Actuaries Institute.

14 May 2024

Senate Community Affairs References Committee
Inquiry into Excess Mortality
PO Box 6100
Parliament House
CANBERRA ACT 2600

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Dear Sir/Madam,

Submission to Senate Inquiry into Excess Mortality

The Actuaries Institute ('the Institute') welcomes the opportunity to provide this submission to the Senate Community Affairs References Committee's Inquiry into Excess Mortality. The Institute is the peak professional body for actuaries in Australia and our members have applied their risk and financial management expertise to analyse pandemic-related data to inform the actuarial profession, the industries they advise, and policy discussions.

The comments made in this submission are guided by the Institute's 'Public Policy Principles' that any policy measures or changes should promote public wellbeing, consider potential impacts on equity, be evidenced-based and support effectively regulated systems. The comments draw on the extensive work of the Institute's Mortality Working Group (MWG). Some of the comments in this submission relate to generally accepted medical practice. These comments are based on the MWG's understanding of issues that have been explained to them by medical practitioners, however the MWG are not medical professionals and cannot vouch for their accuracy or otherwise. Any errors or omissions remain with the MWG.

Summary of Key Points

Please note that these key points should be read in the context of our overall submission.

- Excess mortality in Australia during the period 2020 to 2023 was driven by deaths *from* and *with* COVID-19.
- Non-pharmaceutical defence measures reduced mortality throughout the period, both by limiting COVID-19 deaths and by reducing deaths caused or triggered by other respiratory diseases, including influenza.
- The pandemic has resulted in substantial disruption to the usual patterns of mortality ("mortality displacement[1]"). The indirect impacts of high COVID-19 prevalence coupled with this (negative) mortality displacement are likely to be the main reasons for non-COVID-19 excess mortality in 2021 to 2023.

[1] Mortality displacement occurs when an exposure causes deaths to happen at an earlier time than they would have done without that exposure.

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- The available evidence does not support a significant contribution to excess mortality by the adverse side-effects of COVID-19 vaccines. Indeed, the reverse is true: while every such death is regrettable, it seems clear that the small number of deaths triggered by COVID-19 vaccines is a tiny fraction of the number of COVID-19 deaths that they have prevented.
- Globally, countries with low (or negative) excess mortality in 2020 (like Australia) have generally had lower excess mortality over the period 2020 to 2023 than those with high excess mortality in 2020 (such as the United Kingdom). This is despite the impact of mortality displacement, which makes Australia's excess mortality in 2022 and 2023 look relatively high.
- The continued effectiveness of simple, low-level, non-pharmaceutical defence measures (such as mask-wearing) to protect the most vulnerable demonstrates the benefit of maintaining such measures, to reduce premature death brought on by infectious diseases including COVID-19.

Defining Excess Mortality

Excess mortality is defined as the difference between the actual number of deaths in a period and the predicted number. Excess mortality is a key measure of the impact of a pandemic. It captures direct pandemic-related deaths (including those not reported as such), reduced deaths from defence measures (such as when in Australia border closures and lockdowns reduced the incidence of respiratory diseases) and increases in other deaths that may be indirectly caused by the pandemic (such as those due to delayed medical attention).

The predicted number of deaths used in excess mortality calculations is an **estimate** based on certain assumptions, and therefore the calculated excess mortality is also an estimate. **Excess mortality can only ever be an estimate** – it is not, and cannot be, a known quantity.

The starting point for any estimate of predicted deaths for a population will be the number of deaths that have occurred in recent years (five years has become the accepted norm, but there are no established rules around this). Any reasonable estimate of the predicted number of deaths in a period should take into account:

1. changes in the size of the population over time: the larger the population, the greater the predicted number of deaths (all else being equal);
2. changes in the demographics of the population over time, the most important of which is changes in the age structure of the population: the older the population, the greater the predicted number of deaths (all else being equal); and
3. trends in mortality rates over time: in Australia, mortality rates had improved for decades prior to the pandemic, and it is reasonable to assume that they will continue to do so in future.

Further, any estimate of predicted deaths needs to be supported by a clear explanation of what the predicted number represents. In this submission (and in our work over the course of the pandemic), we have tried to clearly articulate that the predicted number of deaths is **the predicted number had there been no pandemic**. The resulting estimate of excess deaths represents the additional number of deaths due to both direct and indirect impacts of the pandemic.

