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Age-stratified COVID-19 vaccine-dose fatality rate for Israel and Australia

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ABSTRACT: It is now well established from autopsy studies and adverse effect monitoring that the COVID-19 vaccines can cause death. The vaccine-dose fatality rate (vDFR), which is the ratio of vaccine-induced deaths to vaccine doses delivered in a population, has recently been measured by us to be as large as 1 % in India and when “vaccine equity” campaigns were applied in high-poverty states of the USA, and to be 0.05 % in Australia, with data that is not discriminated by age group. Here, we provide the first empirical evaluations of age-stratified vDFRs, using national all-cause mortality and vaccine rollout data, for Israel and Australia. We find that the vDFR increases dramatically with age for older adults, being exponential with a doubling time of approximately 5.2 ± 0.4 years. As a result the vDFR is an order of magnitude greater in the most elderly population than the all-population value, reaching 0.6 % for the 80+ years age group in Israel and 1 % for the 85+ years age group in Australia, compared to < 0.01 % for young adults (< 45 year olds). Our results imply that it was reckless to prioritise vaccinating those deemed to be in greatest need of protection.

It is well established that the COVID-19 vaccines can cause death, as seen from:

- detailed autopsy studies (Choi et al., 2021; Schneider et al., 2021; Sessa et al., 2021; Gill et al., 2022; Mörz, 2022; Schwab et al., 2022; Suzuki et al., 2022; Tan et al., 2022; Yoshimura et al., 2022; Onishi et al., 2023),
- adverse effect monitoring (Hickey and Rancourt, 2022),
- a recent survey study (Skidmore, 2023),
- studies of vaccine-induced pathologies (e.g., Goldman et al., 2021; Kuvandik et al., 2021; Turni and Lefringhausen, 2022; Edmonds et al., 2023; Wong et al., 2023), and
- more than 1,250 peer-reviewed publications about COVID-19 vaccine adverse effects (React 19, 2022).

In particular, a study of the Vaccine Adverse Event Reporting System (VAERS) data for the USA showed that the COVID-19 injections can be understood as individual challenges to the body, and that “toxicity by dose” is a good first-order model of the phenomenon for the adverse effect of death (Hickey and Rancourt, 2022). An exponential increase of lethality with median age of those dying following injection was observed (Hickey and Rancourt, 2022).

There is also the known vaccine injury compensation programmes of states worldwide, which include death resulting from the COVID-19 vaccines (Mungwira et al. 2020; Wood et al., 2020; Crum et al., 2021; Kamin-Friedman and Davidovitch, 2021). Japan, Canada and the UK have granted compensation for COVID-19 vaccine induced deaths (*The Japan Times*, 26 July 2022; Corbett, 6 September 2022; Wise, 2022).

We are pursuing a research program to quantify the vaccine-dose fatality rate (vDFR), which is the ratio of vaccine-induced deaths to vaccine doses delivered in a population. We do this at the population level of states, using epidemiological methods applied to all-cause mortality (ACM) and vaccine rollout data, by time (day, week, month), by jurisdiction and by age group (Rancourt et al., 2022a; Rancourt et al., 2022b; Rancourt, 2022).

Here we report our first age-stratification results.

We recently demonstrated that the COVID-19 vaccine rollouts caused significant increases in mortality in India, the USA, Australia, and Canada (see Rancourt et al., 2022a; and references therein).

Rancourt showed that the vaccine rollout in India (350 million doses) synchronously caused 3.7 million excess deaths, corresponding to a vDFR of 1 %; and provided

comprehensive reasons for concluding a causal relation to the vaccine rollout rather than coincidence involving other causes (Rancourt, 2022).

Our work on the Australian data established a non-age-stratified (all-population) mean vDFR of 0.05 %, in a phenomenon of step-wise increase in mortality synchronous with the vaccine rollout, which was also present in each of the eight states of Australia and in each of the age groups of the most elderly residents (Rancourt et al., 2022a).

Such determinations of vDFR are possible — despite the inherent difficulty in assigning cause to excess mortality, especially despite the difficulty in discerning excess mortality caused by the imposed pandemic-response conditions (or “COVID-19 conditions”) — in two kinds of circumstances:

- i. Jurisdictions in which there is essentially no measurable excess integrated ACM in the pre-vaccination period of the declared pandemic (typically 11 March 2020 to 1 January 2021),¹ followed by a large and sudden step-wise increase in ACM by time, synchronous with the vaccine rollout in the jurisdiction, and sustained through multiple-dose cycles of vaccination (e.g., Australia, India, Israel).
- ii. Cases in which a specific vaccine rollout (e.g., first booster in Australia, “vaccine equity” campaign in the USA, first-dose in Ontario) is synchronous with an anomalous peak in ACM, which is not confounded by occurring at a seasonal peak position inferred from the historic trend.

In all these cases, which we have studied, the vaccine rollouts occur at significantly different times, for different jurisdictions and age groups, yet are always synchronous with the step-wise increases and anomalous peaks in ACM. In this regard, the graphs in our most recent paper and its appendices are compelling (Rancourt et al., 2022a; their figures 1A through 1D, 2, 4, 6A through 6D, 7, 8 and 9; their appendix figures A1-F1 (9 panels) and A2-F1), as are the graphs for India (Rancourt, 2022).

¹ The World Health Organization (WHO) declared a pandemic on 11 March 2020 (the “declared pandemic”). Vaccine rollouts typically did not start until late December 2020 and early January 2021, although several national jurisdictions had significantly later starts.

In addition, the all-population vDFRs, for individual states and for individual anomalous peaks in ACM, are all comparable in magnitude, in the range of approximately 0.03 % – 1 % (Rancourt et al., 2022a ; Rancourt et al., 2022b ; Rancourt, 2022).

The robust criteria described by Ioannidis (2016) for proving causality are amply satisfied:

- **Experiment:** The same phenomenon is independently observed in distinct jurisdictions, for distinct age groups, and at different times, which constitutes ample verification in independent real-world large-scale experiments.
- **Temporality:** The many step-wise increases and anomalous peaks in ACM are synchronous with vaccine rollouts, and the peaks in ACM have the same shapes and widths as the synchronous peaks in vaccine dose delivery by time; including in jurisdictions in which excess integrated mortality did not occur until vaccination was implemented after approximately one year of the declared pandemic.
- **Consistency:** The phenomenon is qualitatively the same and of comparable magnitude in each occasion in which it is observed.

Here, we perform the age-stratification analysis for Australia, and we add Israel.

Our method for quantification of vDFR by age group (or all-population) is as follows (Rancourt et al., 2022a):

- i. Plot the ACM by time (day, week, month) for the age group (or all-population) over a large time scale, including the years prior to the declared pandemic.
- ii. Identify the date (day, week, month) of the start of the vaccine rollout (first dose rollout) for the age group (or all-population).
- iii. Note, for consistency, that the ACM undergoes a step-wise increase to larger values at the date of the start of the vaccine rollout.

- iv. Integrate (add) ACM from the start of the vaccine rollout to the end of available data or end of vaccinations (all doses), whichever comes first. This is the basic integration time window used in the calculation, start to end dates.
- v. Apply this window and this integration over successive and non-overlapping equal-duration periods, moving as far back as the data permits.
- vi. Plot the resulting integration values versus time, and note, for consistency, that the value has an upward jog, well discerned from the historic trend or values, for the vaccination period.
- vii. Extrapolate the historic trend of integrated values into the vaccination period. The difference between the measured and extrapolated (historic trend predicted) integrated values of ACM in the vaccination period is the excess mortality associated with the vaccination period.
- viii. The extrapolation, in practice, is achieved by fitting a straight line to chosen pre-vaccination-period integration points.
- ix. If too few points are available for the extrapolation, giving too large an uncertainty in the fitted slope, then impose a slope of zero, which amounts to using an average of recent values. In some cases, even a single point (usually the point for the immediately preceding integration window) can be used.
- x. The error in the extrapolated value is overwhelmingly the dominant source of error in the calculated excess mortality. Estimate the “accuracy error” in the extrapolated value as the mean deviation of the absolute value difference with the fitted line (mean of the absolute values of the residuals) for the chosen points of the fit. This error is a measure of the integration-period variations from all causes over a near region having an assumed linear trend.
- xi. Apply the same integration window (start to end dates during vaccination) to count all vaccine doses administered in that time.
- xii. Define $vDFR = (\text{vaccination-period excess mortality}) / (\text{vaccine doses administered in the same vaccination period})$. Calculate the uncertainty in $vDFR$ using the estimated error in vaccination-period excess mortality.

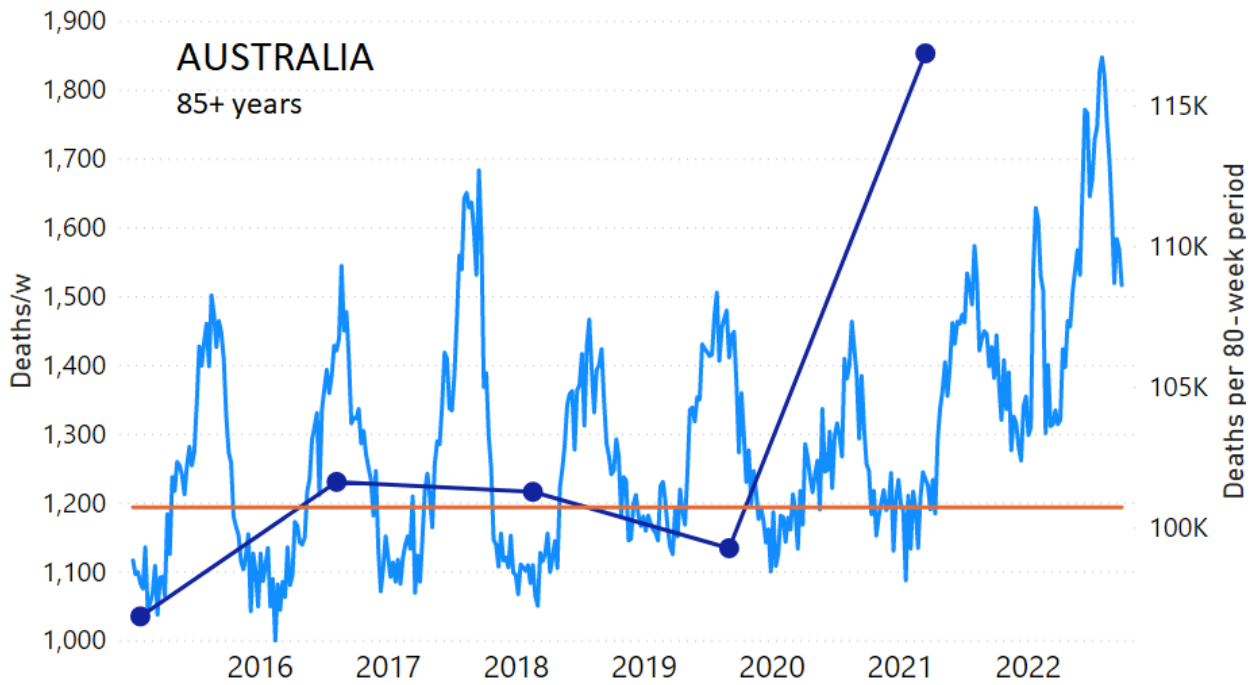
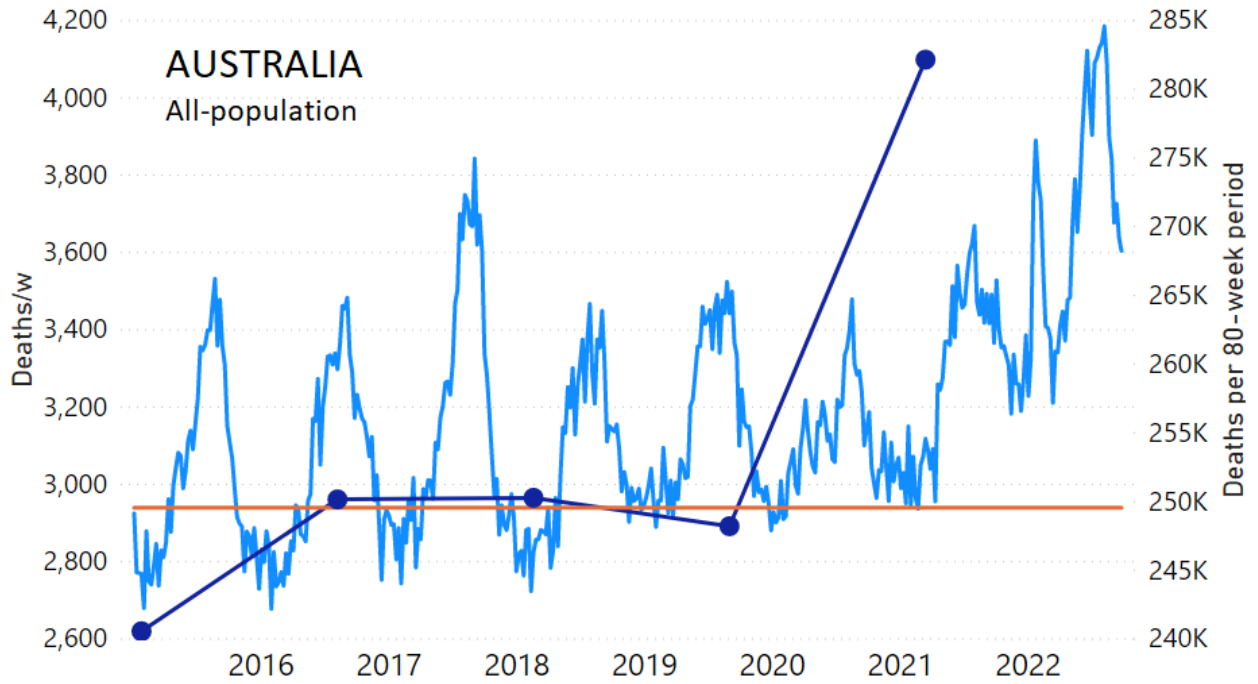
The same method can be adapted to any region of interest of sub-annual duration, by translating the window of integration (of the region of interest) backwards by increments of one year.

