

Keeping Students Safe & Healthy

Invest in Schools, Invest in Future



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Integrating Healthcare in Education

Keeping Students Safe & Healthy

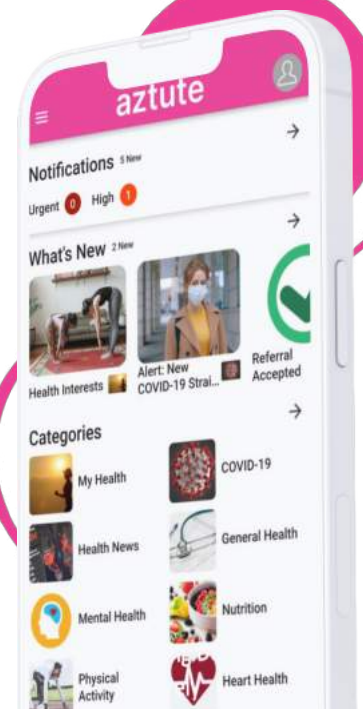
Approximately two years after the beginning of the pandemic and school closures around the US, it is time to reflect on what this meant to our youth.

With increasing evidence in health research demonstrating poor mental and physical health outcomes among such a vulnerable population, it becomes increasingly clear that schools need to take a more proactive approach in caring for our youth's wellbeing.

Technology offers novel solutions for such purposes and can be integral in spreading awareness for public health campaigns, disseminating knowledge regarding health behaviors, and providing secure opportunities for healthcare accessibility among children.

Upon these bases, this paper outlines the unprecedented public health threat facing our youth today, as an aftermath of the pandemic and some of the policies enacted in response over the past two years. Additionally, it offers a detailed and comprehensive explanation of how technology solutions can assist any educational institute in being proactive regarding its population's wellbeing. Finally, the paper demonstrates how funding can be made available and how to best utilize pre-existing and accessible resources for the deployment of such technology enabled solutions.

Communicable Disease Prevention (HIV, STDs, Hepatitis, TB)	Mental Health (Depression, Anxiety, PTSD)
Crisis Prevention Services (Suicide Prevention,)	Disease & Outbreak Management
Emergency/Disaster Response	Wellness and Healthy Living
Immunizations/Vaccinations	Substance Use (Tobacco, Vaping, Opioids Use)
Social Determinants of Health	Chronic Disease Management (Diabetes, Heart Disease, Obesity)



Health Crisis in Schools

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Two years ago, the World Health Organization (WHO) declared the COVID-19 outbreak a pandemic. At the time, society had one priority in mind: prevent the transmission of the virus at all costs. After all, we were running away from an invisible foe – a virus that we did not seem to understand, not even slightly. Two years later, we begin asking some questions. Priorities seem to be shifting. What did it mean for the youth to not be able to go to their schools or colleges? At a profusely significant period of their development, what did it mean for teenagers to not be able to socialize with their peers? What did it mean for young athletes to not be able to practice with their schools' teams?

Impact on Physical Health

Such findings exemplify an acceleration of trends observed prior to the pandemic and resemble a very strong call for action given that mental health and lack of physical activities are tied to multiple other health outcomes, including diabetes, hypertension, and heart disease. Research evidence in the literature consistently demonstrated poor mental health, obesity, and hypertension, across samples of children and young adults globally.

Impact on Mental Health

Across eleven countries, school closures and social lockdown during the first COVID-19 wave were associated with adverse mental health symptoms (e.g., distress and anxiety) and health behaviors (e.g., higher screen time and lower physical activity) among children and adolescents, according to [research published in JAMA Pediatrics](#). Since 2019, there has been a rise in suicide attempts among people younger than age 18, researchers at the Centers for Disease Control and Prevention found when they examined mental-health-related emergency room visits during the past three years.

What led to this?

- ✓ Students were left to face ongoing stressors at home.
- ✓ Parental issues such as intimate partner violence and substance misuse.
- ✓ Little opportunities for physical activity and social interactions among children.
- ✓ No in-person counseling and other after-school activities.
- ✓ Increased stress due to reduced social activities alarming mental health issues.

Need for Broader Integration of Healthcare in Education

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Children's overall wellbeing (including both mental and physical health) will deteriorate if we fail to immediately address this issue. If unaddressed, this will also extend to affect educators and many stakeholders within the educational system.

The pandemic resembles a wake-up call to reshape healthcare within schools.

It has become increasingly evident that schools will need to play a more proactive role. There are many reasons why some of the needs listed below must be addressed with highest level of urgency:

- Screening for negative health outcomes and undesired health behaviors at an early stage leads to better outcomes for children as they grow.
- Improving the school system's ability in understanding the epidemiology of diseases – both communicable and non-communicable in youth will help improve outcomes across the spectrum of care – home care, primary care, public health as well acute care, where required
- Understanding the long-term implication of Adverse Childhood Experiences (ACEs) on children, such as experiencing violence, abuse, or neglect, as well as an absence of a sense of safety, stability, and bonding will help identify care gaps as well as impacts on their physical and mental health.
- Changes to the brain from toxic stress can affect such things as attention, impulsive behavior, decision-making, learning, emotion, and response to stress. Absent factors that can prevent or reduce toxic stress, children growing up under these conditions often struggle to learn and complete schooling.
- Children in such contexts can be at increased risk of becoming involved in crime and violence, use of alcohol or drugs as well as engaging in other health-risk behaviors (e.g., early initiation of sexual activity; unprotected sex; and suicide attempts).