Mortality Displacement

Mortality displacement (see footnote 1) is an important concept in the discussion of excess mortality over a period of time. Excess mortality, by its nature, represents the deaths of a number of people sooner than would have been expected. To the extent that this excess mortality has occurred among the frail

(including, but not limited to the elderly), there will be correspondingly fewer deaths in the next year or two.

Likewise, to the extent that frail lives have been saved by reduced exposure to a pathogen (negative mortality displacement), there will be correspondingly higher deaths in the next year or two.

Term of Reference (a): Estimated Excess Deaths in 2020 to 2023

Since mid-2020, the Institute's MWG has published detailed estimates of excess mortality. This ongoing work remains one of Australia's leading analyses of the continuing effects of COVID-19 on Australia's mortality. The MWG's Research Paper "*How COVID-19 has affected mortality in 2020 to 2022*" (the Research Paper) published in July 2023 fully documents the approach adopted and resulting estimates of excess mortality over the pandemic years of 2020 to 2022. The MWG has adopted the same approach for 2023 and preliminary results are available via *Actuaries Digital*, with plans to publish detailed results around June 2024.

The MWG's analysis of Australian mortality relies heavily on data from the Australian Bureau of Statistics (ABS), primarily its *Provisional Mortality Statistics* publications. The ABS has also prepared formal estimates of excess mortality, the latest being the publication "*Measuring Australia's excess mortality during the COVID-19 pandemic until August 2023*". (These formal estimates of excess mortality differ from the indicative estimates provided in the *Provisional Mortality Statistics* publications, where actual deaths are compared to a "baseline". This baseline does not allow for changes in population size, age demographics or mortality trend and, as stated by the ABS, "it does not provide official estimates of excess mortality".)

The Our World in Data (OWID) website includes two further estimates of excess mortality:

- estimates produced by Kobak and Karlinski (K&K) who have followed the approach documented in their June 2021 paper "*Tracking excess mortality across countries during the COVID-19 pandemic with the World Mortality Dataset*" to estimate excess mortality for Australia along with 84 other countries; and
- estimates produced by The Economist, which built a machine-learning model to estimate the number of excess deaths for 223 countries and regions, including Australia.

Each of these estimates of excess mortality makes allowance for the three key points outlined above – changes in population size, age demographics and mortality trend – but each approach uses different modelling techniques. In other words, they use the same conceptual approach but use different models to arrive at their estimates.[2]

Table 1 on the following page summarises the results of each of these estimates of excess mortality. To put these figures into context, we estimate that, for the 2017 year, where there was no pandemic but a "bad" influenza season, excess mortality was around 1-2%.

[2] For completeness, we also observe that the OECD provided excess mortality estimates in its Health Working Paper No. 163 "*Examining recent mortality trends: The impact of demographic change*". However, as the OECD's approach made no allowance for mortality trend and only partial allowance for age demographics, we do not comment further on its results.

Table 1 – Summary of Excess Mortality Estimates

	MWG		ABS		K&K		The Economist	
Year	Excess	% Excess	Excess	% Excess	Excess	% Excess	Excess	% Excess
2020	-4,300	-3%	-5,300	-3%	-3,400	-2%	-3,400	-2%
2021	3,800	2%	2,800	2%	4,300	3%	4,900	3%
2022	19,300	11%	19,900	12%	22,100	13%	21,900	13%
2023	8,400	5%	NA[3]		11,800	7%	10,900	6%

Note: K&K and The Economist figures sourced from OWID on 20 April 2024, plus analysis

As shown in the table, each of these four estimates of excess mortality gives similar results (i.e., **there is broad consensus as to the level of excess mortality in Australia**). Given the inherent uncertainty in the estimates, we would not view any estimate as statistically significantly different from any other.

Each approach shows:

- moderate negative excess mortality for 2020 of -2% to -3% (i.e., significantly fewer deaths than would have been expected had the pandemic not occurred);
- moderate excess mortality of +2% to +3% for 2021;
- very high excess mortality of +11% to +13% for 2022; and
- high excess mortality of +5% to +7% for 2023, which, while still quite large, is around half the level of 2022.

This pattern (negative excess in 2020, increasing to a large excess in 2022 and a lower excess in 2023) is similar to that experienced in Denmark, Germany, Japan, New Zealand, Singapore, South Korea and Taiwan. A few other countries also reached a peak of excess mortality in 2022.

