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**Long-term excess mortality after COVID19 injections in New Zealand**

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**Abstract**

A large leaked database from New Zealand enables exploring all cause mortality timelines after COVID19 injections. For injections 1-3, daily death rates after injection have two distinct periods. The first period starts upon injection. Daily excess mortality increases rapidly to 4-10x expected age-adjusted mortality and then decreases towards a stable daily rate. This first period is approximately 180, 250 and 315 days long for injections 1, 2 and 3. The second period with stable daily mortality rates is characterized by a return to expected normal mortality for 1st injections, and stable daily excess mortality 2-4x the expected normal mortality rate for injections 2-4). Causes for the two distinct periods remain unknown. The duration of the second period with stable mortality rates remains unknown and will require similar data at ulterior periods.

**Introduction**

A whistleblower from New Zealand published in late October 2023 data on about 4 million injections, including injection and death dates. Here analyses explore the timeline of effects of these injections on all cause mortality. Previous analyses on this subject used weekly population-level information on all cause mortality and injection rates. The leaked New Zealand data enable individual-based (rather than population-based) examination of effects of injections. Table 1 describes the data at disposal.

| Dose | N | N dead |
|---|---|---|
| 1 | 967154 | 11623 |
| 2 | 1034808 | 13681 |
| 3 | 1048575 | 21826 |
| 4 | 762241 | 15541 |
| 5 | 369371 | 3686 |
| 6 | 6633 | 94 |
| 7+ | 108 | 4 |

Table 1. Sample sizes of available data on single COVID19 injections in the leaked New Zealand data.

**Methods**

A crucial point in analysing these data is to focus on the effects of specific injections (1st, 2nd, etc). This requires to analyse only data for individuals who after a given injection, and did not continue getting additional injections. The site VaersAware.com describes this for death cases as a function of days since injection, specifically for individuals who did not get additional injections beyond a focal injection (https://www.vaersaware.com/new-zealand) (Injection 1, 1150 deaths; injection 2, 3084 deaths; injection 3, 14478 deaths). Exploration of death rates require total numbers of individuals in each sample, meaning those that did not get additional injections beyond the focal injection. This information is unavailable at VaersAware.com.

**Results**

*Database quality*

The database consists of excel spreadsheets where each row is for a single injection, and an identifying number for each individual. If an individual received two doses only, his identifier will appear twice, once for dose 1 and once for dose 2, but not for additional doses. There were only 23 cases where the same identifier had the same dose number. In all these cases, the birth dates were identical. The rows with identical identifier and dose number differed in a few cases in which vaccine

was injected (for example, Pfizer vs Astrazeneca, suggesting recording errors in vaccine type), in the remaining cases injection dates were very different, with the ulterior date frequently more than a year after the most ancient date (suggesting an error in recording the dose number). In four rows, injection date was ulterior to death date, suggesting these dates were inverted. Considering that the database includes over 4 million rows, these two error types are extremely rare, meaning a high quality of the data.

*Age-adjusted baseline mortality*

In order to detect effects of injections on all cause mortality, mortality of those injected has to be compared to all cause mortamity for the same age distribution as the injected sample, but without injection. This is calculated by using yearly death rate for each age class from 0 to 99 years old, for the 2020 New Zealand population (https://www.stats.govt.nz/information-releases/new-zealand-cohort-life-tables-march-2023-update/). The expected yearly mortality for a sample of injected individuals is calculated by summing the product of death rate and the number of individuals in each age class over all age classes and dividing this sum by the sample size. The expected/normal/control daily all cause mortality rate is obtained by dividing this yearly rate by 365.

*Daily all cause mortality with a single injection vs others*

The database was sorted to detect all identifying numbers that occur only with injection 1, presumably individuals that did not get any additional injections beyond the first injection. This defines the injection 1-only sample. The same process was done for injections 2, 3 and 4. Table 2 presents age distributions for these injection X-only samples.

