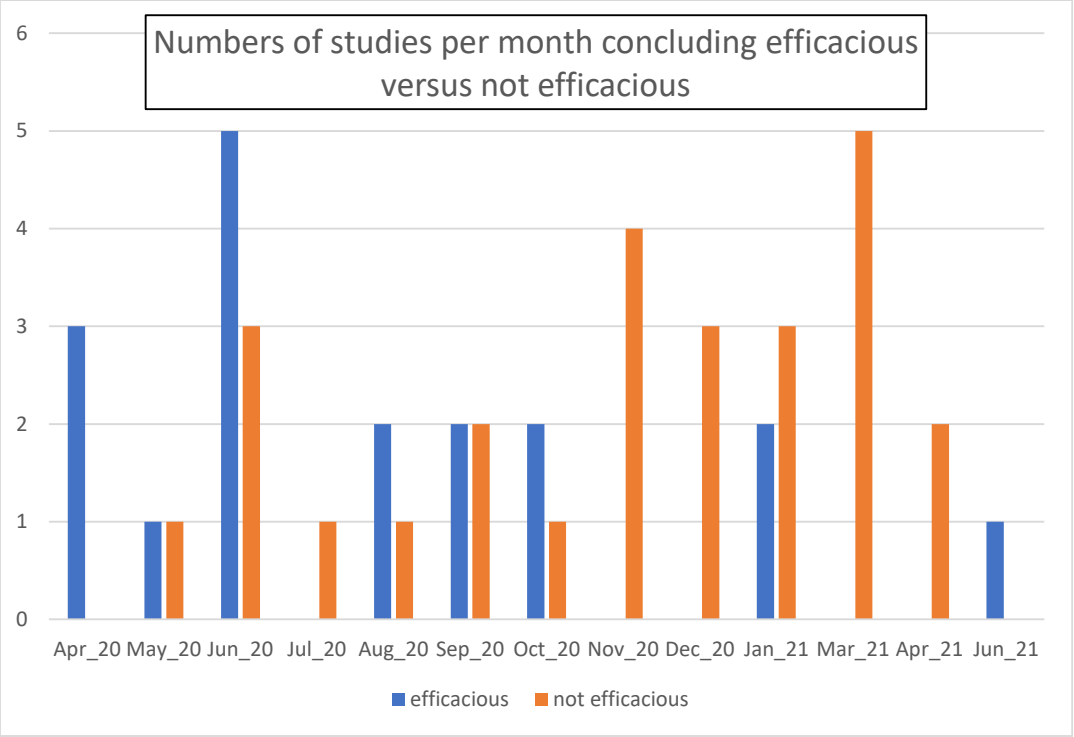
I used Google Scholar with the key words below, examining the first 40 hits for each set of key words. I have also included any studies the existence of which has come to my attention by any means. Such searches are necessarily open-ended. There will be many more out there.

- "Covid+lockdown+effect"
- "Covid+lockdown+effectiveness"
- "Covid+lockdown+efficacy"
- "Covid+Stay at home"

Findings

A Summary Table, below, attempts to classify the stated references into those which conclude that lockdowns were efficacious and those which conclude lockdowns were not efficacious. In some cases I could not classify either way, in which case there is a Note/footnote to explain why not. My Notes (generally quotes) follow the References.

My final step was to re-order the Summary Table chronologically. This is very revealing as there appears to have been a tendency for the early dominance of "efficacious" studies to give way later to the dominance of "not efficacious" studies. The histogram is…



Totals: 18 efficacious, 26 not efficacious.

However, since there will be many more studies out there which I have not identified here (due to limited time & energy) I hesitate to draw any swinging conclusion from this….other than that there is clearly no shortage of studies which refute claims of lockdown efficacy.

Observations

Some of my observations regarding the difficulties in determining the efficacy of lockdowns are given at the end, following the Notes.

Summary Table (chronological order of publication date): 52 relevant studies.

