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I. Introduction

Chairman Sablan, Ranking Member Owens, Chairman Scott, and members of the Committee, thank you for the invitation to participate in this hearing. I am the Dean of the Brown University School of Public Health and Professor of Health Services, Practice and Policy. As an expert on pandemic preparedness and response as well as on health policy research and practice, I have been deeply engaged in the Ebola epidemic, and am now on the frontlines of the COVID-19 response, leading national and international analysis of key issues and advising state and federal policy makers.

Nearly two years since the start of the COVID-19 pandemic, it is important to reflect on how far we have come as a nation. Our healthcare system has expertly moved from confronting a novel disease for which we had no treatment, to developing approaches and treatments that can slow disease progression and lower the number of people who experience severe outcomes from COVID-19. Our public health system has identified successful ways to prevent the spread of SARS-CoV-2 through targeted mitigation measures, such as testing, masking and distancing. And our scientists have developed the most important tool against any deadly infectious disease -- effective vaccines.

Vaccines drastically reduce infections, and prevent almost all hospitalizations and deaths from COVID-19. The Food and Drug Administration (FDA) has fully approved the Pfizer-BioNTech vaccine in adults, and will likely soon do the same for the Moderna vaccine.[1, 2] The Johnson &

[1] https://www.fda.gov/news-events/press-announcements/fda-approves-first-covid-19-vaccine
[2] https://www.nytimes.com/2021/06/01/science/moderna-vaccine-fda-approval.html

Johnson vaccine is available under an emergency use authorization.[3] As a result, roughly 55.3% of the U.S. population are now fully vaccinated.[4]

It is a surprise, considering the progress we have made in our response to this pandemic, that infection numbers across the nation are still high. The United States is experiencing a fourth pandemic wave, again causing businesses to struggle to open or stay open, causing children to miss more school (and parents to miss more work), and resulting in many people falling ill. The country has returned to a devastating toll of over 2,000 daily deaths, almost all in those who were not fully vaccinated when they became ill. This month, we crossed a grim threshold: 1 in every 500 Americans have now died from COVID.[5]

There are three key enablers of this fourth pandemic wave: 1) Too many Americans have not yet been vaccinated. 2) Essential mitigation measures such as masking and testing have been abandoned in communities where they are most needed because vaccination numbers are low and infection rates are high. 3) A new, more contagious variant, Delta, is able to spread faster, especially among unvaccinated and unprotected populations.

The failure to vaccinate more Americans and consistently apply proven mitigation measures leaves our children vulnerable, and our schools in crisis mode. Where we expected a return to normal - children reconnecting with friends and enjoying the benefits of in-person learning this fall - instead we see outbreaks in schools across the nation, communities uncertain again about the safety of

[3] https://www.fda.gov/media/146305/download
[4] https://covid.cdc.gov/covid-data-tracker/#vaccinations_vacc-total-admin-rate-total
[5] https://www.washingtonpost.com/health/interactive/2021/1-in-500-covid-deaths/

classrooms and cafeterias, and increasing numbers of school closings - colossal failures to keep children physically and mentally healthy.[6, 7, 8]

A year ago, when there was much we did not know about the novel coronavirus and who is most vulnerable to it, closing schools to protect students and staff in communities where infection rates were high made more sense. Considering that the virus spreads most efficiently when large numbers of people gather indoors for extended periods of time, keeping schools safe presented us with unique challenges. As a result, many schools closed or switched to hybrid instruction while we learned more about how to prevent SARS-CoV-2 from spreading. Last year, many school closings, while preventable even with the mitigation techniques we knew then, were more understandable. We knew less about the virus. School closings this year are far less justifiable.

The year of in-person instruction lost to the pandemic has generated important findings: Studies show that distance or remote learning can lead to developmental delays in younger children, and to the loss of educational gains and lower rates of educational attainment in all age groups.[9, 10, 11] There is also growing evidence that there are considerable mental health costs to missing in-person school.[12, 13, 14] Ethnic and racial disparities play a significant role as well, with children from underserved communities of color suffering higher rates of learning loss and reporting higher

[6] https://www.usatoday.com/story/news/health/2021/09/05/covid-updates-mu-variant-spreads-hawaii-begs-travelers-stay-away/5735064001/
[7] https://info.burbio.com/school-tracker-update-sept-27-21y/
[8] https://www.covidschooldatahub.com/
[9] https://tracktherecovery.org/
[10] http://hanushek.stanford.edu/publications/economic-impacts-learning-losses
[11] https://www.wsj.com/articles/the-long-term-economic-costs-of-lost-schooling-11614286602#:~:text=Innovation%20and%20skills%20are%20shaped,6%25%20to%209%25%20lower.
[12] https://pediatrics.aappublications.org/content/146/4/e2020016824
[13] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7444649/
[14] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7127630/

levels of psychosocial stress.[15, 16, 17, 18, 19] It is clear that keeping schools open is essential to the wellbeing of all children, and even more so for children living in communities struggling with poverty and systemic racism.

Considering these truths, and that vaccinations are not yet available for children under 12 years old, contentious public debates have erupted, framing the question of COVID-19 safe schooling in stark terms: keep schools open and ignore the real threat that the Delta variant poses -- or close our schools and fail to meet the fundamental needs of children.

This is a false dichotomy. We do not have to choose between the benefits of in-person learning and keeping children and staff safe from COVID. Scientific evidence from the past 18 months of studying SARS-CoV-2, but also from decades of studying how airborne viruses spread and how we can keep those in school buildings healthy, provides us with a clear framework for keeping schools open for in-person learning -- and safe.

Experts at the Centers for Disease Prevention and Control, the U.S. Departments of Health and Human Services and of Education as well as independent academic and educational institutions all agree on a strategy of layered *Infection Prevention and Control (IPC)* measures for schools.

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[15] https://www.mckinsey.com/industries/public-and-social-sector/our-insights/covid-19-and-education-the-lingering-effects-of-unfinished-learning
[16] https://www.mckinsey.com/industries/public-and-social-sector/our-insights/covid-19-and-learning-loss-disparities-grow-and-students-need-help#
[17] https://www.nwea.org/content/uploads/2020/11/Technical-brief-Technical-appendix-for-Learning-during-COVID-19-Initial-findings-on-students-reading-and-math-achievement-and-growth-NOV2020.pdf
[18] http://glenn.osu.edu/educational-governance/reports/reports-attributes/210828_KL_OST_Final.pdf
[19] https://www.aamc.org/news-insights/how-we-re-failing-children-color-during-covid-19

The key measures in this strategy are: 1) vaccinations; 2) ventilation and filtration; 3) robust testing strategies; 4) masking; and 5) physical distancing and personal hygiene.