Technology-driven Approach

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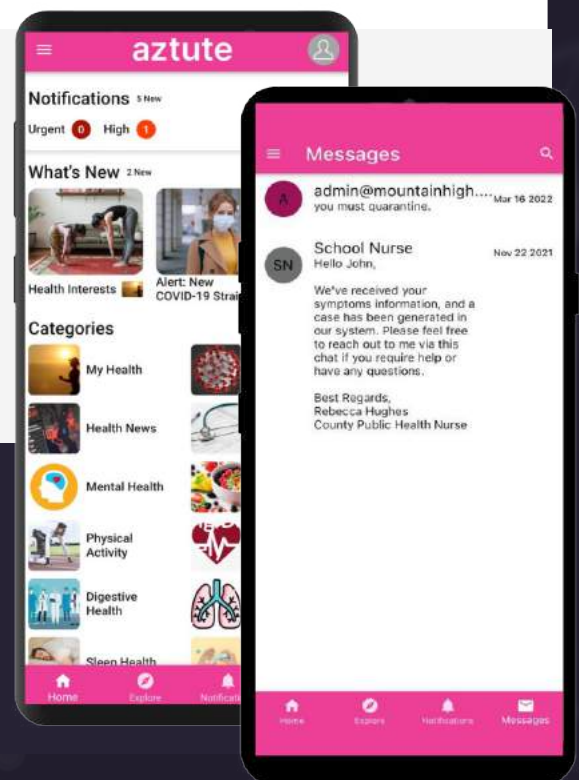
There is a need to shift away from traditional methods and explore other more innovative interventions. Mainly, increased access to healthcare could be achieved through an increased reliance on technology, which has shown to be instrumental in delivering various forms of healthcare throughout the pandemic.

Most schools have already invested in some technologies such as websites, spreadsheets, Learning Management Systems, School/Students Management Systems, dashboards, etc. It is often difficult to string together disparate tools to meet the key requirements related to data privacy, security, scalability, and high degree of interoperability that must form the backbone of any school health solution stack. Investing in schools means not only investing in new student facing technologies, but also leveraging existing technology investment. With the right tools, our interventions to address health threats can be greatly enhanced and prepared for future crises to keep students and staff safe and healthy.

In addition, with over half of children and 84% of teenagers owning their own phone in the US, technology can be effective in delivering information and intervention. For instance, in a systematic review published in JAMA pediatrics, mobile health interventions appeared to be a viable health behavior change intervention modality among individuals 18 years or younger. Furthermore, and in an extensive review published by researchers in Italy, Tele-mental health services were shown to be feasible and appropriate for the support of patients, family members and healthcare providers during this COVID-19 pandemic.

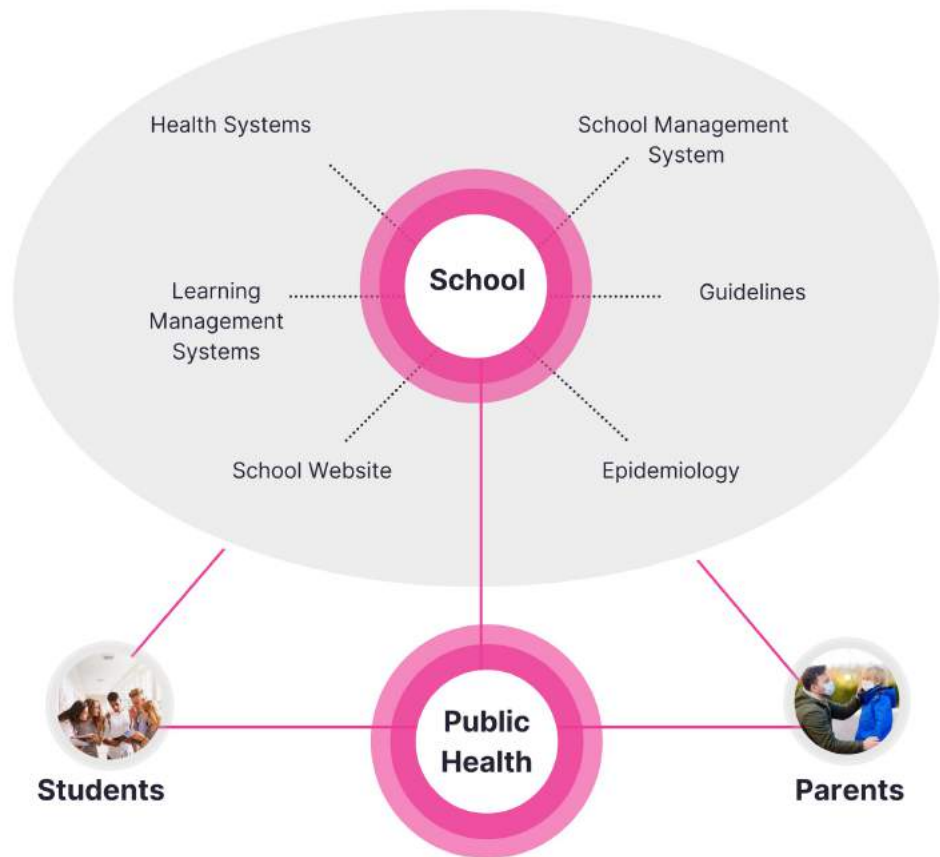
However, it is not just mental health outcomes that can be aided by technology. In fact, the right technology can provide the first opportunity for the schooling system to become an irreplaceable partner in caring for children's overall health. These findings illustrate that it is time for schools to invest in technologies that create a digital foundation for the future – a foundation that can successfully combat the alarming rise in the prevalence of negative health outcomes among the youth.

