

## Distribution in Place of Death for COVID-19–Related Mortality in the United States

### INTRODUCTION

COVID-19 has resulted in considerable mortality in the United States, exceeding 100,000 deaths to-date. Although much attention has been devoted to the clinical challenges in management of critically ill patients with COVID-19, less is known about the end-of-life experience. Place of death is an important determinant of quality of care and patient and caregiver experience. Therefore, we sought to examine the distribution of place of COVID-19–related deaths in the United States.

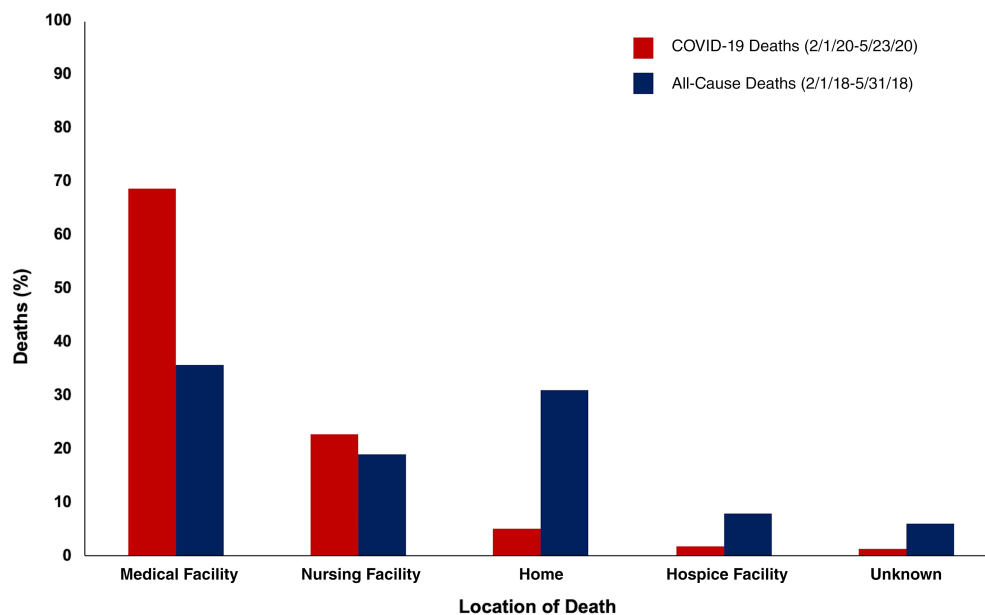
### METHODS

We analyzed publicly available data released by the Centers for Disease Control and Prevention (CDC) for COVID-19 deaths from February 1, 2020 (before the first U.S. COVID-19 death on February 6, 2020)<sup>1</sup> through May 23, 2020. COVID-19–related deaths were identified whereby COVID-19 (*International Classification of Diseases, Tenth Revision (ICD-10):* U07.1) was reported as a cause of death (including “probable” or “presumed” cause). We calculated the proportion of COVID-19–related deaths that occurred in the locations of medical facility, nursing facility, home, and hospice facility using place of death noted on the death certificate. Next, we determined the proportions of all-cause historical deaths in each location over a similar length of time in 2018 (February 1, 2018, to May 31, 2018) using the CDC’s Wide-Ranging

Online Data for Epidemiologic Research database<sup>2</sup> and compared them with COVID-19 distributions using chi-square tests. Odds ratios were calculated to determine the odds of death occurring in a medical facility (vs home) for COVID-19–related deaths in 2020 versus all-cause deaths in 2018.

### RESULTS

Between February 1, 2020, and May 23, 2020, 81,372 deaths from COVID-19 were reported by the CDC (54% men, 23% black, 81%  $\geq 65$  years). The proportions of COVID-19–related deaths occurring in medical facilities, nursing facilities, homes, and hospice were 68.7%, 22.7%, 5.2%, and 1.9%, respectively. At the state level, Wisconsin had the highest proportion of home deaths (9% of 452 deaths), followed by New York (8% of 26,619 deaths). In several states, the proportion of deaths in nursing facilities was higher than the proportion occurring in medical facilities, including Minnesota (60% in nursing facilities, 34% in medical facilities, 745 total deaths), New Hampshire (59% in nursing facilities, 41% in medical facilities, 169 total deaths), and Rhode Island (52% in nursing facilities, 32% in medical facilities, 401 total deaths). For historical comparison, of the 947,739 deaths from all causes reported between February 1, 2018 and May 31, 2018, the proportions occurring in medical facilities, nursing facilities, homes, and hospice were 35.7%, 19.1%, 31.1%, and 7.9%, respectively ( $P < .001$  for each location vs COVID-19–related deaths) (Figure 1). The odds of dying in a medical facility versus home was 11.5 times greater for COVID-19–related deaths in 2020 compared with all-cause deaths in 2018 (95% confidence interval = 11.1–11.8).




**Figure 1** Distribution in location of death for COVID-19–related (February 1, 2020-May 23, 2020) and all-cause (February 1, 2018-May 31, 2018) mortality in the United States.

## DISCUSSION

Most U.S. patients with mortality attributed to COVID-19 died in a medical facility, which is consistent with the clinical profile of a rapidly progressive illness. We observed state-level variation in location of death, which may be related to differences in hospital capacity (leading to more deaths outside of medical facilities) and availability of protective equipment, or suboptimal infection control (leading to more deaths in nursing facilities). Although recent work has demonstrated that U.S. deaths in medical facilities are decreasing and deaths at home and in hospice facilities are increasing, the burden of deaths attributed to COVID-19 may reverse these overall trends.<sup>3,4</sup>

Limitations of these data include reliance on provisional death certificate data for cause and location of death. Further, significant excess mortality not attributed to COVID-19 during this time period has also been reported,<sup>5</sup> but the location of these deaths or their influence on place of death proportions is not yet known. Nonetheless, we describe an important aspect of the ongoing COVID-19 pandemic, highlighting the need to discuss and promote patient-centered care at the end of life.

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## Nursing Home Physician with Normal Chest X-Ray and Probable COVID-19 Based on 18F-Fluorodeoxyglucose PET/CT Imaging

*To the Editor:* We report the clinical, laboratory, and imaging studies of a 75-year-old physician with a history of lymphoma who cared for coronavirus disease 2019 (COVID-19) patients in a nursing home and subsequently developed systemic and laboratory findings consistent with probable COVID-19 with minimal respiratory symptoms. Two reverse transcriptase–polymerase chain reaction (RT-PCR) tests for the detection of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) nucleic acid and his chest X-ray were negative. During hospitalization, a clinical diagnosis of COVID-19 was finally confirmed based on findings suspicious for COVID-19 on 18F-fluorodeoxyglucose positron emission tomography/computed tomography (18F-FDG PET/CT) imaging. The rationale for utilizing 18F-FDG PET/CT in suspected COVID-19 patients with a normal chest X-ray and selected comorbid neoplastic conditions with minimal or no respiratory symptoms and signs and the role of