Ref	Country	Method	Refute	Date	Outcome	Notes
12	generic	MM		7/08	Not Eff	8
39	Itay	timeline		4/20	Eff[6]	28
36	China	timeline		4/20	Eff	
43	China	MA(10)		4/20	Eff	30
51	USA	regression		4/20	*see note*	33
46	USA	MM		5/20	*see note*	32
40	Pakistan	timeline		5/20	[7]	
42	World	regression		5/20	Eff[8]	
8	Europe	MM		5/20	Not Eff	4
1	Germany	timeline		6/20	Eff	
2	Germany	timeline		6/20	Eff	
3	Germany	timeline	1,2	6/20	Not Eff	1
5[1]	Europe	MM		6/20	Eff	
6	Europe	MM	5	6/20	Not Eff	2
32	World	regression		6/20	Eff	
28	World	regression		6/20	Eff	
38	Greece	timeline		6/20	Not Eff	27
7	Europe	regression		7/20	*see note*	3
17	World	OSM		7/20	Not Eff	13
47	USA	regression		8/20	Eff	47
15	24 countries	MM		8/20	Not Eff	11
29	USA	regression		8/20	Eff	
41	Italy	timeline		8/20	*see note*	29
49	USA	timeline		9/20	Eff	
9	Europe	MM	5	9/20	Not Eff	5
11	Israel	CB		9/20	Not CB	7
45	World	MM		9/20	Eff	45
37	World	MA(10)[5]		10/20	Eff	
10	UK	MM		10/20	Not Eff	6
50	USA	regression		10/20	Eff	
21	World	regression		11/20	Not Eff	17
18	World	OSM		11/20	Not Eff	14
19	Taiwan	Informal		11/20	Not Eff	15
20	USA	regression		11/20	Not Eff	16
52	World	regression		11/20	*see note*	34
26	Europe	MM	5	12/20	[4]	22
13	Europe	MM		12/20	Not Eff	9
22	Europe	regression		12/20	Not Eff	18
44	Europe	MM		12/20	Not Eff	31
23	Europe	regression		1/21	Not Eff	19
24	Denmark	CSC		1/21	Not Eff	20
25	World	MA(22)		1/21	9% Eff[3]	21
33	World	regression		1/21	Eff	
48	World	regression		1/21	Eff	
4	UK	timeline	5	3/21	Not Eff	
14	Europe	regression		3/21	Not Eff	10

16	England	CSC[2]		3/21	Not Eff	12
27	World	regression	5	3/21	Not Eff	23
34	USA	OSM		3/21	Not CB	26
30	USA	regression	28, 29	4/21	Not Eff	24
31	World	CB/MA(80)		4/21	Not CB	25
35	USA	timeline		6/21	Eff	

[1]This is the Imperial College Model, which has been critiqued and found wanting by 5 other studies in this list. It is also worth reading the Comments that follow Ref.5 in the online version of the paper in Nature.

[2]Relates to living with children and school closures rather than full lockdown.

[3]91% of Non-Pharmaceutical Intervention effectiveness was not due to lockdowns.

[4]Concludes that Ref.5's conclusion re efficacy of lockdowns is invalid

[5]Most of the 10 studies were models, so it is not clear to what extent this MA is based on real-world data

[6]Although R is shown to drop below 1, I can see nothing in the paper that ties this fact to the lockdown rather than happening naturally, or for other reasons.

[7]The paper claims lockdown to have been effective, but the basis of this is obscure as the data presented show a continuously increasing case-rate during and after lockdown. It seems clear to me that their data implies that lockdown was not effective. So I've left the Outcome column blank.

[8]Less efficacious in developed countries

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Notes

[1] Ref.3 considers that Refs 1 and 2 have not correctly identified the relative timings including delays. They conclude that official data from Germany's RKI agency suggest strongly that the spread of the corona virus in Germany receded autonomously, before any interventions become effective.

[2] "In case of a finite population, the effective reproduction number falls automatically and necessarily over time since the number of infections would otherwise diverge. The model of Flaxman et al contradicts this elementary insight. They estimate R(t) from

daily deaths associated with SARS-CoV-2 using as an a priori restriction that R(t) may only change at those dates where interventions become effective. Such an approach does not prove that NPIs were effective but rather begs the result, i.e., involves circular logic. Contrary to the findings of Flaxman et al, Fig. 2 strongly suggests that the UK lockdown was both superfluous and ineffective."

[3] "We found that closure of education facilities, prohibiting mass gatherings and closure of some non-essential businesses were associated with reduced incidence whereas stay at home orders and closure of all non-businesses was not associated with any independent additional impact."

[4] "Comparing the trajectory of the epidemic before and after the lockdown, we find no evidence of any discontinuity in the growth rate, doubling time, and reproduction number trends."

[5] "Flaxman et al. concluded that "major non-pharmaceutical interventions – and lockdowns in particular – have had a large effect on reducing transmission" [2]. We show that relaxing the assumption of homogeneity to allow for individual variation in susceptibility or connectivity gives a model that has better fit to the data and more accurate 14-day forward prediction of mortality. Allowing for heterogeneity reduces the estimate of "counterfactual" deaths that would have occurred if there had been no interventions from 3.2 million to 262,000, implying that most of the slowing and reversal of COVID-19 mortality is explained by the build-up of herd immunity…. Whatever value is specified for the infection fatality ratio, a model that allows for heterogeneity has better fit to the data than the homogeneity model and supports herd immunity as the main factor underlying the reversal of the epidemic."

