



# Delirium Contributes to Poor COVID-19 Outcomes in Adults Under 65



Kelsey Talkington<sup>1</sup>, Luis Alvarado<sup>2</sup>, Silvina Tonarelli<sup>1,3</sup>

<sup>1</sup>TTUHSC EP Paul L. Foster School of Medicine, <sup>2</sup>TTUHSC EP Biostatistics and Epidemiology Consulting Laboratory, <sup>3</sup>TTUHSC EP Psychiatry

## Introduction

Delirium, a disturbance in attention and awareness, can develop over a short period of time. Though a prevalent disorder, delirium is underdiagnosed in the Emergency Department, Intensive Care Unit (ICU) and on medical floors. Delirium has been linked to adverse clinical outcomes like increased mortality and increased length of hospital stay in ICU and non-ICU settings.<sup>1-4</sup>

COVID-19 is a respiratory disease with a highly variable acute presentation.<sup>5</sup> Delirium is recognized as a common complication and, potentially, a symptom in atypical presentations of the disease.<sup>6,7</sup> Younger COVID-19 patients may present with different symptoms than older patients.<sup>8,9</sup>

## Objective

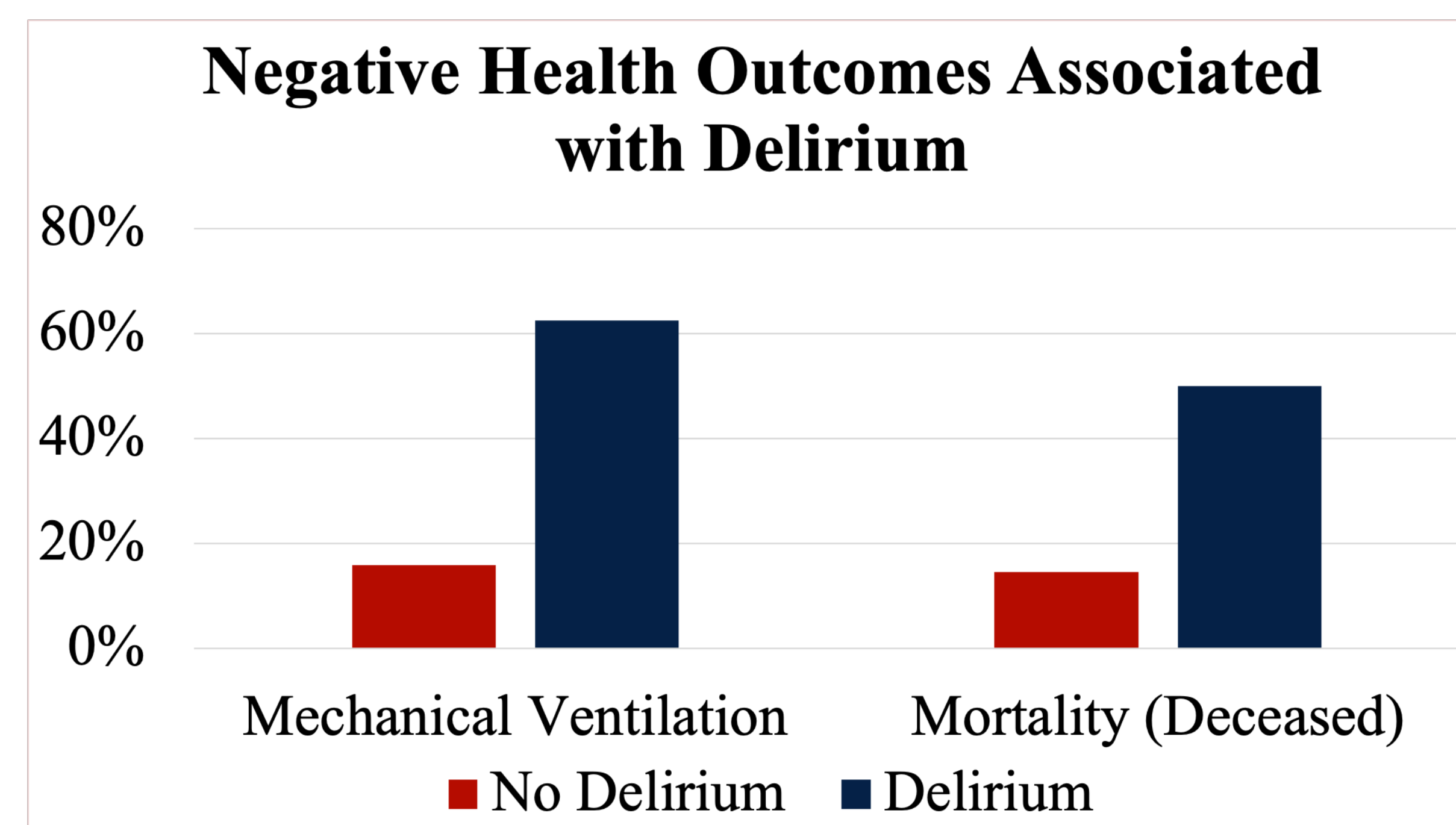
Determine if those with concurrent diagnoses of COVID-19 and delirium have more adverse clinical outcomes, including an elevated mortality rate, than those without a delirium diagnosis, regardless of age.

