Nature of the toxicity of the COVID-19 vaccines in the USA

Joseph Hickey*, PhD, and Denis G. Rancourt**, PhD

Ontario Civil Liberties Association, Ottawa, Ontario, Canada

*joseph.hickey@ocla.ca, **denis.rancourt@alumni.utoronto.ca

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Ontario Civil Liberties Association
603-170 Laurier Avenue West
Ottawa, Ontario
Canada K1P 5V5
http://ocla.ca

In this study of the Vaccine Adverse Event Reporting System data (VAERS data, USA) for COVID-19 vaccines we examine the broad features of the data, resolved by:

- major adverse effect (AE) category (death, life-threatening reaction, hospitalization, disabilities, and all categories),
- vaccine manufacturer (Janssen, Moderna, Pfizer),
- type of injection (shot number in primary series, booster),
- date of injection,
- date of onset or finality of AE, and
- age of the person suffering the AE;

compared to the dates of administration of all the injections, for the different manufacturers and types of injections (see Figure S1), and compared to population characteristics (age structure, poverty, life expectancy, obesity).

We elucidate fundamental aspects of the body's response to these kinds of pulses of toxic charges, related to age-dependent immune efficiency and age-dependent spread of vulnerability, and we identify exponential time decay components in the induced mortalities, with half-life values in the range 13-30 days, possibly arising from the spike protein.

A next version of this report will contain more content, detail, and supplementary materials. Supporting figures illustrating the data and analyses are provided at the end of this report.

We make the following observations and conclusions.

→ The priority targeting of the population “most at risk” at the start of the COVID-19 vaccination campaign had disastrous consequences for that population, with disproportionately large vaccine-induced mortality and AEs (Figure S2).

→ Graphs of AE frequency versus time of onset or finality of the AE in days since injection all show the same time structure (for all resolved AEs and resolved injection characteristics):

- a large initial peak in the first 5 days or less, which is larger and sharper for the mRNA multi-dose injections (Moderna, Pfizer) compared to the virus-vector single-dose injection (Janssen),
- an exponential decay, from ~5 days to ~60 days, with a fitted half-life decay time typically falling in the range 13-30 days, with this same behaviour occurring for all three manufacturers and for all the main categories of AEs, and
- a plateau or “second wave” of AEs at long times, beyond ~60 days and up to ~350 days since injection, which largely consists of AEs having associations with COVID-19 itself. (Figures S3 through S5)

→ Furthermore, the large initial peak in the first 5 days or less ($x < 5$ days) is significantly smaller for a first dose than for a second or third dose, for both Pfizer and Moderna, while the half-life for the exponential part ($5 \text{ days} \leq x < 60$ days) is concomitantly larger for the later doses (Figure S5).

→ The observed exponential decay implies a causal link between death (or AE) and injection, up to ~60 days. Accidental deaths would have a uniform (constant) distribution versus time since injection (versus “x”), mathematically corresponding to an infinite decay time.

→ It is reasonable to postulate that the 13-30 day half-life corresponds to the half-life in the body of a toxic component present in or produced by the vaccines, such as the spike protein; and that the initial peak (< 5 days) is due to a toxic component or adjuvant mostly present in the mRNA injections, such as the cationic lipids.

→ It is also reasonable to postulate that there is an enhanced immune response against the vaccine component that causes the initial ($x < 5$ days) peak of deaths, in the later doses compared to a first dose (Figure S5). If the initial immune response partially debilitates mRNA delivery to cells and organs in the body, then spike-protein cumulative toxicity leading to death could be delayed, with relatively less deaths in the exponential decay phase ($5 \text{ days} \leq x < 60$ days) and longer decay half-lives, for doses in addition to a first dose, as observed (Figure S5).

→ Thus, it would appear that the enhanced initial (< 5 days) immune response partially disables spike protein production and spread, which, in theory, would make the vaccine both less toxic and less effective (if it ever is effective) in doses and boosters beyond

the first dose. In fact, we do observe reductions of overall toxicity with increasing doses and boosters, as per Table 1.

