

THE COSTS AND BENEFITS OF COVID-19 LOCKDOWNS IN NEW ZEALAND AND AUSTRALIA: AN ECONOMIST'S PERSPECTIVE

by Martin Lally

In March 2020, I watched unfolding events relating to covid with considerable consternation, most particularly because proposed actions did not seem to be accompanied by any cost-benefit analysis. On 22 March, I circulated a note that tentatively concluded that even the higher deaths in New Zealand expected from a mitigation policy rather than a China-style suppression policy (drawn from the Ferguson paper for the UK, scaled down for the difference in New Zealand's population) seemed to be hugely outweighed by even a modest guess at the higher GDP losses, using the usual valuation of a Quality Adjusted Life Year (QALY). This first draft morphed into a much more detailed paper, without changing the conclusion. I then applied the same approach to Australia, and the conclusions were the same. Both papers were sent to journals. The Australian paper was eventually published by Monash Bioethics Review in January 2022.¹ The New Zealand paper has yet to be published in a peer-reviewed outlet.²

In both papers, I judged that the primary potential benefit from lockdowns was fewer deaths, and these were estimated from a cross-country regression (using European and South/Central American countries) of death rates against possible explanatory variables. Remarkably, in view of the widely-held view that lockdowns would reduce deaths, the strength of government-mandated restrictions was not significant in explaining deaths in these regressions. Thus, across these countries, those that locked down performed no better or worse in general than those who mitigated. This implies that this data is equivalent to that from a set of countries that each followed a mitigation policy. Accordingly, for any country outside that group and that followed a lockdown policy, the data can be used to estimate the counterfactual covid death rate if this country had instead followed a mitigation policy.

¹ See <https://link.springer.com/article/10.1007/s40592-021-00148-y>.

² See <https://www.medrxiv.org/content/10.1101/2021.07.15.21260606v1>.

Applying this to New Zealand, the result was an estimate of the number of deaths in New Zealand if it had followed a mitigation policy of up to 1,850 to 31 December 2020. For the following year (2021), and as a result of the arrival of the vaccine in December 2020, I expected that a country's vaccination policy and the uptake of the vaccine would primarily determine its covid death rate rather than the statistical model I used for 2020. Rather than attempt to construct a new model applicable to 2021, I estimated New Zealand's counterfactual covid deaths for 2021 under a mitigation policy by using the European average covid death rate for the first six months of 2021 and a further 50% of that for the second half of the year to reflect the downward trend in deaths. From the end of 2021, I anticipated (correctly) that lockdowns would not be pursued in New Zealand and therefore further deaths need not be considered. The resulting estimate of deaths in New Zealand under a mitigation policy up to the end of 2021 was 4,600, compared to the actual experience of less than 30. Thus, I estimated that the lockdowns in New Zealand saved up to 4,600 lives.³ Amongst other reasons, this figure of 4,600 is likely to be too high because New Zealand's extremely low covid death rate up to the end of 2021 (12 per million of population) was followed by an unusually high covid death rate (992 per million of population from 1 January 2022), suggesting that the lockdown policy pursued by New Zealand in 2020 and 2021 simply deferred some covid deaths.⁴ Furthermore, the average covid victim had an estimated residual life expectancy of five years, and a Quality of Life discount of 20%, implying that up to $4,600 * 5 * 0.8 = 18,400$ Quality Adjusted Life Years (QALYs) were saved by the lockdowns.

³ Since the death rate for New Zealand was much less than had it pursued a mitigation policy, one might wonder how this can be reconciled with using a statistical model to estimate New Zealand's death rate if it had followed a mitigation policy that is drawn from data revealing that the policy choice had no effect. The answer lies in the fact that the statistical model only indicates that policy choice was irrelevant in general. It does not preclude the possibility that a small number of countries that pursued lockdowns did experience a lower death rate from doing so, because of unusual circumstances. In the case of New Zealand, the unusual circumstances were the (at least temporary) elimination of the virus, presumably because it is an island, it is well separated from neighboring countries, *and* lockdowns were implemented before the number of cases was large. By contrast, the European and South/Central American comparators that I used did not in general achieve even temporary elimination despite most of them adopting lockdown policies, presumably because most of them are not well separated from neighboring countries or are even islands. In short, New Zealand was blessed by geography. Similar considerations apply to Australia.