With the widespread use and accessibility of mobile devices among children and teenagers, technology can be vital in spreading awareness for public health campaigns, disseminating knowledge regarding health behaviors, and providing secure opportunities for healthcare accessibility among children.



Leverage your existing Investment

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Most schools have already invested in some technologies such as websites, google spreadsheets, LMS, School/Students Management Systems, dashboards, etc. It is often difficult to string together disparate tools to meet the key requirements related to data privacy, security, scalability, and high degree of interoperability that must form the backbone of any school health solution stack. Investing in schools means not only investing in new student facing technologies, but also leveraging existing technology investment. With the right tools, our interventions to address health threats can be greatly enhanced and prepared for future crises to keep students and staff safe and healthy.

A Framework for Schools

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Under the model described here, the technology implementation can be categorized into **four main domains**:

- Detection
- Recovery
- Response
- Prevention.

Within the context of the schooling system, this model aims to adequately intervene to improve mental health and foster healthier behaviors, as well as provide a platform to better understand the epidemiological context of a school.

A common theme across all domains is a data-platform that integrates data providing timely and relevant insights to public health and school administrators and other stakeholders in real time, allowing improved coordination and proactive responses. The cyclical nature of the proposed model attempts to capture the need for an adaptive, recurring, and continuously improving public health response.



Building an infrastructure that combats the rising negative mental health outcomes among children will simultaneously improve physical health outcomes for the coming generation, as well as prevent future diseases from being prevalent within communities. Given appropriate tools, planning and current availability of resources, the wellbeing of the children can be strongly improved.

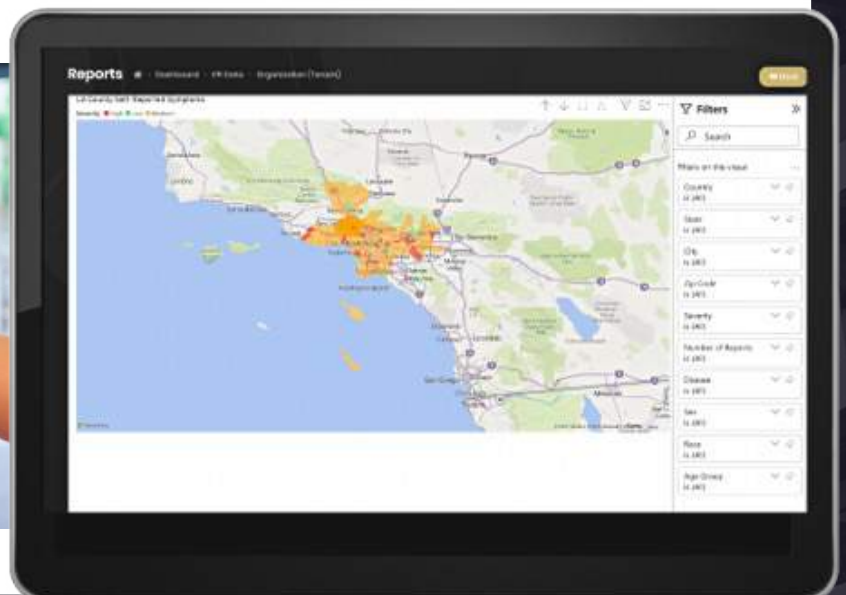
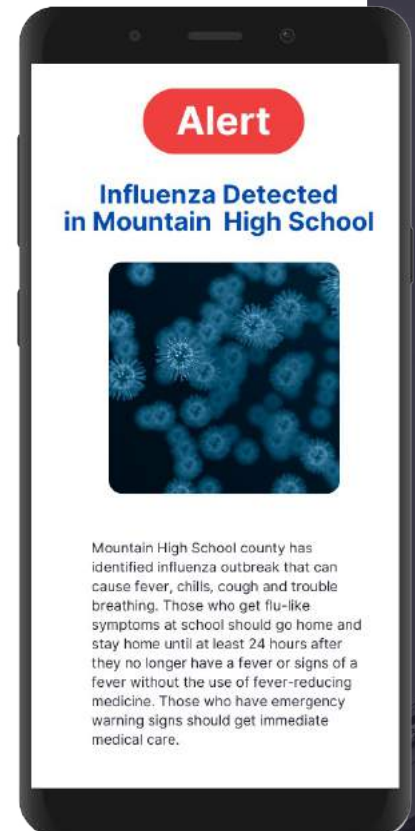
Detect

Framework for Schools

Use data from schools and the community to make decisions and to create effective policies to keep both students and staff safe while fostering a healthier learning environment.

Successful health interventions rely on timely availability of data to monitor the spread of diseases in schools and communities and to understand what threats need a response. While the benefit of this can be apparent in contexts of infectious diseases (e.g., measure the spread of COVID-19 in a school), it is equally important to measure other diseases and risk factors (e.g., anxiety and depressive symptoms, physical inactivity and prolonged sedentary behaviors, and recent illnesses and health complaints).

