

# COVID-19 & the Classroom Webinar Series Air & Surfaces

August 31, 2020



Orange County  
Public Schools



Duke University  
School of Medicine



UNC  
HEALTH CARE



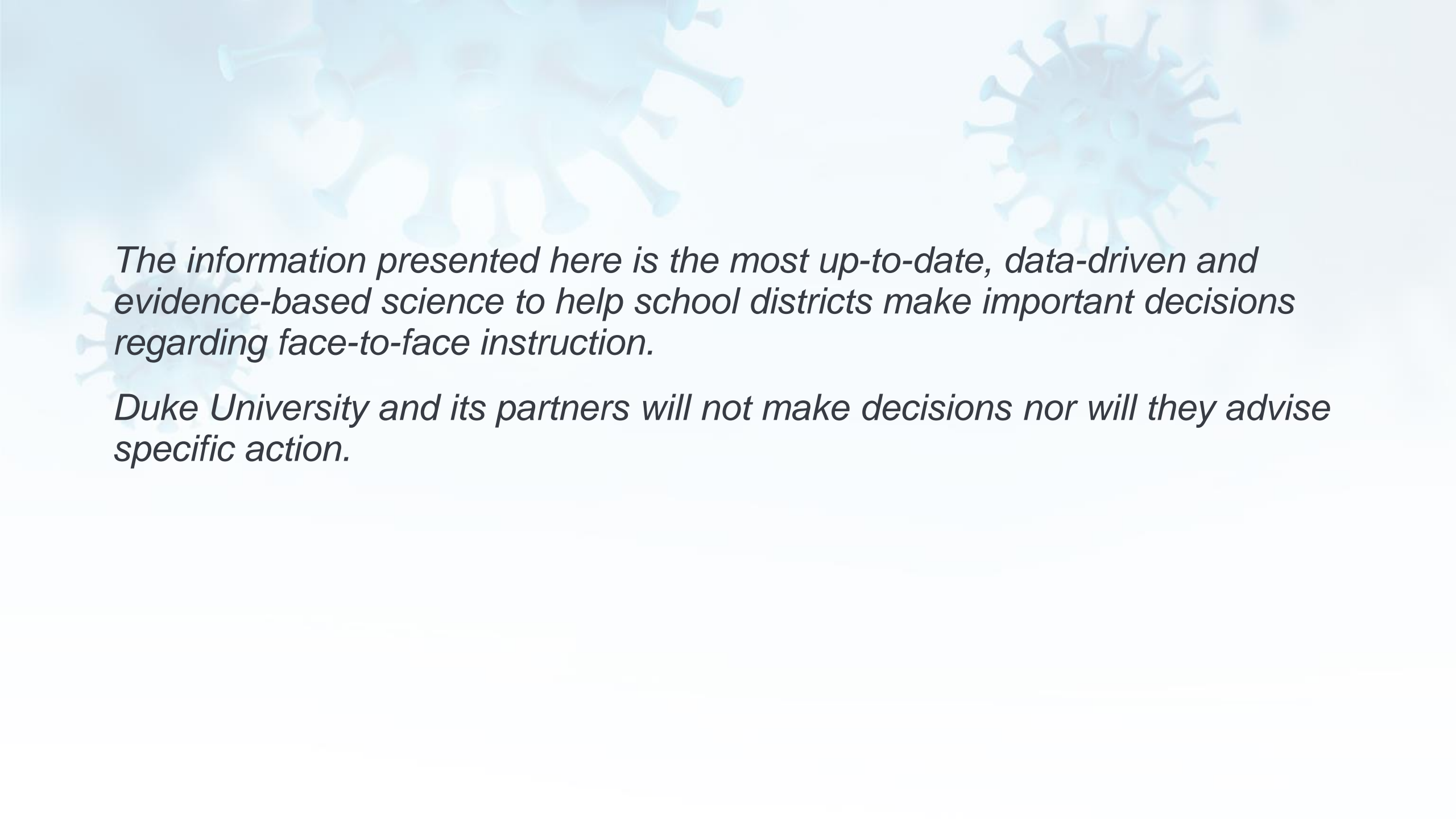
DURHAM  
PUBLIC SCHOOLS



WAKE COUNTY  
PUBLIC SCHOOL SYSTEM



Duke Clinical Research Institute



*The information presented here is the most up-to-date, data-driven and evidence-based science to help school districts make important decisions regarding face-to-face instruction.*