⁴ The data is from <https://www.worldometers.info/coronavirus/>. Since 1 January 2022, the covid death rates per one million of population for the UK, France, Germany, Italy, Spain, Poland and Romania (the most populous European countries) have been 764, 661, 750, 916, 680, 605 and 473 respectively. The average across these European countries is 692, so New Zealand's figure of 992 is 44% higher.

Turning now to the costs of the lockdowns, I judged that the principal cost of the lockdowns was the GDP losses. The GDP losses from the pandemic (relative to a no-covid world) were estimated as the difference between the Treasury's December 2019 forecasts of GDP growth over the 2020-2024 period (being the pre-pandemic forecasts) versus its May 2021 estimates and forecasts for the same years, yielding an aggregate loss over these years of 14% of 2019 GDP, which equates to \$43b. A survey of the empirical literature covering numerous countries suggested that about 40% of the pandemic-related GDP losses were due to lockdowns *per se*, and application of this figure to NZ's GDP loss of \$43b yielded a loss due to the lockdowns of $.40 * \$43b = \$17b$.

Dividing this GDP loss of \$17b by the estimated loss of QALYs from not locking down (18,400) yielded a cost per QALY saved by locking down of \$924,000. My attempted quantification of the effect of lockdowns on medical costs, long covid, work absences, and unemployment did not materially alter this cost per QALY. When making public health decisions in New Zealand, the usual valuation of a QALY is GDP per capita, which was \$62,000 at the time of the lockdowns. Thus, the implicit cost per QALY of the lockdowns (the cost incurred by society to save a QALY) vastly exceeded the usual social value of a QALY, implying that the lockdowns were not justified. Using only data on costs and benefits that was available in March 2020 yielded the same conclusion. Further ex-ante analysis allowed for the possibility of changing policy, i.e., initial lockdown followed by mitigation if the situation turned out to be less serious than originally estimated, or initial mitigation followed by lockdown if the situation turned out to be more serious than originally estimated. Within this further analysis, an initial lockdown was still not optimal.

In summary, both papers (for New Zealand and Australia) estimated the reduced deaths and increased GDP losses from a lockdown policy rather than a mitigation policy, valued the saving in lives using conventional measures, and concluded that the increased GDP losses significantly exceeded the value of the lives saved. In anticipation of or in response to contrary arguments, I examined various additional points including testing whether the regressions suffered from reverse causality (i.e., deaths explaining government restrictions

rather than vice versa) and whether the option for a government to change policy might have justified an initial recourse to lockdowns.

After the release of these analyses as working papers, a number of other arguments were raised by referees (or other commentators) that were not addressed in the papers. I therefore address the most significant of these additional points here. Firstly, some commentators argued that covid deaths and GDP losses were affected not merely by the government's lockdown/mitigation choice but by monetary and fiscal policy, and that it is impossible to disentangle the effect of the lockdown/mitigation choice from the effect of fiscal policy and monetary policy.

I do not agree with this. For the purposes of assessing the lockdown/mitigation decision, it is reasonable and consistent with conventional practice in policy evaluation to treat the monetary and fiscal policy decisions taken by governments and central banks (both here and overseas) as optimal. Consequently, the difference in deaths and GDP losses between countries that did and did not lockdown permits assessment of the optimal policy choice of lockdown or mitigation. Similarly, researchers examining a government's optimal choice of fiscal policy will treat that government's lockdown or mitigation decision as optimal.