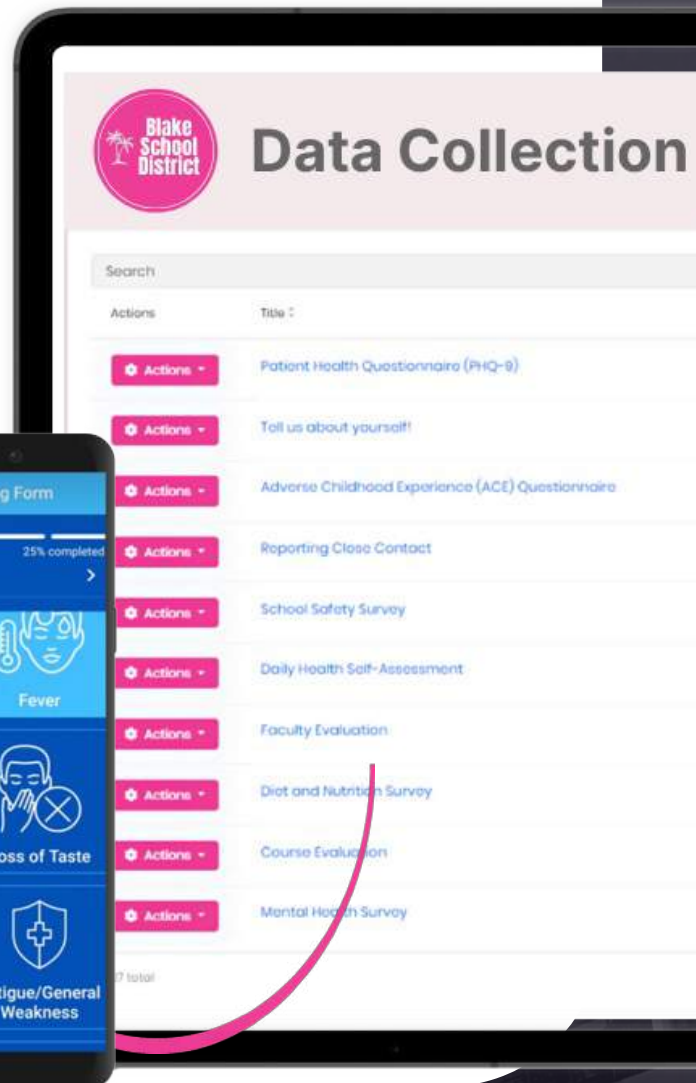
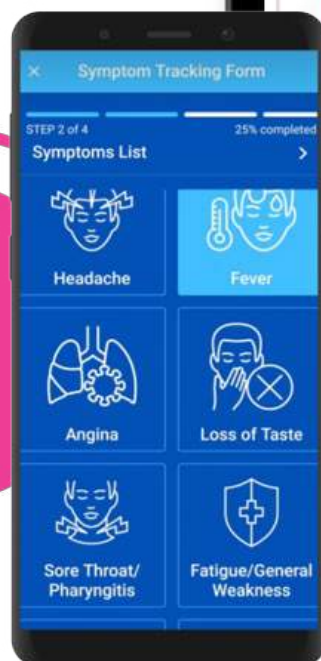
Without automation, this information is often collected via time-intensive and costly manual processes. Most school systems do not have a proper systematic approach for detecting health outcomes among children, whether its mental or physical health outcomes. Inherently, this leads to an absence of understanding the epidemiological reality among the population attending a given school, which delays the first phase of interventions: the detection phase leading to a response that is often incorrect in terms of scale and timing



Use data from schools and the community to make decisions and to create effective policies to keep both students and staff safe while fostering a healthier learning environment.

Schools should be able to adequately detect and evaluate the epidemiological state of their population, technology can be utilized to capture and monitor real-time data. For instance, this includes digitally administrating self-reported surveys among children with validated scales to measure a variety of health outcomes and risk factors. Verbal and visual assessments, which can easily occur via telemedicine, are all that is needed to engage with patients appropriately to obtain full diagnostic accuracy and provide most types of treatments

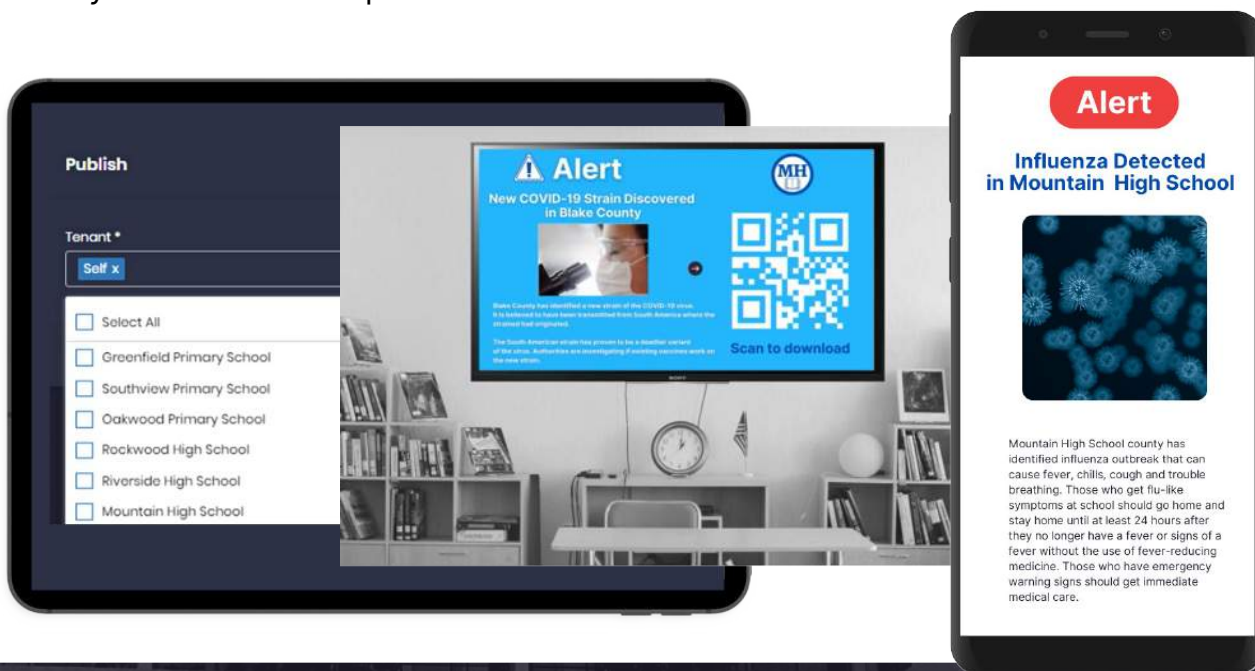
Integration of third-party data and interoperability with external systems allows for a comprehensive understanding of the epidemiology of all schools within a given geographical context. Real-time collected data can also be supplemented with automated detection via AI-based algorithms to detect abnormal patterns or changes, relating both to infectious and other diseases.