*Duke University and its partners will not make decisions nor will they advise specific action.*

# Format

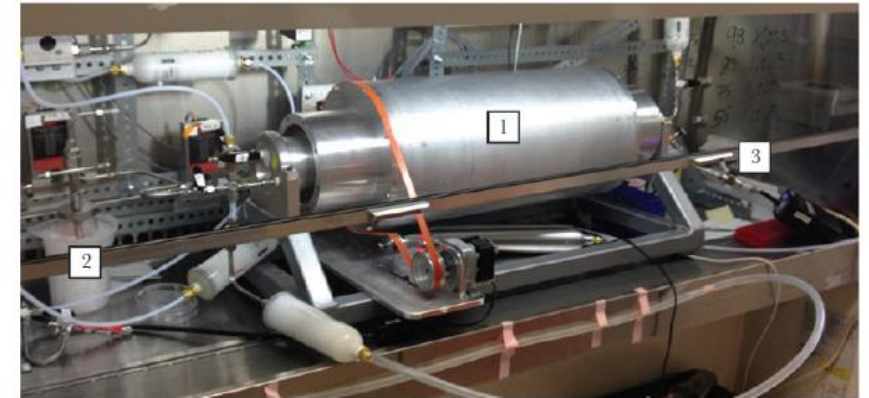
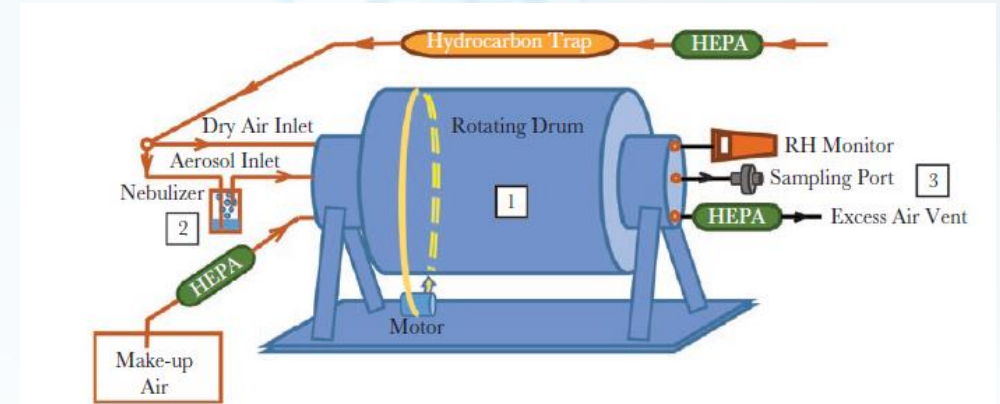
- We will take questions using the Q & A function and work in as many questions as possible.
- Questions that are not answered during the webinar will be collated and may be combined with other questions addressed in a “Frequently Asked Questions” document or future webinars.
- In the coming weeks the recording will be available if you are unable to join live. We are developing a website that will contain these materials.

# Question 1 – Wake County

Is the virus (SARS-COV-2) transmitted  
through the air?