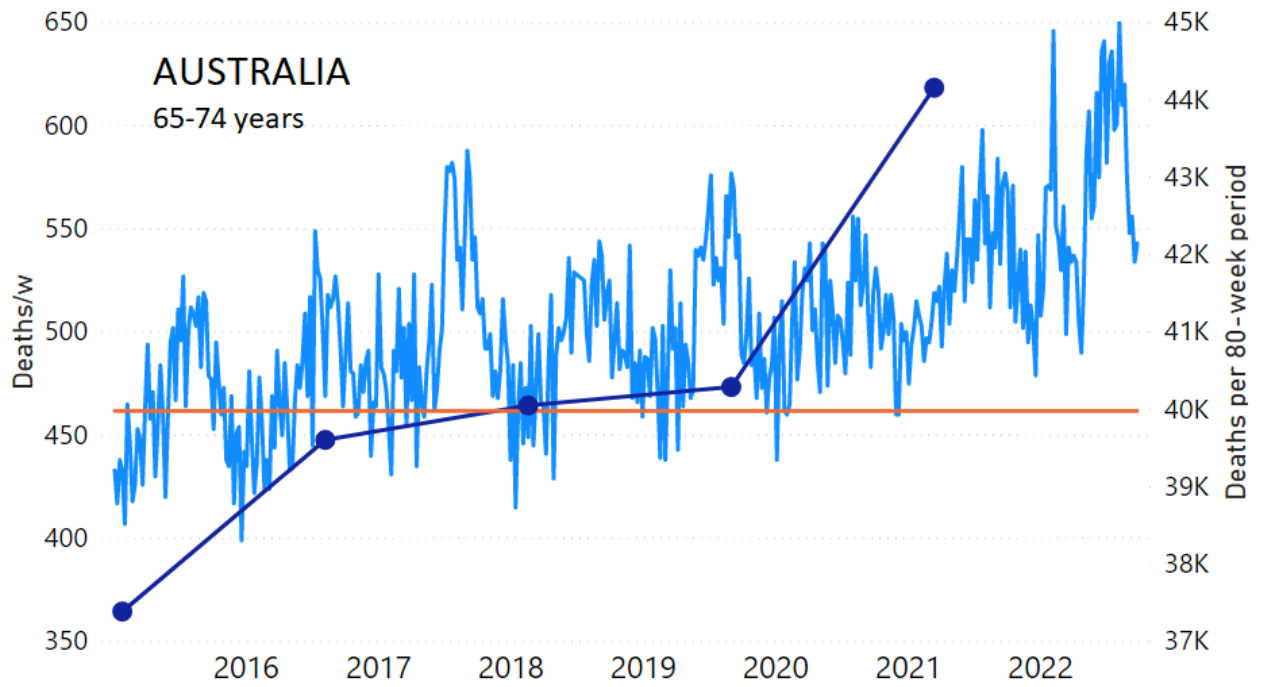
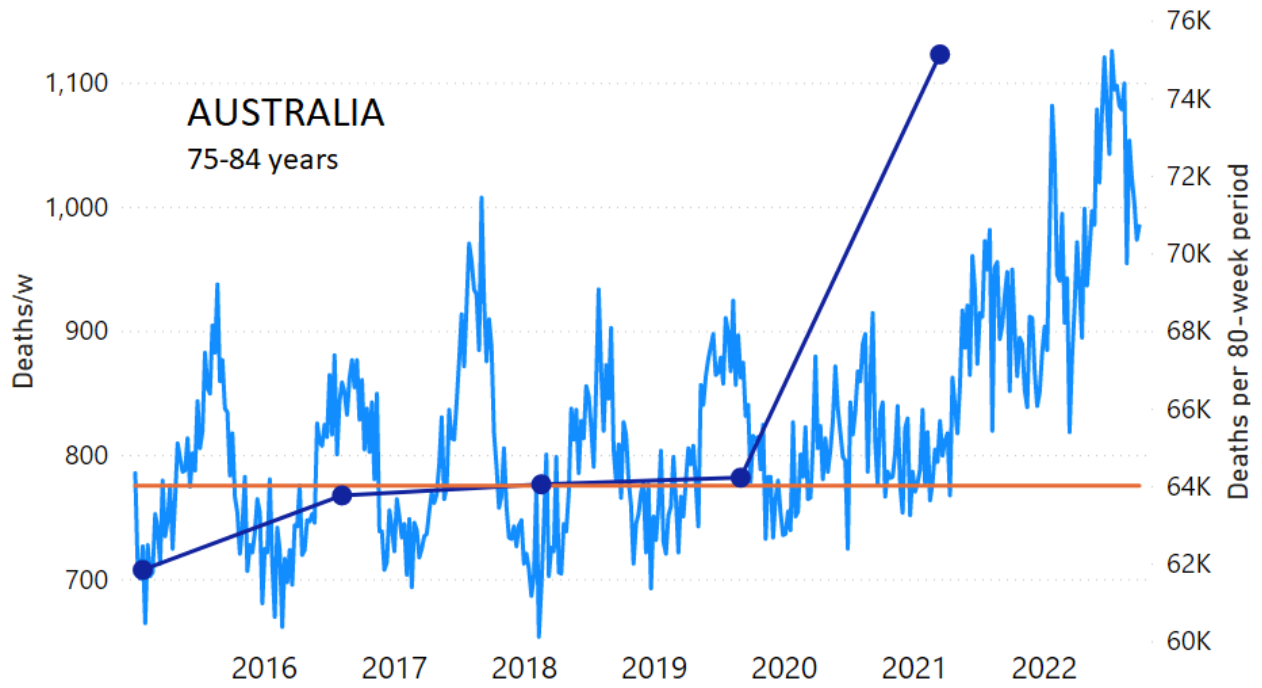
The above-described method is robust and ideally adapted to the nature of ACM data. Integrated ACM has a small statistical error. The large time-wise integration window removes difficulties arising from intrinsic seasonal variations. The historic trend is analysed without introducing any model assumptions or uncertainties beyond assuming that the near trend can be modelled by a straight line, where justified by the data itself. Such an analysis, for example, takes into account year to year changes in age-group cohort size arising from the age structure of the population. The only presumption is that a locally linear near trend for the unperturbed (ACM-wise unperturbed) population is realistic.

The calculation of the excess ACM by age group and for all-population for Australia is illustrated in Figure 1 (age groups as indicated in the figure), as follows. We used the three points sequentially preceding the vaccination period and imposed a horizontal line (zero slope of the fitted straight line), throughout (Figure 1).

The details such as sources of official data, start and end points of integration, and methods for matching ACM and vaccine rollout data by age group, are provided in Appendix 1.

The integration period for Australia was fine-tuned and updated ACM data was implemented (see Appendix 1), compared to our previous analysis (Rancourt et al., 2022a), and the results are essentially identical.





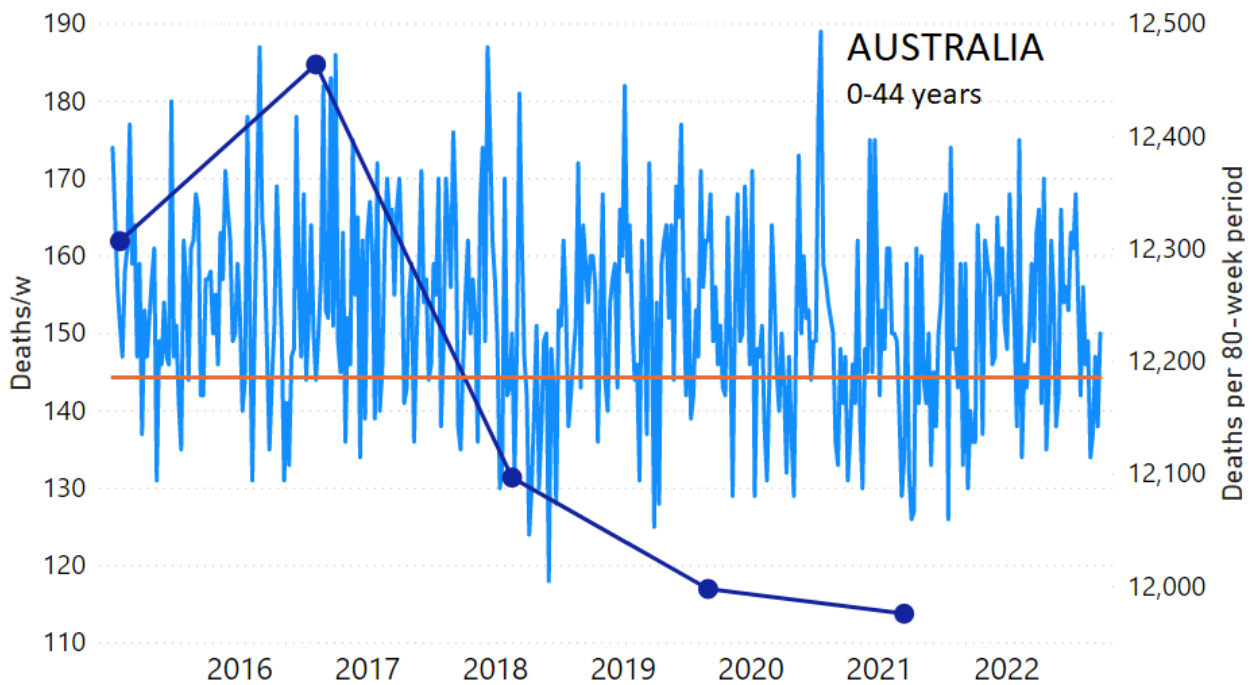
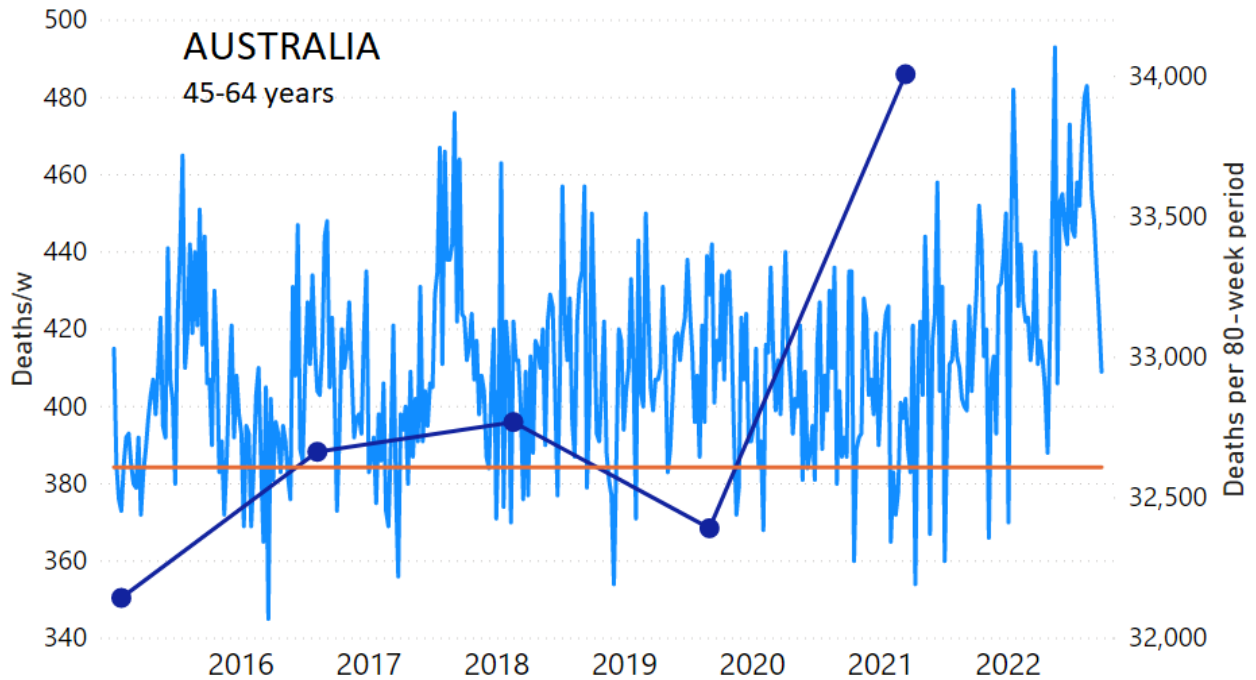