In contrast, many other countries experienced very high or extremely high excess mortality in 2020 and 2021, with the latter generally being the peak, before excess mortality declined in 2022 and 2023. The total excess over the four years 2020-2023 was generally far higher in these countries than in Australia and most other countries with low excess mortality in 2020. This is illustrated in Table 2, which analyses the K&K data from OWID.

Table 2 – Excess Mortality Estimates 2020-2023 – Selected Countries

Year	Australia	Germany	Japan	New Zealand	South Africa	United Kingdom	United States	66 Countries
2020	-2%	3%	-2%	-6%	11%	13%	16%	12%
2021	3%	6%	1%	-2%	36%	9%	17%	21%
2022	13%	10%	8%	7%	7%	8%	9%	9%
2023	7%	5%	7%	3%	6%	8%	0%	3%
2020-2023	**5%**	**6%**	**4%**	**0%**	**15%**	**10%**	**10%**	**11%**

Source: Analysis of K&K data from Our World in Data

OWID has adequate data to assess the total excess mortality over 2020-2023 for 66 countries with populations above 1 million. Excess mortality for these countries over the four-year period ranges from 27% (Ecuador) to 0% (Mongolia and New Zealand). At 5%, Australia's excess mortality ranks 60th on this list.

[3] The ABS has not yet produced a full-year excess mortality estimate for 2023, but we note that the estimate to the end of August 2023 was 6,900 (6%), similar to the MWG estimate of 6,400 (6%) for the same period.

Term of Reference (b): Factors contributing to Excess Mortality

The Inquiry's terms of reference include "factors contributing to excess mortality in 2021, 2022 and 2023". We have also included commentary on excess mortality in 2020, because the mortality experience of that year has a bearing on mortality in subsequent years, due to mortality displacement. While we have not studied this phenomenon in any detail, we consider that mortality displacement (in addition to COVID-19 prevalence) represents a reasonable explanation of the timing of peak excess mortality in different countries, as discussed above. Excess mortality peaked in 2020 or 2021 in countries where early pandemic mortality was very high, while those with low early pandemic mortality saw excess mortality peak in 2022.

Excess Mortality by Cause of Death

Using ABS data, the MWG has prepared estimates of excess mortality at the cause of death level. This analysis can assist with identifying the factors contributing to excess mortality.

For this analysis, the "cause of death" is defined as the single *underlying* cause recorded on the death certificate (contributing causes may also be recorded). Table 3 shows summary results for each of the 2020 to 2023 years (the Attachment expands this table to show the actual and predicted values). Cells shaded green indicate causes where mortality was statistically significantly lower than predicted, while cells shaded red indicate causes where mortality was statistically significantly higher than predicted.

Table 3 – Excess Mortality Estimates by Cause of Death 2020-2023

	2020		2021		2022		2023		Four-Year Total	
	Excess	%	Excess	%	Excess	%	Excess	%	Excess	%
From COVID-19	**906**	*	**1,355**	*	**10,264**	*	**4,630**	*	**17,156**	*
Doctor-certified respiratory disease										
Influenza	(590)	**-93%**	(660)	**-100%**	(390)	-57%	(290)	-42%	(1,930)	**-72%**
Pneumonia	(750)	**-28%**	(780)	**-28%**	(430)	**-15%**	(510)	**-18%**	(2,470)	**-22%**
Lower respiratory	(1,280)	**-16%**	(820)	**-10%**	(290)	-3%	(660)	**-8%**	(3,050)	**-9%**
Other respiratory	(440)	**-13%**	(10)	0%	70	2%	-	0%	(380)	-3%
All doctor-certified respiratory	**(3,070)**	**-21%**	**(2,260)**	**-15%**	**(1,040)**	**-7%**	**(1,470)**	**-9%**	**(7,840)**	**-13%**
Doctor-certified other diseases										
Cancer	(640)	**-1%**	110	0%	560	**1%**	700	**1%**	730	0%
Ischaemic heart disease	(110)	-1%	830	**6%**	1,860	**14%**	660	**5%**	3,240	**6%**
Other cardiac conditions	(480)	**-5%**	440	**5%**	1,000	**11%**	910	**10%**	1,870	**5%**
Cerebrovascular disease	(90)	-1%	360	**4%**	480	**5%**	260	**3%**	1,010	**3%**
Diabetes	330	**7%**	360	**8%**	840	**17%**	660	**14%**	2,190	**12%**
Dementia	(980)	**-6%**	(550)	-3%	(120)	-1%	(1,670)	**-9%**	(3,320)	**-5%**
Other unspecified diseases	(120)	0%	2,360	**8%**	3,360	**10%**	2,300	**7%**	7,900	**6%**
All other doctor-certified disease	**(2,080)**	**-2%**	**3,900**	**3%**	**7,990**	**6%**	**3,810**	**3%**	**13,620**	**3%**
Coroner-referred excl. COVID-19	**(140)**	**-1%**	**740**	**4%**	**2,050**	**10%**	**1,430**	**7%**	**4,080**	**5%**
Total	**(4,300)**	**-3%**	**3,800**	**2%**	**19,300**	**11%**	**8,400**	**5%**	**27,200**	**4%**