# Experiment to assess SARS-CoV-2 in air

- Methods: Aerosols containing SARS-CoV-2 were generated and fed into a Goldberg drum
- Results: SARS-CoV-2 RNA survived 3 hours in the air
- **BUT**: Survival of SARS-CoV-2 in a drum is consistent with aerosol transmission but does NOT demonstrate **airborne (long-distance)** transmission

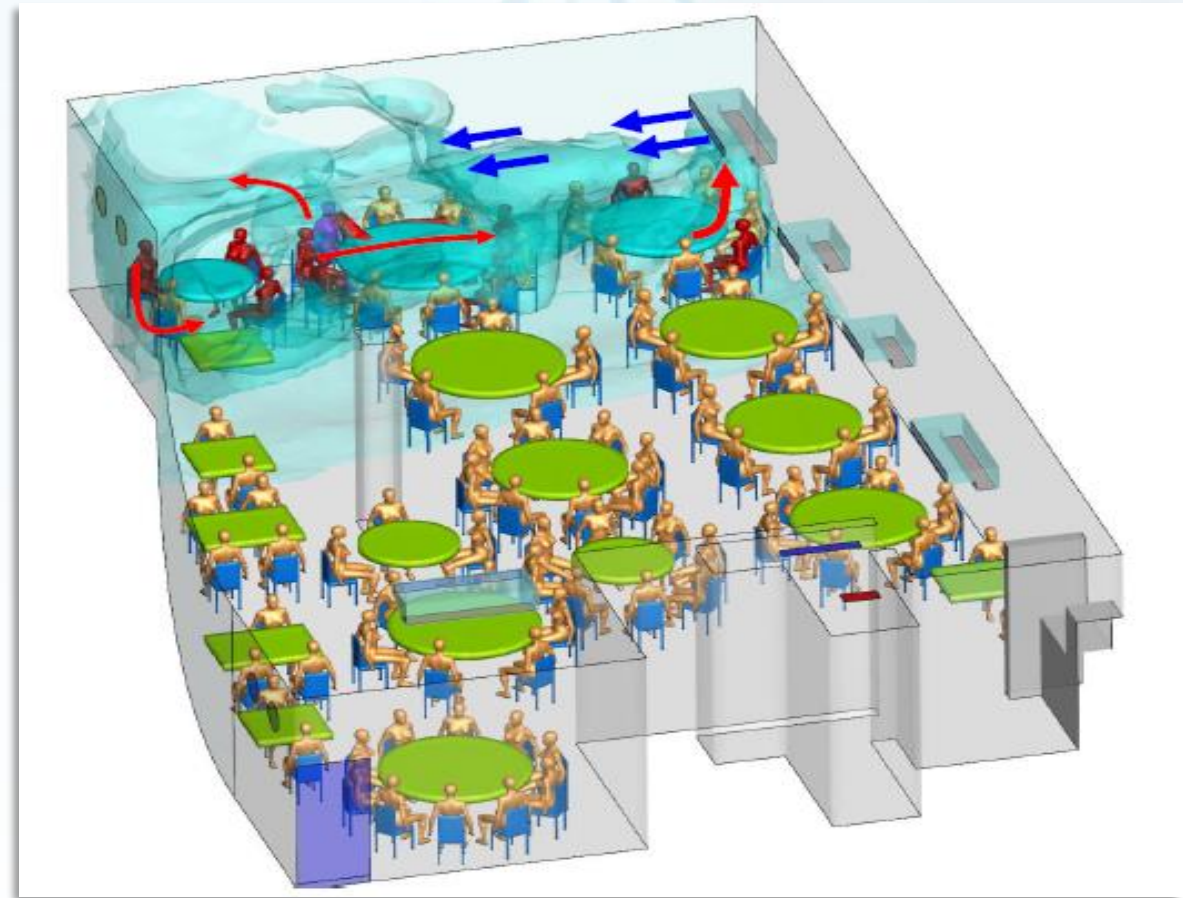


Van Doremalen N, et al. NEJM 2020;382:16 April 2020  
Kormuth KA. et al. JID 2018;XX00:1–9



# What happened in the real world?

- Outbreak in a poorly ventilated restaurant
- Outbreak investigation
  - Involved 3 families, 10 members became infected who sat at 3 neighboring tables; 3 members of family B and 2 members of family A infected
  - **None of the waiters or 68 patrons of the remaining 15 tables became infected**
- Reported conclusion = “Aerosol transmission of SARS-CoV-2 due to poor ventilation” to nearby people