Figure 1: Australia, 2015-2022, by age group as indicated. ACM by week (light blue); integrated ACM by 80-week vaccination-period integration window (dark blue, points), the last point being for the actual vaccination period itself; extrapolation line used to calculate the excess ACM in the

vaccination period (orange). See the text for a description of the method, and Appendix 1 for details.

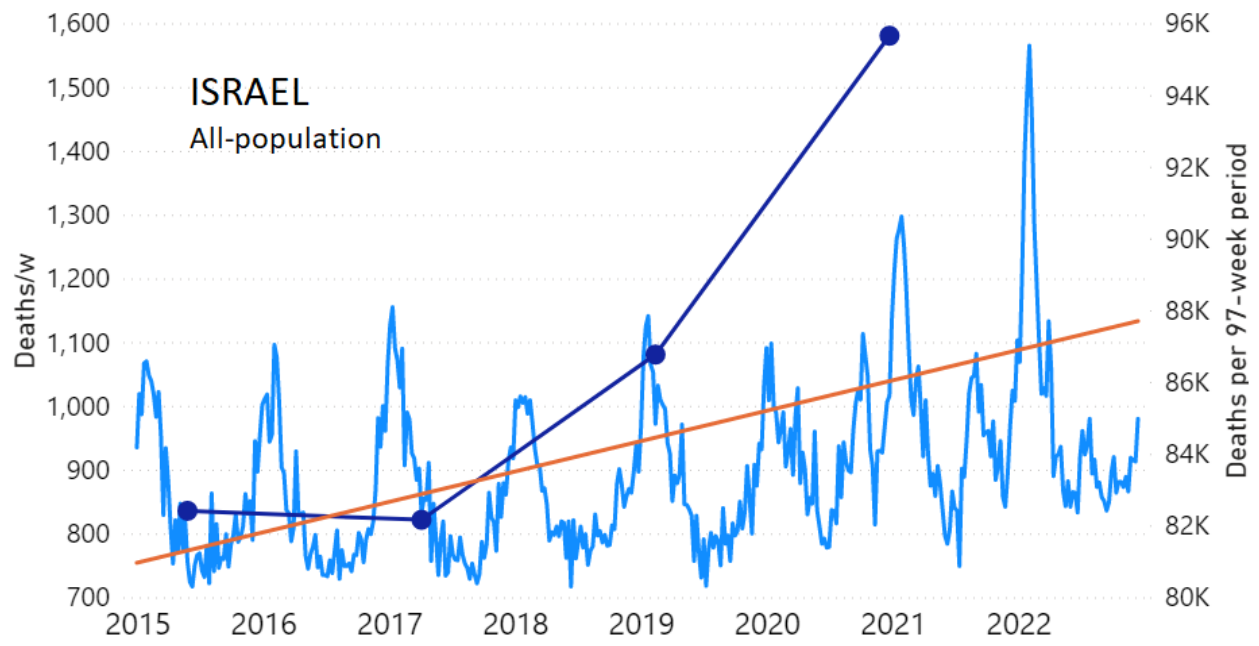
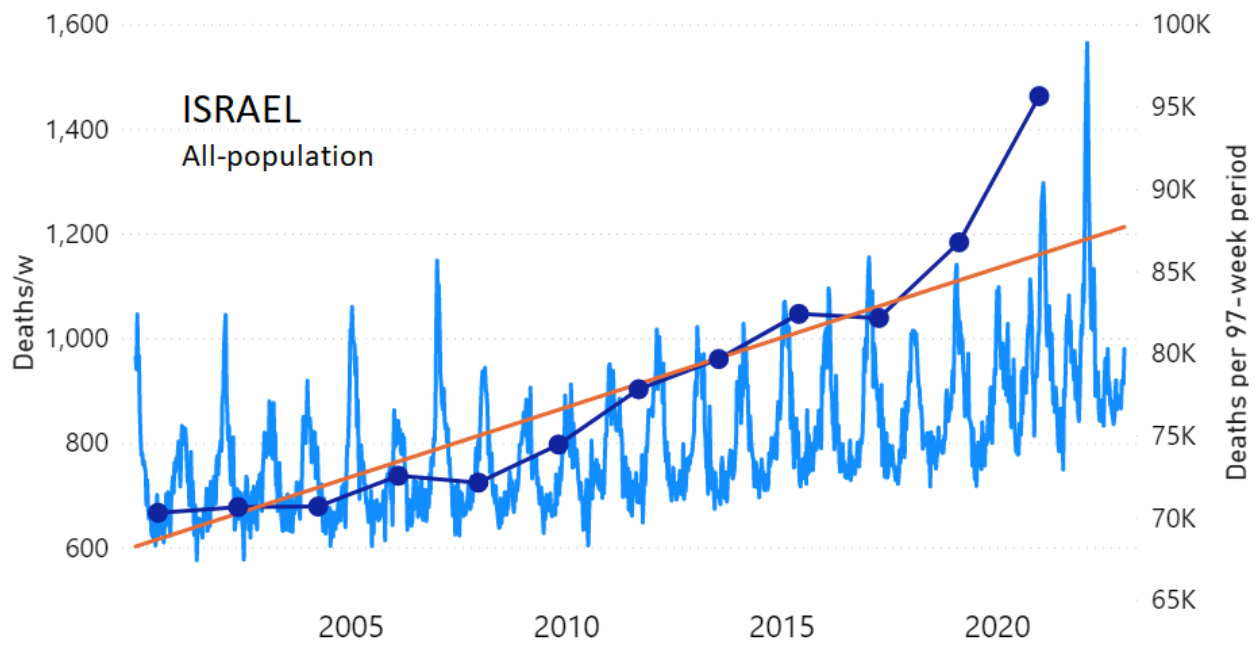
The youngest age group for Australia (0-44 years, Figure 1) shows our chosen extrapolation method not to be optimally suited to the ACM trend, however, in this age group the ACM is small, so this makes little difference. Furthermore, our method here automatically ensures that this difficulty is reflected in a larger estimated error, which is propagated to the calculated excess ACM.

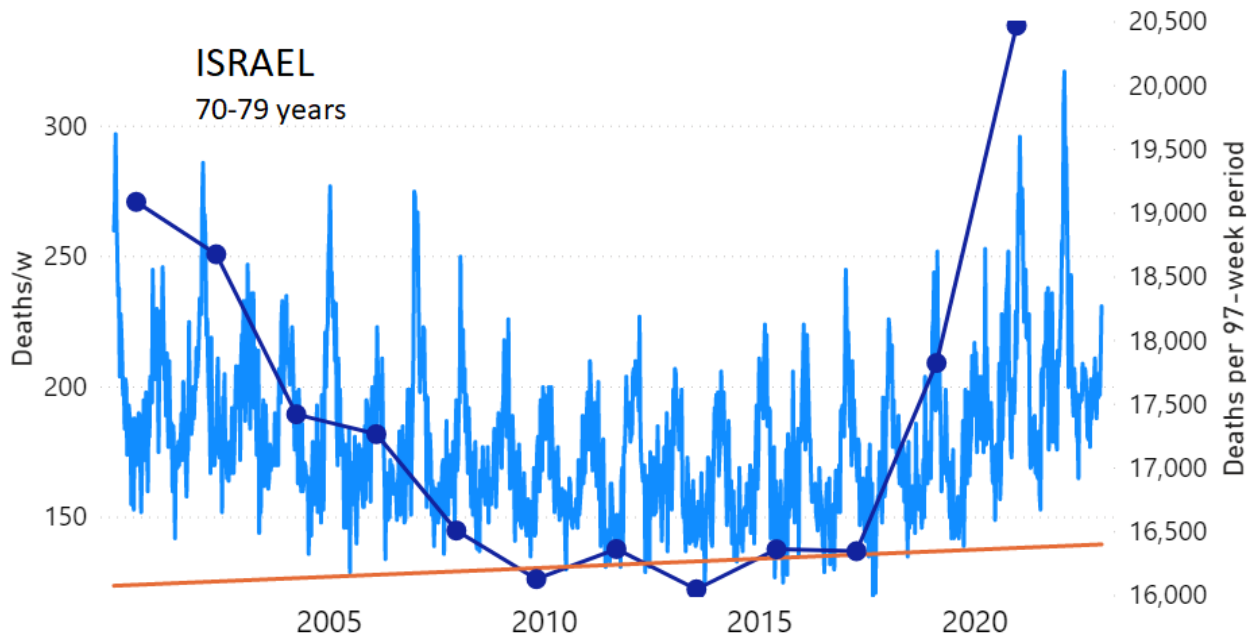
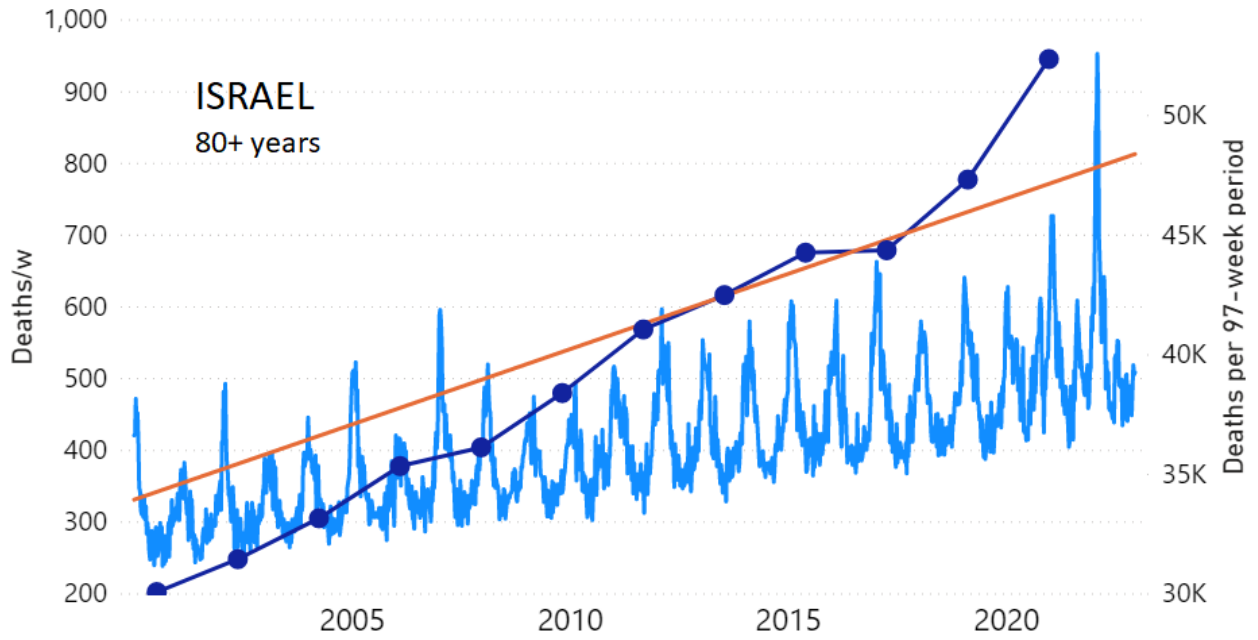
We do the same for Israel. The calculation of the excess ACM by age group and for all-population for Israel is illustrated in Figure 2 (age groups as indicated in the figure), as follows. Here we chose to use different sets of points to use in the extrapolation, as described in Appendix 1, and as can be surmised from Figure 2 itself.