	Pfizer	Moderna	Janssen
first	8.08 (0.48)	15.08 (0.82)	20.4 (2.2)
second	5.76 (0.44)	10.37 (0.75)	-
primary	7.03 (0.33)	12.96 (0.56)	20.4 (2.2)
booster	3.20 (0.58)	3.18 (0.66)	3.8 (3.8)
all	7.77 (0.32)	13.38 (0.53)	26.7 (2.5)
12 to 17	0.60 (0.42)	-	-
18 to 64	2.64 (0.37)	3.47 (0.52)	10.6 (1.7)
65 plus	19.7 (1.9)	25.5 (2.1)	79. (12.)

Table 1. Total number of VAERS deaths divided by total number of doses delivered in the same period (2021) to the same group (all values and errors $\times 10^{-6}$), by dose series and by age group. The age-group rows show, for Pfizer and Moderna (Janssen) the total number of deaths following the second (first) dose divided by the total number of administered second (first) doses. Estimated 2σ errors in parentheses: two times the square-root of the number of deaths divided by the number of doses.

→ We produce graphs of toxicity (number of AEs / number of doses) by vaccination date or by AE date (not shown), using the independent-database administered dose data, which demonstrate strong correlations of toxicity with median age of those injected on the vaccination or AE dates, and which show a gradation of manufacturer-specific age-accounted toxicity (and see Table 1):

Janssen > Moderna > Pfizer,

approximately in the ratio (deaths per dose)

Janssen : Moderna : Pfizer = 4 : 1.3 : 1

→ We find that the number of deaths per administered dose (e.g., < 60 days since injection) increases exponentially with age, with doubling time ~9-10 years, which is approximately the known doubling time (in lived years) of the mortality rate for adults in the general population of the USA. We interpret this to mean that the same age-dependent repair/immune efficiency is in play defending against the assault of the injection as is active protecting against the usual array of environmental and internal assaults that cause death in adults (see discussion below about batches, and Figure S6).

→ We find that the VAERS deaths by 5-year age groups (per general-population of each USA age group) vary exponentially, again, with a doubling time approximately equal to the known doubling time for risk of death per time (per year) for adults in the general population of the USA. This supports our hypothesis that survival from the assault of the vaccine is determined by the same age-dependent limiting kinetics of the protective repair/immune mechanisms that ensure survival of adults subjected to the current array of dominant life-expectancy-limiting challenges in the USA.

→ We find no evidence that supports the hypothesis of “toxic batches” (batch-to-batch heterogeneity in lethality). The vaccine itself, as designed, is toxic.

→ In looking for “toxic batches”, we instead found natural distributions of age-dependent vulnerability to assault, as follows. Graphs of number of VAERS deaths by batch versus

median age of those who died (per batch) have an upper threshold given by the usual exponential (doubling time ~ 9-10 years), and a breadth of distribution of values that also increases exponentially with age, with approximately the same doubling time (Figure S6). We postulate that this behaviour arises from the natural age-dependent spread of vulnerably to assault, not from batch heterogeneity. Indeed, essentially the same behaviour (exponential increase in spread of sub-sample mortality with age, and similar doubling time) is displayed if we make such plots on the basis of the state jurisdictions or on the basis of vaccination date, rather than on the basis of the batch number (not shown).

Supporting figures are as follows.

Figure S1. Daily number of doses administered of the Pfizer (blue), Moderna (orange), and Janssen (green) products throughout 2021. Data is from Centers for Disease Control and Prevention (2022). Administered doses show a strong weekly cycle, with fewer doses administered on Sundays. The large dip occurring in December 2021 is due to an artifact present in the CDC data. Details will be given elsewhere. Note: The doses in a primary series, and boosters are also resolved in the data (not shown).