To be effective, each of these layers must be independently defined, but cohesively implemented. Just as the safety of a car requires well-gripping tires, effective brakes and working seat belts (with none of them being a substitute for the other), IPC in schools requires us to focus on each area, but ensure that all of them are implemented together. This means that in order for recommendations in one layer to translate into improving safety, other layers must be properly implemented as well.

Because each school building and each school community is different, Infection Prevention and Control implementation is site specific, and each school needs to build the organizational capacity to make rapid, localized decisions about how to layer these measures at various turning points in the pandemic. Some districts across the country have already accessed the funding made available in the American Rescue Plan and other relief packages to establish this important function in their schools, sustain safe in-person learning, and achieve pandemic resilience.[20]

The rise of the Delta variant, and the suffering it has caused, underscore the urgent need for us to act. We can apply the lessons we have learned in this pandemic and use the tools we know to be effective. We can make all schools COVID-safe. Our children, educators, and staff deserve it.

II. The Cost of School Closings

A. Losses in Educational Attainment and Quality

[20] https://www.covidcollaborative.us/infection-prevention-and-control-in-schools

The pandemic ushered in an unprecedented wave of school closings across the United States, accompanied by immediate efforts to switch to remote instruction. What was meant to last a few weeks turned into several months, and soon school districts started to notice how the digital divide and other barriers negatively affected learning outcomes for some of their students.

With remote and hybrid learning continuing all through the 2020 - 21 school year, the consequences for K - 12 students have been dramatic. One analysis shows students were on average five months behind in mathematics and four months behind in reading by June 2021.[21] Historically disadvantaged students experienced even worse outcomes. In majority Black schools, students learned only about half the math curricula they should have for the year, and those in low-income schools learned less than their wealthy peers. In low-wage communities, more high schoolers have dropped out than prior to the pandemic, and fewer seniors are moving on to postsecondary education. Many other analyses have reached similar conclusions.[22, 23, 24, 25]

Some studies have also found that student engagement on online platforms has substantially declined since the start of the pandemic.[26] Data from the non-profit research laboratory Opportunity Insights suggests student participation in online math coursework through the commonly adopted Zearn platform declined by 18.6% from January 2020 - May 2021.[27]

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[21] https://www.mckinsey.com/industries/public-and-social-sector/our-insights/covid-19-and-education-the-lingering-effects-of-unfinished-learning
[22] https://www.mckinsey.com/industries/public-and-social-sector/our-insights/covid-19-and-learning-loss-disparities-grow-and-students-need-help#
[23] https://budgetmodel.wharton.upenn.edu/issues/2021/3/11/covid-19-cost-of-virtual-schooling-by-race-and-income
[24] https://www.nwea.org/content/uploads/2020/11/Technical-brief-Technical-appendix-for-Learning-during-COVID-19-Initial-findings-on-students-reading-and-math-achievement-and-growth-NOV2020.pdf
[25] http://glenn.osu.edu/educational-governance/reports/reports-attributes/210828_KL_OST_Final.pdf
[26] https://twitter.com/john_n_friedman/status/1369823895017119744?s=21
[27] https://tracktherecovery.org/

Participation rates also varied substantially by parental income quartile - and have degraded over time in lower-income students.

Other scholars have attempted to quantify the effects of learning losses on the economy. While it is too early to know how COVID-induced school closures will impact long-term graduation rates, existing research suggests educational attainment strongly correlates with lifetime earnings.[28] Thus, school closures and the resulting negative effects on attainment levels could have lasting consequences. A primary analysis conducted earlier this year estimated students in grades 1 - 12 affected by global school closures could expect to receive between 6% - 9% lower income rates over their life cycles, which could result in a 3.5% reduction in annual GDP for the remainder of the century. In the United States, this translates to $28 trillion in lost GDP, as of January 2021.[29, 30]

B. Psychosocial Harms and Mental Health Concerns

School closures also have important mental health consequences. From March to October 2020, mental health visits to emergency rooms in children 12 - 17 were up by 31%, and up by 24 % in children 5 - 11 years old.[31] Data from the Children's Hospital Association shows that the trend continues, as hospitals have seen a 15% increase in children seeking mental health support this

[28] https://www.bls.gov/careeroutlook/2020/data-on-display/education-pays.htm
[29] http://hanushek.stanford.edu/publications/economic-impacts-learning-losses
[30] https://www.wsj.com/articles/the-long-term-economic-costs-of-lost-schooling-11614286602#:~:text=Innovation%20and%20skills%20are%20shaped,6%25%20to%209%25%20lower.
[31] https://www.cdc.gov/mmwr/volumes/69/wr/mm6945a3.htm

year.[32, 33] Another analysis reported that 35% of surveyed parents were very or extremely concerned about the mental health of their children during the past academic year.[34]

School closures and lockdowns have been linked with anxiety among children, as well as lower levels of self-reported well-being.[35] Much of this can be attributed to disruptions in daily life: many children were unable to socialize with peers in isolation, and some may have experienced separation-anxiety from their working parents.[36, 37] Economic stressors were also contributing factors in the rise of mental health issues: many parents lost their jobs during the pandemic (the national unemployment rate increased from 4% in the first quarter of 2020 to approximately 13% in the second quarter of 2020).[38, 39] For parents who have retained their employment, balancing a job with domestic responsibilities in the midst of a global health emergency remains remarkably challenging.

But not all children have been impacted equally, as Black, Hispanic, and Native American communities have experienced more trauma than other groups.[40, 41, 42] Preliminary data suggests that nearly 75% of deaths associated with COVID-19 among children were in Black, Hispanics,

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[32] https://pediatrics.aappublications.org/content/146/4/e2020016824
[33] https://www.npr.org/sections/back-to-school-live-updates/2021/08/30/1032461532/as-schools-reopen-child-psychiatrists-expect-to-see-a-surge-of-kids-who-need-hel
[34] https://www.mckinsey.com/industries/public-and-social-sector/our-insights/covid-19-and-education-the-lingering-effects-of-unfinished-learning
[35] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7444649/
[36] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7127630/
[37] https://www.npr.org/sections/back-to-school-live-updates/2021/08/30/1032461532/as-schools-reopen-child-psychiatrists-expect-to-see-a-surge-of-kids-who-need-hel
[38] https://www.thelancet.com/journals/lanchi/article/PIIS2352-4642(21)00177-2/fulltext
[39] https://www.bls.gov/news.release/pdf/empsit.pdf
[40] https://www.npr.org/sections/back-to-school-live-updates/2021/08/30/1032461532/as-schools-reopen-child-psychiatrists-expect-to-see-a-surge-of-kids-who-need-hel
[41] https://www.aamc.org/news-insights/how-we-re-failing-children-color-during-covid-19
[42] https://www.cdc.gov/mmwr/volumes/69/wr/mm6937e4.htm?s_cid=mm6937e4_w

or American Indian/Alaskan Native children, and in children with underlying medical conditions.[43] Across all age groups, Black and Hispanic people have been almost twice as likely to report a COVID-19 infection than White Americans, and are currently hospitalized at three times the rate of Whites. Native Americans record even more pronounced disparities, despite suffering from data invisibility.[44, 45] These minority communities are experiencing roughly double the mortality rates from COVID-19 as White individuals.

