



CORRESPONDENCE

## Case-fatality with coronavirus disease 2019 (COVID-19) in United States Veterans with spinal cord injuries and disorders

Stephen P. Burns<sup>1,2</sup> · Adam C. Eberhart<sup>3</sup> · Jennifer L. Sippel<sup>4</sup> · Geneva M. Wilson<sup>5</sup> · Charlesnika T. Evans<sup>5,6</sup>

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### To the Editor:

Individuals with spinal cord injuries and disorders (SCI/D) have an elevated risk of death with community-acquired pneumonia [1], and there may be elevated risk with coronavirus disease 2019 (COVID-19). The Veterans Health Administration (VHA) SCI/D National Program Office oversees health care services received by over 24,000 Veterans with SCI/D at 170 medical centers and more than 1000 outpatient care sites. In coordination with the VHA Support Service Center, the National Program Office maintains the VHA SCI/D Registry, which identifies Veterans who have received health care services from the VHA SCI/D System of Care. To support outreach and prevention activities in the response to the current COVID-19 pandemic, the National Program Office developed operational reports showing COVID-19 infection status as determined by occurrence of a positive laboratory test performed by VHA or by entry of a non-VHA lab result. Additional registry data including demographics, neurologic classifications, comorbidities, and geographic setting

were used to determine a preliminary infection risk category and severity risk category for each SCI/D Veteran. These reports were developed in March 2020 and made available to VHA SCI/D Centers on April 7, 2020. The objective of this analysis was to describe case fatality of COVID-19 infection in Veterans with SCI/D as determined using these operational reports.

Between March 9, 2020 and June 30, 2020, COVID-19 was identified in 140 of 17,452 Veterans with SCI/D, inclusive of traumatic and nontraumatic etiologies and excluding both multiple sclerosis and amyotrophic lateral sclerosis. The mean (SD) age of those with infection was 67 (12) years. The racial composition was White: 80 (57%), Black: 50 (36%), and other/declined/unknown 10 (7%). For those with neurologic classifications recorded ( $n = 82$ ), the combined neurologic level and American Spinal Injury Association Impairment Scale (AIS) categories were: C1–C4 tetraplegia AIS A–C: 13 (16%); C5–C8 tetraplegia AIS A–C: 14 (17%); paraplegia AIS A–C: 15 (18%); all AIS D: 40 (49%). Infections were identified in Veterans from 63 VHA health care systems. Inpatient care was received by 67 of 140 (48%) Veterans in VHA hospitals and by an unknown number of Veterans in other inpatient settings.

Of these 140 Veterans who tested positive for COVID-19, 26 (19%; 95% CI, 13–26%) had died as of June 30, 2020, with all except one death occurring within 30 days of testing positive. For the 19 deceased Veterans who received VHA inpatient care, the median duration between positive test and death was 8 days. The case fatality rate of 19% in Veterans with SCI/D can be compared with the rate in the overall US Veteran population enrolled for VHA health care, which has a similar proportion of individuals age 65 years or greater (SCI/D: 54%; overall population: 49%) [2]. As of June 30, 2020, 7.7% of all non-SCI/D Veterans known to have COVID-19 had died: 1564 deaths in 20,369 infected individuals, calculated as overall Veteran population minus SCI/D Veteran subtotals [3]. The SCI/D Veteran case fatality rate with COVID-19 is 2.4 times the rate observed in the non-SCI/D Veteran population, with

✉ Stephen P. Burns  
stephen.burns@va.gov

<sup>1</sup> Spinal Cord Injury Service, VA Puget Sound Health Care System, Seattle, WA, USA

<sup>2</sup> Department of Rehabilitation Medicine, University of Washington School of Medicine, Seattle, WA, USA

<sup>3</sup> Spinal Cord Injury Service, VA St. Louis Health Care System, St. Louis, MO, USA

<sup>4</sup> Spinal Cord Injuries and Disorders National Program Office, Veterans Health Administration, Washington, DC, USA

<sup>5</sup> Center of Innovation for Complex Chronic Healthcare, Edward Hines Jr. VA Hospital, Hines, IL, USA

<sup>6</sup> Department of Preventive Medicine and Center for Health Care Studies, Institute for Public Health and Medicine, Feinberg School of Medicine, Northwestern University, Chicago, IL, USA

an absolute rate that is 11% greater (95% CI: 5–19%;  $Z$  score = 4.8;  $p < 0.0002$ ).

These case fatality rates for Veterans with SCI/D and the overall Veteran population, as well as what has been reported elsewhere for the US population and the world, are overestimates of the infection fatality rate. In each of these populations, individuals with asymptomatic infections are unaccounted for, and individuals with minimal symptoms may not have received testing, particularly early in the pandemic when testing capacity in the US was minimal. Also, it is possible that mild symptoms from COVID-19 in an individual with SCI/D could be misattributed to other medical conditions commonly experienced, such as urinary tract infection. This would bias diagnosis of COVID-19 in individuals with SCI toward cases with greater severity and risk of fatality.

Despite these limitations, these data from a large registry population provide preliminary evidence that individuals with SCI/D have higher case fatality and infection severity with COVID-19 than the general population. The VHA SCI/D population includes a considerable number of older individuals with multiple medical comorbidities and thus case fatality is likely substantial. These findings support current efforts to minimize the risk of outbreaks of COVID-19 in institutional settings caring for individuals with SCI/D. Individuals with SCI/D in all settings should be strongly encouraged to take actions to minimize their chance of acquiring COVID-19.

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**Author contributions** JLS led the design and build of the registry and operational reports that served as data sources for these analyses, with consultation on registry development provided by SPB, ACE, and CTE. ACE developed a risk assessment report based on the registry, serving as an additional data source for this work. SPB, ACE, and JLS independently performed analyses of the data. All authors participated in the interpretation of the results. SPB drafted the initial version of the correspondence, and ACE, JLS, CTE, and GMW revised the correspondence. All authors approved the final version of the correspondence.

## Compliance with ethical standards

**Conflict of interest** The authors declare that they have no conflict of interest.

**Ethics statement** This work is based on operations report data and does not constitute a research activity per VHA Program Guide 1200.21. The contents of this work do not represent the views of Veterans Affairs or the United States Government.

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