* There are no predicted deaths from COVID-19 in the absence of the pandemic

Figures shaded green indicate that the observed values are below the 95% prediction interval while figures shaded red are above the 95% prediction interval. COVID-19 data from ABS customised report 2023 and analysis

Unsurprisingly, **deaths from COVID-19 have been the major contributor to excess mortality**, particularly in 2022 and 2023, once the vast majority of the population was vaccinated and Australia was no longer pursuing a suppression/elimination strategy. Across the four years shown, we estimate that the total deaths from COVID-19 of 17,200 make up almost **two-thirds** of the total estimated excess mortality of 27,200. Pleasingly, COVID-19 waves have shown an encouraging trend of reducing mortality impact since early 2022, with each successive wave resulting in fewer deaths than the previous wave.

Deaths from respiratory disease have been significantly lower than predicted throughout the pandemic. The much lower than predicted respiratory deaths in 2020 and 2021 are driven by the absence

of influenza in Australia in those two years, which has a direct impact on deaths "from flu", but also secondary impacts where influenza would normally be a contributory cause in other respiratory deaths. The return of circulation of influenza in early 2022 has resulted in an increase in respiratory deaths, but they have not returned to pre-pandemic levels, suggesting that non-pharmaceutical interventions (such as isolation, increased sanitisation measures and mask wearing) in hospitals and aged care facilities continue to reduce mortality (relative to pre-pandemic levels).

Cancer deaths account for about 30% of Australian deaths each year. Across the pandemic, cancer deaths have been within 1% of predicted. There were concerns in 2020 and 2021 about the impact of lockdowns on cancer deaths, with people being less able to access medical care. Analysis of screening tests conducted via the three national cancer screening programs (for bowel, breast and cervical cancer) shows that, while there does appear to have been a reduction in cancer screenings during lockdown periods, this was quite short lived and does not seem likely to be a material driver of excess mortality. In both 2022 and 2023, excess cancer mortality was significant, but this can be explained by deaths where COVID-19 was a contributory cause.

Both **ischaemic heart disease and other cardiac conditions** had lower than predicted deaths in winter 2020, which is also likely to be related to the absence of influenza (it is generally accepted that viral infections affect the mortality of people with heart conditions). But, since then, there has been significant excess mortality in both heart categories, with much of the excess coinciding with COVID-19 peaks. In our opinion, the most likely explanations for these excesses are:

- the after-effects of COVID-19 infection, with many studies showing a link between COVID-19 and increased risk of subsequent heart disease;
- (negative) mortality displacement from 2020;
- disruptions to routine medical care of people with heart conditions (i.e., missing early detection, no follow-up checks, no interventions such as medications/exercise to improve outcomes and delay deaths); and
- delayed access to emergency medical care, with longer ambulance wait times and slower emergency department treatment times, particularly in 2022.

Data from the ABS shows that the vast majority of the increase in deaths from ischaemic heart disease is in those with chronic heart conditions, rather than an acute episode, lending further weight to the hypothesis that the after-effects of COVID-19, mortality displacement and lack of routine medical care, are the main drivers.

There has been a consistent excess since mid-2021 for **deaths from cerebrovascular disease** (strokes and the like). **Deaths from diabetes** have been higher than predicted throughout the pandemic, with peaks and troughs following the same patterns as deaths *from* COVID-19. Again, studies have shown that these two conditions have a link to COVID-19, and we also expect that deaths from cerebrovascular disease may be impacted by delayed access to emergency care.