These disparate harms are strongly correlated with underlying social determinants of health. Members of Black communities are also twice as likely to live in denser households than White populations[46], and often work in high-risk industries which can expose them to the virus.[47, 48] Nearly 40% of Hispanic and 31% of Black households include a person who is working in close proximity to others, compared to only 24% in White households.[49]

Black workers in particular constitute a large share of front-line workers (one in every six employees), and are overrepresented in forward-facing industries including public transit, health care, child care, and social services.[50] These groups have also experienced higher rates of job loss and tend to report higher levels of mental health distress than their White peers.[51, 52] School

[43] https://www.cdc.gov/mmwr/volumes/69/wr/mm6937e4.htm?s_cid=mm6937e4_w
[44] https://www.cdc.gov/coronavirus/2019-ncov/covid-data/investigations-discovery/hospitalization-death-by-race-ethnicity.html
[45] https://www.nytimes.com/interactive/2020/07/05/us/coronavirus-latinos-african-americans-cdc-data.html
[46] https://www.epi.org/publication/black-workers-covid/
[47] https://msdh.ms.gov/msdhsite/index.cfm/14,0,71,688,html
[48] https://www.epi.org/publication/black-workers-covid/
[49] https://www.urban.org/sites/default/files/publication/103278/how-risk-of-exposure-to-the-coronavirus-at-work-varies.pdf
[50] https://www.epi.org/publication/black-workers-covid/
[51] https://www.aamc.org/news-insights/how-we-re-failing-children-color-during-covid-19
[52] https://www.cdc.gov/mmwr/volumes/69/wr/mm6932a1.htm

closures have further exacerbated these psychosocial harms, beginning with underlying gaps in access to remote education. In a recent survey of elementary school children, 30% of Hispanic students indicated they lacked internet access, compared to 23% of their classmates.[53] Studies suggest Black and Hispanic children in remote learning models have also reported sharper declines in their mental health status than their higher-income and White peers.[54]

This growing body of evidence shows that remote and hybrid instruction can create generational consequences for children, and especially so for those from disadvantaged backgrounds. Remote schooling may seem a bearable burden of the pandemic to some, but it has consequential and potentially long-lasting negative effects on those most in need.

III. The Risks of COVID-19 in Children

Since the beginning of the pandemic, scientists and clinicians have accumulated important knowledge about COVID-19 and children. We now know that children of any age can contract COVID-19, and that most younger children develop only mild symptoms or remain asymptomatic when infected. We also know that severe complications are infrequent, and that deaths attributed to COVID-19 in children are rare.[55]

But COVID still poses an important risk to children -- because it is a novel disease that is sweeping through our population for the first time. Children now represent about 2% of total COVID

[53] https://www2.ed.gov/about/offices/list/ocr/docs/20210608-impacts-of-covid19.pdf
[54] https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2783714
[55] https://www.health.harvard.edu/diseases-and-conditions/coronavirus-outbreak-and-kids

hospitalizations and 0.25% of cumulative deaths.[56, 57] While these percentages seem small, they represent sizable numbers: Approximately 2,000 children have been hospitalized for COVID-19 each week for the past month. Children now make up 25.7% of weekly cases for the week ending September 16th, and COVID-19 has killed twice as many children as influenza typically does during the first 9 months of 2021.[58, 59] COVID-19 also ranked as one of the top ten leading causes of pediatric deaths in 2020.[60] Additionally, while infected children are at a lower risk of severe outcomes relative to adults, they are not immune to long-term complications; most importantly, Long COVID, MIS-C, and myocarditis.

While the exact prevalence of Long COVID in children is unknown at this point, a UK study found that 4% of young children and teenagers reported COVID-related symptoms lasting a month after infection, while a Lancet article reported that roughly 2% of children still displayed symptoms two months into the illness.[61, 62] A recent study conducted in Israel found that 1.8% of children under the age of 12, and 4.6% of children aged between 12 - 18 were still suffering from symptoms up to 6 months post-infection.[63] Studies have also found that the prevalence and persistence of long COVID increases with age, and can have debilitating effects for those whom it does affect.[64]

[56] www.aap.org/en/pages/2019-novel-coronavirus-covid-19-infections/children-and-covid-19-state-level-data-report/
[57] https://www.businessinsider.com/delta-variant-covid-risk-to-children-kids-2021-6
[58] https://downloads.aap.org/AAP/PDF/AAP%20and%20CHA%20-%20Children%20and%20COVID-19%20State%20Data%20Report%209.16%20FINAL.pdf
[59] https://www.medpagetoday.com/opinion/second-opinions/93055
[60] https://www.wbrc.com/2021/05/23/covid-is-one-top-causes-death-children/
[61] https://apnews.com/article/lifestyle-health-coronavirus-pandemic-056c41ecb90401c9cdc2356797ff2352
[62] https://www.thelancet.com/journals/lanchi/article/PIIS2352-4642(21)00198-X/fulltext
[63] https://www.gov.il/en/departments/news/13092021-01
[64] https://onlinelibrary.wiley.com/doi/10.1111/apa.15673

Recent analyses suggest 12 - 17 year olds more frequently report long-term effects than children under the age of 12.[65]

In some cases, children who test positive for SARS-CoV-2 can also develop Multisystem Inflammatory Syndrome, or MIS-C, which results in the inflammation of the heart, lung, kidneys, brain, skin, eyes, or gastrointestinal organs up to 4 - 6 weeks following an infection.[66, 67] MIS-C can affect children of all ages, even those who have mild cases or initially present as asymptomatic. As of August 27th, 41 children have died of MIS-C in the United States.[68] Hispanic and Black children are disproportionately affected: of the 4,661 children diagnosed with MIS-C, Black and Hispanic children constituted a 61.2% share.

