



# Future-Proofing K-12 Schools for Better Indoor Environmental Health



Intelligent & Sustainable Disinfection Solutions

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# As we emerge from the COVID pandemic, other threats will persist: how will we fight them?

As of early March 2022, millions of U.S. children ages 5-17 had received at least one dose of the COVID-19 vaccine:



**33%**  
of 5-11 year-olds



**67%**  
of 12-17 year-olds<sup>1</sup>

This vaccination is good news for the ~ 25% of teachers at higher risk for serious COVID-19 consequences due to underlying health conditions.<sup>2</sup> It's also good news for the growing number of parents who are concerned about the academic and emotional impact of learning disruptions from COVID on their school-age children.<sup>3</sup>

However, as COVID begins to recede into the background, other threats will persist. For example, experts who predicted a "catastrophic" winter flu season for 2021-2022 have suggested that children would have lower immunity to flu and might be at greater risk of contracting and spreading the flu as they return to schools.<sup>4</sup> In addition, even more experts have pointed to the ongoing threats from antimicrobial resistance (often manifesting as MRSA) as "one of the greatest health threats of our time."<sup>5</sup>

**What do these post-pandemic threats mean for schools?**



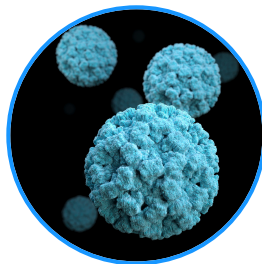
Each day, one fifth of the U.S. population attends one of the 130,000+ public or private schools in the U.S.

**Are we adequately protecting this population from microbial threats?**

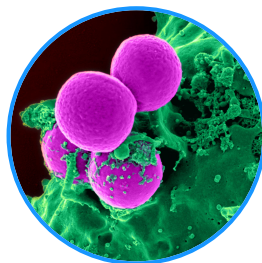
The CDC estimates that about 55 million students and 7 million staff attend the 130,000+ public and private schools in the U.S. each day.<sup>6</sup> This means that 20% of the U.S. population is regularly exposed to microbial risk given the widespread and regular transmission of harmful microorganisms in school settings, such as:



**Influenza<sup>7</sup>**




**Norovirus**



**Methicillin-resistant *Staphylococcus aureus* (MRSA)**





## To ensure the safety of students and staff, **what tools can schools employ to deliver a healthier indoor environment?**

Are chemicals the best way to fight microbial threats? Experts say no. “It doesn’t take much to make a child sick,” says pediatrician Eva Love, MD. “Their small body size and fast metabolism increase their risk of developing significant toxicity from [chemical cleaning and disinfecting] products.”<sup>8</sup>

Other options for schools, such as HVAC system upgrades, can also be problematic. These costly improvements can put strain on older school buildings that weren’t designed with modern HVAC systems in mind. So how should schools think about implementing protocols to stay open safely and avoid further learning disruptions for students?

Fortunately, the U.S. government has made significant funding available through ARP, CARES, and various ESSER rounds. However, much of this funding comes with deadlines for spending in the next several years. Consequently, schools must leverage those funds to enable positive outcomes for students and staff without creating burdens on future budgets.<sup>9</sup>

**Smart UV-C disinfection to facilitate indoor health is an excellent use of these funds.**

# Intelligent, sustainable UV-C disinfection ecosystems are **critical** **to ensuring better** **outcomes for students,** **staff, and schools.**

R-Zero offers higher efficacy, lower costs, sustainability, and visibility to improve the indoor health of shared spaces in school environments.



## R-Zero Benefits



### Performance

R-Zero's solutions deliver 99.9+% efficacy against even the toughest microorganisms.\*



### ROI

R-Zero's suite of solutions delivers +2:1 ROI with fewer chemicals and less labor required to implement..



### Sustainability

R-Zero does everything with sustainability in mind, from product design to waste management, to provide accessible, sustainable disinfection for all.



### Connectivity

R-Zero's IoT platform, R-Zero Connect, provides visibility to a traditionally invisible disinfection process.



### Support

R-Zero empowers customers to credibly communicate the extra care they are taking to make spaces clinically clean.

## R-Zero Products



### Arc: Whole-Room UV-C Disinfection

Intelligent, whole-room UV-C disinfection with hospital-grade efficacy; disinfects an unoccupied 1,000 sq ft room in just 7 minutes.