Excess **deaths from dementia** are observed to follow a similar pattern to excess deaths from respiratory disease. This is because flu is a contributory cause in a large proportion of dementia deaths. We also see the impact of COVID-19 as a contributory cause as dementia deaths have tended to be higher at times of high COVID-19 prevalence.

Deaths from other diseases (where the ABS data does not specify the cause) were also lower than predicted in 2020 (correlated with lower respiratory disease) but have been the largest contributor to non-COVID-19 excess deaths since 2021. This category covers the many different causes of death that are not separately reported on by the ABS in the *Provisional Mortality Statistics*. Given the wide variety of

these causes of death, various factors are likely influencing this outcome. We expect that at least part of the excess will be (negative) mortality displacement. This is supported by ABS data at the detailed cause of death level for 2021 and 2022; that data shows that the excess is spread across a large number of individual causes included in this category, rather than being driven by a handful of causes (which also suggests that COVID-19 vaccines are not a significant contributor). We also expect that there is a contribution from the impacts of interrupted routine care due to lockdowns.

Coroner-referred deaths (excluding those *from* COVID-19) are well above predicted levels from the second half of 2021. However, suicide monitoring reports and road death statistics indicate that deaths from these causes do not account for a material proportion of this excess. A large proportion of deaths from heart-related conditions are generally referred to the coroner, and we expect that this may be the main driver of the excess mortality for this category.

Observations and Interpretation

The lower deaths than predicted from respiratory causes and dementia, particularly in 2020 and 2021, have implications for **mortality displacement.** People who die from influenza tend to be those who are frail, or in a weakened state, and so already would have been more likely to die from another cause within no more than a few years. Excess mortality in 2021 from non-respiratory causes was likely higher than otherwise due to negative respiratory excess mortality in 2020 (i.e., a transfer of deaths from 2020 to 2021, compared with the expected pre-pandemic pattern of mortality). Similarly, part of the non-respiratory excess in 2022 is likely due to negative mortality displacement from 2020 and 2021.

When examining the weekly or monthly deaths timeseries, it is clear that **deaths from non-COVID-19 causes are higher at times when COVID-19 prevalence is high**. Part of this will be due to deaths where COVID-19 was a contributing cause of death, but it does not fully explain the observed experience.

Examination of excess mortality by age band shows that **the vast majority of the excess is in those over 65 years of age**. While around 17% of predicted deaths are in those aged under age 65, only around 5% of excess mortality is in those under 65. This is not surprising given that the majority of the excess mortality is due to COVID-19 and COVID-19 deaths are more highly skewed to older ages than non-COVID-19 deaths.

Section 3 of the MWG Research Paper goes into more detail on the **possible causes of the non-COVID-19 excess mortality**. In brief, the most likely causes are:

- after-effects of COVID-19 infections (i.e., post-COVID-19 sequelae), supported by the large suite of research papers on this topic;
- mortality displacement between pandemic years, supported by the excess mortality analysis by cause of death presented above;
- delays in patients receiving emergency medical care, supported by statistics on ambulance response times and emergency department treatment times;
- delays in patients receiving routine medical care, supported by statistics on elective surgery wait times; and
- undiagnosed COVID-19, which, by its very nature, can only be hypothesised.

Factors that, although of concern in themselves, are unlikely to be numerically significant contributing factors to excess mortality in Australia are:

- mental health issues resulting in suicide, supported by preliminary suicide statistics in the three largest states in Australia;

- increases in deaths related to alcohol abuse; the Research Paper did not cover deaths from this cause, but ABS statistics show that, while the age-standardised death rates have increased in 2021 and 2022, the absolute increase in the number of deaths is small;
- increases in road accident deaths, supported by preliminary statistics on road accident deaths; and
- COVID-19 vaccine-related deaths as discussed further below.

These are the most likely possible causes of non-COVID-19 excess mortality based on the information available. We cannot be definitive about the exact causes, nor can we quantify the impacts more precisely from the publicly available information. To determine the exact causes of excess mortality would require a review of each individual death over several pre-pandemic years as well as the pandemic years, and even that may not provide definitive conclusions.

COVID-19 Vaccines have significantly reduced Excess Mortality

We are aware that excess mortality has been attributed to COVID-19 vaccines by some, but we are unable to identify evidence to support this claim and our view is that **adverse impacts of COVID-19 vaccines are unlikely to be a significant contributing factor**. Rather our view is quite the reverse: **COVID-19 vaccines have significantly *reduced* excess mortality**.

