10 and 21. The underreporting range is 10-100, with the upper end based on Harvard data of Lazarus et al. [292]. Thus, the URF of 10 may be deemed extremely conservative, and the URF of 21 is modestly conservative.

Calculation of the NNV is dependent on COVID-19 prevalence, and for this, we rely on the WHO website's seroprevalence study by Ioannidis et al. [293]. Due to our use of the injury database data, the hierarchy of evidence would be considered lower than for the analyses from the papers of Fraiman et al. [50] and Classen [49], which relied only on RCT evidence.

All of our "harm data" is from the UK's Yellow Card data set, which is stratified by vaccine in Fenton's analysis [291]. While this information comes from the UK population, the trials were principally conducted in North America; nevertheless, it is unlikely that the adverse event rates would be different between the two populations.

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

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Disclosures

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as follows:
Assuming NNV of 119 and IFR of 0.23%, about ~52,000 vaccinations would be needed to prevent one death. Upper limit of lives saved per is 10,000*1/52,000 = 0.19 or ~0.2 or 1/5 of a life is saved for every 10,000 courses of the mRNA vaccine.
Thus, for Pfizer mRNA vaccination, ~2 lives were saved from COVID-19 for every 100,000 courses of the vaccine.

Sources informing the numbers used in this estimate: NNV to prevent a case is 119, based on data from Olliaro et al., 2021 [66], and assuming the infection-fatality ratio of COVID-19 is generously estimated at 0.23%, based on 2021 WHO data from Ioannidis: https://apps.who.int/iris/handle/10665/340124

Estimates of IFR are based on meta-analysis and NNT obtained from the Phase 3 Pfizer trial. Given evidence of RCT fraud, this estimate should be viewed as an upper bound; the true value is likely much lower (i.e., even fewer lives saved).

Risks/Harm

Lives lost per 100,000 vaccinations-calculations based on the most conservative assumptions (URF=10): Fenton calculates 68 deaths/1,000,000 doses = 12.8 deaths per 100,000 per primary course of Pfizer, or just under 13 deaths from serious adverse events per 100,000 for each primary course of the Pfizer vaccine. Comparing AEs to potential benefits, we calculate an excess death risk of 12.8 - 2 = ~11 deaths per 100,000 doses.
Thus, comparing the benefits to harms, at least 5 times more lives are lost than saved by the full course of Pfizer mRNA vaccinations.

Notes on the estimate: Fenton number of 12.8 indicates an excess death risk of 12.8 - 2 = ~11/100,000 comparing the adverse effects to potential benefits. Our estimate is therefore alleging about one excess death per 9,000 Pfizer courses, which seems quite plausible. This is also in line with officially reported all-cause deaths in the Pfizer trial being 15 vaccinated and 14 in unvaccinated, which is a ~7% increase, although obviously not statistically significant. If there is one excess death per 9,000 jabs, a difference of ~2 deaths in 20,000 subjects/arm in the Phase-3 trial (one observed, but could be more) would be expected. Finally, a higher URF (e.g., 21, based on Rancourt data), would yield a higher estimate

Pfizer trial data, applying the same Fenton calculation sequence and 30% false-positive reports, with a moderately conservative URF of 21: (i) Lives saved per 100,000 vaccinated (by preventing one COVID-19 death): NNV to prevent one COVID-19 case = 59,574 (95% CI 51,118-71,381). Lives saved per 100,000 vaccinated = 1.7 (95% CI 1.4-2.0); (ii) Lives lost per million: Net excess deaths per primary Pfizer course: 3,705 (95% CI 3,667-3,744). Excess death risk of 27 deaths (95% CI 26.7-27.3) per 100,000 doses of Pfizer's COVID-19 mRNA vaccine.

Moderna trial data, applying the same Fenton calculation sequence and 30% false-positive reports, but with a moderately conservative URF of 21: (i) Lives saved per 100,000 vaccinations (by preventing one COVID-19 death): NNV to prevent one COVID-19 case = 25,394 (95% CI 22,454-29,254). Lives saved per 100,000 vaccinated (by preventing one COVID-19 death) = 3.9 (95% CI 3.4-4.5); (ii) Lives lost per 100,000 vaccinations (by preventing one COVID-19 death): Net excess deaths per primary Moderna course = 9,292 (95% CI 8,864-9,764). Excess death risk of 10.8 deaths (95% CI 10.2-11.3) per 100,000 Moderna vaccine courses.

Interpretation/context: There are three important numbers to consider in these calculations: net mortality, NNV, and net excess deaths per primary course. Net mortality is the overall mortality, including deaths caused by the vaccines as well as other cause of death that could be biologically plausible given the population. In this case, however, the population is relatively healthy and "low risk" in terms of COVID-19-related mortality (relatively healthy population with no comorbid diseases at baseline), and thus any disproportionate increase in overall mortality must logically be linked with the vaccination.

The epidemiological meaning of "net excess deaths per primary (Pfizer or Moderna) course" (NEDPC) number is the net cumulative incidence of increased death expected after vaccination, within about three months of the vaccine. In our calculation, the NEDPC number is the reciprocal of the net mortality. The interpretation is in the context of the calculation, i.e., benefits versus harms, with fairly conservative assumptions made on the harm side (false-positive reports and under-reporting assumptions).

Based on the founding clinical trial timeframes, we assume that three months is the period of time in which the vaccine would either incur benefit in terms of lives saved (related to the duration of trial and/or immunity) or incur harm, as in serious adverse events related to the vaccination. In real-world observational studies, longer timeframes would likely reveal other serious adverse effects that could result in premature death.

We also assume a 30% false positive rate (very conservative) and differing underreporting factors (URFs) of

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