RESEARCH LETTER

Mortality Among Surgeons in the United States

Although decades of research have examined mortality among physicians and other health care workers,[1,2] little is known about mortality among surgeons. Given the demands of surgical practice—including long work hours, high-pressure environments, workplace violence, and occupational exposures (eg, radiation)—surgeons might be particularly vulnerable to health risks.[3] Understanding mortality patterns among surgeons is critical because their health and longevity affect their capacity to deliver care. We used newly available population-based data to evaluate the rates and leading causes of death among surgeons.

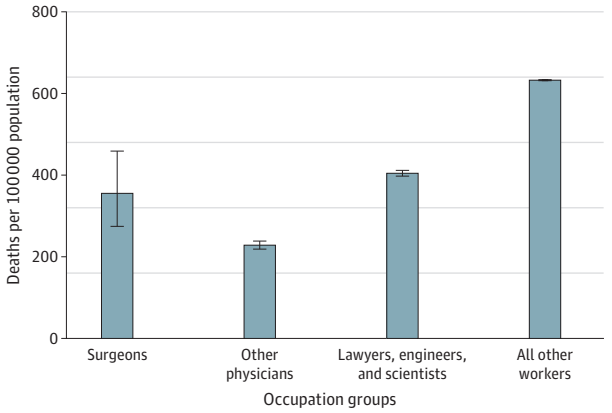
Supplemental content

Methods | We obtained death certificate data on adults aged 25 through 74 years in the 2023 National Vital Statistics System, a registry of all US deaths. The data include decedent age, sex, underlying cause of death (coded using the *ICD-10*), and usual occupation (the occupation in which the decedent spent most of their life, as reported by the decedent's informant). Because mortality rates for a group are calculated as the number of deaths divided by group population, we obtained population count denominators from the 2023 American Community Survey (ACS) by age, sex, and occupation.[4] We cross-verified ACS-determined denominators for male and female surgeons and physicians with the AMA Physician Masterfile, a population-based registry of physicians.

Nonsurgeon physicians served as the primary comparison group, along with lawyers, engineers, and scientists, given their similar education and income.[2] We included all other workers in the general population as another comparison group. Mortality rates were presented as deaths per 100 000 population, age- and sex-adjusted to the 2000 US standard population using direct standardization. Mortality rate ratios (MRR) were calculated to quantify mortality differences between surgeons and comparison groups. Leading causes of death were ranked within each occupation group. Two-tailed alpha levels were set at .05. The study was exempt from consent and human participants review at Harvard Medical School due to the use of publicly available, deidentified data, per institutional policy.

Results | The study included 1 080 298 decedents, including 224 (0.02%) surgeons and 2740 (0.25%) other physicians. The age- and sex-adjusted mortality rate per 100 000 population was higher for surgeons (355.3 [95% CI, 274.5-458.8]) compared with nonsurgeon physicians (228.4 [95% CI, 218.7-238.4]), corresponding to an MRR of 1.56 (95% CI, 1.36-1.78). The mortality rate for surgeons was similar to that for lawyers, engineers, and scientists (404.5 [95% CI, 397.5-411.6]; MRR, 0.88 [95% CI, 0.77-1.00]) and lower than the rate for all other workers (632.5 [95% CI, 631.3-633.7]; MRR, 0.56 [95% CI, 0.49-0.64]) (**Figure 1**).