The response can either be an urgent response (e.g., responding to a wave of infectious disease within school), or a planned long-term response (e.g., promotion of physical activity among children).

Once the epidemiological patterns and emerging health issues are identified within a school environment, a swift and appropriate response is needed through a two-way communication with the community. The traditional communication methods (e.g., websites, emails, flyers) not only take time to produce, but also lack in speed of delivery. Additionally, in the presence of school closures and students being physically disconnected from their school environments, these methods are unproductive, inaccessible, and harmful in the long run.

Moreover, responding to an existing health threat among children requires collaboration among different stakeholders. The right technology can allow for real-time secure collaboration with instant distribution of targeted communication based on policies, protocols, and guidelines. Other interventions can include an option to connect with a counselor can be made available to children and parents immediately through their devices. In turn, this breaks down barriers to access for children and can overcome issues of not only physical inaccessibility, but inaccessibility due to stigma and other logistical issues. Not only does this increase accuracy and speed, but also ensures that all parties involved (e.g., schools, parents, and children) are aware of a health threat or a risk factor in a timely manner to allow productive intervention.

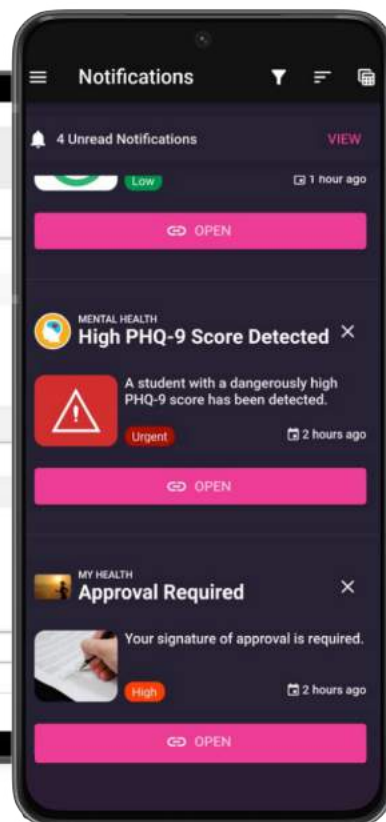


The response can either be an urgent response (e.g., responding to a wave of infectious disease within school), or a planned long-term response (e.g., promotion of physical activity among children).

Responding to an existing wave of infections requires collaboration with students and families. The right technology can allow for real-time secure collaboration with instant distribution of targeted communication based on policies, protocols, and guidelines. It can further help in responding quickly by automating processes to contain the spread of diseases (isolation, quarantine, vaccination recommendations) and thus increase accuracy and speed. This communication can be achieved through an integrated multi-channel distribution approach (e.g., automated email, text alerts, applications, kiosks and online content). For non-urgent health issues, similar systems can be employed to address behavioral changes (e.g., digital awareness campaign on the benefits of wellness activities such as diet, exercise, tobacco, and substance use education, etc.).

The screenshot shows a web application interface with a navigation bar at the top containing: Case Management, Quarantine Management, Vaccination History, Testing History, and Contact Tracing. The main content area is titled "Case Information" and includes several input fields and buttons:

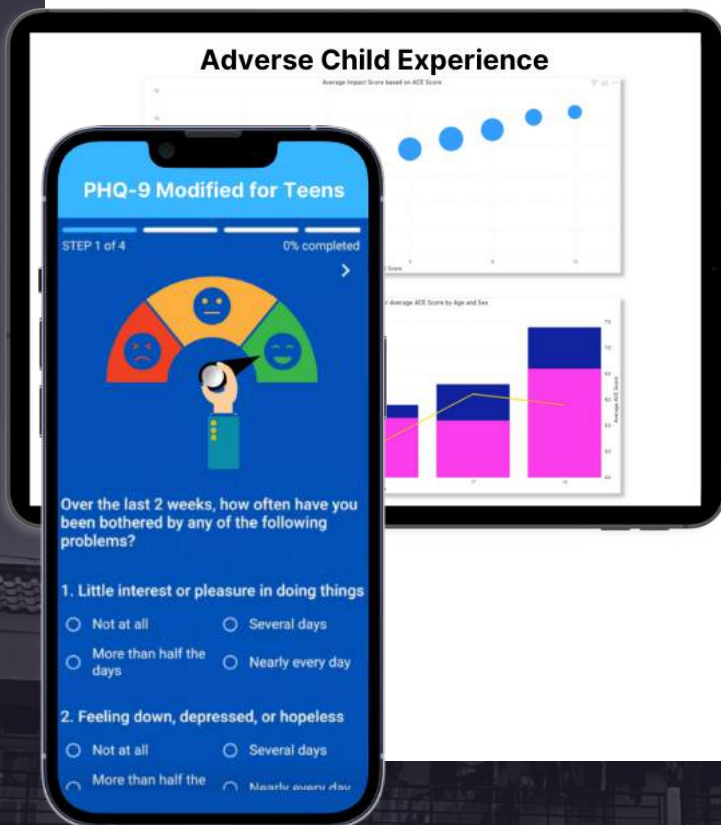
- User: "David Wilson Wilson" with a search icon and a close button.
- Case Id: An empty input field.
- Disease: A dropdown menu with a "Pick" button and a close button.
- Date Reported: "8/22/2021 9:48:11" with a calendar icon.
- Disease specific symptoms: A dropdown menu with "Select" as the current value.
- Other Symptoms: An empty input field.
- Reported By: "David Wilson" with a search icon and a close button.
- Sequelae: "No" with a dropdown arrow.
- EPID Reference Number: "52370436159".
- Case Classification: A section with "Investigation" and "Surveillance" sub-sections, each with an empty input field.