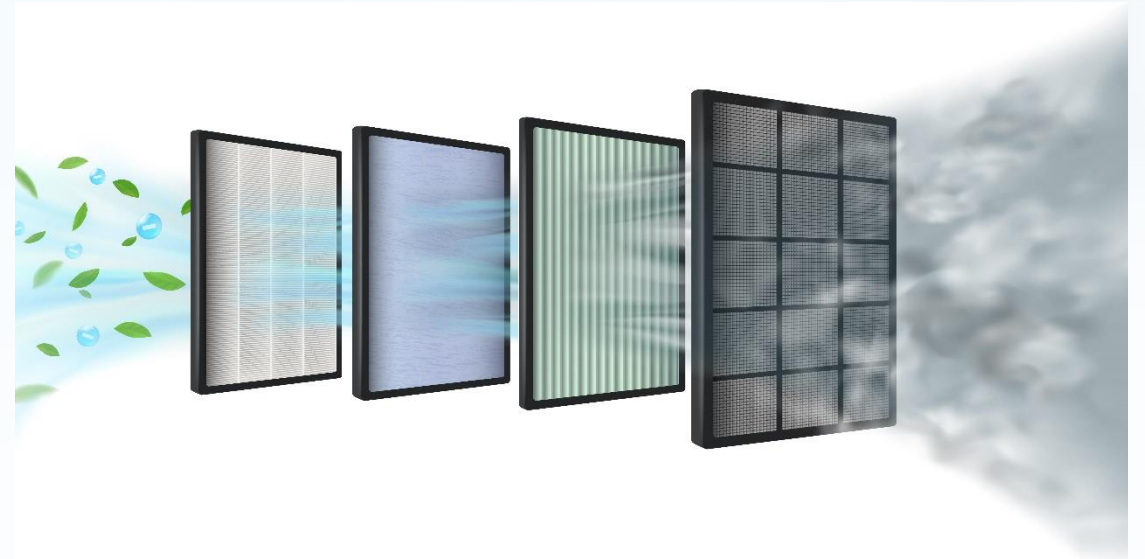
# Key Points from Real World Settings

- All infected persons were sitting within a short distance of each other
- Despite poor ventilation in the restaurant, no infections among those seated further away
- No infections among wait-staff

# Question 2 – Durham County

Recently, the CDC provided recommendations for ***considering*** HEPA filters (especially in nurses' station) and opening doors/windows in schools.

Can you tell us more about the evidence supporting this recommendation?





# Factors to consider with open windows

- Noise and allergens
- Possible issues with maintaining heating and cooling (e.g. cars, houses)
- No data to support its use as a COVID-19 prevention strategy
- Unclear how the use of fans will help here



# Experiment to assess SARS-CoV-2 in the air

- Methods: Samples from patient rooms; detect virus using RT-PCR
- Results: 63% air samples were positive; Virus detected in air (>2m from patient) and hallway
- **BUT**: SARS-CoV-2 RNA outside rooms does **NOT** mean that live virus was present or that there was an infectious dose of virus in the air of that it can infect others



