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Physician deaths from COVID-19 have been lower than expected

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Background	More than 100 US physicians have died from COVID-19. I considered the number of US physician deaths in comparison to the expected COVID death rate in the general population.
Aims	To estimate the whether US physicians are at increased risk of death from COVID-19 due to occupational exposures.
Methods	COVID-related physician deaths were identified through searches using Medscape *In Memoriam*, and multiple internet searches using Google and Facebook. An obituary or death notice was obtained in all but one case. Death rates among physicians were compared to the expected rate based on COVID deaths in the US population.
Results	Up to 7 October 2020, there were 108 deaths among US physicians. Physicians make up about 0.33% of the US population. By 1 October 2020, there were 210 000 COVID deaths in the US population with 693 expected physician deaths. Observed deaths were 16% of expected. Seventy-five per cent of the deaths occurred among physicians older than age 60 and about half appeared to be among those retired from clinical practice.
Conclusions	Observed physician deaths were significantly below expected based on deaths the general population. Prudent use of personal protective equipment may explain the lower-than-expected death rates.
Key words	COVID-19; infection; mortality; physician.

Introduction

By October 2020, more than 108 physicians in the USA had died from COVID-19. Ing *et al.* [1] identified 278 physician deaths worldwide prior to 15 April 2020. At the time of the Ing's analysis, only 12 US physicians had died and many significant policies for PPE deployment had not been implemented. The epidemic has changed considerably since the publication of the Ing's paper. In April, 43% of physician deaths were in Italy in comparison to 4% in the USA. Over the next 6 months, the highest deaths/100 000 population rates shifted from southern Europe to the Americas [2].

This report considers the COVID-19 death rate among physicians in the USA in comparison to the expected rate derived from the US population.

Methods

US healthcare provider deaths from COVID-19 are reported in Medscape [3] on a regular basis. This report considers cumulative deaths reported up to 7 October 2020. Internet searchers yielded an obituary or death notice in all but one case of death. For each decedent, age, medical specialty and location of residence were recorded. Cumulative deaths in the population were obtained from the CDC COVID Data Tracker [2]. Expected physician deaths were calculated by dividing the 1.1 million US physicians by the approximate US population of 330 million (1.1/330 = 0.0033) and multiplying by the number of deaths in the total population.

Results

By 7 October, 108 physicians had died among 210 000 COVID-19 deaths in the population. The deceased physicians ranged in age from 28 to 99 years (mean 69.18, SD 13.03 years, Skewness statistic −0.367). Among the 108 deaths, 81 (75%) were aged 60 or older, 65% were 65 or older, 49% were over 70 and 16% were older than 80 years. In six cases, the physician was older than 90 years. If physicians died at the same rate as people

Key learning points

What is already known about this subject:

- Physicians are assumed to be at high risk for death from COVID-19, but few studies have compared physician deaths to the expected number in the general population.

What this study adds:

- Despite high exposure, US physicians are significantly less likely to die of COVID-19 in comparison members of the general population.
- The ratio of expected-to-observed physician deaths has declined over the course of the US epidemic

What impact this may have on practice or policy:

- Lower-than-expected COVID-19 deaths among US physicians is likely to be attributable to precautionary practices including the use of PPE.
- Although physicians remain at high risk, prudent behaviour and use of high-quality equipment may substantially mitigate risk.

in the general population, we would have expected 693 (0.0033 × 210 000 = 693) deaths by early October. The observed number (108) is 17% of the expected rate ($\chi^2 < 0.001$).

Figure 1 shows the cumulative observed physician deaths and the expected number if the rate of death among physicians was proportional to the death rate in the general population as reported between April and October in 60-day intervals. In each case, the observed rate was significantly below expectation (all χ^2 values < 0.001). On April 1, physician deaths were about 50% of expected in the population. For each successive month, physician deaths have ranged between 14% (June) and 18% (May) of the expected number.

Sensitivity analysis used the number of physicians believed to be active in-patient care (827 000) rather than all physicians. This resulted in modestly lower estimated deviations from the expected death rate but does not affect the trends or conclusions. For each month, the number of observed deaths was significantly below those expected (observed/expected April 63%, May 22%, June 17%, July 20%, August 20%, September 21%). Review of obituary notices suggested that about half of the deceased physicians were retired. Although many notices were ambiguous, the average physician retirement age in the USA is 63 and very few remain in fulltime practice after age 70 [4]. Age 70 was the median age of death in our study, providing other evidence that about half of deaths occurred among physicians no longer practicing.

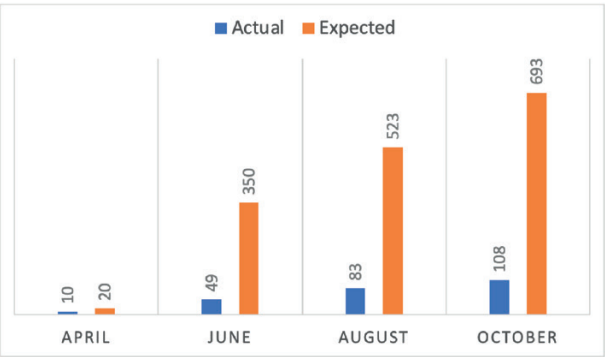

Figure 1. Expected and observed COVID-19 physician deaths in the USA at 2-month intervals in 2020.

Another sensitivity analysis considered undercounts and overcounts. Undercounts may result from cases not being found by the Google searches. Assuming 20% of the deaths were missed, there would be 135 physician deaths (instead of the observed 108), and the percent of observed to expected would increase from 15 to 19%. Overcounts might result from attributing other causes of death to COVID. Assuming a 20% overcount, there would be 86 physician deaths and the observed-to-expected percentage would go from 16 to 12%.

Discussion

Despite potentially dangerous exposure, US physician deaths from COVID-19 have been significantly lower than expected based on rates in the general population. About half of the deaths occurred in older physicians who have a low probability of being actively involved in clinical practice. About three quarters of COVID deaths were in physicians over age 60, while that age group represents only about a quarter of the physician workforce [5]. Although it is difficult to estimate from obituary notices, it appears that at least 50% of physician deaths were among those likely to have retired from clinical practice. Assuming that most physicians retire from practice by age 70, it is possible that about half of the observed deaths result from community-acquired infections.

These findings must be interpreted cautiously for a variety of reasons. First, we do not know whether the physician deaths identified by Medscape are comprehensive. However, a series of Google searches failed to identify any additional cases. Physician deaths are highly salient and likely to gain public attention.

Delayed reporting of physician deaths may have also resulted in an undercount. However, that would not explain why the percentage of physician deaths as a proportion of total COVID-19 deaths has remained relatively constant since May of 2020. Finally, the analysis concentrated on US physicians because death reports were most complete and accessible. Other healthcare workers may be at greater risk and should receive more research attention.

Although the explanation for the lower-than-expected number of physician deaths is unknown, it is likely that PPE does make a difference. Physician deaths in Italy, Spain, and Iran, where providers may have been less well protected in the early stages of the pandemic, were much higher. Other potential explanations include previous evidence that physicians usually have lower mortality in comparison to the general population [6] and the likelihood that physicians isolated themselves, practised domestic hygiene more effectively, and presented for healthcare earlier in their illness than the general population. Privileged socioeconomic status of physicians may have also conferred an advantage.

In summary, COVID-19 deaths among US physicians have been lower than expected. Although all healthcare workers remain at high risk, prudent behaviour and adherence to use of PPE use may mitigate some of the risk.

Competing interest

None declared.

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