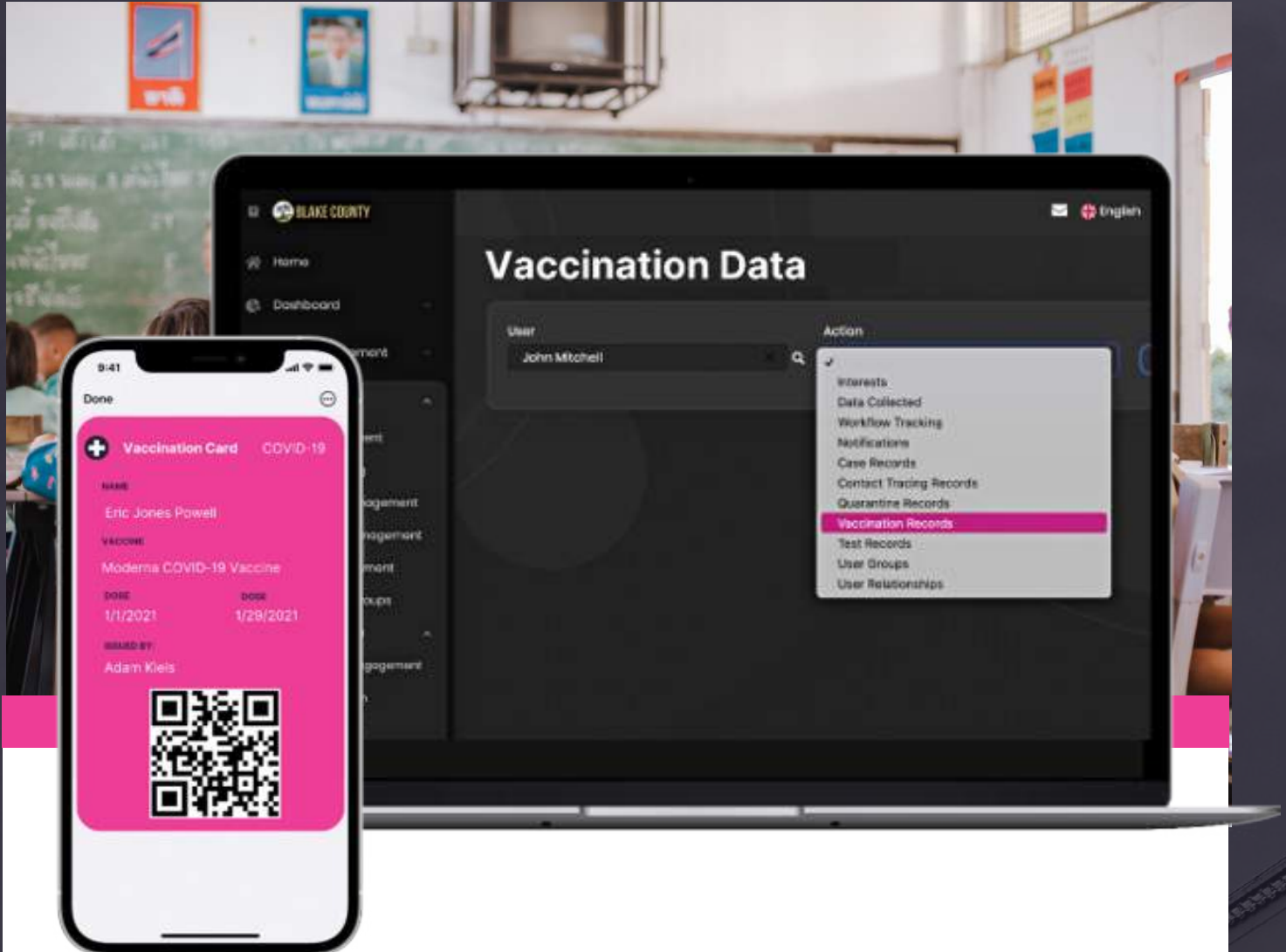
Recovery includes delivery of interventions such as cognitive behavioral therapy (CBT) and promotion of a variety of awareness campaigns to promote healthy behaviors and prevent risk factors. More importantly, such interventions require monitoring of outcomes and periodic evaluation of their effectiveness to ensure adequate recovery. Assessing children for Adverse Childhood Experiences (ACE) and its impact on their education, physical and behavioral health is critical in understanding and addressing care gaps.



Creating a digital health profile for children that provides information regarding vaccinations, past medical illnesses, allergies, and others can be pivotal in understanding need for tailored interventions.