[6] "The model predicted that school closures and isolation of younger people would increase the total number of deaths, albeit postponed to a second and subsequent waves. The findings of this study suggest that prompt interventions were shown to be highly effective at reducing peak demand for intensive care unit (ICU) beds but also prolong the epidemic, in some cases resulting in more deaths long term." From the opinion commentary published alongside the paper: "While school closures are an interesting case, the general lesson from the model is simple. The effective interventions are those which focus strongly on protecting the vulnerable. Broader measures across all of society turn out to be counterproductive in the long term, even if compliance on the most effective features is uncompromised. In practice, the failure to focus on protecting care homes meant that the first wave was, disastrously, to concentrate the pandemic on the most vulnerable."

[7] The Incremental Cost-Effectiveness Ratio was calculated to be on average $45M per death prevented.

[8] "Epidemic theory dictates that a reduction in the force of infection by a pathogen is associated with an increase in the average age at which individuals are exposed. For those pathogens that cause more severe disease among hosts of an older age, interventions that limit transmission can paradoxically increase the burden of disease in a population." (The force of this argument diminishes if vaccines are widely adopted, highly efficacious and maintain their efficacy over life. These conditions are currently still in doubt).

[9] The authors argued that 180 days of lockdown would produce more deaths overall rather than less.

[10] "I explore the association between the severity of lockdown policies in the first half of 2020 and mortality rates. Using two indices from the Blavatnik Centre's COVID-19 policy measures and comparing weekly mortality rates from 24 European countries in the first halves of 2017–2020, addressing policy endogeneity in two different ways, and taking timing into account, I find no clear association between lockdown policies and mortality development."

[11] "Our ability to identify empirically which NPI's have what impact on disease transmission depends on there being enough independent variation in both NPI's and disease transmission across locations as well as our having robust procedures for controlling for other observed and unobserved factors that might be influencing disease transmission. The facts that we document in this paper cast doubt on this premise. Our finding in Fact 1 that early declines in the transmission rate of COVID-19 were nearly universal worldwide suggest that the role of region-specific NPI's implemented in this early phase of the pandemic is likely overstated. This finding instead suggests that some other factor(s) common across regions drove the early and rapid transmission rate declines….Our findings in Fact 2 and Fact 3 further raise doubt about the importance in NPI's (lockdown policies in particular) in accounting for the evolution of COVID-19 transmission rates over time and across locations. Many of the regions in our sample that instated lockdown policies early on in their local epidemic, removed them later on in our estimation period, or have have not relied on mandated NPI's much at all. Yet, effective reproduction numbers in all regions have continued to remain low relative to initial levels indicating that the removal of lockdown policies has had little effect on transmission rates."

[12] "Among 9,157,814 adults ≤65 years, living with children 0-11 years was not associated with increased risks of recorded SARS-CoV-2 infection, COVID-19 related hospital or ICU admission but was associated with reduced risk of COVID-19 death (HR 0.75, 95%CI 0.62-0.92). Living with children aged 12-18 years was associated with a small increased risk of recorded SARS-CoV-2 infection (HR 1.08, 95%CI 1.03-1.13), but not associated with other COVID-19 outcomes….. Among 2,567,671 adults >65 years there was no association between living with children and outcomes related to SARS-CoV-2. We observed no consistent changes in risk following school closure."

[13] "We test and find wanting the popular notions that lockdowns with their attendant social distancing and various other NPIs confer protection."

[14] "Stringency of the measures settled to fight pandemia, including lockdown, did not appear to be linked with death rate."

[15] "The Taiwanese case reveals something extraordinary about pandemic response. As much as public-health authorities imagine that the trajectory of a new virus can be influenced or even controlled by policies and responses, the current and past experiences of coronavirus illustrate a different point. The severity of a new virus might have far more to do with endogenous factors within a population rather than the political response. According to the lockdown narrative, Taiwan did almost everything

"wrong" but generated what might in fact be the best results in terms of public health of any country in the world."

[16] Some counties in the USA adopted lockdowns and some did not, and those did adopt lockdowns did so at a range of dates. These data were used to in regressions using 22 control variables, including county population and density, the elder share, the share in nursing homes, nine other demographic and economic characteristics and a set of regional fixed effects. Conclusion: "There is no evidence that counties with a lockdown have fewer deaths. For all three dates, the coefficient on lockdown is statistically insignificant."

[17] "While conventional wisdom, to date, has been that lockdowns were successful (ranging from mild to spectacular) we find not one piece of evidence supporting this claim. This paper has attempted to document, and estimate, all the methods employed in the literature….We have offered a wide variety of evidence that emphatically rejects the lockdown equals less infections hypothesis. Over 20 indicators of lockdown were tested to identify their effects on the rate of growth of infections (or deaths). In less than ten percent of the cases, the lockdowns had a positive effect. In more than three times the "positive" cases, the effect was perverse i.e. lockdowns led to more infections, more deaths….. Only for 15 out of 147 economies the lockdown "worked" in making infections lower; for more than a hundred countries, post lockdown estimate of infections was more than three times higher than the counter-factual. This is not evidence of success – rather it is evidence of monumental failure of lockdown policy…. In conclusion, we find overwhelming evidence that lockdowns were a failure."