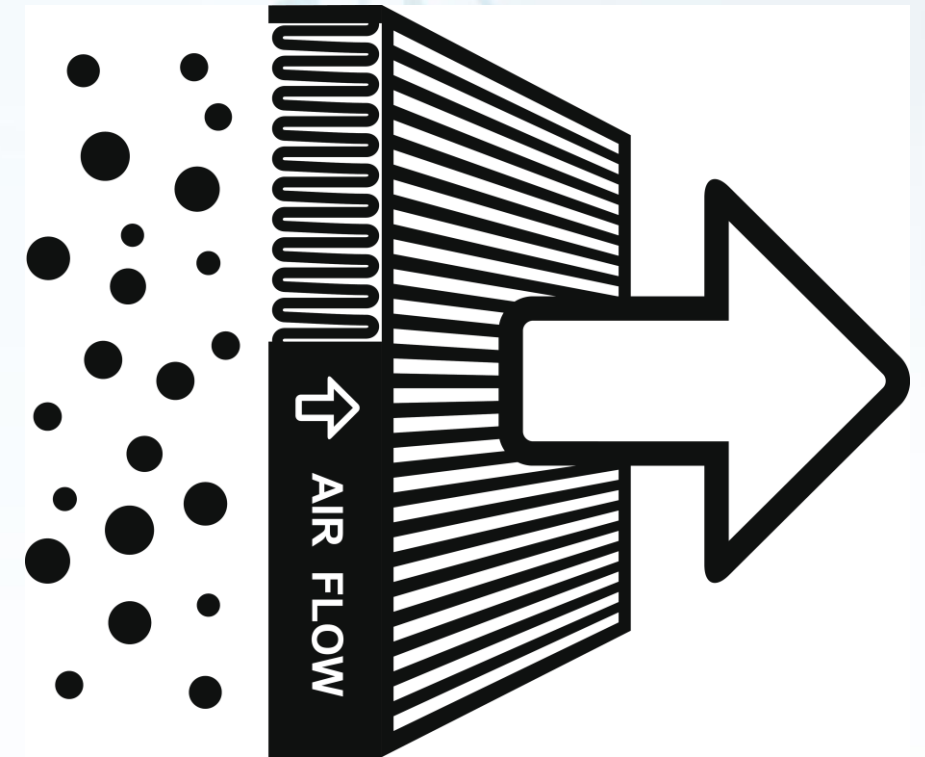
# Filtration for Ventilation Systems

*There is no filter or building system feature that is proven to remove COVID-19 or any other airborne infectious disease from the air other than in specially constructed hospital units.*

## Question 3 – Chapel Hill

Many of the school buildings are older with poor ventilation; some of these classrooms don't have windows that support air flow.

- What does this mean for risk of children and staff in these circumstances?
- What can be done to decrease risk in these circumstances?



# For clarity, this study does not address the question

## Annals of Internal Medicine

### OBSERVATION: BRIEF RESEARCH REPORT

#### Risk for Severe COVID-19 Illness Among Teachers and Adults Living With School-Aged Children

**Background:** Schools provide critical educational and health benefits to children, and reopening them facilitates parents', particularly mothers', return to work (1). Although children rarely have severe coronavirus disease 2019 (COVID-19) illness, they can transmit infection (2).

**Objective:** To determine the prevalence of risk factors for severe COVID-19 illness among teachers and adults living with school-aged children.

- Used data from a 2018 survey to assess risk factors for severe COVID-19 illness:
- Among the ~70 million (M) US adults living with school-aged children, 41% had definite and 54% had definite or possible risk factors
  - 2.5M > 64 years
  - 5M million with heart disease
  - 5M with type 2 diabetes
- Among ~3M teachers, 40% had definite and 51% had definite or possible risk factor for severe COVID-19 illness
  - 32% had a body mass index (BMI) of 30 kg/m<sup>2</sup> or greater
  - 8% had a cardiac condition



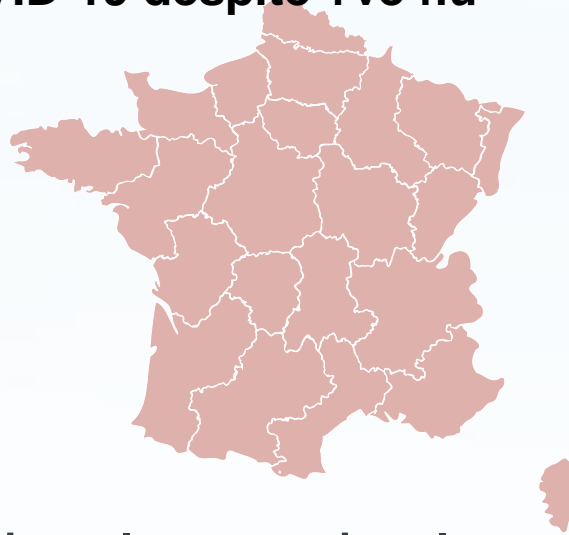
# COVID-19 Transmission and Children: The Child Is Not to Blame