| Age/Injection | NZ 2020 | 1 only | 1+2 only | 1+2+3 only |
|---|---|---|---|---|
| 0 | 0.0045 | 0 | 0 | 0 |
| 1 | 0.0003 | 4 | 3 | 3 |
| 2 | 0.0002 | 3 | 1 | 5 |
| 3 | 0.0001 | 2 | 2 | 3 |
| 4 | 0.0001 | 8 | 6 | 6 |
| 5 | 0.0001 | 700 | 366 | 5 |
| 6 | 0.0001 | 4488 | 4256 | 3 |
| 7 | 0.0001 | 6917 | 6953 | 10 |
| 8 | 0.0001 | 7280 | 7593 | 8 |
| 9 | 0.0001 | 7771 | 8213 | 8 |
| 10 | 0.0001 | 8403 | 9080 | 9 |
| 11 | 0.0001 | 9022 | 9987 | 16 |
| 12 | 0.00015 | 9508 | 10581 | 19 |
| 13 | 0.00015 | 10715 | 12586 | 28 |
| 14 | 0.0002 | 9500 | 17496 | 67 |
| 15 | 0.00025 | 9442 | 17915 | 92 |
| 16 | 0.0003 | 9372 | 17740 | 859 |
| 17 | 0.0003 | 8541 | 16047 | 4946 |
| 18 | 0.00035 | 7965 | 15010 | 6882 |
| 19 | 0.00035 | 7185 | 13176 | 9747 |
| 20 | 0.00035 | 5897 | 10595 | 11805 |
| 21 | 0.0004 | 6157 | 10813 | 11519 |
| 22 | 0.0004 | 6271 | 10905 | 12064 |
| 23 | 0.0004 | 6262 | 11075 | 12353 |

| | | | | |
|---|---|---|---|---|
| 24 | 0.0004 | 5834 | 10541 | 11988 |
| 25 | 0.00035 | 5816 | 10504 | 11983 |
| 26 | 0.00035 | 5869 | 10325 | 12154 |
| 27 | 0.00035 | 5942 | 10441 | 12583 |
| 28 | 0.00035 | 5982 | 10940 | 12619 |
| 29 | 0.00035 | 5844 | 10638 | 13304 |
| 30 | 0.0004 | 6145 | 11023 | 13336 |
| 31 | 0.0004 | 5930 | 10817 | 13138 |
| 32 | 0.0004 | 5874 | 10618 | 13685 |
| 33 | 0.0004 | 5778 | 10562 | 13873 |
| 34 | 0.00045 | 5608 | 9922 | 13552 |
| 35 | 0.00045 | 5268 | 9498 | 13556 |
| 36 | 0.0005 | 5070 | 9176 | 13356 |
| 37 | 0.0005 | 4808 | 8673 | 12788 |
| 38 | 0.0005 | 4597 | 8201 | 13002 |
| 39 | 0.0005 | 4479 | 7995 | 12773 |
| 40 | 0.0006 | 4303 | 7778 | 12451 |
| 41 | 0.0006 | 4051 | 7416 | 12415 |
| 42 | 0.0006 | 3933 | 7084 | 12406 |
| 43 | 0.0007 | 3741 | 6981 | 12365 |
| 44 | 0.0007 | 3580 | 6791 | 12280 |
| 45 | 0.00075 | 3566 | 6622 | 11958 |
| 46 | 0.0008 | 3384 | 6241 | 12103 |
| 47 | 0.00085 | 3323 | 6350 | 12086 |
| 48 | 0.0009 | 3245 | 5996 | 12686 |
| 49 | 0.00095 | 3377 | 6321 | 13053 |
| 50 | 0.00105 | 3441 | 6323 | 13261 |
| 51 | 0.00105 | 3359 | 6373 | 12830 |
| 52 | 0.0011 | 3350 | 6141 | 13052 |
| 53 | 0.0012 | 2994 | 5744 | 12888 |
| 54 | 0.00125 | 2905 | 5427 | 12375 |
| 55 | 0.00135 | 2798 | 5190 | 12402 |
| 56 | 0.00135 | 2681 | 5086 | 11913 |
| 57 | 0.00145 | 2392 | 4692 | 11716 |
| 58 | 0.0015 | 2291 | 4365 | 11582 |
| 59 | 0.0016 | 2274 | 4430 | 11932 |
| 60 | 0.00165 | 2362 | 4486 | 12339 |
| 61 | 0.00175 | 2208 | 4322 | 12081 |
| 62 | 0.0018 | 2004 | 4081 | 11743 |
| 63 | 0.0019 | 1764 | 3515 | 11125 |
| 64 | 0.00205 | 1706 | 3361 | 10585 |
| 65 | 0.0022 | 1497 | 2975 | 9969 |
| 66 | 0.0024 | 1377 | 2744 | 8679 |
| 67 | 0.0026 | 1275 | 2486 | 8066 |
| 68 | 0.00285 | 1049 | 2153 | 7630 |
| 69 | 0.0031 | 1040 | 2096 | 7262 |
| 70 | 0.00345 | 908 | 1837 | 6715 |