[18] "Lockdown appeared the most effective measure to save lives in the original analysis of 11 European countries performed by the Imperial College team through model 1. This analysis was published in Nature and has probably had a major impact to maintain a mentality among policy makers that lockdown should be used during the advent of second waves in many countries in the Fall of 2020. However, model 2 (which was also originally developed by the same team), suggests that these impacts were highly exaggerated, with little or no benefit from lockdown in most of the same countries. Importantly, model 2 typically outperformed model 1 in data fit. Consideration of longer follow-up that included also the lifting of many measures still suggested that the originally claimed effects of lockdown are grossly overstated. Fitting yet a third model, resulted in yet further variant conclusions, with only mobility and event ban having regression coefficients with 95%CIs that did not contain 0 for the period until May 5th. Model 3 found that the simple banning of public events was beneficial, while lockdown had no consistent impact."

[19] This study disaggregates the effect of the more restrictive NPIs (stay-at-home and business closures, i.e., lockdowns) from less restrictive NPIs. "Implementing any NPIs was associated with significant reductions in case growth in 9 out of 10 study countries, including South Korea and Sweden that implemented only less restrictive NPIs (Spain had a nonsignificant effect). After subtracting the epidemic and "less restrictive NPI" effects, we find no clear, significant beneficial effect of more restrictive NPIs (i.e., lockdowns) on case growth in any country. In France, for example, the effect of mrNPIs (lockdowns) was +7% (95% CI: −5%-19%) when compared with Sweden and + 13% (−12%-38%) when compared with South Korea (positive means pro-contagion."

[20] “Here, we analyse the unique case-controlled epidemiological dataset arising from the selective lockdown of parts of Northern Denmark, but not others, as a consequence of the spread of mink-related mutations in November 2020. Our analysis shows that while infection levels decreased, they did so before lockdown was effective, and infection numbers also decreased in neighbour municipalities without mandates.”

[21] “Mandated behavioral changes took place as a result of the banning of certain activities deemed non-essential. Studies which differentiate between the two types of behavioral change find that, on average, mandated behavioral changes accounts for only 9% (median: 0%) of the total effect on the growth of the pandemic stemming from behavioral changes. The remaining 91% (median: 100%) of the effect was due to voluntary behavioral changes. This is excluding the effect of curfew and facemasks, which were not employed in all countries.”

[22] “Flaxman et al (*i.e., my Ref.5*) took on the challenge of estimating the effectiveness of five categories of non-pharmaceutical intervention (NPI)…On the basis of mortality data collected between January and early May 2020, they concluded that only one of these, the lockdown, had been effective in 10 out of the 11 European countries that were studied. However, here we use simulations with the original model code to suggest that the conclusions of Flaxman et al. with regard to the effectiveness of individual NPIs are not justified. Although the NPIs that were considered have indisputably contributed to reducing the spread of the virus, our analysis indicates that the individual effectiveness of these NPIs cannot be reliably quantified. We conclude that the mode (*i.e., of Flaxman et al*) is in effect too flexible, and therefore allows the data to be explained in various ways. This has led the authors to go beyond the data in reporting that particular interventions are especially effective. This kind of error - mistaking assumptions for conclusions - is easy to make, and not especially easy to catch, in Bayesian analysis.”

[23] “87 regions around the world were included, yielding 3741 pairwise comparisons for linear regression analysis. Only 63 (1.6%) comparisons were significant…In ~ 98% of the comparisons using 87 different regions of the world we found no evidence that the number of deaths/million is reduced by staying at home.”

[24] “We study the health, behavioral, and economic effects of one of the most politically controversial policies in recent memory, shelter-in-place orders during the COVID-19 pandemic. Previous studies have claimed that shelter-in-place orders saved thousands of lives, but we reassess these analyses and show that they are not reliable. We find that shelter-in-place orders had no detectable health benefits, only modest effects on behavior, and small but adverse effects on the economy. To be clear, our study should not be interpreted as evidence that social distancing behaviors are not effective. Many people had already changed their behaviors before the introduction of shelter-in-place orders, and shelter-in-place orders appear to have been ineffective precisely because they did not meaningfully alter social distancing behavior.”