Benjamin Lee, MD, William V. Raszka, Jr, MD

**China: 68 kids, Jan 20 – Feb 27, 65 (96%) had prior adult contact**



**France: 9 yo M with COVID, Flu and picoRNA. >80 contacts at 3 schools. No secondary contacts with COVID-19 despite +ve flu**



**Australia: 9 students and 9 staff in 15 schools contacts with 735 students and 128 staff. Only 2 secondary infections (staff & student)**



**SARS-CoV2 transmission in schools may be less important in community transmission than initially feared**

Danis K, Epaulard O, Bénet T, et al; CID. 2020  
Cai J, Xu J, Lin D, et al. CID. 2020  
Wu Q, Xing Y, Shi L, et al. Pediatrics. 2020

**PEDIATRICS**  
OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

# Key Points

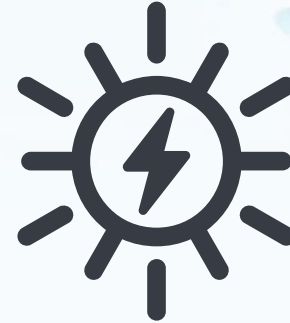
- Other COVID-19 prevention tips (cleaning and distancing) are more effective than a focus on HVAC systems or filters
- Opening windows might have unintended consequences but could be used in the right setting
- Surfaces are not the most likely way to spread COVID-19 but should be kept clean
- Community prevalence will reflect school prevalence
- Reduce COVID-19 spread by washing hands, wearing a mask and waiting 6 feet from others

## Question 4 - Orange County

Can UV light air purification devices in the air ducts help?

# Air Purification Devices in the Ducts

- The amount of UVC in public locations under current rules would stop ~90% of the virus in ~8 minutes.
  - 95% in ~11 minutes
  - 99% in ~16 minutes
  - 99.9% in ~25 minutes
- **Dose and Time:** Many UVC lamps sold for homes are low dose and may take longer to really stop a bacteria or virus.
- **Direct Exposure:** UVC radiation can only stop a virus if it touches a virus directly. Soil, dust or other pollutants may block the UV radiation.
- *Cleaning is still MOST important*



# Key Points

- Ultraviolet light in the air duct does not prevent short range transmission
  - Too far away from the surfaces that could contain droplets
  - Not part of CDC guidance
  - Not a short term solution
- No clinical evidence this decreases the risk of COVID-19 spread in classrooms
- Cleaning is still the best means for preventing transmission



## Question 5

Many schools are not air-conditioned and scientists have brought up concerns about heat exhaustion brought on by masks. What can be done to mitigate this risk?

# Key Points

- No existing scientific evidence that wearing a mask can cause heat exhaustion
- Wearing a mask is safe even while exercising

## Question 6

- Can COVID-19 be transferred through pens, surfaces, and other shared materials?

# Key Points

- The best ways to prevent spread on shared materials is to limit the amount of virus on shared materials:
  - Limit sharing
  - Wear a mask
  - Wash your hands

# Question 7

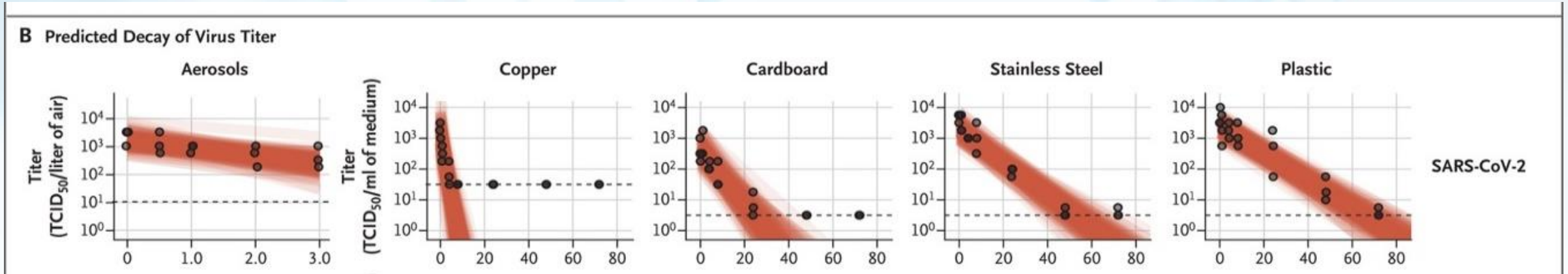


How long is the virus viable on surfaces- cotton mask, metals (doorknobs, etc.), glass, desks, wood, plastics, etc.?