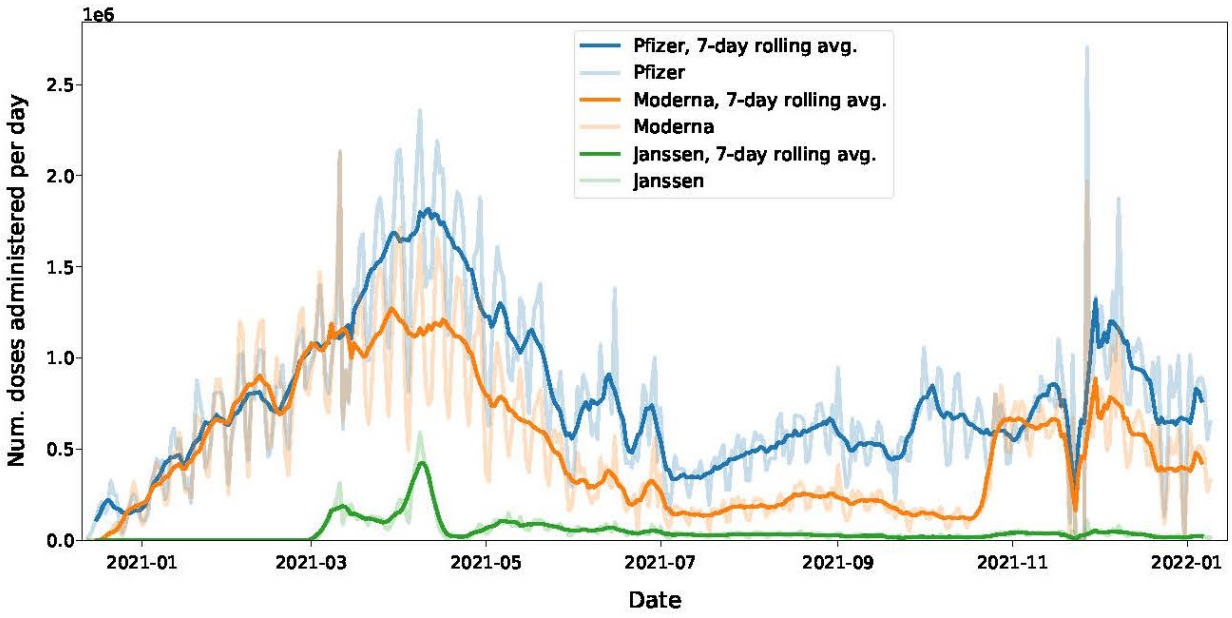
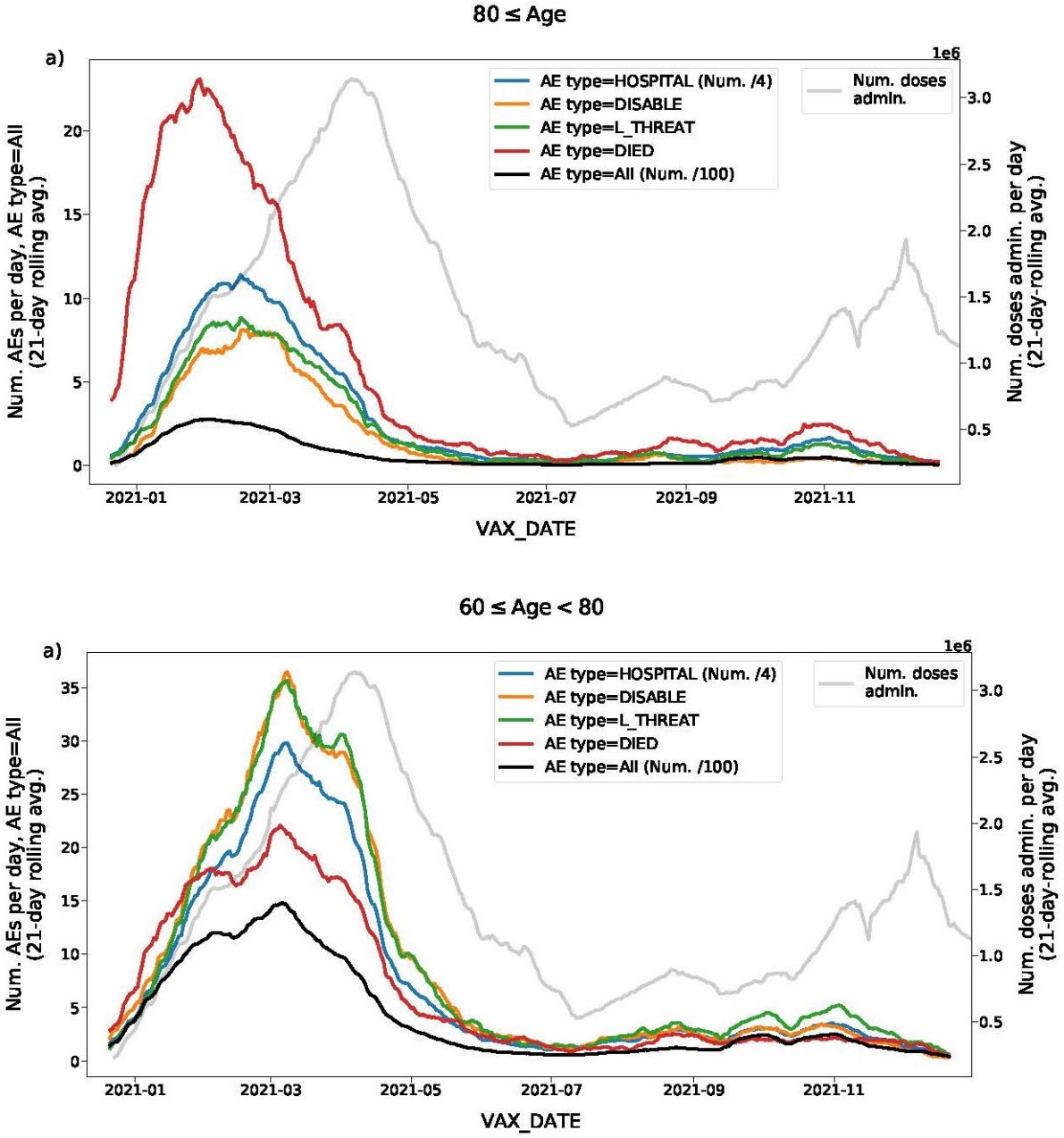