## Methodology

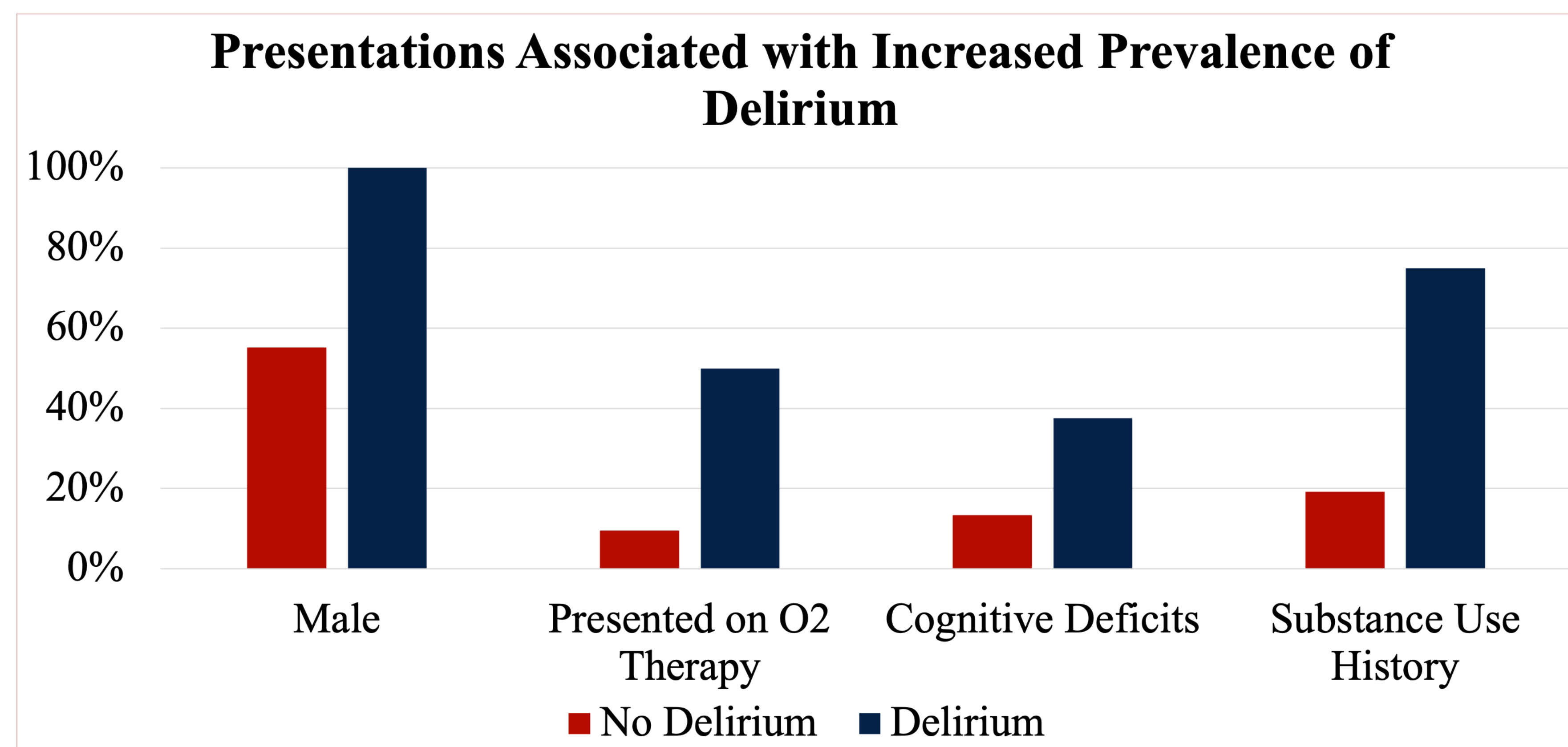
A retrospective cohort study aimed to describe adverse clinical outcomes associated with co-existent COVID-19 and delirium diagnoses in patients 18 to 65 years old hospitalized March 1, 2020—June 30, 2020 through review of medical records after IRB approval.