[25] “An examination of over 80 Covid-19 studies reveals that many relied on assumptions that were false, and which tended to over-estimate the benefits and under-estimate the costs of lockdown. As a result, most of the early cost/benefit studies arrived at conclusions that were refuted later by data, and which rendered their cost/benefit

findings incorrect. Research done over the past six months has shown that lockdowns have had, at best, a marginal effect on the number of Covid-19 deaths. Generally speaking, the ineffectiveness of lockdown stems from voluntary changes in behavior. Lockdown jurisdictions were not able to prevent non-compliance, and non-lockdown jurisdictions benefited from voluntary changes in behavior that mimicked lockdowns. The limited effectiveness of lockdowns explains why, after one year, the unconditional cumulative deaths per million, and the pattern of daily deaths per million, is not negatively correlated with the stringency of lockdown across countries. Using a cost/benefit method proposed by Professor Bryan Caplan, and using two extreme assumptions of lockdown effectiveness, the cost/benefit ratio of lockdowns in Canada, in terms of life-years saved, is between 3.6–282. That is, it is possible that lockdown will go down as one of the greatest peacetime policy failures in Canada's history."

[26] "Thus, the use of blanket shelter-in-place orders during this pandemic is tantamount to killing a fly with a sledgehammer. Given how narrowly focused the mortality of COVID-19 has been, alternative and more targeted policies could have more effectively combatted the disease that would not have had unforeseen consequences such as those mentioned above."

[27] I have classed this as showing lockdowns as "Not Efficacious" despite the Abstract which bullishly asserts this: "Delta Days (DD) referred to the difference in the days of reaching 1 case/million people to the adoption of lockdown. Results: Higher healthcare expenditure as % of the national GDP was not correlated with better 30-day mortality outcomes. DD index was significantly correlated to the incidence of COVID-19 per million people at 30 days (p-value=0.001). The correlation between DD and 30-day mortality was not statistically significant (p-value=0.087). Conclusion: Early lockdown was proven to be the appropriate policy to limit the spread of COVID-19. Greece was a success story in preventing spread despite limited resources." In fact the definition of DD is such that its correlation with the 30-day incidence of Covid means nothing as regards the efficacy of lockdown (this is a logical error), and this is the only positive outcome reported.

[28] "On March 10, 2020, Italy imposed a national lockdown to curtail the spread of COVID-19. Here we estimate that, fourteen days after the implementation of the strategy, the net reproduction number to has dropped below the epidemic threshold – estimated range 0.4-0.7. Our findings provide a timeline of the effectiveness of the implemented lockdown, which is relevant for a large number of countries that followed Italy in enforcing similar measures…. Our results suggest that the restrictive interventions put in place to limit the spread of SARS-CoV-2 in Italy have been successful in bringing the reproduction number significantly below 1 within two weeks from the national lockdown on March 11, 2020." My note: although R is shown to drop below 1, I can see nothing in the paper that ties this fact to the lockdown rather than happening naturally, or for other reasons.

[29] Various regions in Italy were locked down at different times and in two phases. The first 'soft' lockdown included among other measures the closure of all schools and universities in the country, and all non-essential industrial and commercial activities; limiting the activities of public offices; prohibiting any gathering of people in churches, museums, and leisure areas; and decreasing public transportation. The paper claims

that, “mobility restriction was inversely related to the daily number of newly diagnosed SARS-CoV-2 positive cases only after the second, more effective lockdown”. The paper usefully quantifies the reductions in mobility due to the two phases of lockdown, and graphical results show that the two phases each produced about the same degree of mobility reduction immediately (although the second lockdown continued to reduce mobility in a linear manner thereafter also). But the data show that, in all regions, the case-rate increased markedly whilst the first lockdown only was in force (a period of about 18 days). I can see nothing in the comparison of the timelines of the infection curves and the lockdown mobility curves to indicate that the latter had any bearing on the former. The authors seem merely to assume that that must be the case – but one cannot assume what a study is supposed to demonstrate. Consequently I have left the “Outcome” column in my summary Table blank.

[30] This meta-analysis reviews approximately ten studies based on models. The extent to which real-world data constrains these models, versus the extent to which the models are mere theoretical predictions, is not clear.

[31] “As input data, we used COVID-19 epidemiological information collected in fifteen European countries either in private surveys or using official statistics. Thirteen countries implemented lockdown measures, two countries (Sweden, Iceland) not. As output parameters, we studied herd immunity level and time of formation. Comparison of these parameters was used as an indicator of effectiveness / ineffectiveness of lockdown measures. In the absence of a medical vaccine, herd immunity may be regarded as a factor of population adaptation to severe acute respiratory syndrome-related coronavirus-2, the viral pathogen causing COVID-19 disease (SARS-CoV-2), and hence COVID-19 spreading stop. We demonstrated that there is no significant difference between lockdown and no-lockdown modes of COVID-19 containment, in terms of both herd immunity level and the time of achieving its maximum. The rationale for personal and business lockdowns may be found in the avoidance of healthcare system overburdening. However, lockdowns do not prevent any virus with droplet transmission (including SARS-CoV-2) from spreading….. The analysis of both epidemiological data and simulation results indicates that the initially anticipated herd immunity level for SARS-CoV-2 of nearly two thirds of a population or even higher, is hardly ever achievable. The real herd immunity for the current virus is three-six times as less. Therefore, COVID-19 contagiousness is not so high as it was initially thought in January-March 2020. Almost universal and worldwide implementation of lockdown measures and complete switching off the economies, as it has been done in Germany, France, Russia or UK, may be reckless.”