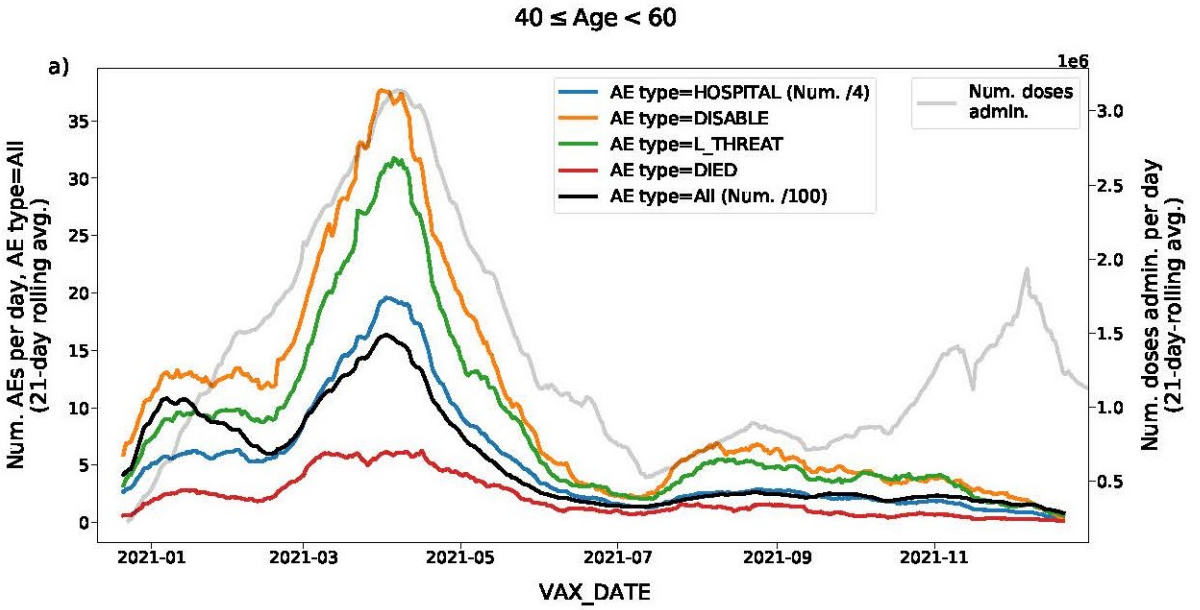