We have come to this view based on the weight of statistical evidence as follows.

1. While there have been deaths in Australia known to have been caused by the administration of COVID-19 vaccines, **the number of such deaths has been small**.
    - The latest Therapeutic Goods Administration (TGA) COVID-19 Vaccine Safety Report issued on 2 November 2023 identified 14 deaths where the cause of death was linked to COVID-19 vaccination (from 1,004 reports received). All but one of these deaths were linked to the AstraZeneca vaccine which is no longer in use in Australia. There have been no new vaccine-related deaths identified since 2022, even though COVID-19 vaccines have continued to be administered.
    - The TGA does not make formal determinations of cause of death for individuals; that is the role of treating medical practitioners and coroners. The ABS reporting of death certificate data shows that there have been 16 deaths registered to the end of 2022 where the underlying cause of death was the use of COVID-19 vaccines, very similar to the 14 deaths identified by the TGA.
2. The **timing of when COVID-19 vaccinations were administered does not correspond** with the timing or shape of excess mortality (as shown in the Research Paper). Mortality displacement is a much more likely explanation for the excess in non-respiratory causes in 2021. The majority of the excess in 2022 and 2023 can be explained either directly by deaths from COVID-19 or by the indirect impacts of high prevalence of COVID-19 (i.e., the timing of excess mortality in these years corresponds to the timing of high COVID-19 prevalence).
3. It is widely acknowledged that the mRNA COVID-19 vaccines may result in myocarditis (inflammation of the heart) and/or pericarditis (inflammation of the membrane around the heart) as rare side effects, particularly in young males. ABS statistics show that in 2021 and 2022 there were 31 deaths from myocarditis and 5 deaths from pericarditis. These numbers are small and **are not any higher than in (pre-vaccination) earlier years**.
4. When looking for vaccine-related causality, consideration is given to both timing and the "mechanism of action" (biological plausibility) of any death. Unlike myocarditis and pericarditis, we have been advised by the TGA that **neither they, nor any other international medicines**

regulator, has established a causal link between COVID-19 vaccines and ischaemic heart disease. As stated above, excess deaths seen from this cause are likely related to the after-effects of COVID-19 infection, mortality displacement, a lack of routine medical care earlier in the pandemic, and delayed access to emergency care.

5. The majority of excess mortality in Australia is in people over the age of 65. However, Australia has very high vaccination rates for those over the age of 16. If COVID-19 vaccines were a significant contributor to excess mortality, we would observe higher excess mortality in those aged between 16 and 65 years. Indeed, excess mortality due to vaccines should be even more obvious among younger people where there is a much lower expected mortality rate. **The pattern of excess mortality by age group does not support COVID-19 vaccines as a significant cause.**

6. The COVID-19 vaccines administered in Australia are exactly the same formulation as the vaccines administered in other countries, each of which has their own oversight body equivalent to Australia's TGA. These oversight bodies share information, and it is through this sharing process that the rare thrombosis with thrombocytopenia syndrome (TTS) associated with the AstraZeneca vaccine was identified and confirmed in April 2021. The world-wide response was swift, including in Australia where there was an immediate change to recommendations regarding the AstraZeneca vaccine. **It is extremely unlikely that there remains a significant unidentified risk of death from the COVID-19 vaccines currently administered in Australia**.

7. While we have not conducted an exhaustive analysis, **we have not been able to find an obvious statistical relationship suggesting that COVID-19 vaccinations caused excess mortality in any other country**.

8. Many studies around the world have shown that COVID-19 vaccines reduce the severity of the disease. For example, a recent study "*Assessing the impact of Australia's mass vaccination campaigns over the Delta and Omicron outbreaks*" presented a conservative estimate that deaths from COVID-19 would have been six times as high with no vaccinations. This meant that almost 18,000 deaths were averted between August 2021 and July 2022 in people aged over 50 by the COVID-19 vaccines in NSW alone. Extrapolating this nationally, more than 50,000 deaths were averted in this 48-week period. In other words, **COVID-19 vaccines have significantly *reduced* excess mortality**.