[32] The paper does not make an explicit conclusion about lockdown effectiveness. It concludes, “In all 4 states, cumulative hospitalizations up to and including the median effective date of a stay-at-home order closely fit and favored an exponential function over a linear fit. However, after the median effective date (*i.e., of lockdown*), observed hospitalization growth rates deviated from projected exponential growth rates with slower growth in all 4 states”. But this does not establish a causal link.

[33] This paper reverses the usual assumed order of causality and considers how rising infection rates lead a population to restrict its own mobility, independent of

Government mandated lockdowns. “We find that a rise of local infection rate from 0% to 0.003% is associated with a reduction in mobility by 2.31%”.

[34] The paper only discusses the impact of timing of lockdown on the time taken to reach peak case-rate or death-rate. It does not discuss whether lockdowns reduce either peak rates or total integrated cases/deaths. Therefore I have left the Outcome column blank.

Observations

I noted many papers which were purely mathematical model ***predictions***, not analyses of real-world data. These were not included in my Summary Table. Inevitably such models would include some form of assumption for decreased transmission rates consequent upon decreased population mobility. Equally inevitably such models will “predict” a beneficial effect of lockdown, but only because the model is based upon that assumption. To examine whether the assumption is valid, examination of real-world data following lockdowns is essential.

It is clear that if lockdowns are sufficiently draconian (in the limit, locking the entire population into one-person cells, with only sterilised items entering the cell and zero human contact) then infection must be curtailed. Figure 1 below, from Ref.45, suggests that lockdowns might have been sufficiently draconian in China – and possibly in South Korea.

This Figure illustrates the difficulty of identifying a lockdown effect in other cases (countries). The green arrow denotes the start of lockdown whilst the curve is cumulative cases. It hardly leaps out at one that there is a beneficial effect (though Ref.45 does conclude efficacy). Infection rates continue to increase for a long time after lockdown, in some cases without reducing at any time plotted.

Figure 1 (Ref.45)