Figure 1. Mortality Rates Among Surgeons and Other Occupation Groups, 2023

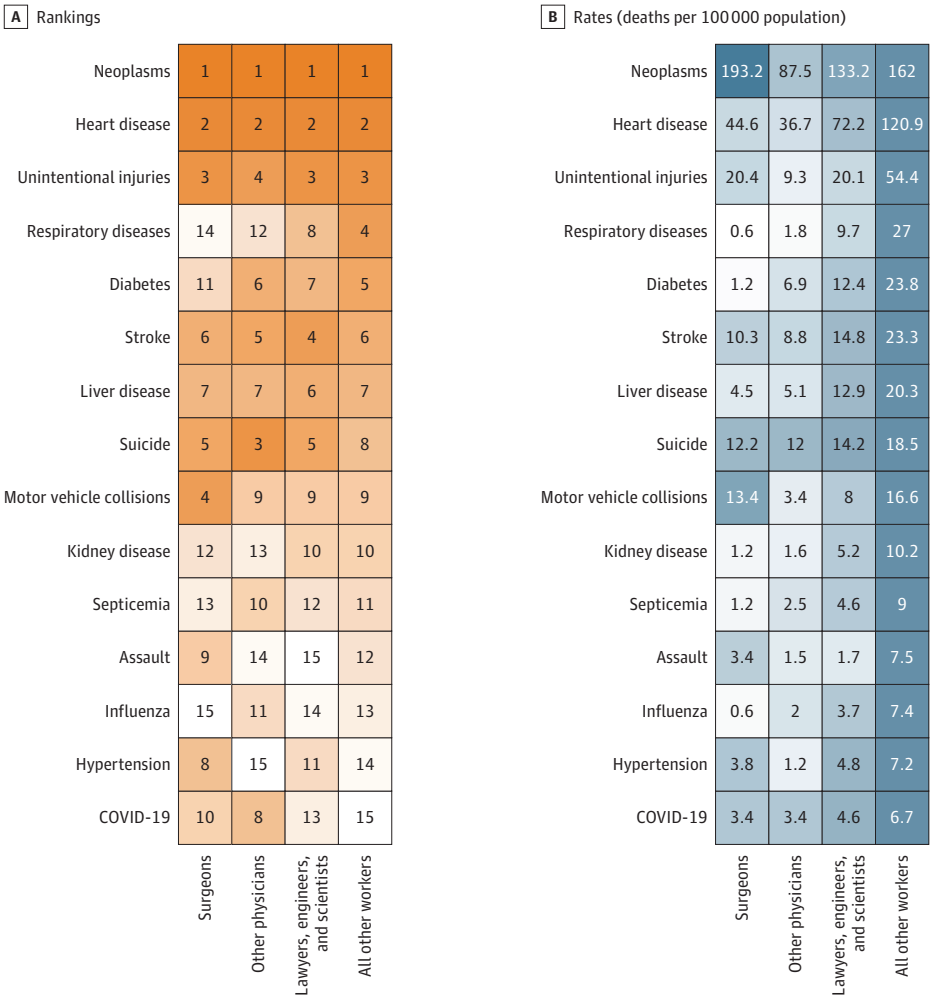


Rates are for adults aged 25 through 74 years and were age- and sex-adjusted to the 2000 US population. Error bars represent 95% CIs.

Although neoplasms (first) and heart disease (second) were the leading causes of death across all occupation groups, certain causes were more common among surgeons (**Figure 2**). Motor vehicle collisions were the fourth leading cause of death among surgeons but ninth in all other occupation groups. Deaths from hypertension and assault also ranked higher among surgeons (eighth and ninth, respectively) than in other groups. Mortality from neoplasms was higher among surgeons (193.2 [95% CI, 128.2-284.0]) than any other group, including nonsurgeon physicians (87.5 [95% CI, 81.4-94.0]; MRR, 2.21 [95% CI, 1.75-2.80]).

Discussion | Although nonsurgeon physicians have lower mortality rates than other highly educated professionals, this mortality benefit does not extend to surgeons. Because surgeons and nonsurgeon physicians have similar levels of health care knowledge and resources, higher mortality rates among surgeons might reflect differences related to work environment, professional demands, and lifestyle.[3] Our results indicate that several causes of death (eg, motor vehicle collisions), disproportionately affect surgeons, aligning with evidence that hazardous driving events associated with extended work hours are especially pronounced among surgeons.[5] Research is needed to understand other observed mortality patterns among surgeons, such as elevated cancer-specific mortality and assault.[6] One study limitation is the inability to examine year-to-year variations in mortality because only 2023 data are currently available.

Figure 2. Leading Causes of Death Among Surgeons and Other Occupation Groups, 2023



The leading causes of death are shown for adults aged 25 through 74 years in each occupation, based on age- and sex-adjusted mortality rates ranked in descending order to the general population. In panel A, the color of the cells corresponds to the ranking of each cause of death. In panel B, the color of the cells represents the mortality rate ratio for each occupation compared with other workers in the general population (far right column), such that the darkest cells represent the occupations with the highest mortality rates for each cause of death. Unintentional injuries include poisonings (eg, drug overdoses), drownings, falls, firearm injuries, and other nontransport injuries.

The number of decedent surgeons was relatively small but reflects the size of the surgical workforce, as all eligible surgeon deaths were included in this analysis.

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