Conducting enforcement activities is not limited as a response to pre-existing conditions among the child population, but also to sanitary codes, creating a healthy environment in school, promoting activities, as well as timely follow-up on hazards, preventable injuries, and exposure related diseases identified in community settings. Here again, the technology can come to the rescue by replacing phone calls, in-person inspections and paper-based documentations with customizable inspection and compliance tools, online referrals to other agencies, and telehealth counseling could be made available for organizations to adequately deploy successful policy and interventions.



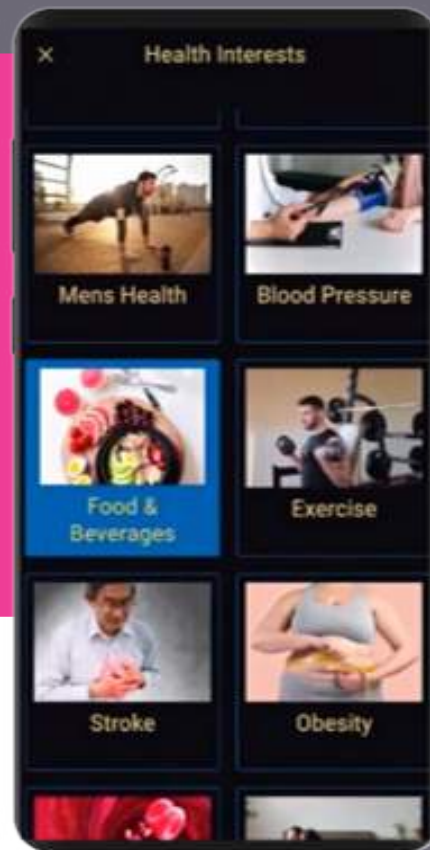
Recovery includes delivery of interventions such as vaccines and/or therapeutics which still requires monitoring of vaccine outcomes, such as the need for revaccination or boosters, detecting early potential disease outbreaks from existing or new variants, and measuring case seasonality, among others. In regions, vaccination certificates and even immunity passports may be required to help circumvent travel restrictions for “certified” individuals. This requires integration with state, local and national vaccination registries and testing data, and sharing this information securely when needed.

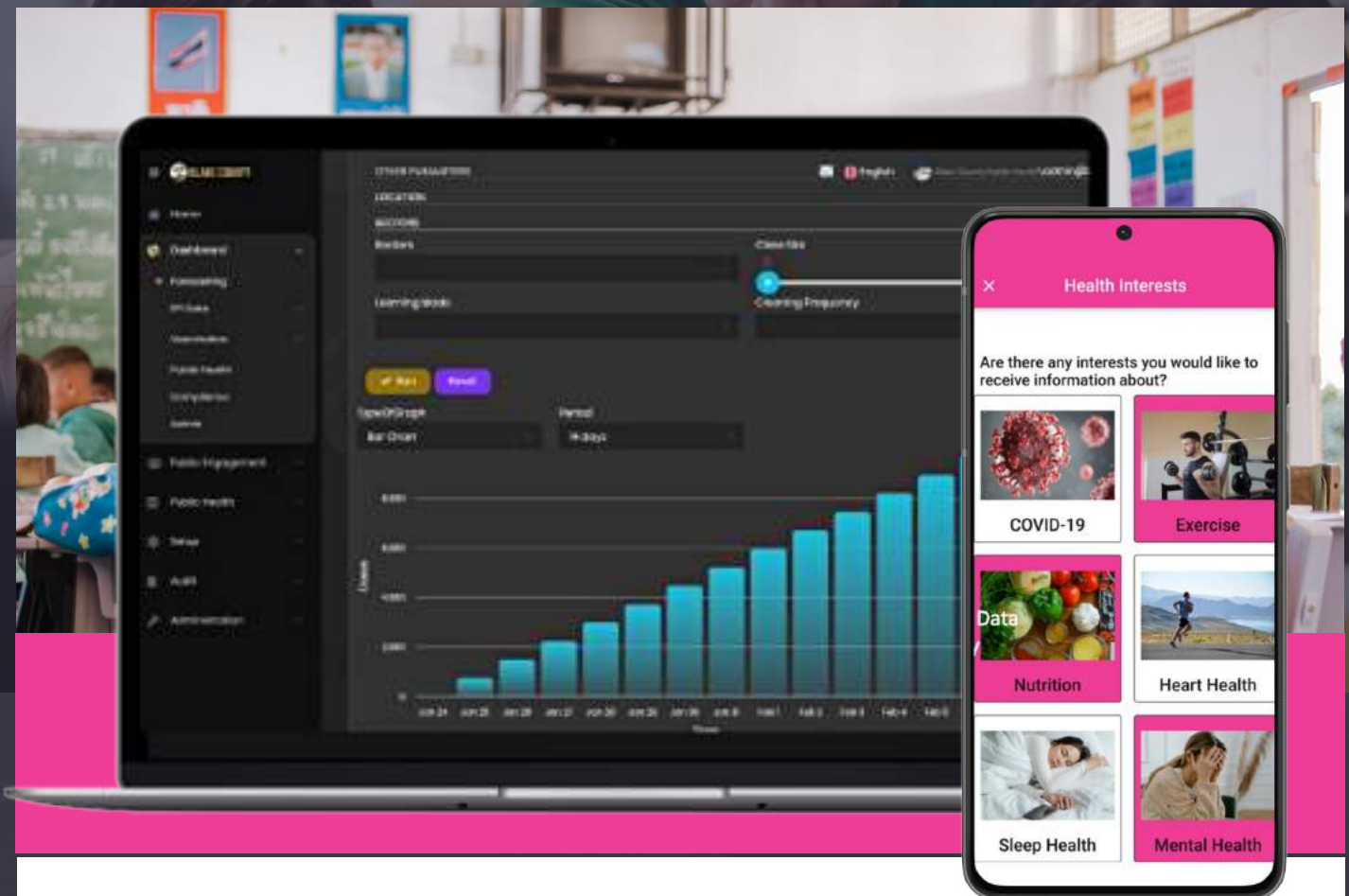
Unique to the child population is the process of habit formation. Interventions aimed at behavioral health often persist with children and constitute a foundation for long-term behavioral change, exemplifying the importance of intervening adequately, timely, and effectively. A study conducted at 40 elementary schools involving 8000 children and 400,000 child-day observations reported that short-run interventions (e.g., 5 weeks) to promote healthy eating produced long-term changes in behavior that persisted after the intervention was removed.