Secondly, some commentators on my New Zealand analysis argued that the New Zealand medical system would have "collapsed" had a mitigation policy been adopted, thereby compelling adoption of a lockdown policy. I do not agree. Unlike buildings, medical systems do not collapse. In the face of a substantial increase in patient demand, and perhaps also the temporary or permanent loss of some medical staff through illness or death, medical systems adapt by reducing the quality of care offered to many patients so as to maximise the number of people or QALYs saved. The greater the demand increase, the more strongly the system adapts. There is even a word to describe medical systems operating under such extreme conditions (triage) and medical staff are trained to work under such conditions. Consistent with this, countries that adopted mitigation measures did not experience a

“collapse” in their medical systems.⁵ Using the word “collapse” amounts to fear mongering. Furthermore, since I estimated New Zealand’s deaths under a mitigation policy based on observed deaths in European and Central/South American countries and their medical systems would have been adversely affected by covid, their covid death rates would have reflected these covid-induced stresses upon their medical systems. Thus the adverse impact of a mitigation policy upon New Zealand’s medical system is not an issue that precludes adoption of that policy, nor does it even require any additional work in estimating the death toll within my analysis.

Thirdly, and as a variant of the preceding point, some commentators argued that the New Zealand health system was significantly inferior to those of many other high-income countries, and therefore that my use of death rates in foreign countries would underestimate the death rate in New Zealand if it pursued a mitigation policy. The first point is true; the Global Health Security Index for 2019 (which ranks the preparedness of countries to respond to epidemics) ranked New Zealand at only 35th in the world. However, the relevant comparison is with the average of the health systems of the European and South/Central American countries that I used to estimate New Zealand’s covid death toll had it pursued a mitigation policy rather than with the health systems of “other high-income countries”. In respect of the 33 European countries and the 28 South/Central American countries used in my analysis, their average scores were 58.2/100 and 41.0 (the latter based on 23 of the 28 countries for which the Index value was provided), with an overall weighted average score of 51, whilst New Zealand’s score was 54. So, New Zealand’s health system was above rather than below average relative to these comparators. Thus, my use of these comparators would be expected to overestimate rather than underestimate New Zealand’s death rate if it had pursued a mitigation policy rather than a lockdown policy.

⁵ For example, Sweden did not suffer a collapse in its medical system despite following a mitigation policy. Nor did New Zealand after the omicron wave arrived in January 2022, and lockdowns (which had ceased months earlier) were not reinstated, leading to over half of the population being infected within a few months; the system responded to the demand surge by deferring non-urgent hospitalisations, urging people who tested positive to isolate at home, using telephone consultations to identify and hospitalise only the most extreme cases, and paying GPs to deal with patients in the evenings and weekends to reduce the inflow to hospital emergency departments.

Fourthly, some commentators argued that the relative success of the New Zealand and Australian lockdowns in eliminating the virus led to relatively short lockdowns, and therefore the GDP effect of the lockdown policy in both countries may have been less severe than that from a mitigation strategy, implying that lockdowns were desirable because they yielded lower GDP losses as well as lower deaths than under a mitigation policy. For example, suppose lockdowns generated GDP losses (relative to no pandemic) of \$100m per day whilst in the lockdown state, the lockdown-free periods under a lockdown strategy generated GDP losses of \$30m per day, mitigation induced GDP losses of \$50m per day, and pursuing a lockdown policy involved implementing lockdowns for 15% of the time. A lockdown policy would then generate average GDP losses per day of \$41m, which are lower than those of a mitigation policy (\$50m per day). Since my estimate of the incremental GDP losses from lockdowns relative to mitigation in New Zealand and Australia was determined by estimating the pandemic-induced GDP losses in each country, estimating the proportion of these losses due to lockdowns (from studies in multiple countries), and applying the latter proportion to the former, the fourth argument here implies that the estimate of the latter proportion (based on data from multiple countries) was not relevant to New Zealand or Australia.

This issue could be investigated by allocating the aggregate GDP losses under the lockdown policy (relative to no pandemic) between the lockdown and no-lockdown periods, then allocating each of these losses to sectors of the economy, and then using these estimates as upper and lower bounds in estimating the losses in each sector under a mitigation policy. Adding these sector-specific losses would then yield the aggregate losses under a mitigation policy. Comparison of the aggregate losses under the two strategies (lockdown versus mitigation) would then determine whether those from a lockdown policy were higher and, if so, what proportion of these losses was due to lockdowns *per se*.