Children can also develop COVID-induced myocarditis. SARS-CoV-2 tends to attack multiple organs, and myocardial cells are one of the virus's potential targets.[69] While the connection between myocarditis and COVID-19 has not been confirmed, a CDC study suggests that patients with COVID-19 had nearly 16 times the risk for myocarditis (150 cases per 100K) compared to those without COVID-19 (9 cases per 100K).[70, 71] Preliminary evidence suggests younger populations are at higher risk of developing myocarditis after contracting COVID. This follows from standard epidemiological principles - viruses are the most common cause of pediatric

[65] https://www.thelancet.com/journals/lanchi/article/PIIS2352-4642(21)00198-X/fulltext
[66] https://www.alabamapublichealth.gov/covid19/mis-c.html
[67] https://apnews.com/article/lifestyle-health-coronavirus-pandemic-056c41ecb90401c9cdc2356797ff2352
[68] https://covid.cdc.gov/covid-data-tracker/#mis-national-surveillance
[69] https://www.acc.org/latest-in-cardiology/articles/2021/02/05/19/37/covid-19-as-a-possible-cause-of-myocarditis-and-pericarditis
[70] https://pubmed.ncbi.nlm.nih.gov/34473684/
[71] https://www.cdc.gov/mmwr/volumes/70/wr/mm7035e5.htm?s_cid=mm7035e5_e&ACSTrackingID=USCDC_921-DM64772&ACSTrackingLabel=MMWR%20Early%20Release%20-%20Vol.%2070%2C%20August%2031%2C%202021&deliveryName=USCDC_921-DM64772

myocarditis. During the 2009 H1N1 influenza outbreak, reports from American and Japanese pediatric ICUs indicated myocarditis in 1 - 2% of their young patients.[72] According to multiple reports reviewing pediatric and adolescent COVID cases, MIS-C also often presents alongside myocarditis.[73]

Throughout the pandemic, the COVID-19 risk for children has been downplayed and dismissed as negligible, on the basis that children are not nearly as severely impacted as adults. This is the wrong comparison: Children almost always have better disease outcomes than adults, from influenza to cancer. For example, in 2018 - 2019, an average of around 0.85 influenza deaths per 100,000 were recorded in children aged 0 - 17, as opposed to 48.7 deaths per 100,000 in those 65-plus.[74] In 2017, Our World in Data reported cancer deaths of 2.6 per 100,000 in ages 5 - 14, as opposed to 1,213 per 100,000 in those aged 70-plus.[75]

As clinicians, we do not disregard leukemia in children because it is rare or because children have a higher chance of survival than adults. To the contrary, we do everything we can to protect these lives. This must be the same with COVID-19. When we open schools, we must do so while ensuring we protect every child.

IV. Charting the Path Forward: Layered Infection Prevention and Control in Schools

Like hospitals, schools are an essential service and need to be equipped to stay open for in-person learning, even when community spread of an infectious disease is high. To promote safe in-person

[72] https://www.acepnow.com/article/is-there-an-increased-incidence-of-covid-related-myocarditis-in-kids/
[73] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7674714/
[74] https://www.cdc.gov/flu/about/burden/2018-2019.html
[75] http://ourworldindata.org/cancer

learning environments for students and staff, school leaders must develop effective practices in these key categories of infection prevention and control: 1) vaccinations; 2) ventilation and filtration; 3) robust testing and tracing strategies; 4) universal and correct use of masks and 5) physical distancing and personal hygiene.

IPC measures are supported by a deep scientific evidence-base, including many studies in U.S. schools.[76] They represent alignment across experts, organizations, and the CDC. Schools, district leaders, and communities should understand the interactions among these measures. Effective IPC is rooted in multiple layers of mitigation: During this pandemic, schools require robust ventilation and air filtration as well as proper mask wearing, testing and contact tracing, vaccinations and other measures.

How to layer the measures depends on local circumstances -- every school and every community is different. Space and size constraints, student demographics and needs, staff vaccination status, community transmission rates, local and state laws and many other factors vary greatly by setting. This is one of the reasons why many plans to improve COVID-safety in schools have not worked -- there is no single strategy for viral containment. IPC needs to be customized for individual settings.

To be able to implement this in practice, districts need to invest in local, county, or tribal "situation rooms", and in school-based IPC teams. While many educational stakeholders have been working

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76 https://static1.squarespace.com/static/5f85f5a156091e113f96e4d3/t/6088352ca985de7585b38684/1619539244698/Scientific+Consensus+Statement+Schools+4.26.21.pdf

on infection prevention and control and have been developing a wide array of partnerships with public health officials over the past 18 months, formalizing this area of activity for the K – 12 sector is critical. Without a thorough understanding of evidence-based IPC practices at the building level, there is an increased risk of disjointed and inconsistently observed prevention and control components. Integration is crucial for minimizing any school-related transmission.[77]

School districts who have done this, from New York City to Manatee County in Florida, have consistently seen success. Others need support from across all jurisdictional levels, agencies and community partners, to access federal and state funds, train teams, improve buildings and create safe and healthy spaces for student learning.

A. Vaccinations

Most elementary school children have not yet received the COVID-19 vaccine, because they remain ineligible under FDA guidelines. Currently, roughly 45% of children aged 12 - 17 -- those in middle and high school -- have received both doses of the Pfizer vaccine (which was approved under Emergency Use Authorization for ages 12 - 15 in May of this year).[78, 79] Trial data on vaccinations for 5 - 11 year old children is forthcoming, and an EUA approval for at least one

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[77] https://static1.squarespace.com/static/5f85f5a156091e113f96e4d3/t/60885fa500e63d4a1980ec2f/1619550124862/FINAL+ROADMAP_4.27.pdf

[78] https://downloads.aap.org/AAP/PDF/Child%20Vaccinations%20Report%20US%20and%20by%20State%20Sept%2022%20Corrected.pdf

[79] https://www.fda.gov/news-events/press-announcements/coronavirus-covid-19-update-fda-authorizes-pfizer-biontech-covid-19-vaccine-emergency-use

vaccine in this age group is expected later this fall.[80] [81] The FDA should review the data carefully, but must ensure that there are no delays in processing the applications -- as long as children are unvaccinated, they remain vulnerable to infection.