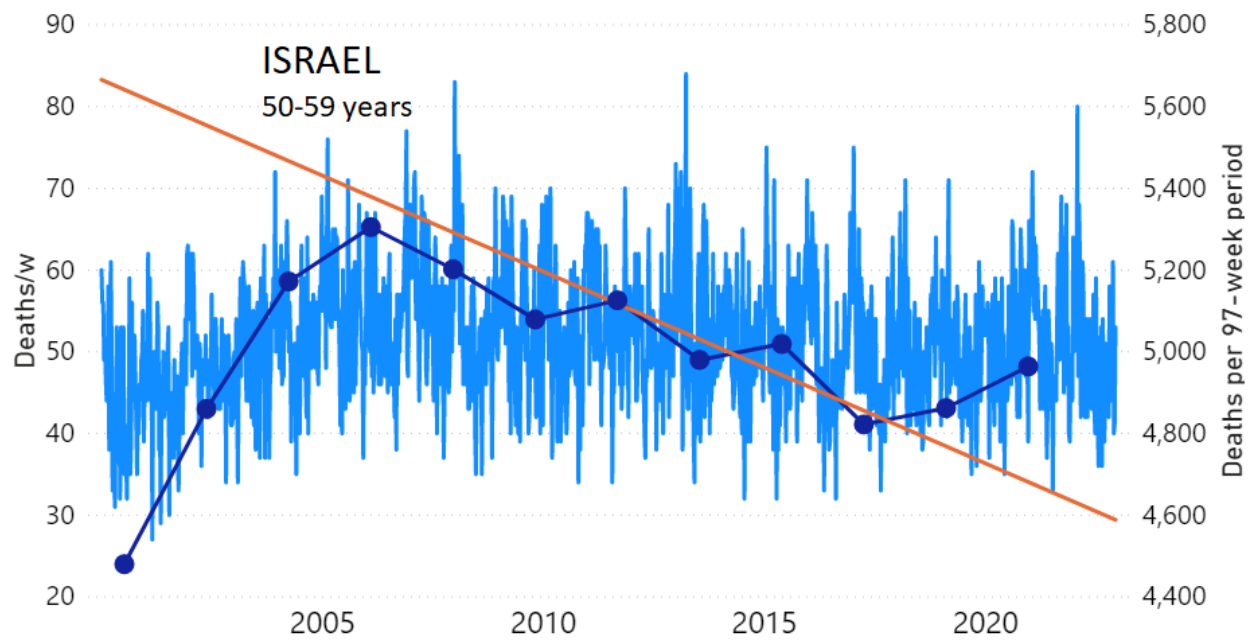
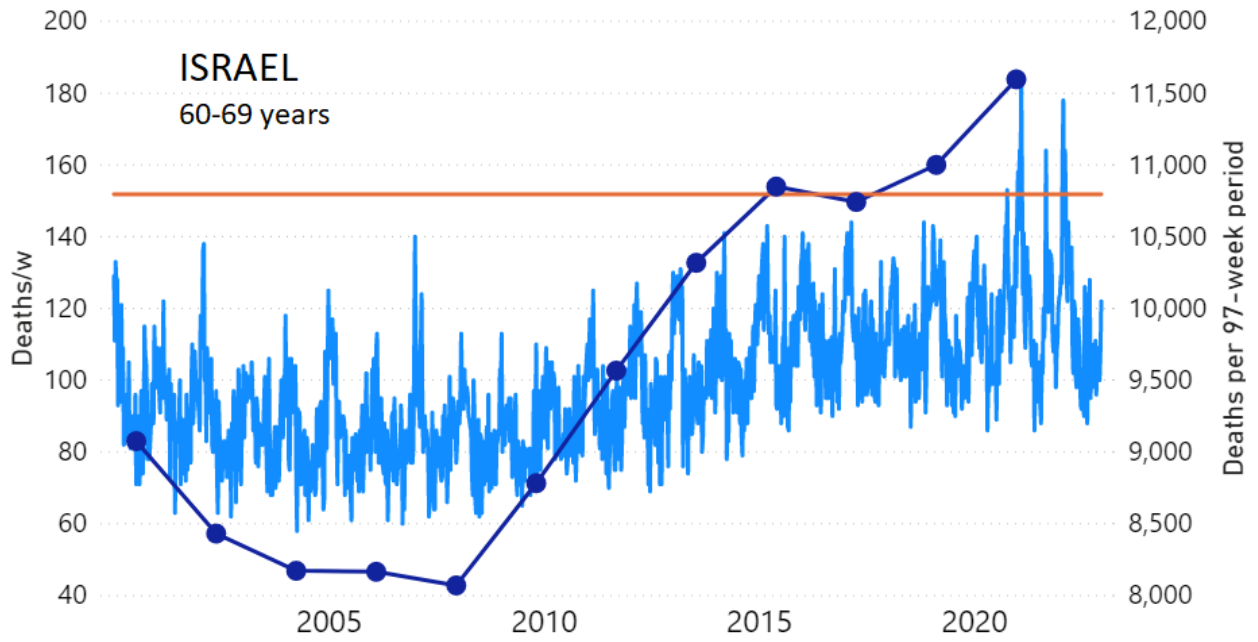
In this way, we account for the different historical trends in ACM that occur in the different age groups for Israel, and we avoid the point immediately preceding the vaccination period where it appears to include a significant excess mortality in the pre-vaccination period of the declared pandemic.

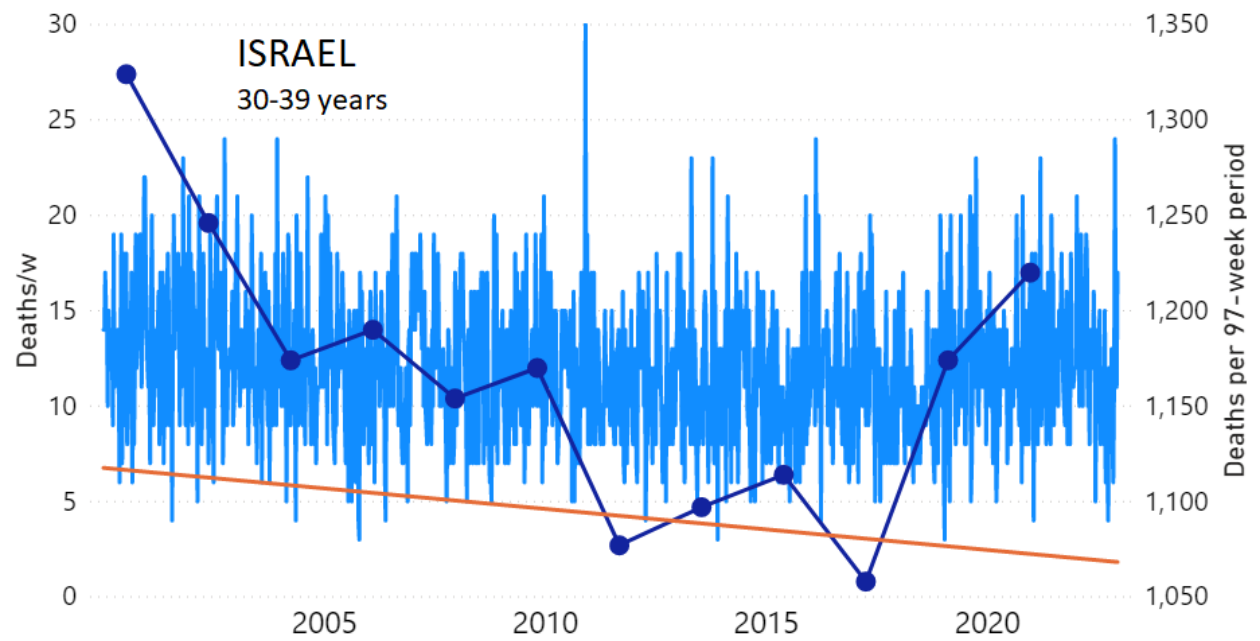
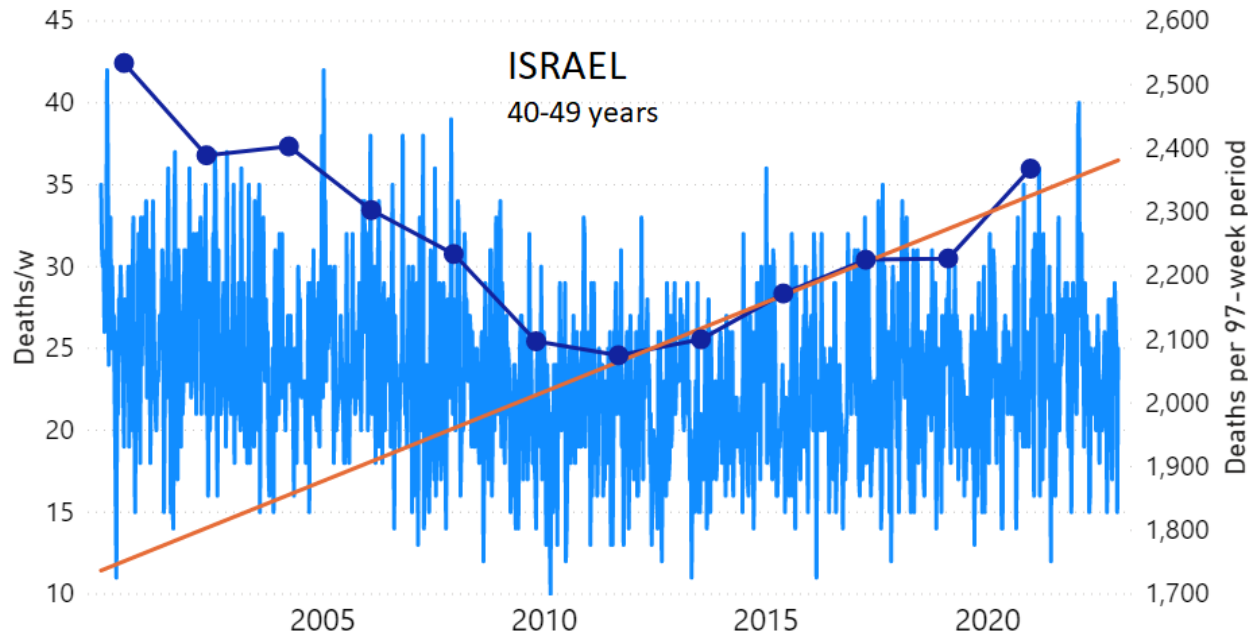
The details such as sources of official data, start and end points of integration, and methods for matching ACM and vaccine rollout data by age group, are provided in Appendix 1.

