Short-term Vaccine Fatality Ratio of booster and 4th dose in The Netherlands

Research · October 2022

DOI: 10.13140/RG.2.2.29841.30568

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Short-term Vaccine Fatality Ratio of booster and 4th dose in The Netherlands

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Rodotti, Netherlands, 19 October 2022

Abstract
This report proposes a new and simple method to measure vaccination-mortality correlation, test for causality, and if passed, obtain Vaccine Fatality Ratio (VFR), in the short-term of 0-4 weeks after vaccination. Only data of weekly administered number of doses and weekly all-cause-deaths are required, without reference to e.g. mortality prognoses, covid-labeled deaths or excess mortality.

The method uses "short-term" time-filtering of both mortality and vaccination, by subtracting a moving monthly average from weekly rates. This removes events on timescales of a month or longer, such as seasonal mortality baseline, covid waves, and overall vaccination campaign dynamics, while retaining possible short-term mortality/vaccine interactions. Pearson correlation and regression coefficients are determined between filtered rates of vaccination and -4 to +4 weeks time-shifted mortality. Assymetric correlation significance, absent before the week of vaccination and present during/after, is used as causality test from vaccination to mortality. If the test is passed, VFR is obtained as the sum of significant regression coefficients in weeks during/after vaccination.

The method is applied to booster (3rd) and 4th covid vaccine doses administered in the Netherlands. For the booster, applied to ages 18+ during the first omicron wave, no significant correlation with short-term mortality is observed ($r^2 \approx 0.00$). For the 4th dose, applied to ages 60+ in absence of major covid waves, significant positive correlation is observed ($r^2 \approx 0.25$, a 5-sigma event). Time-shifted correlations passed the causality test unanimously and VFR was established.

This report presents evidence of a short-term causal relation from 4th-dose covid-vaccination to mortality in The Netherlands, with a VFR of 0.18% corresponding to ca. 4400 vaccine-related deaths, in the order of magnitudes of covid IFR and observed excess mortality.

Statement of Interest
I declare that this work was done with an interest in science, and personal safety for myself, loved ones, and humanity. Pro bono, independent, without payroll, not funded. The only competing interest was time taken from my normal job (indy app developer in entertainment and music). If you want to support my work, feel free to (anonymously) buymeacoffee.com/AndreRedert.

Introduction
Since the covid vaccination campaigns in The Netherlands, high excess mortality rates have been observed, starting in the second half of 2021 and rising up to ~40 people/day in October 2022. Based on the sparse publicly available Dutch data on mortality and vaccination, excess mortality was found to correlate positively with vaccination on short-term [Mee,Sch] and long-term [Red].

I propose a new and simple method to measure vaccination-mortality correlation, test for causality, and if passed, obtain Vaccine Fatality Ratio (VFR), all in the short-term of 0-4 weeks after vaccination. The method is applied to booster (3rd) and additional (4th) covid vaccine doses administered in The Netherlands.

Method and results

My method uses source data only in the form of weekly administered number of doses and weekly all-cause mortality, without reference to e.g. mortality prognoses, covid-labeled deaths or excess mortality. Figure 1 shows source data from the Netherlands [Cbs], for 3rd dose (ages 18+), 4th dose (ages 60+) and all-cause mortality (all ages), all as percentages of the relevant cohort per week.