Can COVID-19 be transferred through pens, surfaces, and other shared materials?



# Decreased virus on different surfaces over time



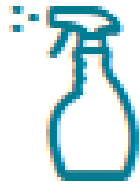
Amount of virus in these experiments was really high:  
MUCH higher than what happens with droplet  
transmission, especially if masks are used

# Real life experience



# Question 8

- How often are cleaning and disinfection needed to clear viruses on surfaces
- What are the appropriate precautions for performing these tasks?



# Surfaces - Cleaning & Disinfection

## ■ Cleaning

—physically removes germs, dirt, and impurities from surfaces or objects by using soap (or detergent) and water

- Wear reusable or disposable gloves
- Clean surfaces using soap and water, then use disinfectant
- Cleaning with soap and water **reduces number of germs, dirt and impurities** on the surface. **Disinfecting kills germs** on surfaces
- Practice routine cleaning of frequently touched surfaces.

# Surfaces Cleaning & Disinfection

## ■ Disinfecting

- Using chemicals to kill germs on surfaces or objects
- Keeping surface wet for a period of time
- Precautions such as wearing gloves and making sure you have good ventilation during use of the product
- **Always read and follow the directions on the label** to ensure safe and effective use
  - Sealed bleach solutions will be effective for disinfection up to 24 hours.
  - Alcohol solutions with at least 70% alcohol may also be used.
- Remember safety first



# Key Points



Clean high-touch surfaces frequently



Limit shared equipment



Designate people to clean spaces before, during and after use



Place cleaning products in key locations



Use approved cleaning products

[EPA.GOV; List of Disinfectants](https://www.epa.gov/disinfectants)

# Key Points for Cleaning & Disinfecting Surfaces

- Clean and disinfect frequently touched surfaces
- Limit the use of shared objects
- Discourage sharing of items that are difficult to clean or disinfect
- Keep each student's belongings separated from others'
- Ensure adequate supplies to minimize sharing

# Question



Have any studies determined the degree to which active coronaviruses on a surface can become airborne again after a surface is disturbed and how this might contribute to viral load overtime?