In terms of specific features in ACM by time, examples of synchronicity between ACM peaks and vaccine dose rollouts for Israel are shown in Appendix 2.









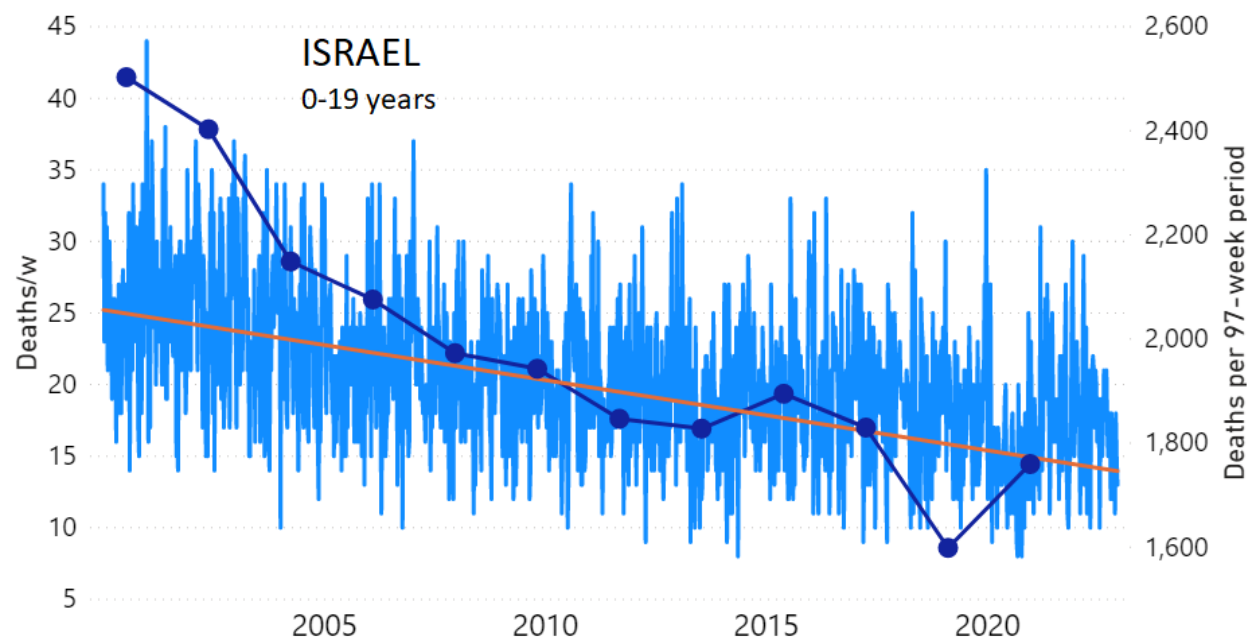
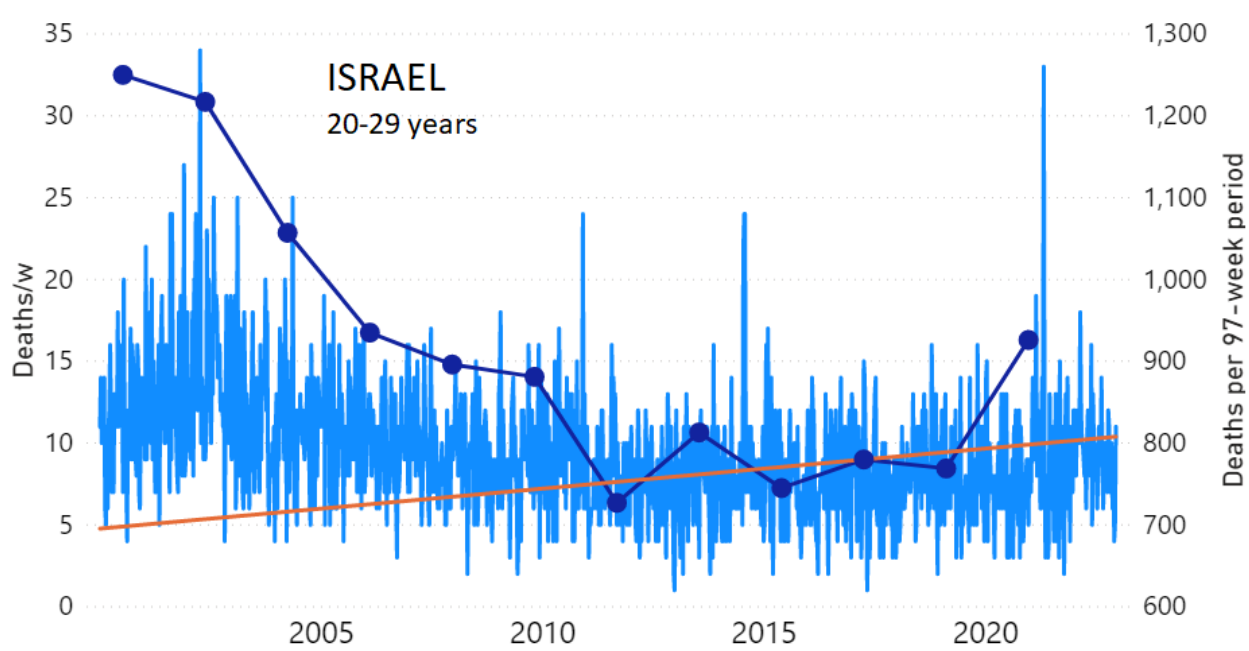


Figure 2: Israel, 2000-2022, by age group as indicated; and on expanded time axis 2015-2022 for all-population, as indicated. ACM by week (light blue); integrated ACM by 97-week vaccination-period integration window (dark blue, points), the last point being for the actual vaccination period itself; extrapolation line used to calculate the excess ACM in the vaccination period (orange). See the text for a description of the method, and Appendix 1 for details.

For Israel (Figure 2), although there is necessarily a degree of arbitrariness in the choice of the points to include in the linear regression, this does not significantly affect the results since:

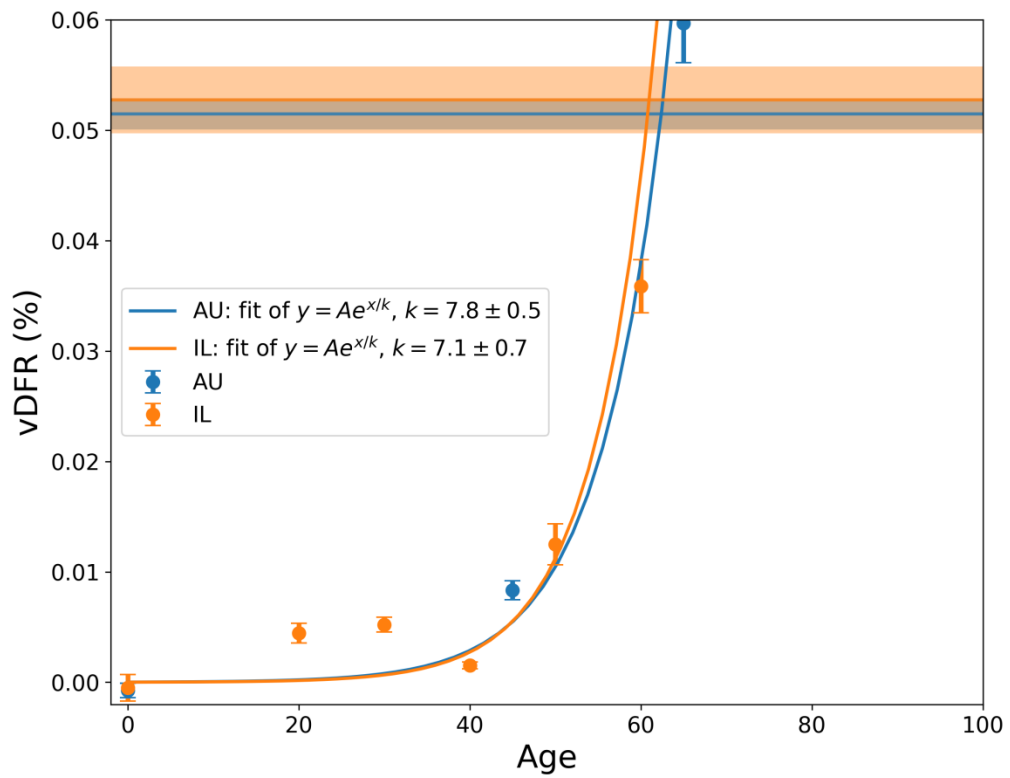
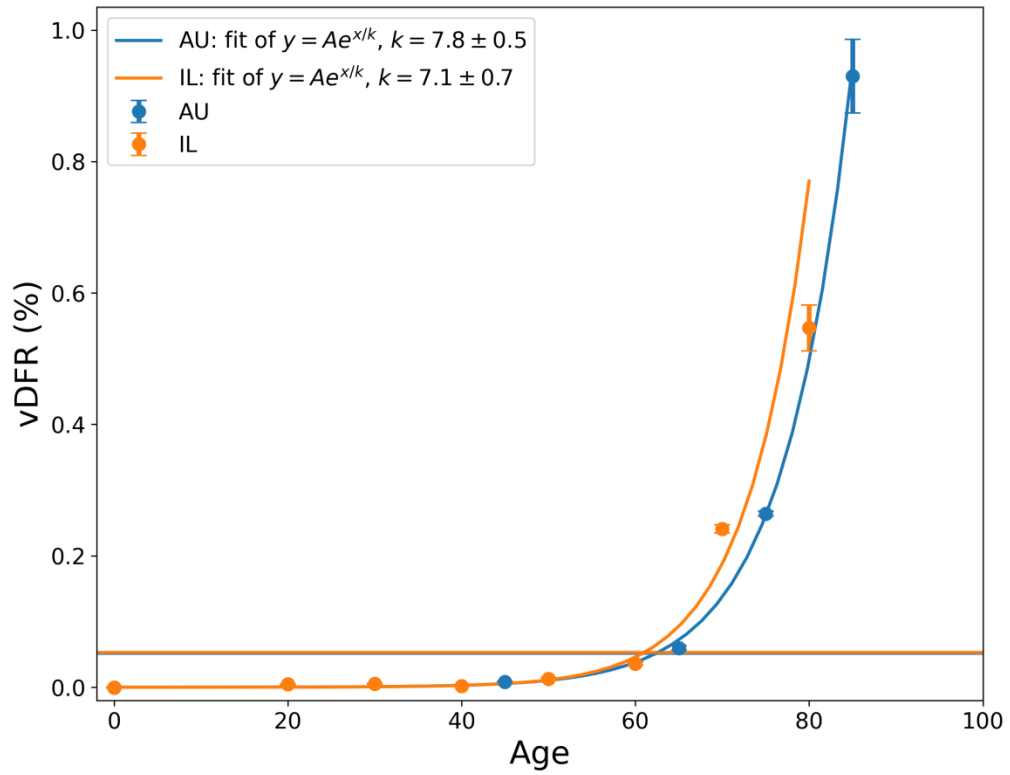
- i. The effect (age-stratified excess ACM in the vaccination period) is large enough not to be sensitive to the said arbitrariness.
- ii. The integrated ACM for the vaccination period is generally significantly and anomalously greater than its value for the immediately preceding integration period.
- iii. Essentially the same result (age-stratified excess ACM in the vaccination period) occurs if we use the simplest possible method of taking the extrapolated vaccination-period ACM to be equal to the value for the immediately preceding point, which amounts to removing mortality occurring pre-vaccination in the pandemic period while assuming a locally constant trend in integrated ACM.