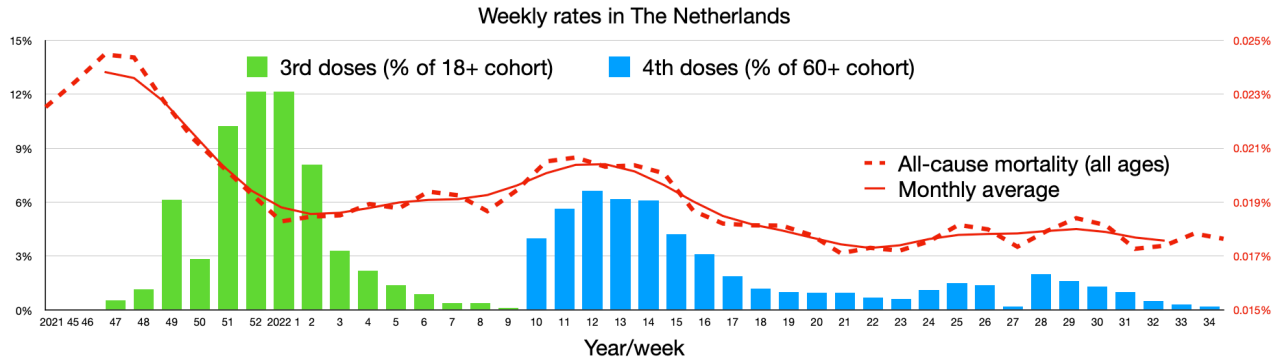

Figure 1: Weekly rates in the Netherlands for 3rd/4th covid vaccine dose and mortality.

Figure 2 shows Pearson correlations between mortality rate and 3rd/4th doses. Remarkably, the 3rd dose does not correlate at all with mortality ($r^2 \approx 0.00$, 15 weeks, 2021w47-2022w9), while the 4th dose correlates extremely strongly with $r \approx 96.3\%$ (25 weeks, 2022w10-2022w34). Both results however, may include all kinds of longer-term effects, such as seasonal mortality baseline, covid waves, overall vaccination campaign dynamics, etc.

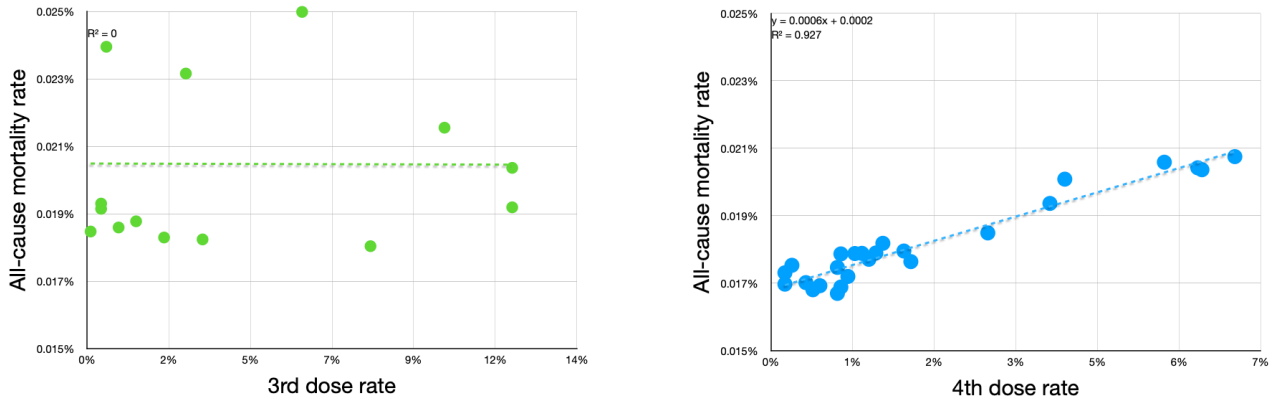

Figure 2: Pearson correlations between mortality rate and 3rd/4th dose rate.

To extract only short-term events, I perform a simple monthly-averaging temporal filter, with 5 weekly coefficients [0.1 0.25 0.3 0.25 0.1], symmetric and centered at the middle coefficient so that zero time delay is introduced. This filter retains all long-term events occurring on timescales of months or longer, while filtering out short-term events within a month. Figure 1 shows monthly-averaged mortality rate. Subtracting monthly average from the raw weekly data yields weekly-difference-with-monthly-average (WDMA) data, effectively obtained by temporal filter [-0.1 -0.25 0.7 -0.25 -0.1]. Figure 3 shows the data from Figure 1 after WDMA filtering.

