Nationwide study finds no significant link between in-person schooling and COVID infection rates

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A new study led by faculty at Binghamton University, State University of New York shows that COVID-19 incidence rates were not statistically

different in counties with in-person learning versus remote school modes in most regions of the U.S.

As the COVID-19 virus arrived on U.S. shores in early 2020, nearly every school district went to all-remote learning in the hopes of slowing down the spread of the outbreak. Parents, teachers and education administrators soon discovered that the sudden implementation of online classes had many drawbacks, such as students' difficulties learning and isolation from their friends.

After having the summer to evaluate, school officials faced three choices when reopening last fall while keeping everyone safe. Many districts went to all-online learning, others continued to stay open as usual, and some developed a hybrid approach where students would take turns attending in person two or three days a week and learn remotely the rest of the week.

Many educators believe that in-person learning results in high learning outcomes but that it also may increase the community spread of the virus. A recent study published in *Nature Medicine* challenges this assumption by analyzing data from the 12 weeks after school opening from July to September 2020, before the Delta variant became predominant and before vaccines were available.

The research compared the learning models used at 895 districts—about half of all schools nationwide—to the infection rates collected by the federal Centers for Disease Control and Prevention from the 459 counties where those schools are located. After controlling for case rate trends before school start, state-level mitigation measures and community activity level, COVID-19 incidence rates were not statistically different in counties with in-person learning versus remote school modes in most regions of the U.S.

Serving as lead author for the study is Assistant Professor Zeynep Ertem from the Department of Systems Science and Industrial Engineering at Binghamton University's Thomas J. Watson College of Engineering and Applied Science. Her collaborators are from across the U.S., including the Department of Medicine at Harvard University, the Boston University School of Medicine, Brown University, the Beth Israel Deaconess Medical Center, the Department of Veterans Affairs' Boston Center for Healthcare Organization and Implementation Research (CHOIR), the Iowa City VA Healthcare System and the University of Utah.

"The main argument to close schools is driven by earlier conclusions from flu studies that younger children don't always show symptoms but they may transmit the disease to their family members, which may include older groups at risk," Ertem said. "However, our study finds no evidence of this in most regions of the U.S."

Ertem and her team sifted through information such as grade levels, local and state COVID mitigation efforts, the extent of community mobility, and the differences between urban and rural areas to better compare different school districts and regions.

"In most of the U.S., we found no evidence linking school mode to COVID incident rates, suggesting that there is no point in disrupting students' learning experiences—even though in the South, there was a statistically significant increase in cases when they were open for hybrid and traditional learning," Ertem said. "There might be other factors behind it, because Southern states used limited mitigation measures compared to other regions. But in the Northeast and Midwest regions, the differences in the number of cases were not detectable across any of the three learning modes."

By comparing education modes to infection rates, the research gives

policymakers more information when making decisions regarding the current pandemic or any future one. The conclusions don't offer simple answers, however.

"It's not a one-size-fits-all model," Ertem said. "It's hard to say 'do not open' or 'do not close the schools.' Depending on the region, other factors might have an effect."

Earlier this year, Ertem published other research assessing the effectiveness of early social-distancing measures in communities with different population characteristics, such as urban versus rural areas. Next, she will lead a study on how the pandemic has changed the body-mass index (BMI) of children and teens.

"The effects of COVID-19 will be with us for many years to come," she said. "We must understand the consequences if we are to learn better responses for the future."

More information: Zeynep Ertem et al, The impact of school opening model on SARS-CoV-2 community incidence and mortality, *Nature Medicine* (2021). DOI: 10.1038/s41591-021-01563-8

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