The best way to protect unvaccinated children is to surround them with vaccinated adults.[82] Children rarely spread SARS-CoV-2[83, 84], and the majority of kids contract the virus from an adult, usually when members of their household bring the virus home.[85, 86] While breakthrough cases can occur, vaccinated people are five times less likely to get infected than unvaccinated individuals.[87, 88]

Recent data from Israel shows that COVID cases in unvaccinated populations, particularly children, decreased after the broader eligible population received vaccines - even when schools were open. A 20% increase in Israel's adult vaccination rates correlated with a halving of child infection rates over the same time period.[89]

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[80] https://www.forbes.com/sites/brucelee/2021/08/28/when-will-covid-19-vaccines-be-available-for-kids-under-12-years-old/?sh=2493fee315da
[81] https://www.cnn.com/2021/09/20/health/covid-19-vaccine-young-children-next-steps-wellness/index.html
[82] https://www.theatlantic.com/politics/archive/2021/08/how-keep-kids-safe-delta-variant/619686/
[83] https://www.nbcnews.com/news/us-news/kids-sick-covid-are-filling-children-s-hospitals-areas-seeing-n1276238
[84] https://www.washingtonpost.com/health/2021/08/28/delta-variant-unvaccinated-children-elementary-schools/
[85] https://www.nbcnews.com/news/us-news/kids-sick-covid-are-filling-children-s-hospitals-areas-seeing-n1276238
[86] https://www.theatlantic.com/politics/archive/2021/08/how-keep-kids-safe-delta-variant/619686/
[87] https://www.cdc.gov/mmwr/volumes/70/wr/mm7037e1.htm?s_cid=mm7037e1_whttps://www.cdc.gov/mmwr/volumes/70/wr/mm7037e1.htm?s_cid=mm7037e1_w
[88] https://www.bmj.com/content/374/bmj.n2282
[89] https://www.timesofisrael.com/hope-for-herd-immunity-vaccines-shown-to-protect-israelis-who-dont-get-them/

Based on the overwhelming evidence regarding the safety and efficacy of existing vaccines, authorities should strongly consider mandating vaccinations for teachers and staff - with only limited exceptions for medical or religious reasons. Most states already mandate vaccines with only medical or religious exemptions. Some states only allow for a very narrow set of medical exemptions.[90]

We must increase our efforts to get more 12 - 17 year olds vaccinated. Vaccinations remain our most potent tool -- every vaccinated adult and teenager reduces the risk for an unvaccinated younger child or immunocompromised educator or staff member.[91] Some states have successfully used vaccine incentives for this age group. California prioritized vaccinating teenagers in May[92] and August and witnessed a decrease in pediatric infections over the summer.[93, 94 95] Los Angeles County School District is now mandating COVID vaccinations for all children ages 12 and up, a policy that is also being considered by the state of California.

Childhood vaccination mandates have a long history in the United States, the first dating back to a smallpox mandate in 1809.[96] Motivated by a commitment to the safety of our children, we must continue on this path started 200 years ago - one that has allowed us to dramatically improve lives and prosperity across the nation.

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[90] https://msdh.ms.gov/msdhsite/index.cfm/14,0,71,688,html
[91] https://www.whitehouse.gov/briefing-room/press-briefings/2021/08/12/press-briefing-by-white-house-covid-19-response-team-and-public-health-officials-49/
[92] https://abc7.com/pfizer-vaccine-kids-california-12-15-covid-teens-coronavirus-vaccines/10625727/
[93] https://www.latimes.com/california/story/2021-09-10/kid-coronavirus-cases-fall-in-l-a-county
[94] https://www.mercurynews.com/2021/09/17/covid-19-cases-among-kids-fall-after-first-month-of-school/
[95] https://www.latimes.com/california/story/2021-08-11/despite-surge-california-doing-much-better-with-delta-variant-than-florida-texas-heres-why
[96] https://www.npr.org/2021/08/29/1032169566/the-u-s-has-a-long-precedent-for-vaccine-mandates

B. Ventilation and Filtration

The evidence of the health benefits of effective ventilation and filtration strategies in school settings has been clear and compelling for years. Now that federal funding has been provided through the American Rescue Plan, the onus is on our school administrators to implement these critical upgrades. These investments will not only help to end the pandemic, but also improve the overall safety and health of our students and staff.

High-quality ventilation and filtration systems help prevent the airborne transmission of SARS-CoV-2 in closed spaces, but also improve cognitive performance and mitigate other environmental health stressors which affect our children's health.[97] Students spend most of their school days indoors, and the air quality in school buildings impacts their cognition and mood.[98, 99] In most indoor settings, ventilation standards have been constructed to meet the bare minimum for acceptable indoor air quality. Instead, districts need to *maximize* building air quality.[100]

Green building design can influence our health both at the individual and population level.[101] At the individual level, a healthier building makes for a healthier human. Poor indoor air quality can link with higher levels of carbon dioxide, which have harmful effects on our health.[102] Additionally, closed environments without exposure to natural light have been linked with a stronger expression of stress hormones including cortisol and a higher rate of depression in

[97] https://www.nytimes.com/2021/09/16/well/air-quality-brain-function.html
[98] https://www.nature.com/articles/s41370-019-0195-5
[99] https://forhealth.org/9_Foundations_of_a_Healthy_Building.February_2017.pdf
[100] https://www.hsph.harvard.edu/news/multimedia-article/better-off-allen/
[101] https://link.springer.com/article/10.1007/s40572-015-0063-y
[102] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3548274/

occupants.[103] Multiple studies have found pronounced improvements in cognitive function when we address these concerns through strong ventilation practices and greener spaces, with one of these papers[104] documenting a doubling in cognitive scores when occupants were placed in buildings with low concentrations of volatile organic compounds, and high rates of outdoor air flows.[105, 106, 107] At the population level, healthier buildings make for a healthier society. Globally, nearly four million people die prematurely each year from poor indoor air quality.[108, 109] In the United States, radon is the second leading cause of lung cancer and kills approximately 15,000 - 20,000 people each year. Children, elderly populations, and those with preexisting conditions are at greater risk.[110, 111]

In order to improve indoor air quality, three strategies must be implemented: source control, improving ventilation, and investing in air cleaners.[112] Source control involves locating any appliance or utility that may increase the risk of poor indoor air quality, and removing it from the built environment. Ventilation improvement can help decrease levels of harmful particles within a household or (such as radon and carbon monoxide) by promoting air flow.[113, 114] Lastly, proper air