**Inclusion criteria:** age  $\geq 18$  and  $\leq 65$ , COVID-19 diagnosis, hospital admission

**Statistical Analysis:** Data were analyzed using Fisher's exact test or an unpaired *t*-test where appropriate and univariate analysis was performed to establish relative risk (RR). Confidence intervals (CI) were set at 95% and *p* values  $\leq 0.05$  were considered significant.



Factor	No Delirium	Delirium	<i>p</i> -value
N	125	8	
Mean length of hospital stay in days (SD)	7.5 (6.8)	18.0 (11.0)	<0.001
Median length of ICU stay (IQR)	0.0 (0.0, 2.0)	11.0 (2.5, 23.0)	<0.001
Median number of days on mechanical ventilation (IQR)	0.0 (0.0, 0.0)	8.5 (0.0, 16.5)	<0.001



## Relative risk of being placed on a mechanical ventilator determined via univariate regression analysis

Factor	Relative Risk	95% CI	<i>p</i> -value
Respiratory Rate	1.08	1.01 - 1.16	0.022
SpO <sub>2</sub>	0.96	0.95 - 0.97	<.0001
Gender			
Male (ref)			
Female	0.34	0.13 - 0.92	0.033
Delirium	3.91	1.46 - 10.41	0.006

Relative risk >1 indicates increased risk of intubation, relative risk <1 indicates decreased risk of intubation. Increased respiratory rate at presentation increased risk of intubation. Lower SpO<sub>2</sub> at presentation increased risk of intubation. Female gender decreased risk of intubation. Presence of delirium increased risk of intubation.

## Results

- 6% of COVID-19 patients had delirium.
- Fifty percent of delirium patients died during hospitalization compared to 14.63% of those without delirium.
- Patients with delirium spent more days hospitalized, in the intensive care unit, and intubated than their non-delirious counterparts.
- Delirium increased risk of being placed on mechanical ventilation.
- Delirium was not more common in patients with pre-existing psychiatric diagnoses.

## Conclusions

In this study population, 6% of patients were diagnosed with delirium; lower than expected. This may be due to the young subject population and established under-diagnosis of delirium by physicians and nurses. Though delirium is more prevalent in older populations with existing cognitive issues, it was found to be a significant factor in this study population of adults under 65.

Delirium presentation in COVID-19 patients is significantly associated with worse health outcomes and increased risk of being placed on mechanical ventilation.

COVID-19 patients need to be actively assessed for delirium and precautionary measures should be implemented.

## Citations

- <sup>1</sup>European Delirium Association; American Delirium Society. The DSM-5 criteria, level of arousal and delirium diagnosis: inclusiveness is safer. *BMC Med.* 2014 Oct 8;12:141. doi: 10.1186/s12916-014-0141-2. PMID: 25300023; PMCID: PMC4177077.
- <sup>2</sup>Suffoletto B, Miller T, Frisch A, Callaway C. Emergency physician recognition of delirium. *Postgrad Med J.* 2013;89(1057):621-625. doi:10.1136/postgradmedj-2012-131608
- <sup>3</sup>Ely EW, Shintani A, Truman B, et al. Delirium as a predictor of mortality in mechanically ventilated patients in the intensive care unit. *JAMA.* 2004;291(14):1753-1762. doi:10.1001/jama.291.14.1753
- <sup>4</sup>Watt CL, Momoli F, Ansari MT, et al. The incidence and prevalence of delirium across palliative care settings: A systematic review. *Palliat Med.* 2019;33(8):865-877. doi:10.1177/0269216319854944
- <sup>5</sup>Zipsper CM, Seiler A, Deuel J, et al. Hospital-wide evaluation of delirium incidence in adults under 65 years of age. *Psychiatry Clin Neurosci.* 2020;74(12):669-670. doi:10.1111/pcn.13155
- <sup>6</sup>Zhu J, Ji P, Pang J, et al. Clinical characteristics of 3062 COVID-19 patients: A meta-analysis. *J Med Virol.* 2020;92(10):1902-1914. doi:10.1002/jmv.25884
- <sup>7</sup>Watne LO, Tonby K, Holten AR, Olasveengen TM, Romundstad LG, Neerland BE. Delirium is common in patients hospitalized with COVID-19 [published online ahead of print, 2021 Apr 8]. *Intern Emerg Med.* 2021;1-4. doi:10.1007/s11739-021-02715-x
- <sup>8</sup>Liu Y, Mao B, Liang S, et al. Association between age and clinical characteristics and outcomes of COVID-19. *Eur Respir J.* 2020;55(5):2001112. Published 2020 May 27. doi:10.1183/13993003.01112-2020
- <sup>9</sup>Mori H, Obinata H, Murakami W, et al. Comparison of COVID-19 disease between young and elderly patients: Hidden viral shedding of COVID-19. *J Infect Chemother.* 2021;27(1):70-75. doi:10.1016/j.jiac.2020.09.003