

US modelling study estimates impact of school closures for COVID-19 on US health-care workforce and associated mortality ^[1]

Study estimates 1 in 7 frontline medical workers may miss work to care for their children when US schools are closed to reduce the spread of COVID-19

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AVAILABILITY

[Access full study online](#) ^[2]

Excerpted from summary

Background

The coronavirus disease 2019 (COVID-19) pandemic is leading to social (physical) distancing policies worldwide, including in the USA. Some of the first actions taken by governments are the closing of schools. The evidence that mandatory school closures reduce the number of cases and, ultimately, mortality comes from experience with influenza or from models that do not include the effect of school closure on the health-care labour force. The potential benefits from school closures need to be weighed against costs of health-care worker absenteeism associated with additional child-care obligations. In this study, we aimed to measure child-care obligations for US health-care workers arising from school closures when these are used as a social distancing measure. We then assessed how important the contribution of health-care workers would have to be in reducing mortality for their absenteeism due to child-care obligations to undo the benefits of school closures in reducing the number of cases.

Methods

For this modelling analysis, we used data from the monthly releases of the US Current Population Survey to characterise the family structure and probable within-household child-care options of US health-care workers. We accounted for the occupation within the health-care sector, state, and household structure to identify the segments of the health-care workforce that are most exposed to child-care obligations from school closures. We used these estimates to identify the critical level at which the importance of health-care labour supply in increasing the survival probability of a patient with COVID-19 would undo the benefits of school closures and ultimately increase cumulative mortality.

Findings

Between January, 2018, and January, 2020, the US Current Population Survey included information on more than 3·1 million individuals across 1·3 million households. We found that the US health-care sector has some of the highest child-care obligations in the USA, with 28·8% (95% CI 28·5–29·1) of the health-care workforce needing to provide care for children aged 3–12 years. Assuming non-working adults or a sibling aged 13 years or older can provide child care, 15·0% (14·8–15·2) of the health-care workforce would still be in need of child care during a school closure. We observed substantial variation within the health-care system. We estimated that, combined with reasonable parameters for COVID-19 such as a 15·0% case reduction from school closings and 2·0% baseline mortality rate, a 15·0% decrease in the health-care labour force would need to decrease the survival probability per percent health-care worker lost by 17·6% for a school closure to increase cumulative mortality. Our model estimates that if the infection mortality rate of COVID-19 increases from 2·00% to 2·35% when the health-care workforce declines by 15·0%, school closures could lead to a greater number of deaths than they prevent.

Interpretation

School closures come with many trade-offs, and can create unintended child-care obligations. Our results suggest that the potential contagion prevention from school closures needs to be carefully weighted with the potential loss of health-care workers from the standpoint of reducing cumulative mortality due to COVID-19, in the absence of mitigating measures.

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