Tables 1 and 2 give the resulting age-stratified (and all-population) vDFR values for Australia and Israel, respectively. See Appendix 1 for details.

Table 1: AUSTRALIA			
Age group (years)	Excess ACM in the vaccination period (\pm)	Vaccine doses in the vaccination period	vDFR (%) (\pm)
All ages	32,610(890)	63,342,668	0.0515%(0.0014%)
85+	16,120(970)	1,734,308	0.930%(0.056%)
75-84	11,120(170)	4,210,402	0.264%(0.004%)
65-74	4,180(250)	6,994,831	0.0597%(0.0036%)
45-64	1,400(140)	16,791,268	0.00833%(0.00086%)
0-44	-210(190)	28,706,437	-0.00073%(0.00065%)

Table 2: ISRAEL			
Age group (years)	Excess ACM in the vaccination period (\pm)	Vaccine doses in the vaccination period	vDFR (%) (\pm)
All ages	9630(550)	18,251,720	0.0527%(0.0030%)
80+	5220(330)	954,235	0.547%(0.035%)
70-79	4100(110)	1,699,838	0.2410%(0.0065%)
60-69	800(54)	2,230,502	0.0359%(0.0024%)
50-59	283(42)	2,264,319	0.0125%(0.0019%)
40-49	42(8)	2,740,576	0.0015%(0.0003%)
30-39	148(19)	2,825,151	0.0052%(0.0007%)
20-29	128(26)	2,872,200	0.0045%(0.0009%)
0-19	-13(32)	2,664,899	-0.0005%(0.0012%)

The results from Tables 1 and 2 are plotted in Figure 3, with exponential fits, both on linear and logarithmic scales for vDFR.



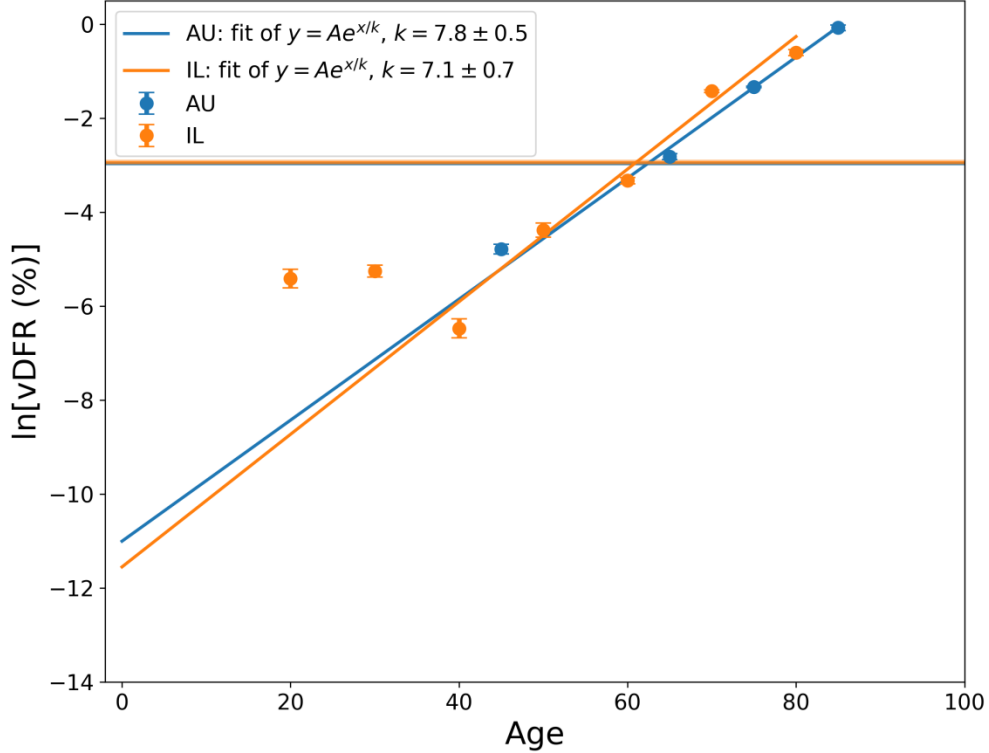


Figure 3: vDFR, which is the ratio of vaccine-induced deaths to vaccine doses delivered in the population of the specified age group, versus age for Israel (orange) and Australia (blue), on full (top) and expanded (middle) linear scales, and with semi-log scale (bottom). Horizontal bands are for the all-population values of vDFR. The age (X-axis value, years) assigned to a given age group is the starting age of the window of ages for the age group.

In Figure 3, the age (X-axis value, in years) assigned to a given age group is the starting age of the window of ages for the age group. This particular choice makes little difference because translating the x values by any constant number, for example, does not affect the doubling time obtained by fitting an exponential function, and only slightly affects the y intercept at $x = 0$ (the prefactor in the exponential).

The fitted exponentials (Figure 3) are of the form:

$$y = A \exp(x / k)$$

or

$$vDFR = A \exp(\text{Age} / k)$$

where A is the prefactor.

The doubling time (T2) is related to k as:

$$T2 = k \ln(2).$$

The fitted values of k (and T2) are:

Fitted function: $vDFR = A \exp(\text{Age} / k)$			
Country	Number of points in fit	k (\pm) (years)	T2 (\pm) (years)
AU	5	7.8(0.5)	5.4(0.3)
IL	8	7.1(0.7)	4.9(0.5)

This doubling time by age of approximately 5 years for risk of dying per injection of the COVID-19 vaccines is approximately half of the doubling time by age of 10 years for risk of dying per year of all causes in a modern human population, and of the main old-age diseases cancer, pneumonia and heart disease (Strekler and Mildvan, 1960). This implies a toxicity effect rather than simply inducing death by old age.

Furthermore, there is a non-exponential constant vDFR for young adults (vDFR \approx 0.005 %, 20-40 years, Figure 3, Table 2). This suggests an accidental mechanism of death with a constant probability for these ages. One might postulate, for example, that vDFR is a product of a constant (age-independent) probability of accidental intra-vascular injection and a constant probability of death given intra-vascular injection. One might further postulate that one or both of these probabilities is larger in athletes with highly developed vascular systems and rapid circulatory rates (Cadejani, 2022; Klein et al., 2022).

Our all-population value of vDFR of approximately 0.05 % (Figure 3, Tables 1 and 2) implies that in the USA, following the administration of approximately 670 million COVID-19 vaccine doses to date (669.60 million doses, up to 31 January 2023, *Our World in Data*),² approximately 330,000 USA residents would have died from the COVID-19 vaccines (1 in 1,000 on a population basis), assuming that elderly and vulnerable individuals are not more abundant or more aggressively targeted than in Australia or Israel. This number is comparable to the 278,000 fatalities found by Skidmore (2023) in his survey study for the USA. Our number of 330,000 is probably an underestimate, in light of the exponential dependence of vDFR with age that we have demonstrated and the known exceptionally large pools of highly vulnerable residents in the USA (Rancourt et al., 2022b).

Most importantly and concretely, our results establish a large vDFR in elderly people, as large as the 1 % measured for India when frail elderly people and patients with comorbidities were targeted (Rancourt, 2022), and when the same was presumably done in the high-poverty states of the USA, under the banner of vaccine equity programmes (Rancourt et al., 2022b).

The public health notion that elderly and vulnerable individuals must be prioritized for COVID-19 vaccination assumes:

- i. a constant age-independent vDFR
- ii. a small value of the vDFR optimistically estimated from managed trials, funded by the pharmaceutical industry

Our research shows that both assumptions (i and ii) are false, and far from reality in the field, on the scale of nations.

The said public health notion has always been baseless since it was not anchored in any sufficient evaluation of age-stratified risk of fatality from the injection (e.g., Veronese

² <https://ourworldindata.org/grapher/cumulative-covid-vaccinations?country=~USA>, consulted on 6 February 2023.

et al., 2021; Abbatecola et al., 2022; Gao et al., 2022), and is now proven to be contrary to reality. Prioritizing elderly people for vaccination, in the absence of relevant data, was reckless. Norway may be the only jurisdiction that immediately and publicly recognized a problem and changed its policy regarding vaccinating the most elderly and frail (*Reuters*, 18 January 2021; *Fortune*, 15 January 2021).

Some readers will be tempted to compare our results (Figure 3) with published age-stratified COVID-19 infection fatality rates (IFR) (e.g., COVID-19 Forecasting Team, 2022; Pezzullo et al., 2023). While in principle this is a correct approach of risk-benefit analysis, we believe that the IFR studies are not reliable, for the following reasons:

- i. The deaths in the numerator of IFR are “COVID-19 deaths”, and this cause of death assignment is susceptible to bias and is highly uncertain (e.g., Rancourt et al., 2022c; Rancourt et al., 2021).
- ii. The number of infections, in the denominator of IFR, is reliant on molecular antibody tests, which are not specific and have not been sufficiently validated (e.g., Rancourt, 2021).
- iii. If the IFR evaluations were valid, then it would be virtually impossible for jurisdictions like India and Australia to have no detectable excess ACM in the pre-vaccination period of the declared pandemic.
- iv. We do not detect any excess ACM that can be attributed to COVID-19 in the jurisdictions that we have studied in detail (USA and all its states; Canada and its provinces; France and its departments and regions; Australia and its states).

The COVID-19 vaccines did not only not save lives but they are highly toxic.

On the global scale, given the 3.7 million fatalities in India alone, having vDFR = 1 % (Rancourt, 2022), and given the age-stratified vDFR results presented in this work, it is not unreasonable to assume an all-population global value of vDFR = 0.1 %. Based on the global number of COVID-19 vaccine doses administered to date (13.25 billion

doses, up to 24 January 2023, *Our World in Data*),³ this would correspond to 13 million deaths from the COVID-19 vaccines worldwide. By comparison, the official World Health Organization (WHO) number of COVID-19 deaths to date is 6.8 million (6,817,478 deaths, reported to WHO, as 3 February 2023),⁴ which are not detected as COVID-19 assignable deaths in ACM studies.

We are continuing our research on ACM, extending it to many national and sub-national jurisdictions. We hope that the present report will help put an end to the misguided and baseless public health policy that elderly people should be prioritized for vaccination.

(See Appendixes, below References)

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³ <https://ourworldindata.org/covid-vaccinations>, as archived on 30 January 2023 here: <https://archive.ph/u2gEO>

⁴ <https://covid19.who.int/>, as archived on 6 February 2023 here: <https://archive.ph/boboE>

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Appendix 1:

Data and Methods

Data

Table A1 describes the data used in this work and the sources of the data.

Data	Country	Period	Time unit	Filters	Source
ACM	Australia	2015-2022*	Week	Age group ¹ , sex	ABS, 2022
ACM	Israel	2000-2022**	Week	Age group ² , sex	CBS, 2022
Vaccines	Australia	2021-2023 ⁺	Week	Age group ³ , sex	AG, 2022a AG, 2022b
Vaccines	Israel	2020-2022 ⁺⁺	Day	Age group ⁴	Data Gov, 2022
Population	Australia	2021	Year	Age group ⁵ , sex	ABS, 2021

Table A1. Data retrieved. All-cause mortality (ACM), vaccine rollouts, population.

* At the date of access, data were available from week-1 of 2015 (week finishing on January 4, 2015) to week-38 of 2022 (week finishing on September 25, 2022).

** At the date of access, data were available from week-1 of 2000 (week starting on January 3, 2000) to week-50 of 2022 (week starting on December 12, 2022).

⁺ The reports of September 16, 2022 have been used in this work, reporting data as at September 14, 2022.

⁺⁺ At the date of access, data were available from Sunday December 20, 2020 to Tuesday October 25, 2022.