| | | | | |
|---|---|---|---|---|
| 71 | 0.00375 | 913 | 1829 | 6320 |
| 72 | 0.0042 | 808 | 1626 | 6248 |
| 73 | 0.0047 | 749 | 1598 | 5868 |
| 74 | 0.00525 | 623 | 1388 | 5534 |
| 75 | 0.00595 | 688 | 1390 | 5265 |
| 76 | 0.00685 | 580 | 1236 | 5290 |
| 77 | 0.00795 | 540 | 1093 | 4538 |
| 78 | 0.0093 | 457 | 961 | 3998 |
| 79 | 0.01095 | 432 | 881 | 3600 |
| 80 | 0.01305 | 371 | 776 | 3252 |
| 81 | 0.01565 | 357 | 778 | 3186 |
| 82 | 0.01875 | 334 | 698 | 3242 |
| 83 | 0.02255 | 322 | 686 | 2959 |
| 84 | 0.02715 | 302 | 587 | 2738 |
| 85 | 0.0328 | 273 | 525 | 2358 |
| 86 | 0.0397 | 224 | 452 | 2147 |
| 87 | 0.04805 | 191 | 432 | 1931 |
| 88 | 0.05805 | 188 | 403 | 1689 |
| 89 | 0.06985 | 206 | 367 | 1550 |
| 90 | 0.08335 | 159 | 308 | 1395 |
| 91 | 0.0986 | 144 | 277 | 1300 |
| 92 | 0.11515 | 110 | 230 | 1106 |
| 93 | 0.13255 | 103 | 206 | 846 |
| 94 | 0.1504 | 95 | 164 | 699 |
| 95 | 0.16825 | 57 | 126 | 534 |
| 96 | 0.1857 | 36 | 59 | 457 |
| 97 | 0.20285 | 40 | 96 | 318 |
| 98 | 0.21985 | 29 | 58 | 224 |
| 99 | 0.2369 | 15 | 35 | 173 |
| 100 | | 14 | 22 | 97 |
| 101 | | 12 | 15 | 62 |
| 102 | | 3 | 3 | 38 |
| 103 | | 5 | 7 | 17 |
| 104 | | 1 | 2 | 13 |
| 105 | | 1 | 1 | 4 |
| 106 | | 0 | 0 | 3 |
| 107 | | 0 | 0 | 2 |
| 108 | | 0 | 0 | 0 |
| 109 | | 0 | 0 | 0 |
| 110 | | 0 | 0 | 1 |
| 111 | | 0 | 0 | 0 |
| 112 | | 0 | 0 | 0 |
| 113 | | 0 | 0 | 0 |
| 114 | | 0 | 1 | 0 |
| 115 | | 0 | 0 | 0 |
| Sample size | | 321781 | 544945 | 710860 |
| Exp dead/day | | 1.070074 | 2.080134 | 7.018439 |

Table 2. Age distribution of samples with one, two and three injections only. Columns are: 1- age, 2- 2020 all cause yearly death rate for New Zealand averaged for sexes, 3-5 – numbers of individuals with only that number of injections for each age category from column 1. The last rows indicate total sample size and expected deaths per day for that sample assuming the age distribution in the column and the yearly mortality rate in column 2.

Figure 1 plots the ratio between observed daily deaths for those with a single injection and the expected death rate for the 2020 New Zealand population assuming the same age distribution as for the sample of individuals with only a single injection.