Figure S2. Number of adverse effects (AEs) of different types (hospitalization, disabled, life-threatening, death, all-AEs, as indicated) per day versus date of vaccination, for different age groups (80+, 60-79, 40-59, 0-39 years, as indicated). Grey curve shows number of doses administered per vaccination date (right y-axes).




40 ≤ Age < 60
a)
1e6
AE type=HOSPITAL (Num. /4)
AE type=DISABLE
AE type=L_THREAT
AE type=DIED
AE type=All (Num. /100)
Num. doses admin.
Num. AEs per day, AE type=All (21-day rolling avg.)
Num. doses admin. per day (21-day-rolling avg.)
VAX_DATE

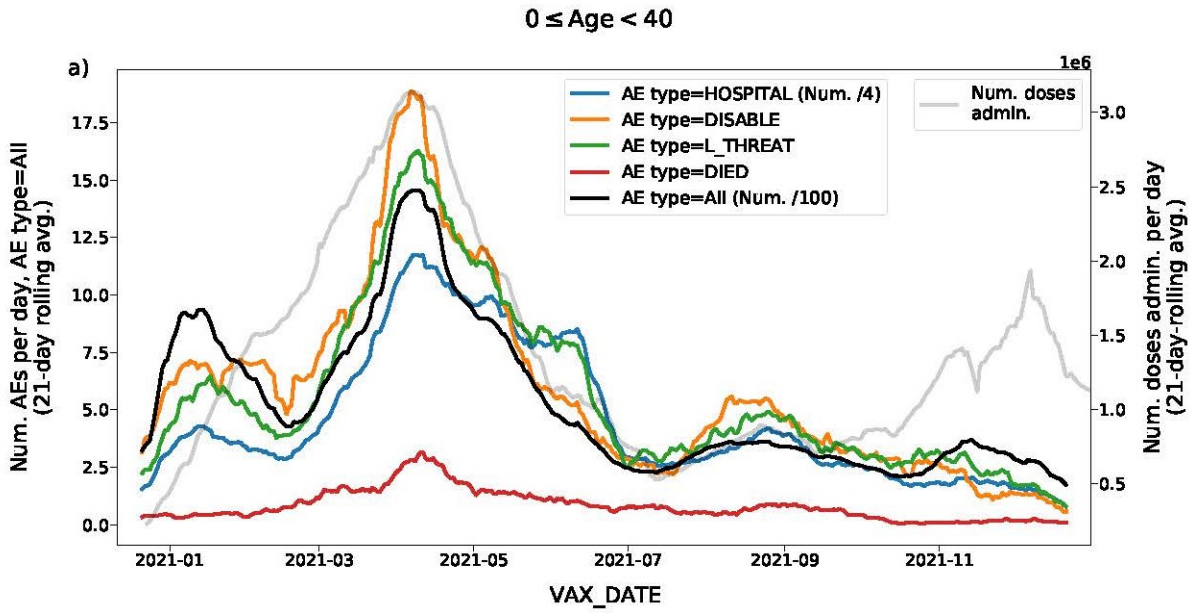

0 ≤ Age < 40
a)
1e6
AE type=HOSPITAL (Num. /4)
AE type=DISABLE
AE type=L_THREAT
AE type=DIED
AE type=All (Num. /100)
Num. doses admin.
Num. AEs per day, AE type=All (21-day rolling avg.)
Num. doses admin. per day (21-day-rolling avg.)
VAX_DATE

Figure S3. Histograms showing the share of VAERS deaths occurring x days after vaccination. (a) shows the full distribution, and its inset shows the same data but zoomed-in on the y-axis. (b) shows the same data but zoomed-in on the x-axis.