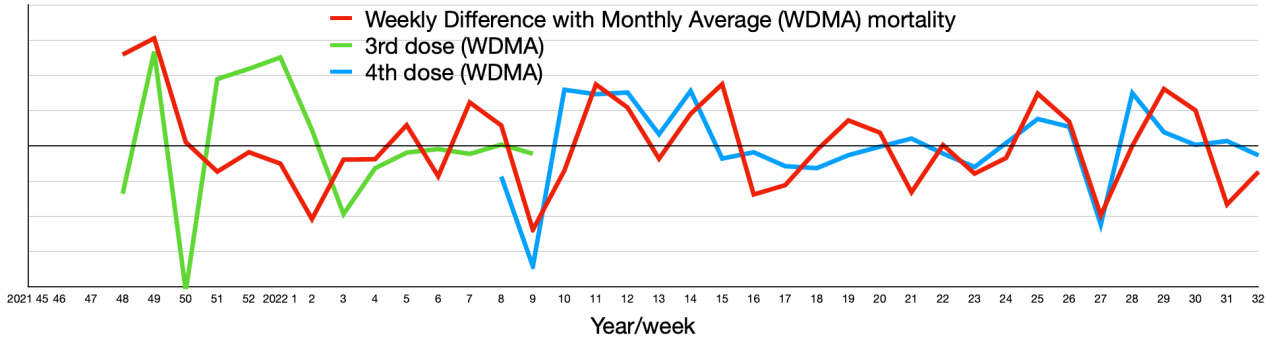

Figure 3: Weekly rates in the Netherlands for 3rd/4th vaccine dose and mortality, WDMA filtered to obtain short-term events only. Each graph is separately scaled to fit, to illustrate (absence of) correlations.

Pearson correlation and regression coefficients are determined from both doses to -4 to +4 weeks-time-shifted mortality using the WDMA data of applicable weeks, with N_{3rd} = 14 and N_{4th} = 21 datapoints (slightly less weeks than in Figure 1 to enable WDMA filtering and time-shifting). For correlation coefficient r, the significance threshold is $r^2 \geq (N\text{-}1)^{-1}$. Figure 4 shows r^2 and thresholds for both doses, and relevant regression coefficients.

