

Procedure for calculating driver death rates by vehicle make and series

July 2026

A vehicle series is defined as the combination of vehicle model, body style, and drivetrain (e.g., the Ford F-150 two-wheel-drive and four-wheel-drive are different series). Counts of registered vehicles for each make and series were obtained from Mobility Global. Registration counts are a snapshot of vehicles registered as of July 1 of each year, and they tend to misrepresent annual registrations of the current model year. For example, registration counts on July 1, 2024, did not include any of the yet unsold 2024 models, nor did they provide information on how many months any new vehicle had been registered. Thus, counts of vehicle registrations for each model year were restricted to calendar years later than the model year. Nearly all such vehicles registered on July 1 would have been on the road for the whole year.

The goal was to estimate real-world fatality rates for passenger vehicles from model year 2023. To maximize sample size and statistical power, the vehicle list included vehicles from model years 2020–2023 that were not significantly different in design from the 2023 model year. If, for example, a vehicle series was redesigned in 2022, then only model years 2022–2023 were included in the vehicle list. Safety-relevant design changes included changes in engineering design, such as the dimensions or weight of the vehicle, or the addition of crash avoidance technology, such as automatic emergency braking or lane departure warning or prevention.

For each make, series, and model year in the vehicle list, counts of driver deaths in both the case vehicles and the vehicles they collided with during 2021–2024 were obtained from the U.S. Department of Transportation's Fatality Analysis Reporting System (FARS). Because registration counts do not include government-owned vehicles, case vehicles listed as police vehicles or vehicles with government tags were excluded from the analysis. The case-vehicle and other-vehicle driver death rates for each vehicle make and series were computed by dividing reported deaths by registered vehicle years (in millions).

Driver death rates are influenced both by vehicle crashworthiness and by the likelihood of a crash. To partially account for differences in driver behavior, the raw death rates described above were adjusted for the age and sex distributions of crash-involved case-vehicle drivers. The standardized case-vehicle driver death rate for each vehicle series was estimated as the raw driver death rate multiplied by $(1 + 1.48 P_C) / 1.30$, where P_C was the proportion of females ages 25–64 among the fatally injured case-vehicle drivers. The standardized other-vehicle driver death rate was estimated as the raw rate multiplied by $(1 + 0.64 P_O) / 1.18$, where P_O was the proportion of other-vehicle driver deaths for female case-vehicle drivers ages 25–64.

For more information on the adjustment procedure, see

"Demographic adjustments to driver death rates by vehicle type and size," by C. M. Farmer, 2024, *Traffic Injury Prevention*, 25(2), pp. 173–181 (doi.org/10.1080/15389588.2023.2279912).