Perhaps the most important lesson we have learned during these repeated waves of COVID-19 variants affecting our communities is that health priorities shift rapidly.

Consequently, schools need a more holistic approach for public health measures within their premises. School's "health monitoring" efforts do not stop merely when a wave of infection subsides. Rather, school's need to have an infrastructure in place ready to intervene to prevent other health outcomes from deteriorating, especially given the vulnerability of the children population.

To better build resiliency and prevent undesired health outcomes among children, schools must place further emphasis on prevention. Replacing the current "reactive" approach with "upstream" prevention can go a long way. This may be achieved through a variety of strategies. There are many facets of prevention including hiring and training resources, infrastructure, and technology adoption. It will allow for timely sharing of relevant information and with students, parents, and teachers to help keep schools open safely and to help students achieve the emotional, psychological, and educational benefits of in-person learning. This includes evidence-backed information with students in areas such as wellness, chronic diseases, and mental health.





There are components of technology, such as data and 'intelligent' content delivery, that can play a significant role. Powerful predictive analytics engines can be employed to prepare a proactive response to an emerging crisis. Regardless of the epidemiological situation within our environment, technology can be leveraged to deliver timely evidence-based health education and content. In turn, this can promote health behaviors that are in line with most recent public health recommendations within school environments. As part of more advanced strategies, groups with less access to healthcare outside schools can be selectively involved based on social determinants to address health disparities and support more uniform population well-being. It is of utmost importance that schools become aware of the social determinants of health for students and understand the unique living experience of students outside school, which heavily contributes to their health outcomes.



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Funding Availability and Use of Funds

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What Congressional Funding Means for K-12 Schools (FutureEd)

A spending plan that cleared Congress will provide \$42.6 billion for K-12 schools for the remainder of the fiscal year, an increase of \$2 billion from the past year with extra funding for schools serving students living in poverty, for mental health services and Community Schools programs.

State plans often gave insight into other initiatives like accessing high-quality curriculum, creating a welcoming and engaging school climate, implementing high-dosage tutoring, and improving data capacity by implementing early warning systems and other strategies.

- Support for student mental health, which Biden stressed in his State of the Union address, received a boost with:
 - \$111 million budgeted for mental health professionals in schools, up from \$16 million last year
 - \$55 million toward related demonstration grants, up from \$10 million last year
 - \$56 million for support school-based mental health services grants, up from \$11 million last year
 - \$82 million for social-emotional learning, up \$15 million from last year
- \$75 million for full-service Community Schools, up from \$30 million in fiscal year 2021 but far below the \$443 million sum Biden originally requested
- \$120 million for Project AWARE, an increase of \$13 million over last year in the Health and Human Services budget

For more information, please visit <https://www.future-ed.org/what-congressional-covid-funding-means-for-k-12-schools/>

How Much Will Congress Spend to Shore Up Schools

The Covid-19 relief plans before Congress all dedicate billions to stabilizing education budgets amid declines in state revenue. But the amounts vary from bill to bill.

FutureEd <small>EDUCATORS UNIVERSITY</small>	CARES Act Signed into Law March 2020	Covid Relief Package Signed into Law December 2020	American Rescue Signed into Law March 2021
Education Total	\$30.7 billion	\$82 billion	\$168 billion
K-12	\$13.2	\$54	\$122
Higher Ed	\$14	\$22	\$40
Governors	\$3	\$4	\$2.7

Use of Funds (Examples)

Some local and state education agencies are already investing in integrating health and safety in their schools.

Some examples of such investment in the following priority areas:

- **Invest in mental health, social and emotional needs** through screening, assessment, referrals, and monitoring to ensure that students have the supports to learn and thrive, including integrated physical and mental health and social services.
- **Provide health and wellness services**, including physical examinations, immunizations, hearing and visions screening.
- **Contact tracing, screening, and monitoring** at the district level including disseminating information to schools, students and families on safety and health.
- **Training for teachers and staff to detect mental health problems**, impact of trauma and toxic stress and related informed care and education to help build resiliency and to help students and families heal.
- **Modernize school and district information systems** to provide reporting tools empowering schools leaders and educators to support individualized needs of the students.
- **Improving COVID preparedness, coordination, and response** by implementing and automating procedures and processes to improve preparedness and response.
- **Provide access to an early warning system** to identify at-risk students, determine needed interventions, and address disproportionalities within student sub-populations.
- **Implement telehealth/teletherapy** to address student mental health concerns including youth suicides and other major high-risk behaviors.
- **Augment the state's data reporting system.** Collect, analyze, and report data in real time so that schools and health officials can react and respond to situations quickly to outbreaks and other crises.

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About Aztute

Aztute is a public health management solution for schools that helps schools deal with a health crisis like COVID-19 and mental health to keep the students safe and healthy while achieving the emotional, psychological, and educational benefits of in-person learning.

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