¹ 5 age groups: 0-44, 45-64, 65-74, 75-84, 85+

² 8 age groups: 0-19, 20-29, 30-39, 40-49, 50-59, 60-69, 70-79, 80+

³ 19 age groups for vaccine doses 1 and 2: 5-11, 12-15, 16-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64, 65-69, 70-74, 75-79, 80-84, 85-89, 90-94, 95+ (Excel file report, AG 2022a) and 14 age groups for vaccine doses 3 and 4: 5-11, 12-15, 16-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64, 65-69, 70+ (PDF file report, AG 2022b)

⁴ 9 age groups: 0-19, 20-29, 30-39, 40-49, 50-59, 60-69, 70-79, 80-89, 90+

⁵ 18 age groups: 0-4, 5-9, 10-14, 15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64, 65-69, 70-74, 75-79, 80-84, 85+

In addition to the data retrieved as per Table A1, we also examined cumulative vaccine dose by time data for Australia, as per our previous paper about Australia (Rancourt et al., 2022), from <https://www.covid19data.com.au/vaccines>.

In all the calculations and illustrations, both all-cause mortality (ACM, mortality from all causes of death) and numbers of vaccine doses administered are for the specific jurisdiction and age group.

Vaccine data for Australia are given as cumulative data (AG, 2022a and AG, 2022b).

Vaccine data for Israel are given as incremental data (Data Gov, 2022).

In the vaccines data of Israel, when the number of doses administered in a day is between 1 and 15, inclusively, the data shows “<15” (Data Gov, 2022). In order to have a figure to work with, we replaced “<15” by 15, choosing the upper bound of this unknown value. The net effect of this approximation is negligible.

For the vaccine data in Australia, doses 1 and doses 2 are given for 19 age groups (AG, 2022a), which cover the age groups of the ACM by age data (ABS, 2022). However, for doses 3 and 4, 14 age groups are given (AG, 2022b), which do not match the same age groups as for the ACM by age data (ABS, 2022). For this reason, we proceeded as follows.

Figure A1 is the figure from the Australian Government, on page 7 of their report (AG, 2022b):

Number of people vaccinated by age

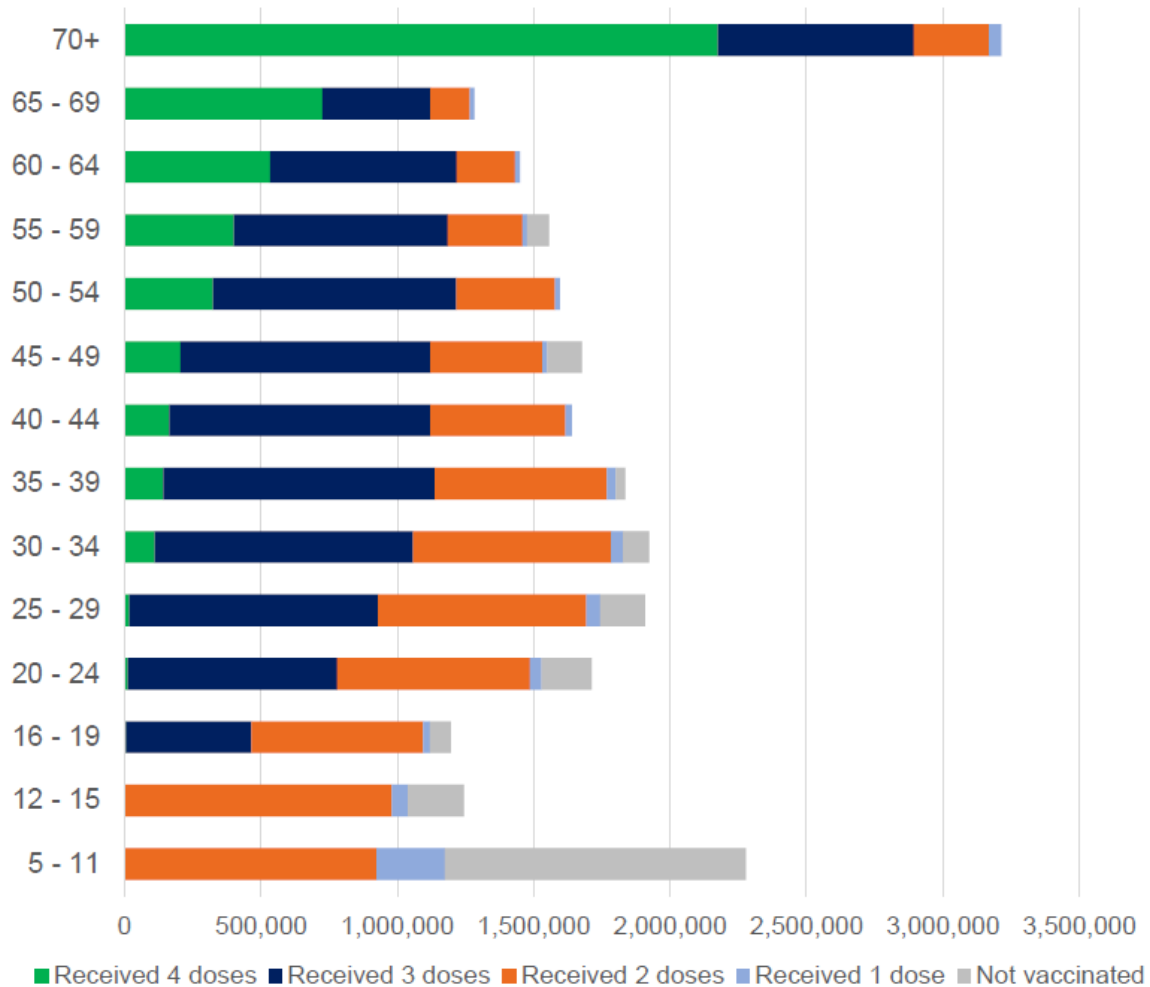


Figure A1. Vaccinations by age from the Australian Government, report of September 16, 2022, page 7 (AG, 2022b).

First, we estimate the number of doses 3+4 administered by age group from this figure (Figure A1). This is done in Table A2.

Age group	Measure (cm)	Doses 3+4
70+	8.40	2,896,551
65-69	3.23	1,113,793
60-64	3.51	1,210,344
55-59	3.41	1,175,862
50-54	3.53	1,217,241
45-49	3.25	1,120,689
40-44	3.25	1,120,689

35-39	3.3	1,137,931
30-34	3.1	1,068,965
25-29	2.7	931,034
20-24	2.25	775,862
16-19	1.33	458,620

Table A2. Estimation of the number of doses 3+4 by age group from AG, 2022b.
Scale used = 1,000,000 people for 2.9 cm.

Next, we estimate the number of doses 3+4 for the missing age groups: the 70-74, 75-84 and 85+ age groups. We assume and use a simple proportion of the population of those age groups (ABS, 2021). This is done in Table A3.

Age group	Population (ABS, 2021)	Doses 3+4
85+	542,342	510,100
75-84	1,376,518	1,294,687
70-74	1,160,768	1,091,762

Table A3. Estimation of the number of doses 3+4 for the 70-74, 75-84 and 85+ age groups.

Finally, we sum the estimations from Table A2 and Table A3 into relevant age groups to get the final number of doses 3+4 by ACM age group for Australia. This is done in Table A4.

Age group	Estimated number of doses 3+4
85+	510,100
75-84	1,294,687
65-74	2,205,555
45-64	4,724,136
0-44	5,493,101

Table A4. Estimation of the number of doses 3+4 by age group in Australia.

These age groups (Table A4) match those of the mortality data for Australia. Note that for the age group 0-44, doses 3 and 4 are for ages 16-44 years. There is no data for doses 3 and 4 for ages 0-15 years in Figure A1 (AG, 2022b).

Vaccination periods

For Israel, we use the same start date (week) of the vaccination period for all age groups. The integration of number of vaccine doses over the vaccine period is inclusive of the first and last weeks defining the said period. The same holds for integrated ACM periods.

For Australia, we use the vaccine-period end-date cumulative value of number of administered vaccine doses.

Table A5 defines the vaccination periods used in this work.

Country	Beginning	Ending	Duration (in weeks)
Australia	Week-10 of 2021	Week-37 of 2022	80
Israel	Week-52 of 2020	Week-43 of 2022	97

Table A5. Vaccination periods for Australia and Israel used in this work.

“The week number is based on the ISO (International Organization for Standardisation) week date system. In this system, weeks are defined as seven-day periods which start on a Monday. Week 1 of any given year is the week which starts on the Monday closest to 1 January, and for which the majority of its days fall in January (i.e. four days or more). Week 1 therefore always contains the 4th of January and always contains the first Thursday of the year. Using the ISO structure, some years (e.g. 2015 and 2020) contain 53 weeks.” (definition from ABS, 2022).

Trendlines

Table A6 describes the method used to calculate the trendlines fitted to ACM integrated over the periods of equal duration as the duration of the vaccination period. The said trendlines are used to calculate the baseline integrated mortality in the vaccination period, in order to obtain the excess ACM of the vaccination period.

Country	Age group	Number of integration periods used*	Method
Australia	All	3	Average
Australia	85+	3	Average
Australia	75-84	3	Average
Australia	65-74	3	Average

Australia	45-64	3	Average
Australia	0-44	3	Average
Israel	All	4	Linear regression
Israel	80+	4	Linear regression
Israel	70-79	4	Linear regression
Israel	60-69	2	Average
Israel	50-59	4	Linear regression
Israel	40-49	4	Linear regression
Israel	30-39	4	Linear regression
Israel	20-29	4	Linear regression
Israel	0-19	6	Linear regression

Table A6. Method to estimate the trendlines. For Australia, we use the integrated ACM of the 3 periods prior to the vaccination period, each period being of duration equal to that of the vaccination period (80 weeks) and consecutive to each other, and we calculate the average. For Israel, we use the integrated ACM of the number of periods indicated in the table, prior to the first period directly preceding the vaccination period, each period being of duration equal to the duration of the vaccination period (97 weeks) and consecutive to each other, and we fit a linear trend.

* This is the number of integrated ACM points (periods) used to calculate the trendlines.

The error in the calculated baseline value of integrated ACM over the vaccination period is estimated as the average of the absolute values of the residuals (fit to data) for the points (periods) used in the fit.

