

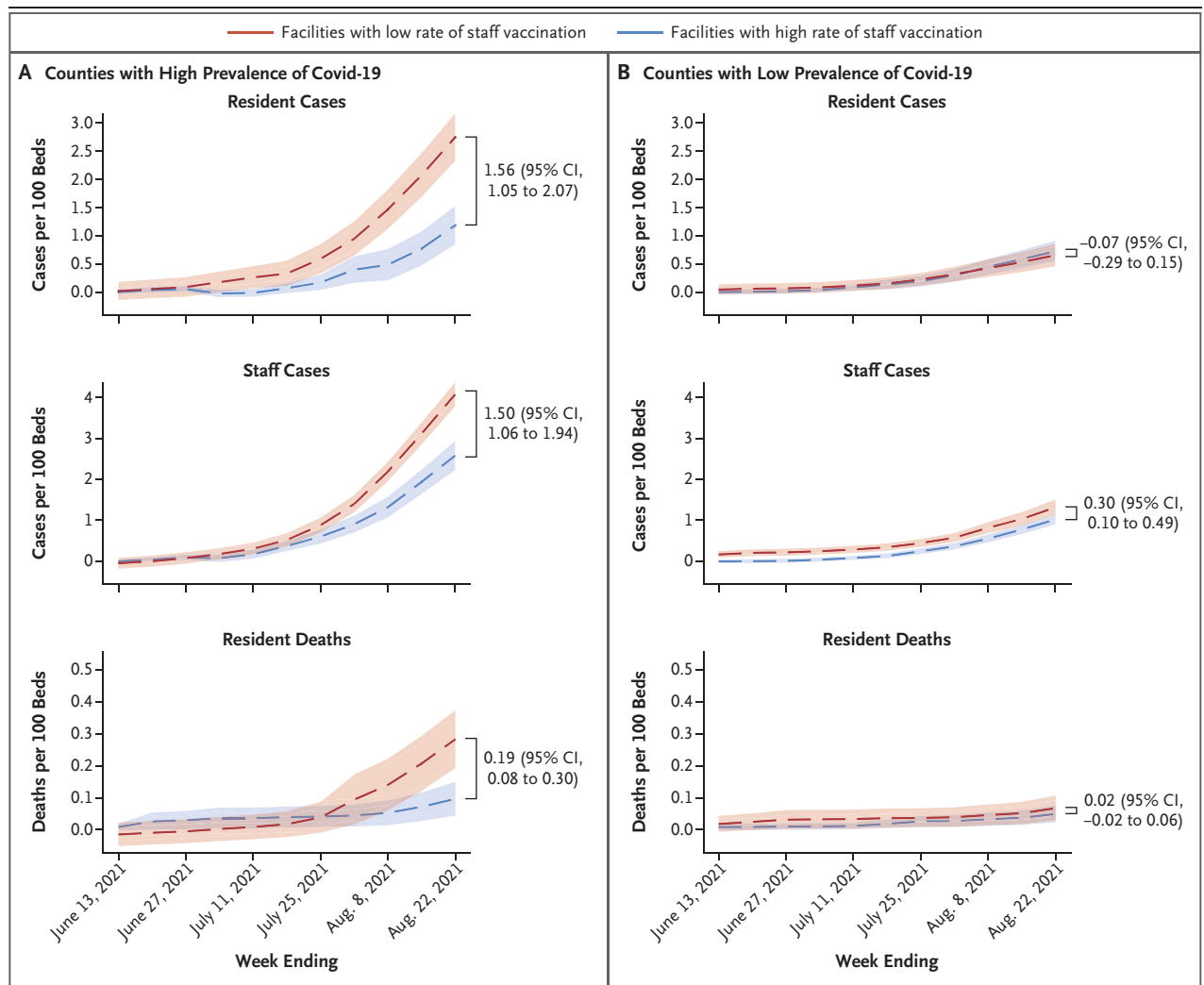
CORRESPONDENCE

## Nursing Home Staff Vaccination and Covid-19 Outcomes

**TO THE EDITOR:** Nursing home staff are considered to be a source of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection in nursing homes.<sup>1,2</sup> The emergence of the B.1.617.2 (delta) variant has heightened concerns about coronavirus disease 2019 (Covid-19)-related illness and death in nursing homes, especially given the

low vaccination rates among the staff at many facilities.<sup>3</sup> These concerns prompted the federal government to mandate that staff at nursing homes be vaccinated.<sup>4</sup> However, the potential effect of staff vaccination rates on Covid-19 in nursing homes has not been well studied.

Using national data (mainly from the Centers



**Figure 1.** Cumulative Adjusted Covid-19 Outcomes, According to Nursing Home Staff Vaccination Coverage and County-Level Prevalence of Covid-19.

Shaded areas indicate 95% confidence intervals.

for Medicare and Medicaid Services Covid-19 Nursing Home Public File database), we classified 12,364 nursing homes (81% of all nursing homes in the United States) into quartiles of provider staff Covid-19 vaccination coverage as of June 13, 2021. We determined the number of Covid-19 cases among residents, the number of Covid-19 cases among staff, and the number of Covid-19–related deaths among residents (each per 100 facility beds) between June 13 and August 22, 2021. We compared outcomes between facilities with low (lowest quartile) and high (highest quartile) staff vaccination coverage, grouped according to quartiles of county-level prevalence of Covid-19 during the time of the study. We used multivariate regression models, with adjustment for resident vaccination rates, previous Covid-19 infection rates among staff and residents, facility characteristics, and county as a fixed effect. (Details and results of sensitivity analyses are provided in the Supplementary Appendix, available with the full text of this letter at NEJM.org.)

In counties in the highest quartile of prevalence of Covid-19, the lowest quartile of staff vaccination coverage was associated with 1.56 (95% confidence interval [CI], 1.05 to 2.07) additional Covid-19 cases per 100 beds among residents, 1.50 (95% CI, 1.06 to 1.94) additional cases per 100 beds among staff, and 0.19 (95% CI, 0.08 to 0.30) additional Covid-19–related deaths of residents per 100 beds relative to facilities in the same county that were in the highest quartile of staff vaccination (Fig. 1). These values represented outcomes that were 132%, 58%, and 195% higher, respectively, than those of predicted outcomes if all the facilities had had high vaccination coverage. In counties in the lowest quartile of prevalence of Covid-19, higher staff vaccination coverage was associated with small differences in Covid-19 outcomes. Estimates from our model suggest that if all the nursing homes in our sample had been in the highest quartile of staff vaccination coverage (82.7% on average), 4775 cases among residents (29% of the total during the study window), 7501 cases among staff (29% of the

total), and 703 Covid-19–related deaths among residents (48% of the total) could possibly have been prevented.

In the presence of high community prevalence of Covid-19, nursing homes with low staff vaccination coverage had higher numbers of cases and deaths than those with high staff vaccination coverage. These findings show the extent to which staff vaccination protects nursing home residents, particularly in communities with high Covid-19 transmission.

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