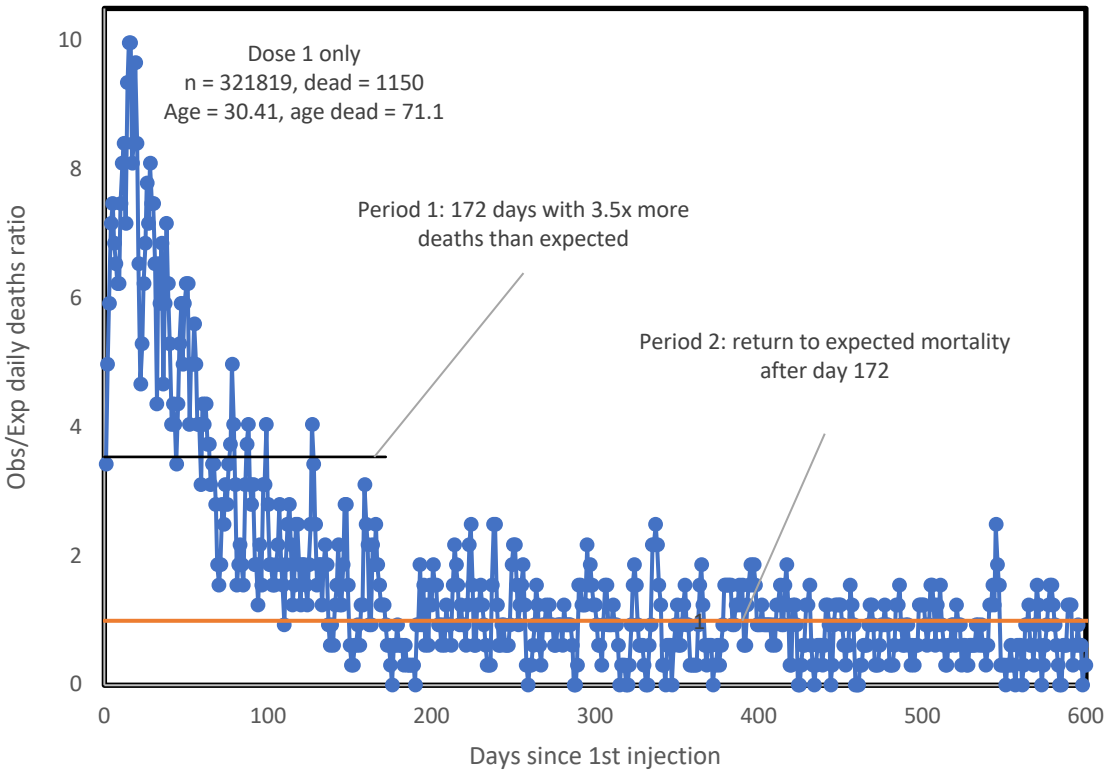



Figure 1. Ratio between observed and expected daily deaths as a function of days since first injection. Data for each day are smoothed for presentation purposes, they are the running average of that day, the prior and the next day. The orange line indicates ratio 1, meaning expected and observed are identical. Data above the line indicate over-mortality, below that line less than expected mortality.

Patterns in Figure 1 show two periods in relation to excess deaths (excess deaths are above the orange line). Until approximately day 172 after first injection, there is excess mortality, characterized by a quick rise in daily mortality just after injection, followed by a slower decay in mortality. After day 172, mortality reach overall the expected baseline predicted from the New Zealand control mortality in 2020.

*Only one injection or lack of record of ulterior doses ?*

Table 1 indicates that over 300 thousand individuals who received the first injection have no record in the database of receiving ulterior injections. This is about a third of the sample of individuals recorded with the first injection in the database. This clashes with statements that 1.16 percent of people who received the first injection did not take the second injection https://en.wikipedia.org/wiki/COVID-19_vaccination_in_New_Zealand. It is difficult to ascertain whether this is because of missing records of additional injections in the database, or whether the

database is biased towards individuals who were reluctant to take additional injections. A possible function of the database might have been to list those reluctant for reminding, explaining the much higher proportion of individuals with a single injection than in the population at large. Figure 2 is identical to Figure 1 but plots in addition to daily mortality in those who received solely the first injection, daily mortality in the remaining individuals with one injection in the database.