We cannot conclusively disprove that adverse impacts of COVID-19 vaccines are a substantial driver of excess mortality. However, **the overwhelming weight of the available evidence does not point to COVID-19 vaccines as a cause of significant numbers of additional deaths**. As noted above, of the MWG's estimate of 27,200 excess deaths across 2020-2023, just over 17,000 have been identified as being caused by COVID-19, while fewer than 20 deaths have been identified as being caused by COVID-19 vaccination. And if the number of COVID-19 vaccine deaths is very small in relation to COVID-19 deaths, it is an even smaller fraction of the number of COVID-19 deaths that the vaccines have prevented in Australia – a conversative minimum of 50,000 based on the NSW study referenced above.

Our considered view is that, **while there could be COVID-19 vaccine-related deaths that have not been identified as such, the number of such deaths is likely to be small, especially in the context of the estimated number of excess deaths and the lives saved by vaccination**. There are other, more plausible, reasons that explain excess mortality in Australia.

Term of Reference (c): Recommendations on how to address any identified preventable drivers of excess mortality

As should be evident, we believe that the primary driver of excess mortality in Australia has been COVID-19, with a degree of mitigation in (other) respiratory diseases due to the defence measures protecting the most vulnerable.

We consider that excess mortality would be reduced if there was greater take-up of vaccination against infectious disease (including COVID-19) and greater use of non-pharmaceutical defence measures against airborne diseases. The continued reduction in deaths from influenza and other respiratory diseases in 2022 and 2023 shows that simple measures, such as isolation of those who are sick, extra sanitisation measures and mask wearing where frail and otherwise vulnerable people are likely to be (such as hospitals and aged care), can save many lives.

There is a clear role for government here, including in the supply of vaccines (for both COVID-19 and influenza), supply of protective personal equipment (PPE), encouragement of extra sanitisation and mask wearing (particularly around those most vulnerable), encouragement of isolation when unwell, and in the messaging around these simple measures.

We recognise that even simple measures such as these come at an economic and/or social cost, which may not always be borne proportionately by those who benefit from the increased protection. This applies to all measures introduced to save lives in society (e.g. seatbelts and smoking restrictions). It is a key role of government to weigh up the risks, costs and benefits of implementing a particular measure – and of not implementing it.

Improved ventilation and air filtration in crowded places where airborne diseases are known to spread (such as schools, conference centres and other large buildings where people gather indoors in close quarters) is also likely to reduce the spread of COVID-19 and other dangerous airborne diseases, thus reducing mortality.

Other interventions to reduce mortality that could be explored by State and Federal governments address the ongoing problems experienced by the healthcare system itself.[4] These include measures to improve:

- Ambulance response times: The latest NSW, Victoria and Queensland statistics (December 2023) show that ambulance response times for highest priority patients, while improved on 2022 statistics, continue to be substantially worse than before the pandemic.
- Ambulance “ramping”[5]: NSW and Queensland statistics show that transfer times from ambulances to emergency departments continue to be substantially worse than before the pandemic. The Victorian statistics show that transfer times are significantly below target (no pre-pandemic figures are available for comparison).
- “Bed block”[6]: NSW statistics show that wait times in emergency departments for those who are subsequently admitted to hospital are significantly longer now than before the pandemic.
- Emergency department treatment times: The proportion of NSW emergency department patients starting treatment on time has improved relative to 2022 but remains substantially worse than before

[4] Note that the statistics quoted here illustrate the problems. The absence of statistics for a particular state or territory does not imply the absence of similar issues.
[5] Defined as the inability of ambulances to transfer patients to emergency departments on arrival due to the emergency department itself having reached capacity.
[6] Defined as when patients in emergency departments cannot be moved to hospital beds because they are occupied, often by patients who could be discharged from hospital but, for various reasons, are not.

the pandemic. For Victoria, equivalent statistics show improvement on 2022 levels, but no pre-pandemic figures are available for comparison.

- Waiting lists for elective/planned surgery: Pleasingly, the latest NSW statistics show that the backlog of patients who have waited longer than clinically recommended for elective/planned surgery has been mostly cleared over the course of 2023. However, the total elective surgery waiting list is substantially larger than before the pandemic, particularly for those with semi-urgent conditions. For Victoria, planned surgery waiting lists have reduced since early 2022, but again no pre-pandemic figures are available for comparison.