### Beam: Upper Room Air Disinfection

Upper room ultraviolet germicidal irradiation (UVGI) to continuously and autonomously disinfect air in occupied spaces



### Vive: Far UV Air & Surface Disinfection

Continuous, autonomous air and surface disinfection using Far UV, the only UV-C light safe for human exposure.



### Smart Sensors

Space utilization reporting to enable facilities costs optimization.

\*Third party testing of SARS-CoV-2, feline calicivirus, MRSA, and E. Coli on hard, non-porous surface in seven minutes, samples taken at eight feet.

# R-Zero Arc in Schools: A Case Study

LeRoy Community Unified School District, LeRoy, Illinois



## The Challenge

For Fall 2020, LeRoy CUSD wanted to get students back in school for in-person instruction. Given all of the obstacles associated with providing healthier indoor environments, they had two key questions:

1. How can we provide rich, personalized, and hands-on learning opportunities for students at all grade levels?
2. How can we ensure that our teachers are not burdened with the work of sanitizing every item that is touched in a classroom on a daily basis?

“We needed to ensure that our classrooms and learning experiences could be as rich and meaningful as possible given all of the obstacles.”

—Gary Tipsord, Superintendent

“The R-Zero [Arc] was the answer to our classrooms functioning as normal as possible under the reality of this airborne virus.”

—Gary Tipsord, Superintendent

## The Solution

The administrative team spent the summer of 2020 developing a comprehensive school opening plan to execute consistent best practices in ensuring their buildings, classrooms, technology, and equipment would be safe for students to return. As the finishing touch to this COVID health and wellness plan, the LeRoy CUSD leadership acquired R-Zero Arc disinfection units for each of their schools. Their custodial staff received training on how to use the device to ensure each unoccupied classroom was disinfected at night.

## The Results

With R-Zero Arc, LeRoy CUSD was able to provide an extra layer of protection for their students, teachers, and staff when reopening school in the fall of 2020. This protection afforded all stakeholders in their school community immense peace of mind while allowing them to resume in-person classes.

Furthermore, their internal school data proved the efficacy of R-Zero Arc in providing disinfection. **During the 2020-2021 school year, Arc was a critical component of LeRoy CUSD's layered approach to ensuring safer indoor environments for students and staff.**

“This machine will continue to benefit our entire school system even after the immediate threat of the pandemic is over.”

—Gary Tipsord, Superintendent

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### Sources

1. "Summary of data publicly reported by the Centers for Disease Control and Prevention." American Academy of Pediatrics. March 9, 2022.  
<https://www.aap.org/en/pages/2019-novel-coronavirus-covid-19-infections/children-and-covid-19-vaccination-trends/>
2. "Science Brief: Transmission of SARS-CoV-2 in K-12 Schools and Early Care and Education Programs – Updated." Updated July 9, 2021.  
[https://www.cdc.gov/coronavirus/2019-ncov/science/science-briefs/transmission\\_k\\_12\\_schools.html](https://www.cdc.gov/coronavirus/2019-ncov/science/science-briefs/transmission_k_12_schools.html)
3. "Academic, emotional concerns outweigh COVID-19 risks in parents' views about keeping schools open." Pew Research. February 4, 2022.  
<https://www.pewresearch.org/fact-tank/2022/02/04/academic-emotional-concerns-outweigh-covid-19-risks-in-parents-views-about-keeping-schools-open/>
4. "Health experts are anxious to prevent a 'catastrophic' winter flu season." July 7, 2021.  
<https://www.cnn.com/2021/07/07/winter-flu-season-could-be-big-experts-warn.html>
5. "The next pandemic is already here. Covid can teach us how to fight it." June 23, 2021.  
<https://www.technologyreview.com/2021/06/23/1026763/pandemic-covid-antimicrobial-resistance/>
6. "Guidance for School Administrators to Help Reduce the Spread of Seasonal Influenza in K-12 Schools." <https://www.cdc.gov/flu/school/guidance.htm>
7. Flu image:  
<https://www.cdc.gov/flu/resource-center/freeresources/graphics/images.htm>
8. "Household Cleaning Products Can Be Dangerous to Kids (and Here's How to Use Them Safely)." May 4, 2021.  
<https://health.clevelandclinic.org/household-cleaning-products-can-be-dangerous-to-kids-heres-how-to-use-them-safely/>
9. "Schools Are Receiving \$129 Billion in Stimulus Aid. Where Is It Going?" July 13, 2021.  
<https://www.nytimes.com/2021/07/13/education/school-budget-stimulus.html?smid=url-share>