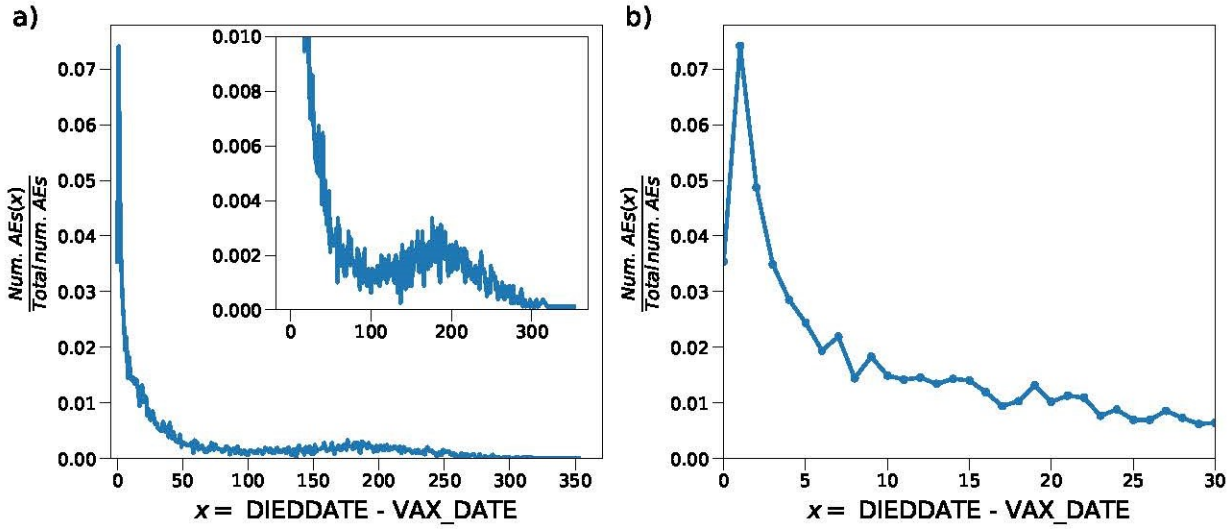


Figure S4. Histograms showing the share of VAERS deaths occurring x days after vaccination, for each manufacturer separately. y-axes are linear on the top row and logarithmic on the bottom row. In the plots in the left column (a and c), deaths at all x values are included in the calculation (but the plots are truncated for better visualization), whereas in the right column (b and d), only deaths for which x < 60 were used. The y-axis in (a) was also truncated for better visualization. Note: The exponential fit (d) gives a half-life equal to 14 days, as indicated.