[103] https://www.tandfonline.com/doi/abs/10.3109/07420528.2014.982757
[104] https://ehp.niehs.nih.gov/doi/10.1289/ehp.1510037
[105] https://ehp.niehs.nih.gov/doi/10.1289/ehp.1510037
[106] https://www.tradelineinc.com/reports/2016-10/improved-workplace-ventilation-shown-studies-double-cognitive-function-scores
[107] https://link.springer.com/article/10.1007/s40572-015-0063-y
[108] https://www.nature.com/articles/s41370-020-0247-x
[109] https://www.urmc.rochester.edu/encyclopedia/content.aspx?ContentTypeID=1&ContentID=2163
[110] https://www.nature.com/articles/s41370-020-0247-x
[111] https://www.epa.gov/radon/health-risk-radon
[112] https://www.epa.gov/indoor-air-quality-iaq/improving-indoor-air-quality
[113] https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/Improving-Ventilation-Home.html
[114] https://www.lung.org/clean-air/at-home/ventilation-buildings-breathe

cleaners can provide better indoor air quality by filtering harmful particles from dense, indoor spaces.[115]

The Department of Education has now outlined clear guidance related to improving ventilation and filtration, which should inform school investments across our nation. Foundational steps in improving ventilation and filtration include: 1) frequently commissioning inspections of existing ventilation systems to check for decay; 2) purchasing portable air filtration units, including HEPA filters with high clean air delivery rates; 3) investing in MERV-13 filters for standard HVAC systems; 4) ensuring the proper flow of indoor air through the strategic placement of fans and the opening of windows; and 5) purchasing carbon dioxide monitors and air flow capture hoods.[116, 117] The Department of Education has outlined a number of other steps where ARP funding can be allocated to improve airflow, and detailed overviews of worthwhile investments are readily available from experts.[118]

Proper ventilation and filtration strategies are a critical element to ensuring safe and healthy schools, and provide lasting benefits beyond this pandemic.

C. Testing

Routine testing is a critical element of IPC. It serves as a lever to identify community risk, and is a valuable indicator of COVID prevalence in schools.[119] Testing of all students and staff,

[115] https://www.epa.gov/indoor-air-quality-iaq/air-cleaners-and-air-filters-home
[116] https://www.ed.gov/improving-ventilation-schools-colleges-and-universities-prevent-covid-19
[117] https://twitter.com/j_g_allen/status/1420036367388758023?s=21
[118] https://schools.forhealth.org/ventilation-guide/
[119] https://www.statnews.com/2021/09/21/covid-testing-data-help-schools-stay-open/

regardless of the presence of symptoms, allows schools to immediately identify cases and prevent larger outbreaks, which in turn helps prevent school closures. It also gives us better information on who is at risk of infection. Children are often asymptomatic carriers of SARS-CoV-2, and a robust and holistic approach to testing is needed to understand where the virus is spreading and if the applied layered mitigation measures are effective..[120]

Thus far, states have offered a plethora of testing options to schools (including multiple formats of PCR and rapid tests) - which allows administrators to make procurement decisions that best meet their needs. Some local jurisdictions have already experimented with different types of testing protocols in schools: New York City has mandated weekly COVID testing of school staff and students, North Carolina has set up voluntary screening programs, and California has suggested testing protocols depending on community risk and school outbreaks.[121, 122, 123] Some schools have opted for pool testing, which has proven to be a successful way to bring children back gradually from hybrid to in-person learning.[124] [125] [126] To stand up such programs, some schools have partnered with biotech companies. [127]

[120] https://www.healthline.com/health-news/lack-of-covid-19-testing-children-returning-to-school
[121] https://nypost.com/2021/09/20/de-blasio-mandates-weekly-covid-testing-of-school-staff-and-students/
[122] https://www.wral.com/coronavirus/wake-school-board-begins-plans-for-coronavirus-testing-for-students-staff/19886833/
[123] https://edsource.org/2021/why-some-schools-are-mandating-covid-tests-while-others-arent/658944
[124] https://boston.cbslocal.com/2021/04/08/massachusetts-schools-covid-19-testing-april-vacation/

[125] https://www.milforddailynews.com/story/news/state/2021/04/17/covid-19-pool-testing-mass-schools-seen-some-national-model/7243461002/

[126] http://hometownweekly.net/medfield/medfield-heads-back-to-school/

[127] https://www.concentricbyginkgo.com/

Robust testing programs have proven to be incredibly effective in reducing in-school transmission of SARS-CoV-2. Starting in March of this year, Baltimore's City Schools partnered with the City's Health Department, the University of Maryland Medical Systems, the Rockefeller Foundation and Concentric by Ginkgo and launched a rigorous, large-scale testing program.[128] The school district witnessed a decline in positive cases during the 2020 - 2021 academic year, and was eventually able to bring back students, teachers, and staff to in-person learning.[129]

In Brooklyn, PS 705, an Arts and Science elementary school, utilized New York City's surveillance system testing program to identify cases before they created outbreaks.[130] Surveillance testing programs such as the one in New York City involve testing a random group of individuals across the district, whether they have COVID symptoms or not.[131] This provides administrators with a better sense of true in-school case rates.

In addition to their robust testing platform, PS 705 also invested in proper ventilation systems, and implemented social distancing within their classroom. The combination of these components, as well as rigorous contact-tracing efforts in the case of a positive test, provided administrators with rapid information on viral spread and allowed for swift actions to limit contagion. In this way,

[128] https://www.baltimoresun.com/education/bs-md-testing-city-schools-20210224-kt7owrkzxrebznkt7kdhqyxwdu-story.html

[129] https://www.baltimorecityschools.org/testing-national-model

[130] https://coviddatadispatch.com/2021/09/12/opening-profile-going-above-and-beyond-in-crown-heights-brooklyn/

[131] https://sph.umich.edu/news/2020posts/surveillance-testing-gathering-the-data-on-covid-19.html

testing served as an initial line of defense, enabling the school to enforce appropriate measures quickly before an outbreak resulted in closures.[132]

Wherever possible, all students and staff should be tested for COVID-19 weekly, regardless of vaccination status or symptom presentation. The Biden Administration has allocated over $10 billion in funding for this purpose. The resources to test at a large scale are available, and we must do so holistically to ensure a safe environment for children.