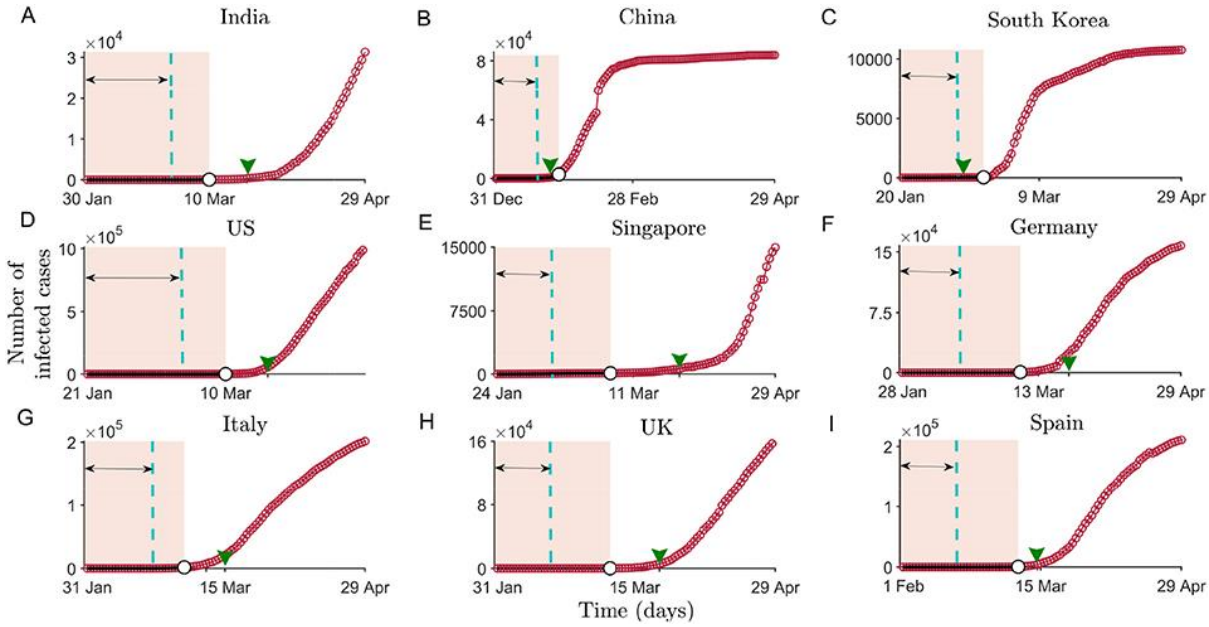
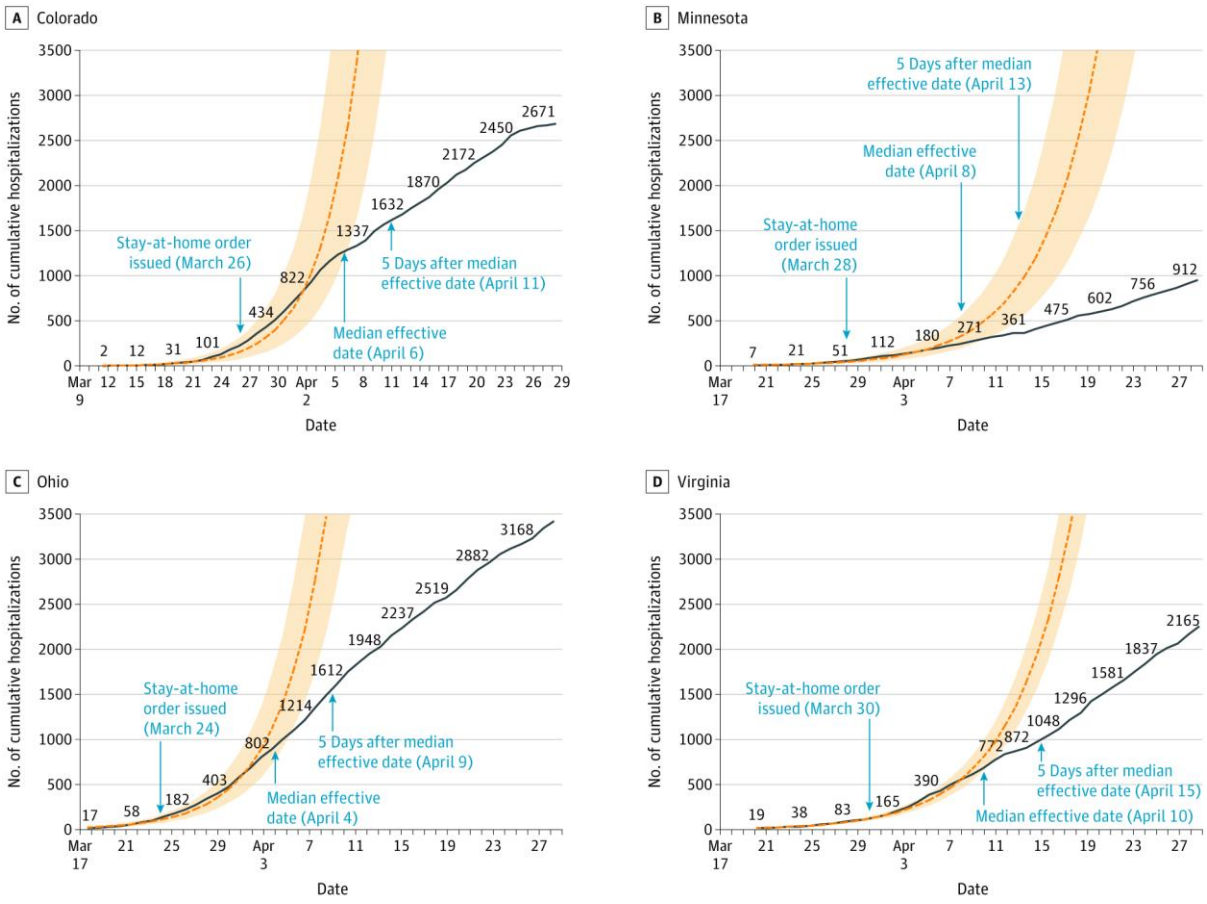


Figure 2, from Ref.46, relates to four States of the USA. It merely fits an exponential curve to the early data – and then notes that the data after lockdown lies below this extrapolated exponential curve. To be fair the paper does not actually claim that this demonstrates lockdown efficacy – but it seems to imply that might be indicated. But an extrapolated exponential curve is certain to exceed any real-world data – because nothing is ever

exponential for long. This illustrates a generic issue with many models. In order to identify a lockdown effect one needs to know the counterfactual – what would have happened without lockdown. Since this is not known, authors may rely on model predictions, but then any conclusion about lockdown efficacy is not really about lockdown efficacy – it's about model accuracy in predicting the course of infections (or deaths) if lockdowns were not adopted – an accuracy which is unknowable. Since many models appear not to include those factors which would naturally cause an epidemic to be self-limiting (e.g., herd immunity) one can say immediately that their implicit no-lockdown accuracy would be woeful and hence any conclusions about lockdown efficacy invalid. In short, they might be claiming a benefit for lockdowns which would have occurred anyway.