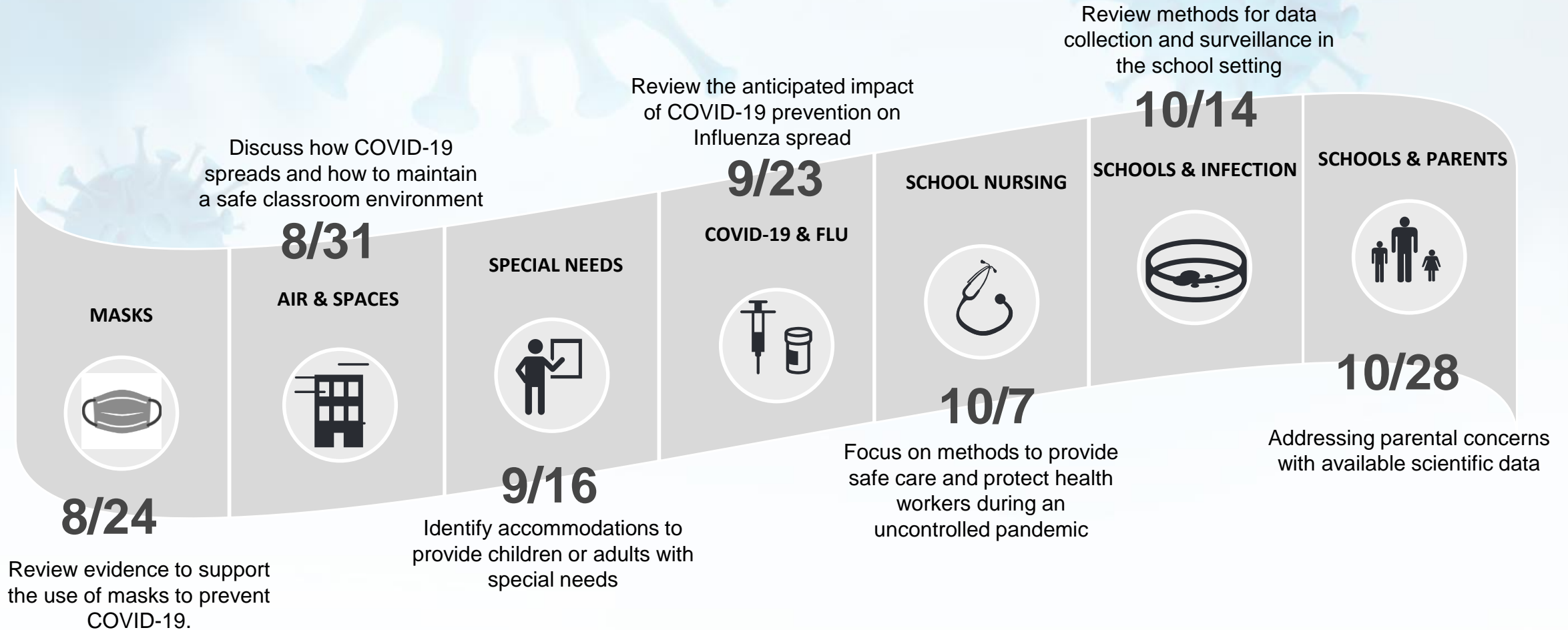
**COVID-19**  
**Download:**  
**Ask CDC**

**Can COVID-19 last on surfaces  
and in the air?**



U.S. Department of  
Health and Human Services  
Centers for Disease  
Control and Prevention

# Stay tuned for more webinars



**Upcoming Webinars and Topics** *(All topics and dates are subject to change)*

The background of the slide features three stylized, blue, spherical virus-like particles with numerous spikes or protrusions. One large particle is positioned at the top center, another medium-sized particle is at the top right, and a smaller one is at the bottom left. The overall color scheme is a gradient of light blues.

# Questions



# Available resources

- North Carolina Public Health resources:
  - <https://www.ncdhhs.gov/divisions/public-health/covid19>
- CDC resources:
  - <https://www.cdc.gov/coronavirus/2019-ncov/index.html>
- WHO resources:
  - <https://www.who.int/emergencies/diseases/novel-coronavirus-2019>

- Many schools are not air-conditioned and scientists have brought up concerns about heat exhaustion brought on by masks. What can be done to mitigate this risk? - *Orange County (North Central Region / District 3)*
- What is the plan to address air quality issues within the building? In addition, some of these classrooms don't have windows that support air flow? – *CHCSS (Chapel Hill-Carrboro, North Central Region / District 3)*
- Parents are also asking questions about air quality and facilities. What can we communicate to parents about this aspect of school safety? – – *CHCSS (Chapel Hill-Carrboro, North Central Region / District 3)*
- Please discuss the evidence for airborne transmission of SARS-CoV2? - *(24Aug2020 Webinar)*
- Have any studies determined the degree to which active coronaviruses on a surface can become airborne again after a surface is disturbed and how this might contribute to viral load overtime? - *(24Aug2020 Webinar)*
- Can Having UV light Air Purifier in the classroom help? - *(24Aug2020 Webinar)*
- Importance of hand hygiene and surface disinfection – *UNC (Chapel Hill-Carrboro, North Central Region / District 3)*
- How long is the virus viable on surfaces- cotton mask, metals (doorknobs, etc.), glass, desks, wood, plastics, etc.? – *(24Aug2020 Webinar)*