D. Masking

Widespread mask-wearing remains a very good prevention strategy against the spread of COVID-19. Masking protects the wearer and the people around them from transmitting COVID-19 and other viruses through airborne particles.[133, 134] In three separate studies conducted by the Centers for Disease Control and Prevention (CDC), masking was found to present a significantly lower risk of infections for both teachers and students. One study reported masking in teachers and other staff combined with improved ventilation led to a 40% reduction in the incidence rate of COVID-19.[135] Another study compared US counties with school mask mandates to those without, observing community transmission rates were twice as high in schools without mandates. An additional analysis of schools in Arizona's most populous counties found schools without mask mandates were more than three times more likely to report COVID outbreaks.[136, 137]

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[132] https://www.statnews.com/2021/09/21/covid-testing-data-help-schools-stay-open/?utm_content=bufferf21b3&utm_medium=social&utm_source=twitter&utm_campaign=twitter_organic
[133] https://www.nature.com/articles/s41591-020-0843-2%C2%A0
[134] https://files.fast.ai/papers/masks_lit_review.pdf
[135] https://www.cdc.gov/mmwr/volumes/70/wr/mm7021e1.htm
[136] https://www.cdc.gov/mmwr/volumes/70/wr/mm7039e3.htm?s_cid=mm7039e3_w
[137] https://www.cdc.gov/mmwr/volumes/70/wr/mm7039e1.htm?s_cid=mm7039e1_w

Masks are safe. While some children have reported mild discomfort from mask-wearing, there are masks designed especially for children and those tend to improve satisfaction rates.[138] It is also crystal clear that masking does not increase CO2 levels and does not promote the spread of harmful pathogens.[139, 140] In fact, no serious negative health effects from mask-wearing have been found.[141] This is not surprising: the medical profession has been wearing masks for decades to protect healthcare workers and their patients from disease. If there was a potential for dangerous mask-borne viral pathogens infecting surgeons in our nation's hospitals, we would know. Every day, physicians and nurses in hospitals wear masks for up to a dozen hours a day with no ill effect.

Different styles of masks provide varying levels of protection, with disposable and cloth masks providing the least protection, followed by standard surgical masks, and finally high-quality masks.[142, 143, 144] The best masks have a double layer of fabric that keeps the wearer from spreading infected droplets into the air, and should fully cover the user's nose and mouth.[145, 146]

The benefit of a mask is driven by two key features: its fit and its filtration. Cloth masks tend to have both poor fit and uneven filtration. Therefore, most cloth masks are considered to be only 10

[138] https://www.nature.com/articles/s41598-019-55451-w
[139] https://jamanetwork.com/journals/jamanetworkopen/article-abstract/2776928
[140] https://factcheck.afp.com/http%253A%252F%252Fdoc.afp.com%252F9DL4TQ-1
[141] https://newsnetwork.mayoclinic.org/discussion/benefits-of-kids-wearing-masks-in-school/
[142] https://integracareclinics.com/protective-masks-whats-the-difference-and-how-effective-are-they/
[143] https://www.fda.gov/medical-devices/personal-protective-equipment-infection-control/n95-respirators-surgical-masks-face-masks-and-barrier-face-coverings
[144] https://theconversation.com/evidence-shows-that-yes-masks-prevent-covid-19-and-surgical-masks-are-the-way-to-go-167963
[145] https://www.hopkinsmedicine.org/health/conditions-and-diseases/coronavirus/coronavirus-face-masks-what-you-need-to-know
[146] https://jamanetwork.com/journals/jama/fullarticle/2776536

- 20% effective at preventing infections -- better than nothing, but not by a lot. Surgical masks tend to have much better filtration (though they too vary in quality) but fit can be an issue, for example because of gaps that allow air to escape out and come in. High quality surgical masks are thought to have 30 - 60% effectiveness, driven largely by their variable fit.[147, 148, 149, 150] The fit of surgical masks can be improved by layering them with a cloth mask ("double-masking"). One CDC study found marked reductions in exposure rates to SARS-CoV-2 with double-masking, reporting declines of roughly 80%. Knotting medical masks with elastic loops, or tucking them to ensure proper fit was also linked with lower exposure rates, reducing exposure rates by roughly 50%.[151] Finally, there are high quality masks such as N95s, KN95s, and KF94s. They are variable in their comfort and fit, but there are now several pediatric versions of these high filtration masks which likely provide a very high degree of protection.[152, 153, 154]

While there is no evidence of physical health costs due to mask wearing, some have raised concerns about potential long-term psychosocial harms of masking. The question raised is if mask-wearing inhibits social communication and can interfere with a child's ability to read and process emotions.[155] It is an important question, and we need better data to ascertain one way or another whether these concerns are valid. It is worth noting that most kids are in school for approximately 28 hours a week and most of their awake hours are spent unmasked. Most public health experts

[147] https://www.poverty-action.org/publication/impact-community-masking-covid-19-cluster-randomized-trial-bangladesh
[148] https://www.science.org/doi/10.1126/science.abg6296#body-ref-R2-1
[149] https://www.nature.com/articles/s41598-020-72798-7
[150] https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/2769441
[151] https://www.cdc.gov/mmwr/volumes/70/wr/mm7007e1.htm
[152] https://www.nature.com/articles/s41598-019-55451-w
[153] https://www.cdc.gov/mmwr/volumes/70/wr/mm7007e1.htm
[154] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7883189/
[155] https://healthpolicy.usc.edu/article/mandatory-masking-of-school-children-is-a-bad-idea/

agree that at this point that the evidence for the benefits of masking in children far outweigh the evidence of harms of masking in children.[156] Promoting non-masked communication while at safe spaces in the household can also substitute for traditional classroom exposures. Whether pre-school children (those 5 years of age or younger) should wear a mask is far less clear, and we need better evidence to guide parents or policymakers.

E. Social Distancing and Personal Hygiene

Multiple studies have established the value of social and physical distancing, handwashing, and respiratory etiquette in preventing the spread of COVID-19 and other communicable diseases.[157] In particular, instructing students on proper hand hygiene and respiratory etiquette can provide lasting benefits, fostering healthier behaviors that limit the spread of infections including the flu and common cold. CDC guidance details adequate spacing between children and teachers in indoor classroom settings, as well as resources to guide school administrators in implementing spacing needs alongside ventilation and filtration requirements.[158, 159] Schools should consider outdoor learning as an alternative to the classroom when possible, which greatly reduces infection risks. Finally, although cleaning of high-touch surfaces is recommended as part of general health and safety protocols, there is almost no evidence of the fomite (surface) transmission of SARS-CoV-2, .[160] Cleaning high-touch areas with water and soap once a day is generally sufficient in schools.