My tentative analysis of this issue for New Zealand suggests that the key issue was the ratio of the daily GDP losses under a mitigation policy to those during a lockdown period for the “entertainment” sector (being the sector most sensitive to perceptions of covid risk). If this ratio were greater than 40%, mitigation would yield higher aggregate losses than a lockdown policy, consistent with the commentators’ claims. However, it is impossible to estimate this

ratio using only New Zealand data, because it did not pursue a mitigation policy and the ratio would significantly depend upon public perceptions of risk from the virus under a mitigation policy, and this in turn would significantly depend upon the message that the government chose to present to the public if it pursued a mitigation policy; government messaging in a mitigation world could range from claiming (correctly) that the virus was not a significant threat to healthy people under 65 (which would lower the ratio) to instead claiming that it was a threat to the entire population (which would raise the ratio). Commentators may be assuming that a government pursuing a mitigation policy would present the same public health message as they would when pursuing a lockdown policy, but this is unlikely. Governments that pursued lockdown policies naturally sought a high level of compliance with their lockdown directives and therefore tended to emphasise the dangers of the virus to the entire community. By contrast, governments pursuing mitigation policies tended to emphasise that the risks were concentrated in the old and unhealthy. In view of this problem, of determining how the general public would have viewed the risks of the virus if a government pursuing a lockdown policy had instead pursued a mitigation policy, the best (but imperfect) approach to estimating the proportion of pandemic-related GDP losses due to lockdowns seems to be the use of multi-country evidence, on which I rely in my papers.

Fifthly, some commentators argued that my analysis failed to acknowledge the positive consequences of lockdowns in addition to fewer deaths, such as reduced crime, reduced carbon emissions, and fewer influenza deaths. I accept this, but my analysis also did not enumerate a number of further negative consequences of lockdowns, as follows. Firstly, if one accepts that the GDP losses from a lockdown policy were greater than from a mitigation policy, then the government borrowing induced by a lockdown policy (primarily to provide income support to those prevented from working) would be greater than from a mitigation policy, and this would incur the deadweight costs of eventually raising taxes to at least meet the interest payments on that additional borrowing. Secondly, and again contingent on lockdowns inducing greater GDP losses and greater government borrowing, both contributed significantly to the current inflation outbreak. Thirdly, and again contingent on lockdowns inducing greater government borrowing, this increased borrowing reduced the cushion available to address other fiscal emergencies (such as the 2022 cyclone-induced floods in

New Zealand). Fourthly, lockdowns necessarily involved some students and employees not attending schools and their places of work, and there was (naturally) a subsequent and prolonged campaign by the New Zealand government to encourage people who “felt unwell” to stay home. Unsurprisingly, there have been considerable difficulties in encouraging many of them to return. Attendance is facilitated by the force of habit and the opprobrium from acting otherwise, and both were undercut by both the lockdowns and the subsequent encouragement to stay home if feeling unwell. Covid-induced ill-health justifies many cases of non-attendance by employees and students, but the difficulties of distinguishing between genuine cases of ill health and the other sort has provided ready cover for reluctant students and employees. These further negative consequences of lockdowns seem at least as important as the additional positive consequences identified by commentators. Other cost-benefit studies of Antipodean lockdowns have attempted to estimate such costs and they are not insubstantial.⁶

In summary, my analysis of both the Australian and New Zealand cases concluded that the GDP losses from the covid lockdowns significantly exceeded the (conventional) value of the lives saved. Numerous contrary arguments have been raised, and considered here. I do not think that any of these contrary arguments reverses the conclusions reached in my analysis.

⁶ For example, “Do Lockdowns and Border Closures Serve the Greater Good?”, by Gigi Foster and Sanjeev Sabhlok, https://www.connorcourtpublishing.com.au/Do-lockdowns-and-border-closures-serve-the-%E2%80%9Cgreater-good%E2%80%9D-A-cost-benefit-analysis-of-Australia%E2%80%99s-reaction-to-COVID-19--Gigi-Foster-with-Sanjeev-Sabhlok_p_507.html.