COVID-19 Deaths by Vaccination Status

Texas Department of State Health Services

Technical Notes

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TEXAS
Health and Human Services

Texas Department of State Health Services

Methods

Data Sources

- ImmTrac2, Texas Immunization Registry
- Death Registry, Vital Statistics

Rates are calculated using the state population distribution based on the 2019 U.S. Census standard population estimates. Calculations include only the 18 years and older population. The analysis start was chosen because September 23, 2022 represents the first day a Texan could be vaccinated with an updated booster and died. Note that deaths can occur days or weeks after a person is infected with COVID-19. Data are provisional and are subject to change, particularly in more recent time periods.

Definitions

- Vaccinated without updated booster: deaths in individuals who received an FDA-authorized or approved COVID-19 primary series and have had at least 14 days to establish protection OR deaths in individuals who received at least one dose of an FDA-authorized or approved monovalent booster/additional dose on or after August 13, 2021 and have had at least 14 days to establish protection. Because data on the immune status of deaths are not available, booster doses cannot be distinguished from additional doses.

- Vaccinated with updated booster: deaths in individuals who received an FDA-authorized or approved COVID-19 primary series and have had at least 14 days to establish protection AND received at least one dose of an FDA-authorized or approved bivalent booster/additional dose on or after September 1, 2022 and have had at least 14 days to establish protection. Because data on the immune status of deaths are not available, booster doses cannot be distinguished from additional doses.

- Unvaccinated: deaths in individuals who did not receive any doses of an FDA-authorized or approved COVID-19 primary series or booster/additional dose.

- A COVID-19–associated death occurred in an individual with a documented COVID-19 diagnosis who died, or whose death local health authorities reviewed using vital records and public health investigation. A COVID-19– associated death is defined as a case with no period of complete recovery between illness and death. Classification must align with the Council of State and Territorial Epidemiologists (CSTE) case definitions. A death should not be reported if there is an alternative agreed upon cause of death which is unrelated to an infectious process (E.g., an adult with a positive SARS-CoV-2 test whose death clearly resulted from trauma after a car accident would not qualify as a COVID-19—associated death.)

Timeframes

- The first COVID-19 bivalent boosters were administered in Texas beginning September 2022. Allowing for 14 days to build full protection, we are reporting deaths beginning with September 23, 2022. Data are graphed starting May 2022, to show comparison trends for unvaccinated and vaccinated without bivalent booster deaths.

Linking methods

- All information on COVID-19 deaths provided by this report use death registry data linked to vaccination data. The links are based on a comparison of the first name, last name, and date of birth of deaths to the first name, last name, and date of birth of those with COVID-19 vaccination in ImmTrac2. Only exact matches on all three items are considered the same person. Missing or misspelled names and incorrect dates of birth may lead to some vaccinated people being incorrectly classified as unvaccinated. COVID-19 deaths with vaccines not reported to ImmTrac2 as described above are considered unvaccinated in this report.

Rate Calculations

- The vaccinated without updated booster population is defined as the number of individuals who are determined to have completed a primary series OR received a monovalent booster/additional dose in the specified age group by the middle of each week in the time period.

- The vaccinated with updated booster population is defined as the number of individuals who are determined to have completed a primary series AND received a bivalent booster/additional dose in the specified age group by the middle of each week in the time period.

- The unvaccinated population is defined by subtracting the number of individuals who have completed at least a primary series (primary series only + monovalent booster + bivalent booster) and those who are partially vaccinated (one-dose of a two-dose series, or two doses of a two dose series received less than 14 days prior, or one dose of a one-dose vaccine received less than 14 days prior) for the specified age group and week from the entire Texas state population 18 years and older.

- When considering rates, it's important to adjust for age. For example, older adults are both more likely to be vaccinated than younger people and more likely to have underlying health conditions that may increase their risk for dying if they get COVID. To compare most accurately, we compare vaccinated and unvaccinated people of similar ages. This is called adjusting for age.

- "Impact" was calculated as the Incidence Rate Ratio: incidence rate among unvaccinated cases / incidence rate among vaccinated with updated booster.

- The estimate for unvaccinated Texans begins to near zero as more Texans get vaccinated. Reasons for this can include 2019 population estimates that consider models using 2010 US Census data and dramatic growth of the Texas population. This analysis adds a correction factor to unvaccinated estimates. Assuming no more than 95% of the Texas population becomes vaccinated, 5% of each age group will remain unvaccinated in rate calculations. As our data evolves, new data collection, measurement, and analysis challenges will present themselves. We continue to explore ways to improve the precision of our population estimates.

Limitations

- Duplicates among exact matches were hand checked. Those who had outliers such as a vaccine dose date after a date of death were classified as unvaccinated. However variable linkage of case, vaccination, and mortality data might have resulted in misclassifications that could influence IRR estimates.

- Death registry data are updated on an ongoing basis, lags in reporting may lead to some information being incomplete at the time of analysis.

- Immunization data for COVID-19 are dependent on clinician report of status to ImmTrac2.