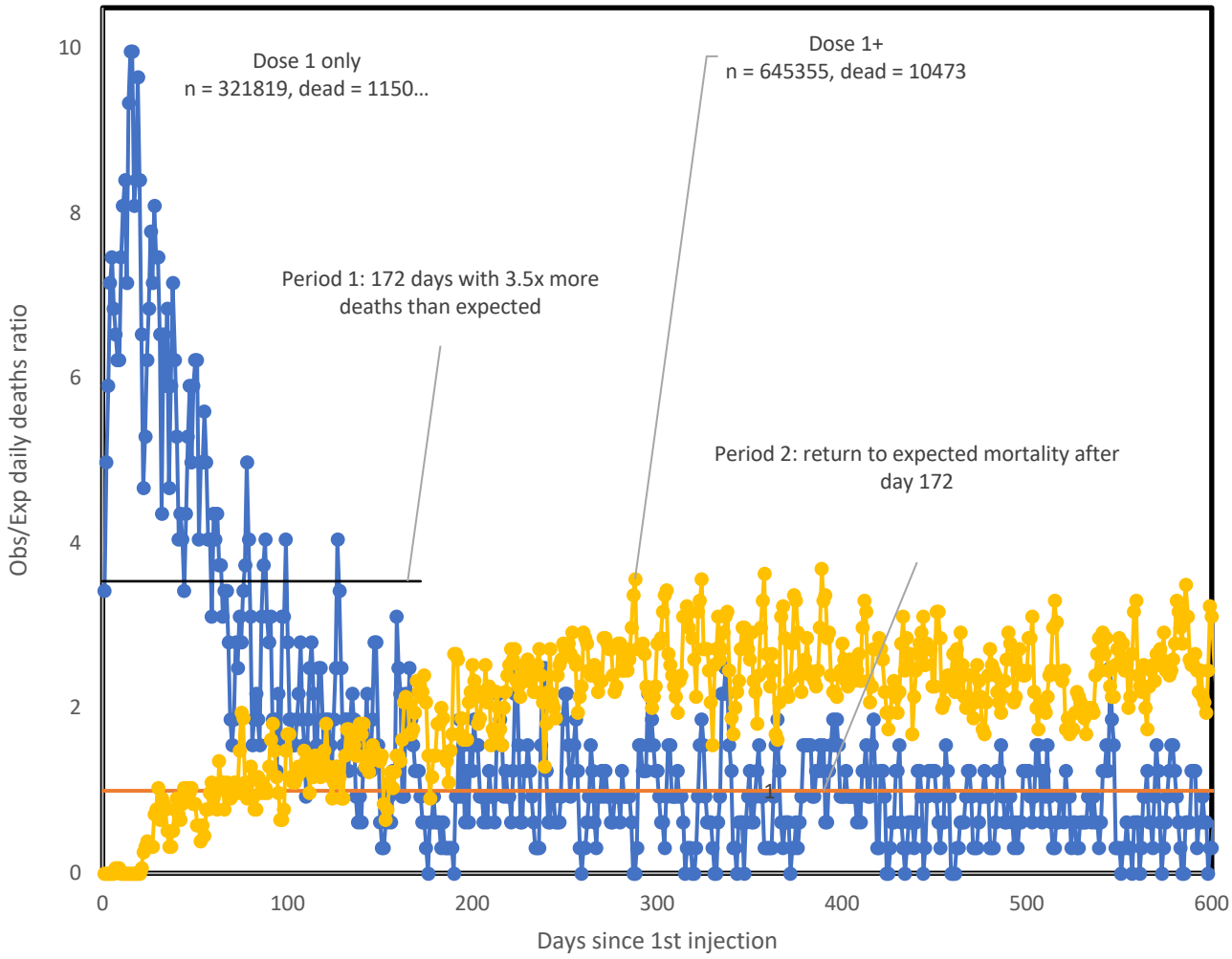



Figure 1. Ratio between observed and expected daily deaths as a function of days since first injection. Data for each day are smoothed for presentation purposes, they are the running average of that day, the prior and the next day. The orange line indicates ratio 1, meaning expected and observed are identical. Data above the line indicate over-mortality, below that line less than expected mortality. The Yellow data are for individuals who received the first injection as well as additional injections. Note that mortality is zero for the yellow line until day 21 after first injection.