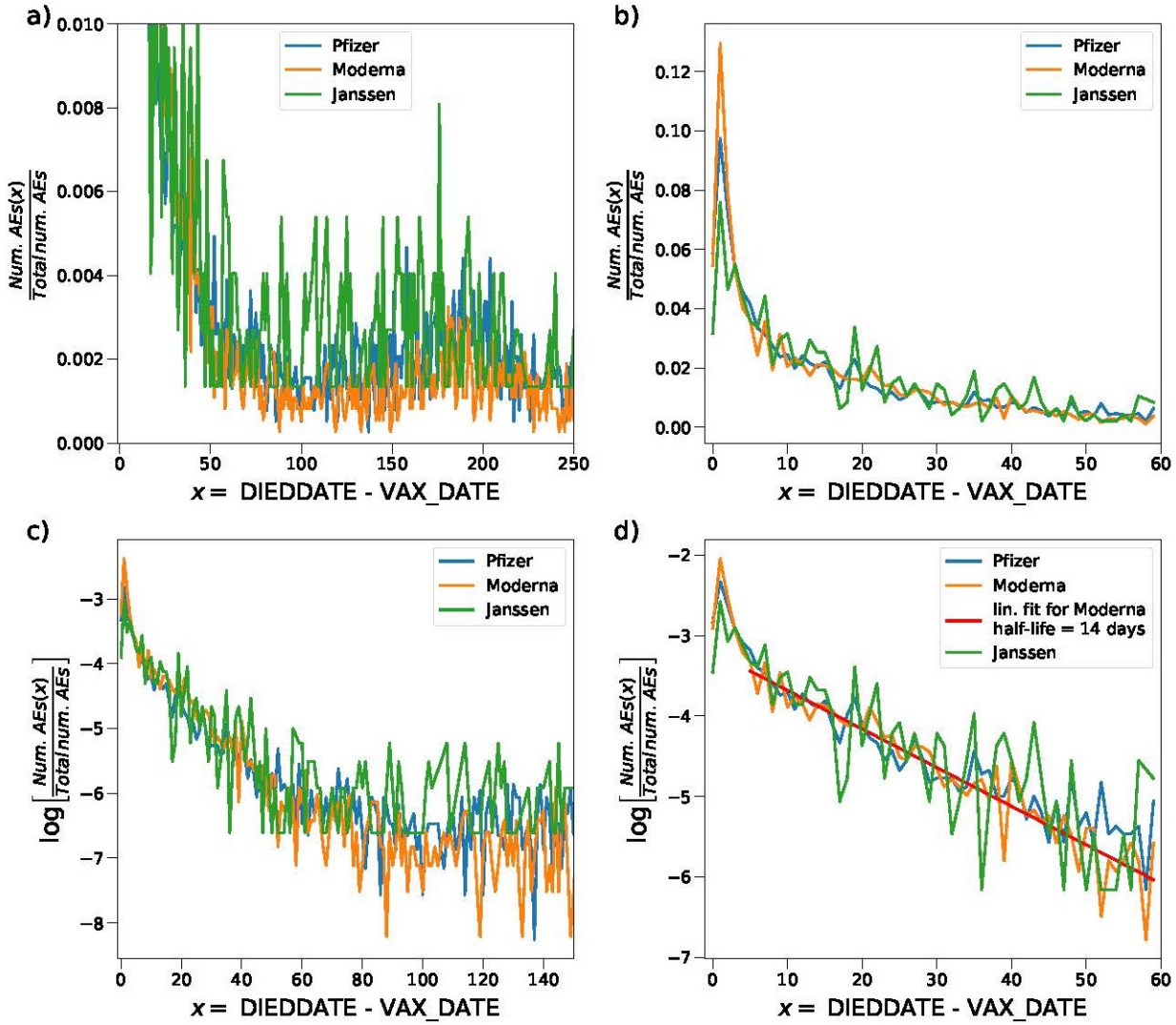


Figure S5. Histograms showing the share of VAERS deaths occurring x days after vaccination, for each manufacturer separately: Pfizer (P) (top row), Moderna (M) (middle row), Janssen (J) (bottom row). The left-most column is for the first dose in a primary series; the second column is for the second dose; and the right-most column is for a third dose. Data for x < 60 days is used. The mean time to death and the total deaths in the graph are as indicated. The exponential fits (red lines) have the following half-life value estimates: 16 days (P1), 25 days (P2), 30 days (P3); 13 days (M1), 21 days (M2), 14 days (M3); 18 days (J1).