Regression can, in principle, isolate different causal contributions – but one is still at the mercy of having no data for counterfactuals. Comparative cohort studies against control groups are the way to go to defeat this problem – but are no good if there are significant differences between the populations (in terms of ethnicity, culture, socioeconomics, etc).

Figure 2 (Ref.46)

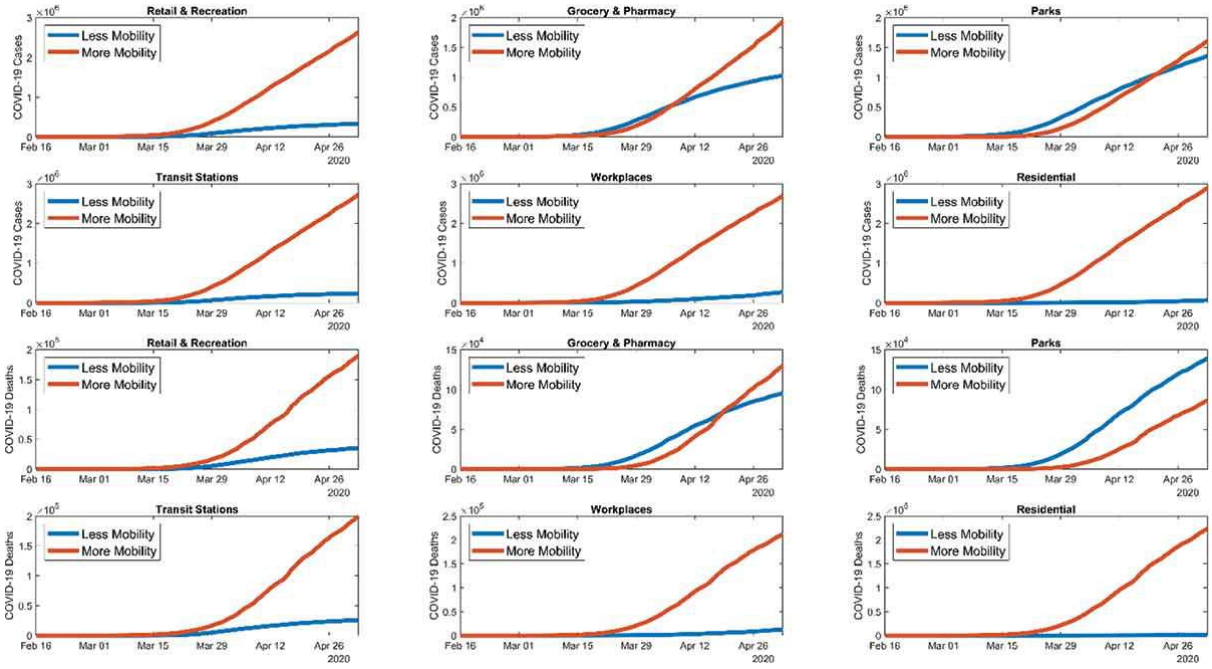


A common logical fallacy in studies seems to be to evaluate case rate, or death rates, before and after lockdown and then to assume that if the latter are reduced compared to the former, then this must be because of the lockdown. This is not only a failure to demonstrate causal connection but worse – it fails to acknowledge that epidemics have a natural growth and subsidence peak. Lockdowns were typically introduced when Government panicked after noting a rising rate of infections or deaths. But the natural course of the epidemic would be such that a peak infection/death rate would be reached after a certain time, perhaps 20 or 28

days or so, and infection/death rates would start to reduce somewhere between the two dates. How, then, can the effect of lockdowns be isolated? I am not convinced that anyone has correctly done so.

Figure 3, from Ref.48, shows cumulative cases and deaths against more mobile or less mobile populations (obtained from all-world data). This is perhaps the most convincing evidence in favour of claims of lockdown efficacy that I spotted. I haven't attempted to critique it.

Figure 3 (Ref.48)



Finally…

I close with a quote from the 2006 advice Disease Mitigation Measures in the Control of Pandemic Influenza compiled by authors including the late Donald A. Henderson, the man acclaimed more than any other individual for the eradication of smallpox.

"Experience has shown that communities faced with epidemics or other adverse events respond best and with the least anxiety when the normal social functioning of the community is least disrupted. Strong political and public health leadership to provide reassurance and to ensure that needed medical care services are provided are critical elements. If either is seen to be less than optimal, a manageable epidemic could move toward catastrophe."

I note that "leadership to provide reassurance" is the exact opposite of what western Governments have been doing.