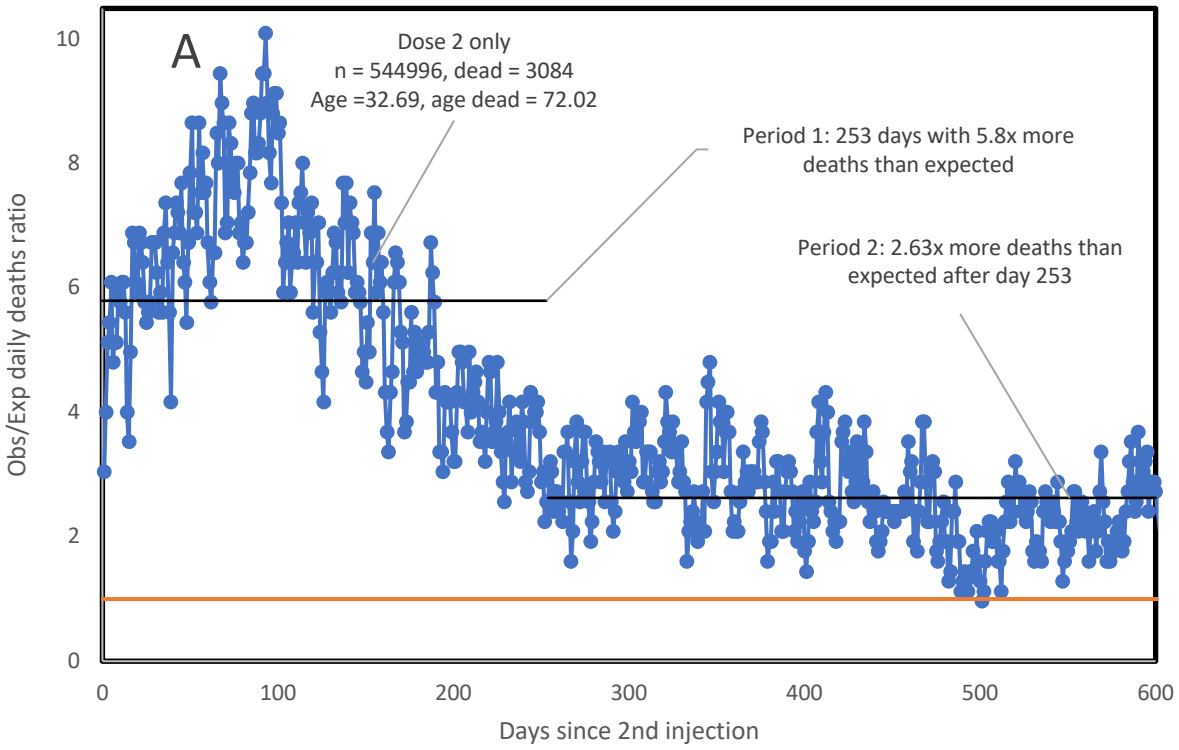
Patterns of mortality in Figure 2 for those receiving more than one injection (yellow in Figure 2) differ widely from those with only the first injection (blue in Figure 2). This observation suggests that the sample presumed with no additional dose after the first injection is not or only slightly contaminated with individuals with additional injections whose additional injections beyond the first injection were not recorded in the available database.

Similarly, the sample of individuals with additional injections beyond the first injection is not or little contaminated by individuals who stopped injections beyond the first injection, because mortality is zero for that sample until day 21 after the first injection. Indeed, the minimal period between first

and second injections is 3 weeks. Hence, one expects no deaths for that period for individuals with more than one injection. Daily mortality is far below that of the sample with only the first injection, until day 80-100 after the first injection. The much higher mortality of those who did not get a second injection than for those who did get a second injection between days 22 and 80-100 after the first injection suggests those who did not get a second injection had adverse events, besides death, that lead to the decision to not take additional injections. For the sample with additional injections, the mortality ratio increases from day 100 to 200 after the first injection to about 3x the expected daily mortality for a comparable uninjected population. In principle, 180 days would approximately correspond to the third injection.

Excess mortality for second and third injections

Figures 3A and 3B plot mortality ratios for those with only two, and those with only three injections, respectively.