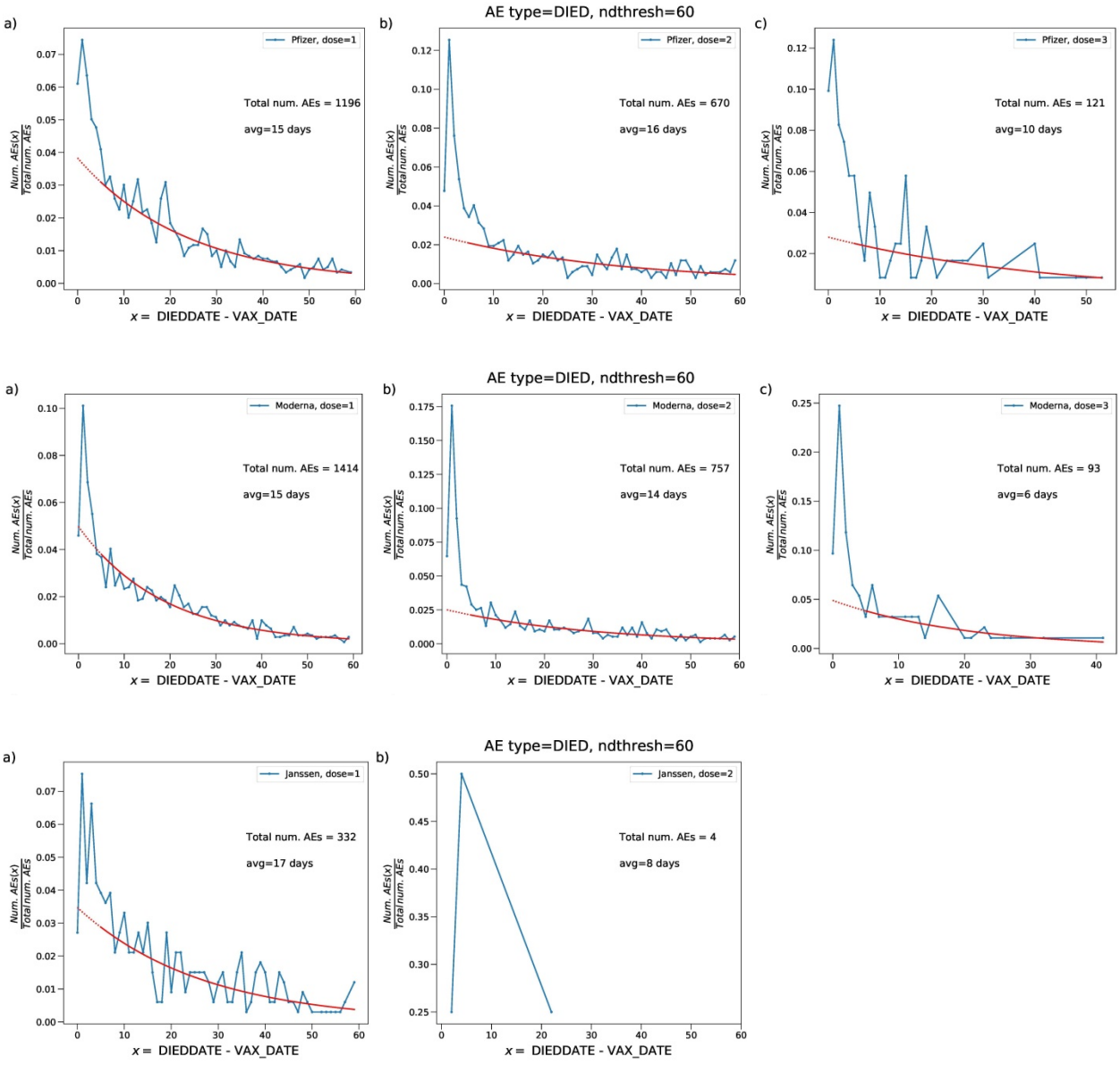


Figure S6. Number of VAERS deaths by batch for the 200 top batches versus median age of those who died (per batch): Linear Y-scale (left), log Y-scale (right). Symbol size is scaled to time (in days) since 11 December 2020.