Finally, the MWG's analysis of excess mortality would not have been possible without the timely and comprehensive data available from State and Federal governments throughout the period of analysis. The timely availability of a wide variety of information about public health and outcomes assists not-for-profit organisations such as ours to provide analysis to support public health. We encourage the continuation of the wide availability of public health data. While the publication of timely data in itself does not reduce mortality, it is only possible to identify drivers of mortality and respond based on the emerging evidence.

Concluding Comments

If you would like further information on this submission, please contact the Institute on
or

Yours sincerely

(Signed) Elayne Grace

CEO

Actuaries Institute.

Attachment – Detailed Excess Mortality Estimates by Cause of Death 2020-2023

This table expands Table 3 for each year, to show actual deaths by cause and those predicted in the absence of a pandemic.

	2020				2021				2022				2023			
	Actual	Predicted	Excess	%	Actual	Predicted	Excess	%	Actual	Predicted	Excess	%	Actual	Predicted	Excess	%
From COVID-19	**906**	**-**	**906**	*	**1,355**	**-**	**1,355**	*	**10,264**	**-**	**10,264**	*	**4,630**	**-**	**4,630**	*
Doctor-certified respiratory disease																
Influenza	43	640	(590)	**-93%**	2	660	(660)	**-100%**	289	680	(390)	-57%	405	700	(290)	-42%
Pneumonia	1,940	2,690	(750)	**-28%**	1,980	2,750	(780)	**-28%**	2,340	2,770	(430)	**-15%**	2,330	2,840	(510)	**-18%**
Low er respiratory	6,820	8,100	(1,280)	**-16%**	7,410	8,230	(820)	**-10%**	8,080	8,370	(290)	-3%	7,830	8,490	(660)	**-8%**
Other respiratory	3,090	3,540	(440)	**-13%**	3,630	3,640	(10)	0%	3,780	3,720	70	2%	3,840	3,850	-	0%
All doctor-certified respiratory	**11,890**	**14,960**	**(3,070)**	**-21%**	**13,020**	**15,280**	**(2,260)**	**-15%**	**14,490**	**15,530**	**(1,040)**	**-7%**	**14,410**	**15,880**	**(1,470)**	**-9%**
Doctor-certified other diseases																
Cancer	48,290	48,930	(640)	**-1%**	49,790	49,680	110	0%	50,720	50,160	560	**1%**	51,470	50,770	700	**1%**
Ischaemic heart disease	13,700	13,810	(110)	-1%	14,130	13,310	830	**6%**	15,060	13,190	1,860	**14%**	13,320	12,670	660	**5%**
Other cardiac conditions	8,640	9,120	(480)	**-5%**	9,640	9,200	440	**5%**	10,350	9,350	1,000	**11%**	10,250	9,340	910	**10%**
Cerebrovascular disease	9,110	9,200	(90)	-1%	9,350	8,990	360	**4%**	9,370	8,890	480	**5%**	8,880	8,620	260	**3%**
Diabetes	4,990	4,660	330	**7%**	5,080	4,720	360	**8%**	5,650	4,810	840	**17%**	5,450	4,790	660	**14%**
Dementia	15,300	16,280	(980)	**-6%**	16,520	17,070	(550)	-3%	17,740	17,860	(120)	-1%	17,060	18,720	(1,670)	**-9%**
Other unspecified diseases	29,710	29,820	(120)	0%	32,740	30,380	2,360	**8%**	35,640	32,280	3,360	**10%**	35,560	33,260	2,300	**7%**
All other doctor-certified disease	**129,740**	**131,820**	**(2,080)**	**-2%**	**137,240**	**133,340**	**3,900**	**3%**	**144,530**	**136,540**	**7,990**	**6%**	**141,980**	**138,170**	**3,810**	**3%**
Coroner-referred excl. COVID-19	**20,130**	**20,280**	**(140)**	**-1%**	**21,060**	**20,320**	**740**	**4%**	**22,870**	**20,820**	**2,050**	**10%**	**22,660**	**21,230**	**1,430**	**7%**
Total	**162,700**	**167,000**	**(4,300)**	**-3%**	**172,700**	**168,900**	**3,800**	**2%**	**192,200**	**172,900**	**19,300**	**11%**	**183,700**	**175,300**	**8,400**	**5%**

* There are no predicted deaths from COVID-19 in the absence of the pandemic

Figures shaded green indicate that the observed values are below the 95% prediction interval w hile figures shaded red are above the 95% prediction interval. COVID-19 data from ABS customised report 2023 and analysis