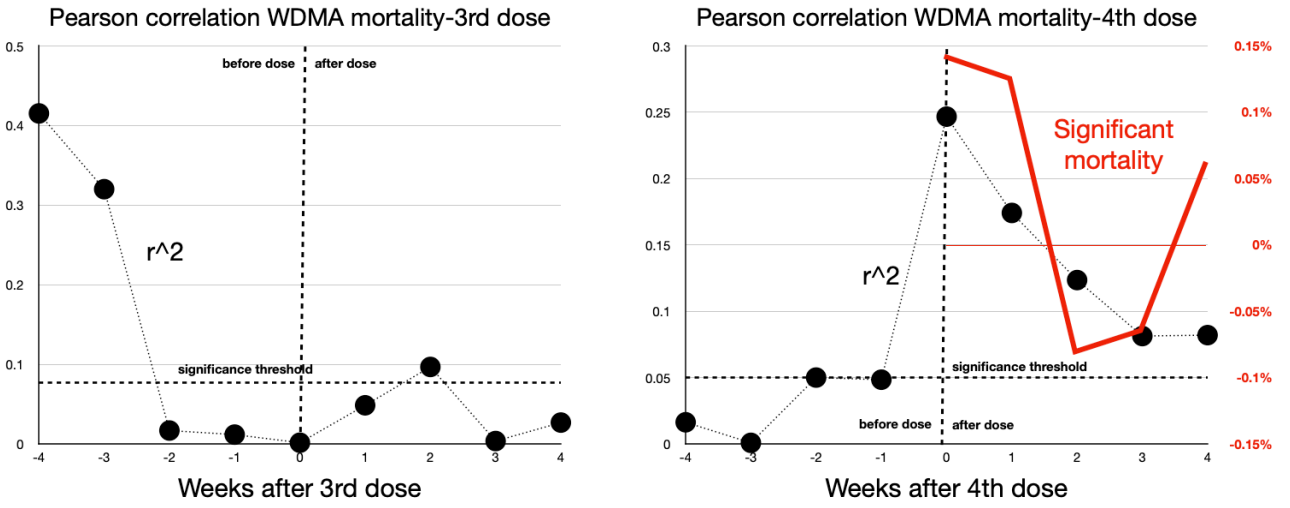

Figure 4: Pearson correlation coefficients between WDMA 3rd/4th doses and mortality. Regression coefficients (red) shown for significant correlations if causality test is passed (only 4th dose).

Assymetric correlation significance, absent before the week of vaccination (shift < 0) and present during/after (shift ≥ 0), is used as causality test from vaccination to mortality. If the test is passed, VFR is obtained as the sum of significant regression coefficients for weeks during/after vaccination.

For the 3rd dose, correlation does not pass this causality test, by far. For the 4th dose, the assymetric significances pass the causality test unanimously, starting with $r^2 \approx 0.25$ ($r \approx 0.50$), at week 0, a 5-sigma event as r^2 is about 5 times its significance threshold. For each significant correlation, the corresponding regression coefficient is the amount of mortality caused in week $w \geq 0$ by the vaccination in week 0. VFR is obtained as the sum of significant regression coefficients, which for all of the five weeks 0-4 together is 0.18%. The latter includes proper accounting of the cohort sizes for mortality data (all ages) and the 4th dose cohort (60+): the established causality allows the absolute number of correlating deaths in the all-ages cohort to be assigned directly to the 60+ age cohort.

Conclusions and discussion

I found evidence of a causal relationship from vaccination to mortality during the 4th covid vaccination campaign in the Netherlands (2022 weeks 10-34), amounting to a positive VFR of 0.18% in the month after vaccination. This VFR has the same order of magnitude as the covid IFR in the relevant age group (60+) [Liu,Pez]. The 60+ population in The Netherlands is approx. 4.5 million people, and with a 54.2% 4th-dose vaccination-coverage at end of Aug 2022 (end of data availability), the VFR amounts to about 4400 vaccine-related deaths. This number has the same order of magnitude as excess mortality in The Netherlands during the 4th-dose campaign.

My study was limited in many ways. The available source data was not case-based but national weekly mortality and vaccine-dose rates. Deaths by other causes were not explicitly taken into account, although these may interfere when related to vaccination, e.g. covid itself. The latter would require test/diagnosis data, which are notoriously unreliable.

Further, this study examined just two vaccination campaigns, the 3rd (booster) and 4th dose, of which the former did not provide any evidence of causality. A big difference for two campaigns using the same vaccine in the same country. During the 4th campaign covid was relatively absent, while the booster was rolled out during the first omicron wave. The booster's covid-protective effect may have caused a zero net result on mortality, as has been observed in other studies [Ben]. Also VFR may depend heavily on age, seasonal characteristics such as temperature, vaccine batches, the number of past vaccination campaigns, etc.

Additionally, my method may have systematic errors in computing VFR. The time-shift correlation procedure effectively measures VFR(Δw), in signal-processing terms the "impulse response" of vaccination to mortality. There are better ways to compute it, e.g. by deconvolution with proper regularization. I invite others to perform this research. Importantly, my VFR(Δw) measurement is symmetric in time and thus so is its bias. The causality test however relies on time-assymetric correlations, which must reside in the data if observed.

Finally, my method has all kinds of flaws unknown to me, to all [Bre]. Despite all this, the evidence of a causal relationship from vaccination to mortality is a very strong alarm signal.

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