

School-Based Surveillance of Respiratory Pathogens on “High-Touch” Surface

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Background & Objectives: The density and proximity of children within school and childcare facilities provides a ready environment for infectious disease transmission. To identify sources of pathogen transmission in the school environment.

Methods: Surface swabs were collected weekly at three public elementary schools in Seattle, USA from November 2019 to March 2020. **High-touch plastic, wood and metal surfaces including door and fountain handles and handrails were pre-selected and sampled weekly by thoroughly wiping with a synthetic polyester swab** in the same time window. Additionally, intensive twice daily sampling during the last week of February 2020 was conducted in two schools in mornings and prior to dismissal. **Scheduled school cleaning typically took place daily in the afternoons after dismissal. Bioaerosol samples from a cafeteria and hallway were collected** during a weekly 90-min period using the SKC QuickTake 30 Air Pump. All samples were tested for 25 respiratory viruses including SARS-CoV-2 and *S. pneumoniae* by multiplex TaqMan real-time PCR on the Open Array platform (Thermo).

ACADEMIC P.E.A.R.L.S

Pediatric Evidence And Research Learning Snippet



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Results: Of samples collected at three schools, 49 (34%) of 208 total samples tested positive for one or more viruses, **most commonly human rhinovirus (hRV) (28/208, 13%) and adenovirus (14/208, 6.7%)**. Overall, 65% of samples were positive for *S. pneumoniae*. **No SARS-CoV-2 was detected on any of the samples tested.** There was no significant difference in viral and bacterial Crt values across surface material type, although wooden surfaces had the highest quantity of viral detections (average, 1.3 viral detections per sample collected) followed by metal (average, 0.2 viral detections per sample). **No virus was detected through bioaerosol sampling.** During the week of twice daily intensive sampling, no virus was persistently detected on a surface for more than two consecutive samples. **More viruses were found during morning compared to afternoon sampling**, but not significantly so ($p = 0.24$).

Conclusion: Across three elementary schools, high-touch wooden surfaces had the highest number of viral pathogen detections. Overall, viral presence on surfaces was transient and did not persist for longer than 1 day during the intensive week of sampling, either as result of natural degradation or efficacy of standard cleaning practices.

EXPERT COMMENT

“This study provide data supporting the notion that surfaces in school and childcare facilities inhabit respiratory pathogens and may act as a source for infectious disease transmission. As schools continue to re-open, frequent targeted cleaning of high-touch surfaces particularly wooden surfaces, can complement other measures to reduce potential fomite transmission of perennial respiratory pathogens in the context of the global SARS-CoV-2 pandemic. There is a need for similar studies in Indian settings to understand the local epidemiology.”

DR Abdul Rauf KK

MD (PGI), DNB, FNB (Pediatric Intensive Care), FECMO
Consultant Pediatric Intensivist
Baby Memorial Hospital, Calicut, Kerala

With warm regards,

**DR MANINDER S
DHALIWAL**

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Reference

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