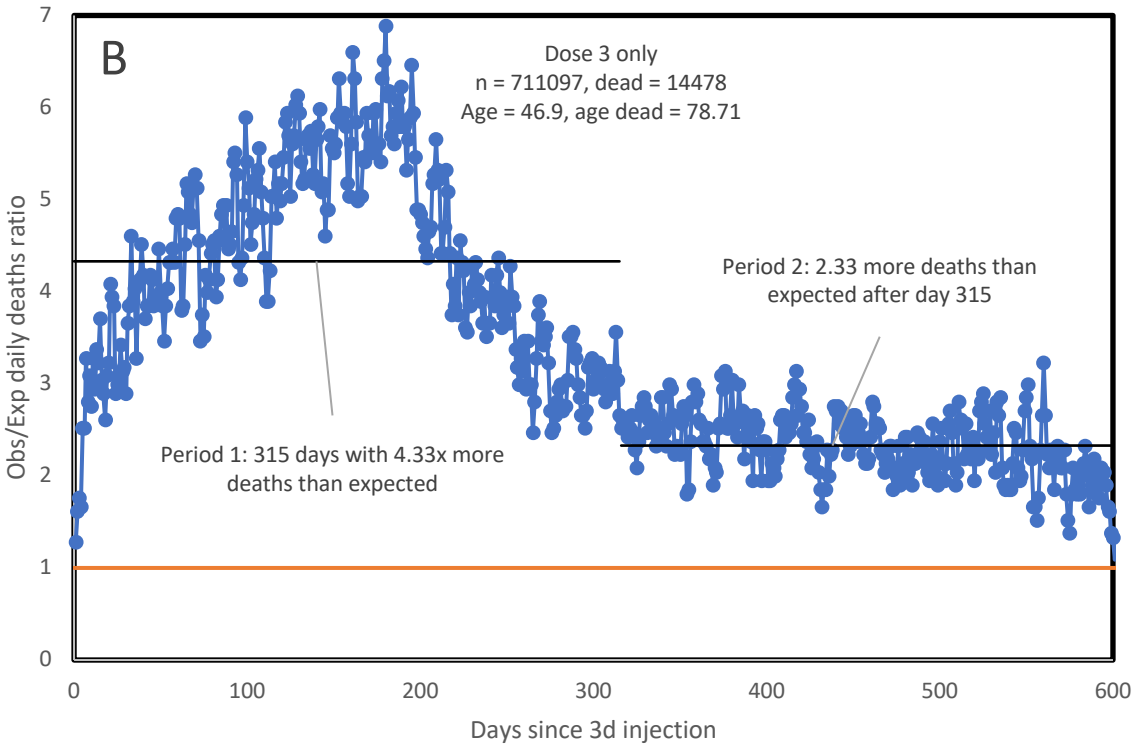



Figure 3. Ratio between observed and expected daily deaths as a function of days since A second and B third injection. Data for each day are smoothed for presentation purposes, they are the running average of that day, the prior and the next day. The orange line indicates ratio 1, meaning expected and observed are identical. Data above the line indicate over-mortality, below that line less than expected mortality.

Patterns excess mortality after only second and only third injections are similar to those described for only the first injection (Figure 3A,B). For all those, the mortality ratio increases immediately upon injection, reaches a maximum after 16 (first injection), 93 (second injection) and 180 days (third injection). In all three cases, after that maximum, the mortality ratio decreases to an overall stable level for the rest of the period covered by the data, after 172, 253 and 315 days for injections 1 to 3. The mortality ratio stabilises to 1 (no excess mortality), 2.63 and 2.33 for injections 1-3. It is unclear whether these stable levels will remain beyond the period covered by the database.

**General discussion**

Observations reported here show clearly two phases in effects of injections, a first period with rapidly changing, high excess mortality, and a second phase with a stable, lower excess mortality. There is no excess mortality after 172 days for those with only a single injection. The duration of the first period of rapidly changing high mortality increases with injections, from 172 to 315 days. At this point there is no explanation for what causes these very distinct phases of effects of injections on mortality. This could reflect the detoxification of some components of injections until the end of the first period. It could also reflect a first overdrive in the reaction to the injection which then stabilises during the second period with stable mortality.

For the first injection, the first period of rapidly increasing, then decreasing mortality reminds patterns observed for COVID19 positivity rates after the first injection in a large sample from Israel (Figure 4, data from ). There, COVID19 infections increase upon first injection, reach a maximum on day 10 after injection, and decrease to their stable pre-injection rate three weeks after the first injection. This increase in infections immediately upon first injection was interpreted as reflecting an

overall fragilization of the immune system by the injection. This and other effects of a fragilized immune system would cause death in some cases, delayed by a few days compared to the timing of infections. The maximal infection rates are on day 10 after first injection in Figure 4, maximal mortality rates in Figure 1 are on day 16 after first injection. The decrease in mortality after day 16 to return to normal control rates lasts from day 16 to day 172 after first injection, effects on COVID19 infection rates disappear after 21 days in Figure 4.