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<https://correlation-canada.org/report-probable-causal-association-between-australias-new-regime-of-high-all-cause-mortality-and-its-covid-19-vaccine-rollout/>

Appendix 2: ACM and Vaccine Rollout Coincidences, for Israel, by Age Group

We have previously illustrated synchronicity between anomalous all-cause mortality (ACM) peaks and vaccine rollouts for:

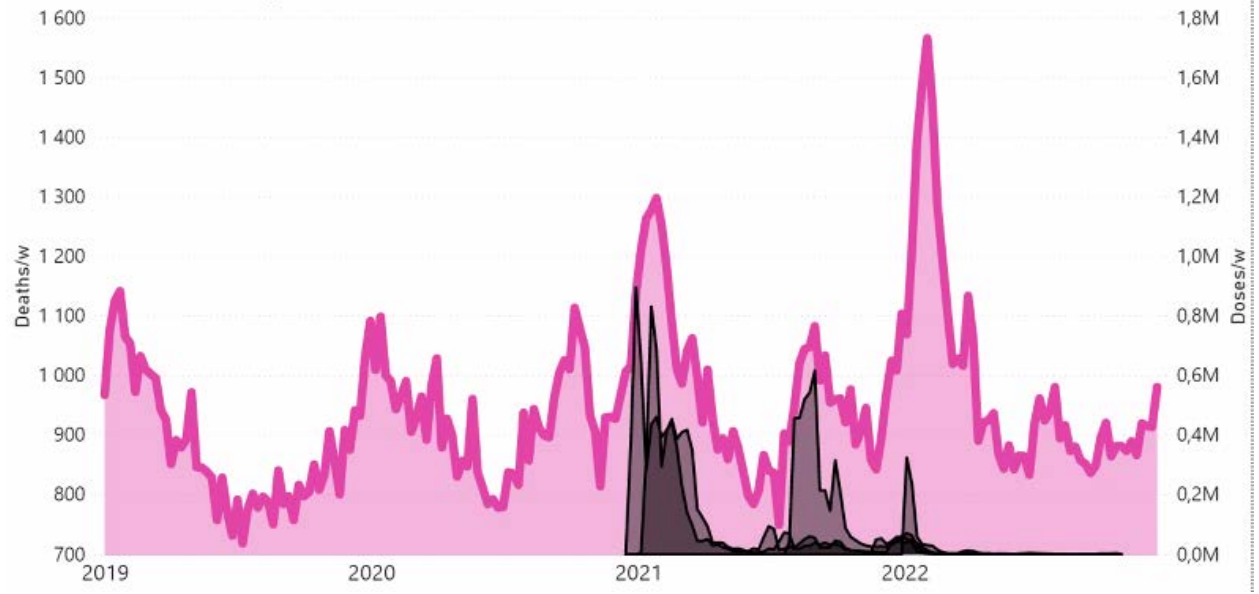
- Australia (and each of its states New South Wales, Victoria, and Queensland),
- the USA (and its high-poverty states),
- the USA state of Michigan, and
- the Canadian province of Ontario

(See: Rancourt, D.G., Baudin, M. and Mercier, J. /// Probable causal association between Australia's new regime of high all-cause mortality and its COVID-19 vaccine rollout. /// *Correlation Research in the Public Interest*, 20 December 2022 ///

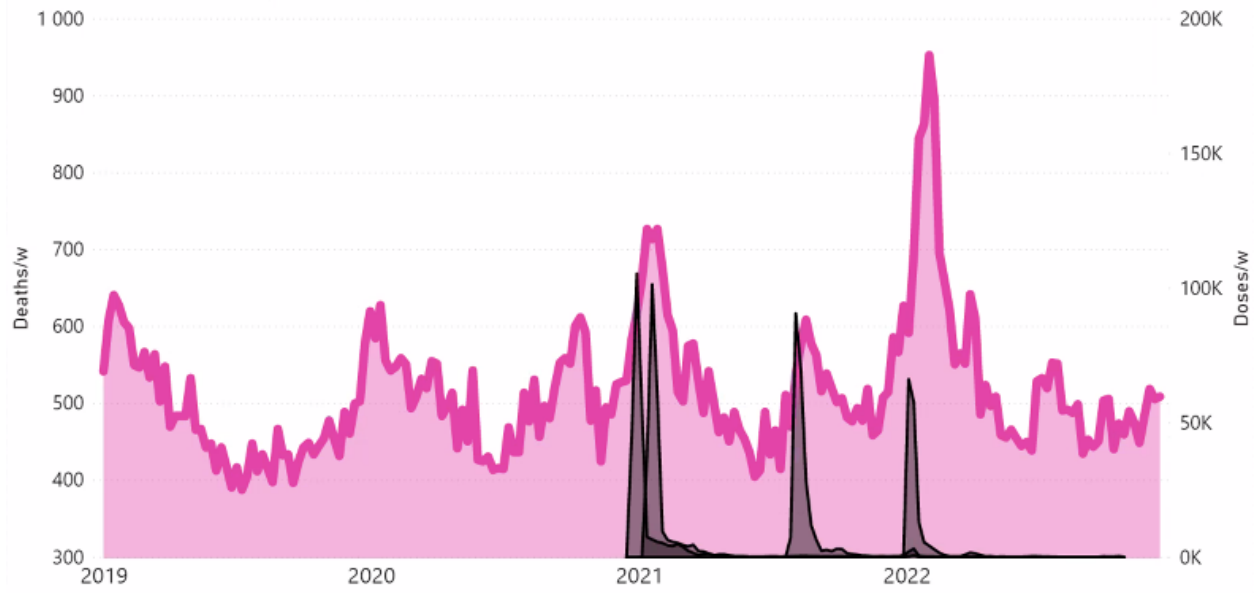
<https://correlation-canada.org/report-probable-causal-association-between-australias-new-regime-of-high-all-cause-mortality-and-its-covid-19-vaccine-rollout/>)

Here, we examine this question for Israel and some of its age groups (as indicated), in the following Figure A2-F1:

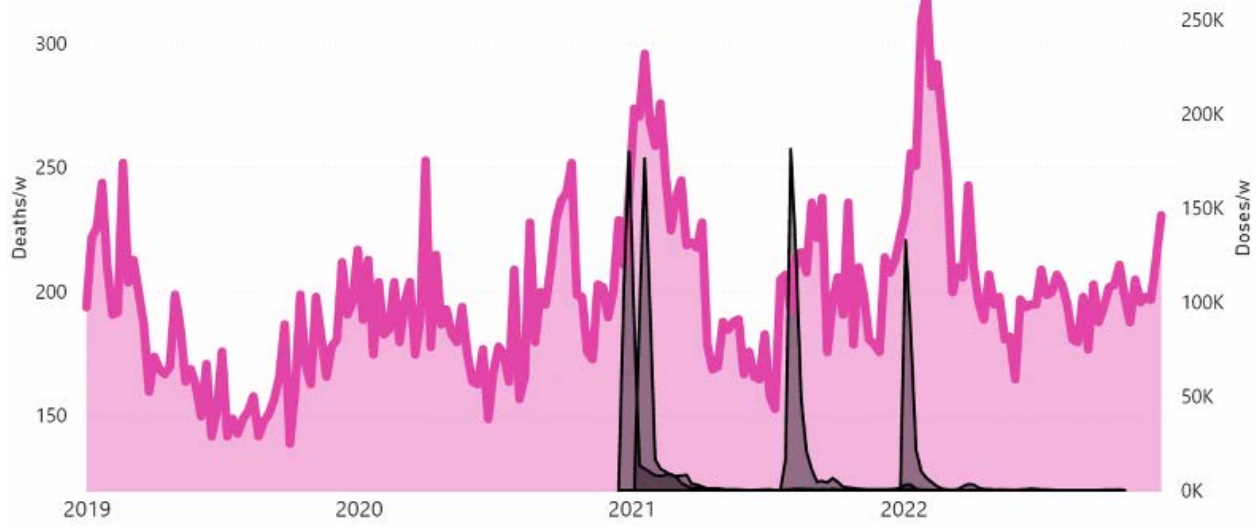
ACM/w and vaccine doses by week, Israel, 2019-2022



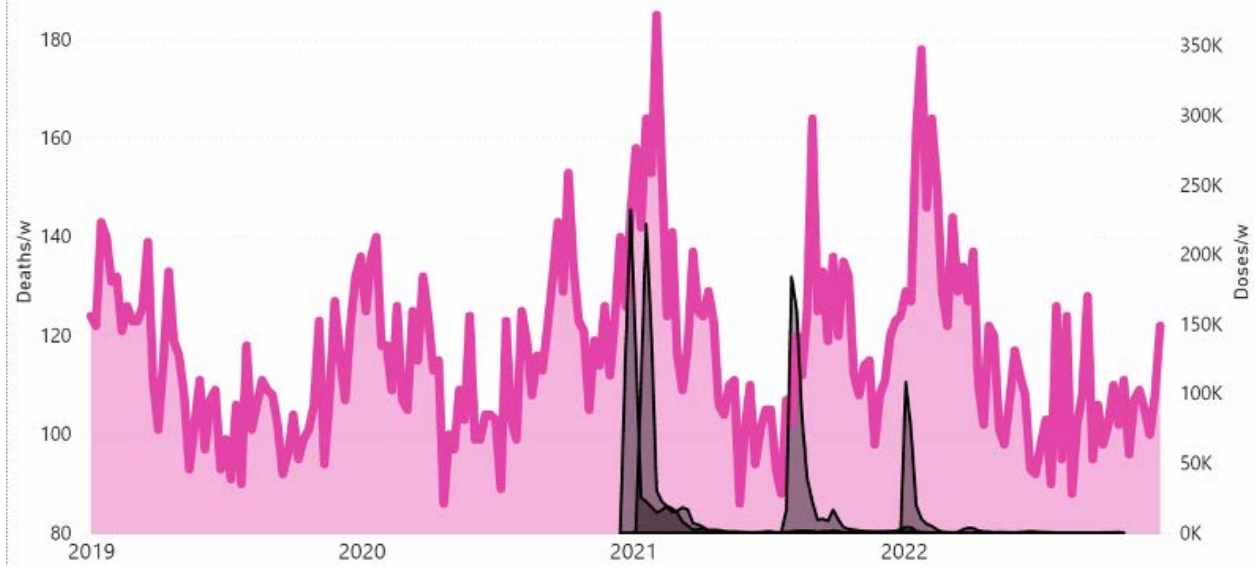
ACM/w and vaccine doses by week, Israel, 80+, 2019-2022



ACM/w and vaccine doses by week, Israel, 70-79, 2019-2022



ACM/w and vaccine doses by week, Israel, 60-69, 2019-2022



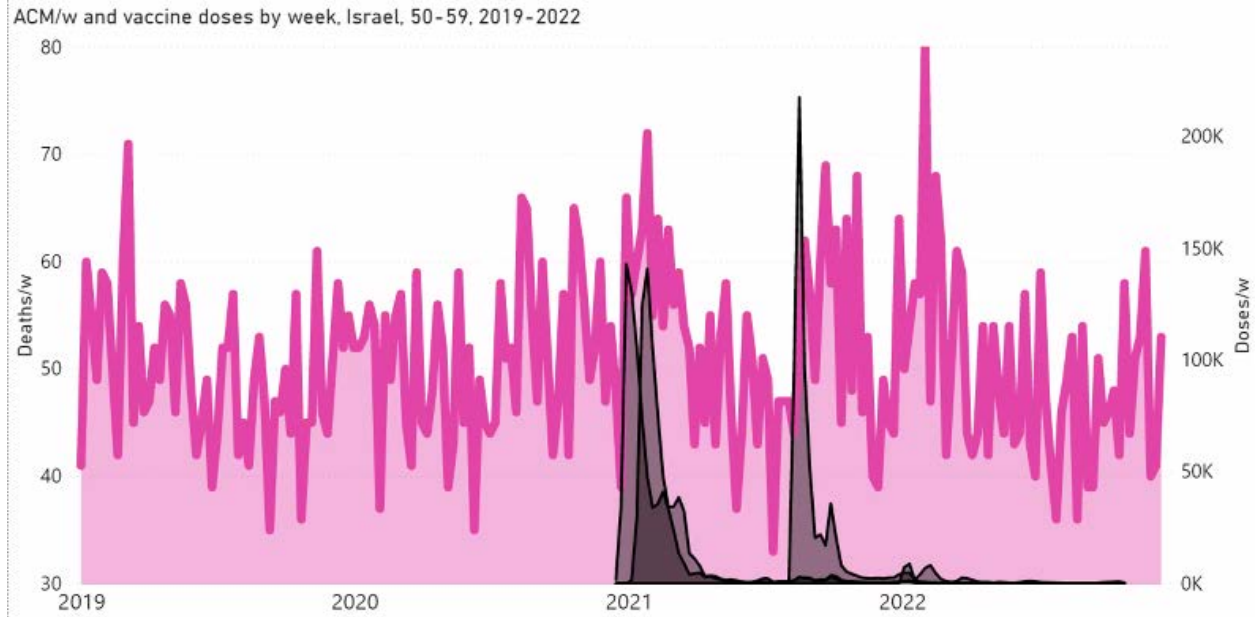


Figure A2 F1: Israel, 2019-2022, for (top to bottom, and as indicated) all ages, 80+ years, 70-79 years, 60-69 years, and 50-59 years. All-cause mortality (ACM) by week (pink, left y-scale); successive vaccine dose rollouts for doses 1, 2, 3 and 4, as numbers of doses administered by week (black and overlapping greys, right y-scale). The sources of all data are given in Appendix 1.