disinfection/sterile processing

School Daze: COVID-19 Spreads Fear, Confusion

BY KEVIN KAVANAGH, MD

he myriad of the widely different strategies emerging throughout our nation when it comes to the reopening of schools (as of, it must be stressed, this August writing) can be called nothing other than a Great American Experiment, and our children are the subjects with little safeguards in place. We know that school-aged children are less likely to develop severe coronavirus disease 2019 (COVID-19) illnesses. In a recent study, the US Centers for Disease Control and Prevention's COVID-19 Response Team reported that only 1.6% to 2.5% of children below the age of 20 who acquired COVID-19 required hospitalization. And intensive care unit (ICU) admissions and deaths were not observed in 123 patients.1

When Europe opened its schools this summer, it did so during an exceptionally low nadir of community spread. Even then, viral outbreaks occurred, and some schools had to be closed in France and Germany.^{2,3} In one country, Israel, public health guidance was reported to be thrown to the wind, allowing older students to attend early on and, because of the hot desert, without masks.⁴ This was associated with spiking cases and the closure of 130 schools.⁵ South Korea also had to reclose more than 800 schools.⁶

Infection preventionists (IPs) are a critical asset that school systems should lean on to provide the safest strategies and environmental modifications to suppress the transmission of the SARS-CoV-2 virus.

That's because deaths can rarely occur, and severe disease in children can manifest 2 to 4 weeks later in the form of multisystem inflammatory syndrome in children (MIS-C). MIS-C can cause shock, cardiac, respiratory, renal, gastrointestinal, and neurological disorders. MIS-C occurs in less than 1% of children diagnosed with the SARS-CoV-2 virus.⁷ As of the end of July, more than 300 cases have been reported in the United States. In one study, 80% of children with MIS-C required ICU admission, 80% had cardiovascular involvement, 20% required mechanical ventilation, and 2% died.⁸ Finally, infants less than 12 months of age appear to be at high risk for severe COVID-19, possibly due to their underdeveloped immune systems.

Two Possibilities

However, 2 possibilities exist: That children are not as likely to get infected by the

SARS-CoV-2 virus, or that they contract the infection, but the vast majority of children are asymptomatic.

Studies are indicating that both may be a factor. Davies et al, writing in *Nature Medicine*, reported that almost 80% of the children who acquire the SARS-CoV-2 virus are asymptomatic as compared with only 31% of the elderly.⁹ They also estimated that children were half as susceptible to infection as adults.

In addition, infected children shed the virus similar to adults and that "pre- or mildly symptomatic children carry viral loads likely to represent infectivity." There was "little evidence in the present study to support the suggestion that children may not be as infectious as adults."¹⁰

A report from South Korea studied the chances of spreading the virus based upon age of those infected¹¹. Ten to 19-year-olds were found to spread the virus to 18.6% of family members, higher than any other age group, including adults. Young children, from age 0 to 9, spread the virus between 0.29 to 0.76 times less than adults. But



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against a backdrop of a raging epidemic, even this level of spread is too much. Before opening schools, many experts advise that the SARS-CoV-2 diagnostic test positivity rate needs to be less than 5% and there should be less than 5 cases per 100,000 residents per day.

These children also pose a risk of spreading SARS-CoV-2 to their parents, grandparents and very young siblings, all of whom are at risk of developing severe COVID-19 infection. Finally, 24% of the teachers are also at a higher risk for severe COVID-19 disease, having co-morbidities, such as diabetes, COPD, BMI over 40 or being older than 65.¹²

There are unknowns. One is whether the virus can aerosolize. Another is whether the high-pitched, often loud vocalization of our children will promote such aerosolization. At least one study has shown loud talking can produce small viral droplets,¹³ and studies of various settings such as churches,¹⁴ restaurants,¹⁵ and hospitals¹⁶ strongly suggest aerosolization of this virus. If so, the virus may linger in the air, surviving for up to 3 hours¹⁷ and spread widely via heating and air conditioning units.

Our schools are anything but healthy buildings.¹⁸ Concerns have existed for decades regarding both the air quality and the crowded conditions our children are exposed to, but no one has been watching, with the last US Government Accountability Office report conducted in 1995.¹⁹

Upgrade Schools Now

We need to upgrade our schools with extensive infrastructure investments to prevent the spread of infectious diseases, with larger rooms to allow at least 6 feet of social distancing between desks²⁰ and with windows that open to allow in fresh air. We need to upgrade substandard and dilapidated HVAC systems to increase airflow and to filter and serialize the air. Common areas need to be made safer; and cafeterias, restrooms, and hallways redesigned with attention to student flow and contact. School districts should even consider switching to classroom models that can easily be changed from indoor to outdoor environments. We do this for sports stadiums, why can't we do the same for our schools?

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There is no doubt that the COVID-19 pandemic may be on its way to resolution before all of this can be accomplished, but schools are also a nidus for other infectious diseases, such as influenza. After Middle East Respiratory Syndrome (MERS), SARS and Ebola, let's not delude ourselves into thinking this epidemic will be our last.

School bubbling, or keeping a small number of children and teachers together and not exposed to others, needs to be implemented. Students may need to eat in their classrooms with intermittent bubble privileges for the cafeteria. Initially, schools should scale back to basic core activities. Pool testing will become extremely important for the testing of students in the bubble and their families. Testing is key to safely opening schools. If professional sports teams are employing bubbling strategies, along with extensive and frequent testing, the same should be true for our children.

We need ample hand sanitizer stations, bathroom soap dispensers that work, and pristine cleaning of fixtures and contact surfaces. This should be standard, but in the COVID-19 pandemic, availability of janitorial supplies is of utmost concern.²¹ Masks need to be worn by all.

Mounting evidence has found that children become infected and shed the virus, that the virus aerosolizes, that school buildings are crowded with poor air circulation and quality, and finally that 24% of teachers are at high risk for COVID-19. What could possibly go wrong?

Lessons Learned

Similar to our healthcare system as a whole, COVID-19 is shedding a light on deficiencies and the dearth of personal safeguards in our schools. Let us not forget, schools are a nidus for spreading the flu and other diseases. Opening schools should depend upon low rates of viral spread in the community, widespread testing, rigorous following of public health guidelines, and upgrading the physical infrastructure of our buildings. COVID-19 should be viewed as an opportunity for transformation, allowing us to build a better school system with smaller class sizes for better education and implement strategies to prevent the spread of all infectious diseases.

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REFERENCES AVAILABLE AT INFECTIONCONTROLTODAY.COM