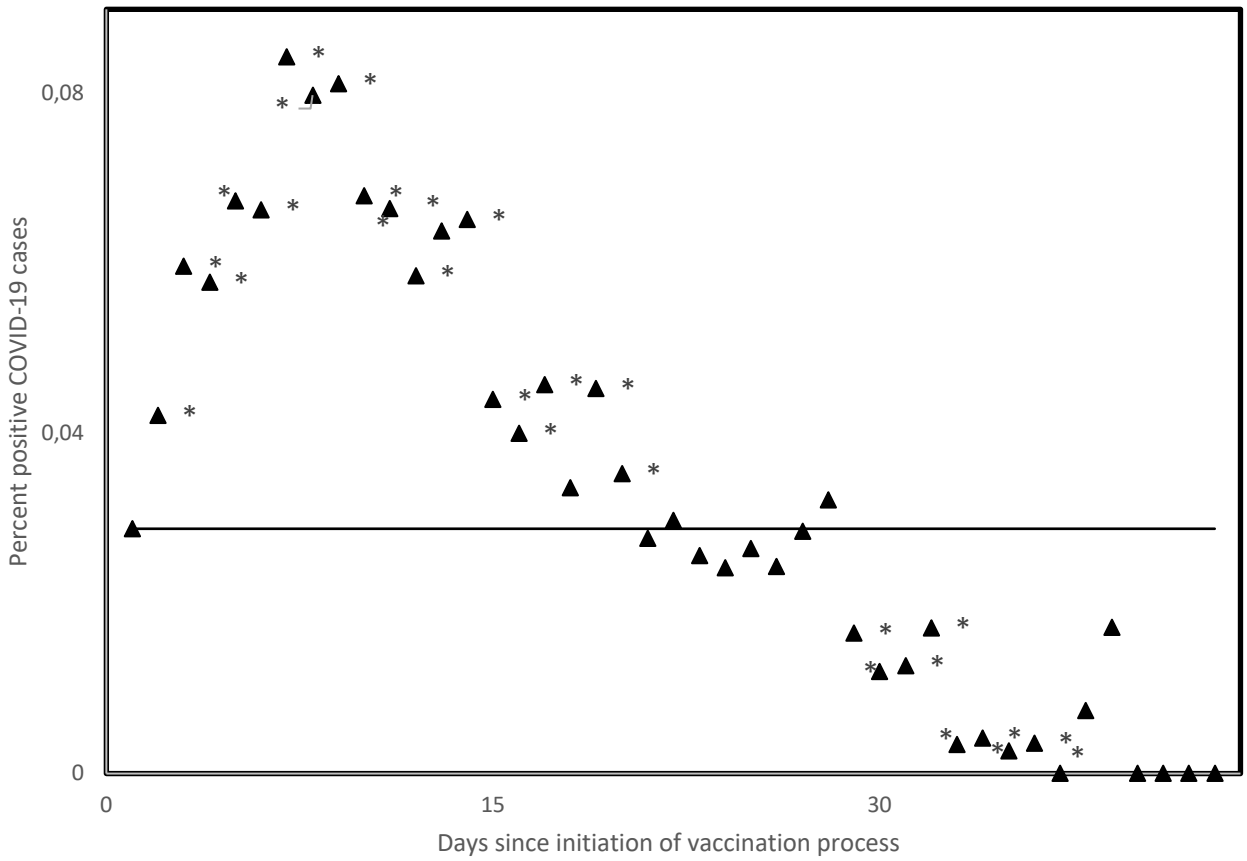



Figure 4. Daily vaccinated COVID-19 incidences vs days since 1st dose. Baseline: day 1 COVID-19 incidence. *: P < 0.05 vs baseline. Data from supplementary table in Dagan et al 2021. BNT162b2 mRNA Covid-19 Vaccine in a Nationwide Mass Vaccination Setting. N Eng J Med 2021; 10.1056/NEJMoa2101765.

Patterns for the first injection match reasonably well death counts after the first injection as found in VAERS (Vaccine Adverse Event System): deaths are the most frequent during the first weeks after first injection, and then decay, as in Figure 1. This is despite that VAERS relies on self-reporting, which results in under-reporting and other biases, such as increasing under-reporting the longer time since injection. Another method, based on all cause mortality (from euromomo.eu) and injection rate comparisons between populations but without information on death and injections for specific individuals produces also similar patterns, with high weekly excess mortality rates associated with high weekly injection rates during the first weeks after first injection. This method also detects excess mortality associated with injections after week 20, meaning day 140 after first injection, which coincides approximately with the stabilisation of excess deaths in those with more than a single injection. However, in this population-based study, injections seem to have protective effects as they associate with lower than expected all cause mortality from weeks 6 to 19 (days 42 to 133) after first injection. The discrepancies between results obtained by different methodologies deserve further

investigations. The similarities indicate that all methods produce useful results, especially when unbiased data are unavailable.

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