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[156] https://khn.org/news/article/science-shows-mask-wearing-is-largely-safe-for-children/
[157] https://washmatters.wateraid.org/blog/hand-hygiene-crucial-to-control-covid-19-and-prevent-future-pandemics
[158] https://www.cdc.gov/coronavirus/2019-ncov/community/schools-childcare/k-12-guidance.html
[159] https://schools.forhealth.org/risk-reduction-strategies-for-reopening-schools/
[160] https://www.cdc.gov/coronavirus/2019-ncov/more/science-and-research/surface-transmission.html

"Deep cleaning" or frequent high-intensity disinfection is neither required nor recommended in school settings.[161, 162]

Social and physical distancing is a straightforward way to reduce airborne transmission and remains a cornerstone of our COVID response, but it is most effective when implemented in tandem with other core IPC strategies. Social distancing alone is inadequate to prevent infections as students and teachers will be in close contact over the course of a school day. However, in the presence of the other core pillars of testing; vaccination; mask-wearing; and ventilation, social distancing helps prevent infections. Debates over the exact distance and spacing between students matter less than whether students and staff are vaccinated and wearing masks and are in classrooms with high-quality ventilation systems, and in schools with robust testing strategies.

F. Federal Funding Initiatives and the American Rescue Plan

The US Department of Education has recently outlined allocation plans for the use of the American Rescue Plan (ARP).[163] The ARP funds multiple interventions relevant for school learning, including the acceleration and sustainability of a safe return to in-person instruction, funding for summer learning and enrichment programs to address learning gaps and recoup the academic impact of lost instructional time, and the provision of social, emotional, and mental health support to students and families affected by the pandemic.

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[161] https://www.nytimes.com/2021/04/08/health/coronavirus-hygiene-cleaning-surfaces.html
[162] https://www.bloomberg.com/news/features/2020-12-16/covid-pandemic-microbiomes-could-be-key-to-stopping-spread-of-future-viruses
[163] https://www.ed.gov/news/press-releases/us-department-education-posts-state-plans-use-american-rescue-plan-funds-support-students-and-safe-and-sustained-reopening-schools

Many states have announced allocations in these areas, and some local governments and health authorities have already begun to implement core IPC measures to ensure a safe return for children and adolescents. However, there are many logistical obstacles. During the 2020 - 2021 academic year, many states cited difficulties in implementing testing programs due to inadequate staffing of nurses, a lack of space and the proper conditions to store tests, and a shortage of test supply during outbreaks.[164] The ARP was meant to address these issues, and has already done so in some cases. Many school districts have found success through partnerships with biotech companies, and rigorous training programs for staff.[165] However, the state-by-state experience varies widely.

While some states have just started launching their testing pilots in schools, others have well-established programs. Many states have also cited issues of demand for tests, with some schools prioritizing screening models, in which students and staff self-report their symptoms, as opposed to testing programs.[166, 167] Additionally, the funds which school districts utilize are not uniform. For example, many jurisdictions have utilized funds from the CDC to develop their testing programs, and directed ARP funding towards other needs - such as mental health support and ventilation improvements.[168, 169, 170] The federal government and affiliated agencies will need to carefully monitor the use of these funds to ensure they serve their intended purpose.

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[164] https://www.usnews.com/news/best-states/articles/2021-08-26/what-missouri-learned-the-hard-way-about-rapid-covid-testing-in-schools
[165] https://news.stlpublicradio.org/coronavirus/2021-08-23/as-missouri-students-head-back-to-class-state-launches-new-covid-testing-program
[166] https://www.denverpost.com/2021/09/22/colorado-schools-covid-19-testing-quarantining/
[167] https://coloradosun.com/2021/08/12/covid-testing-colorado-schools-late/?utm_content=bufferdca73&utm_medium=social&utm_source=twitter.com&utm_campaign=buffer
[168] https://foxbaltimore.com/news/local/some-md-districts-planning-programs-to-screen-students-for-covid-19
[169] https://marylandeducators.org/what-does-the-arp-mean-for-maryland/
[170] https://calbudgetcenter.org/resources/american-rescue-plan-provides-assistance-to-millions-of-californians/

G. Improvements in Data Collection and Reporting

The federal government must also invest heavily in data architecture related to COVID-19 in children. At this stage of the pandemic we should not be making decisions without the data required to make informed decisions: representative national data on in-school transmissions, the status of school closures, and reliable statistics on child infections, for example. Inconsistencies in the available data (including non-standardized age bins and varied reporting mechanisms across jurisdictions) have confounded the ability of students, parents, and staff to make informed decisions on the risks and benefits of in-person instruction. While valiant volunteer efforts have provided us with a preliminary picture of COVID-19 in school settings, the federal government should scale up this infrastructure to the national level. This data will be of foundational value for core IPC teams in school settings, who will require high-quality, granular data at the state, county, city, and zip-code level to guide their decisions.

V. Conclusion

Reflecting on our fight against this pandemic over the past year, we see that in a time of great loss, there has also been important progress: The development and rollout of life-saving vaccines which are safe and effective is one of the most remarkable achievements of the scientific community in recent history. The federal government's prioritization and provision of funding for pandemic recovery has been admirable, and will serve as the basis for a stronger nation post-pandemic. The American public's patience and willingness to adhere to critical public health measures, as well as people's interest in educating themselves on the progression of this deadly virus, has been an integral component of our ability to build resilience.

However, we have a lot more to do to ensure we overcome the challenges posed by the Delta variant and move towards an equitable recovery from the pandemic.

Most importantly, we need to assist vulnerable subpopulations, including children. The costs of this pandemic have disproportionately affected children of color and those living in low-income settings. Thankfully, we are now at a stage in this pandemic where the scientific evidence on safe and healthy behavior is clear. Layered infection prevention and control strategies must shape our school response, and can assure a return to safe in-person instruction. However, we cannot ask schools to do this important work without significant support from local, state and national agencies and organizations. In order to support school systems, it is critical for the federal government to maximize the utility of the funding provided through the American Rescue Plan. That means providing the tests and vaccines needed, but also ensuring schools have the organizational capacity and support needed to put all IPC tools to work.

The federal government can support schools and ease the burden on staff and administrators by encouraging the development of core school-based IPC teams, and local situation rooms at the county or tribal level. Members of this team work with school administrators and staff, community members, and local health officials to adapt IPC strategies to their unique settings, and maintain the standards required to prevent in-school transmission.

It is imperative that we invest in these key pillars of infection prevention and control, to end this pandemic once and for all - and to build resilience against the pandemics of the future. Our ability

to implement these measures will not only impact the children of our generation, but those yet to be born. We now have the knowledge, willingness, and resources to make this happen. Let's get it done.