Modeling Cost and Outcomes of SARS-CoV-2 School Testing Programs

To the Editor We read with interest the article by Bilinski et al[1] modeling transmission outcomes and cost of SARS-CoV-2 school testing programs. It is crucial to understand the realities of screening and surveillance in kindergarten through 12th-grade (K-12) testing programs when determining value.

Screening and surveillance school testing programs offer unique challenges that should be considered in model development. Universal enrollment and rapid turnaround times improve efficacy of testing programs, yet enrollment is often limited in voluntary programs, and consistent access to rapid tests is not always available. In New York City public schools, fewer than 25% of students were enrolled in testing programs.[2] Accessing caregivers equitably to obtain consent can be difficult. More than 20% of US children speak a non-English language at home, and 5% live in limited-English-speaking households.[3] Consent forms must be multilingual with audio options for those with visual impairments or limited literacy. Explanations of who is performing the test, why testing is being performed, and how data will be used should be available to overcome misinformation and distrust. Low enrollment fails to effectively capture asymptomatic SARS-CoV-2 infection. Achieving 90% enrollment as proposed in the article[1] is likely not feasible for most K-12 US schools.

In publicly funded K-12 schools, the logistics of school testing programs are predominately determined by the state. Laboratory-based pooled testing with backup testing is sensitive and cost-effective when infection rates are low, but it is not universally available or useful during periods of high transmission. State testing plans include antigen with polymerase chain reaction (PCR) backup, school-based pools requiring subsequent individual tests of positive pools, and individual PCR.[4] PCR turnaround times are often more than 24 to 48 hours, with virus surges and deconvoluting positive pools contributing to additional result delays, limiting the effectiveness in curbing transmission.[5]

Lastly, school-based testing programs require personnel to locate and identify students; perform tests; follow up with results; notify families, state agencies, and health departments; and perform contact investigations. School nurses are primarily responsible for COVID-19 testing and related duties in addition to their normal role of caring for sick children, administering medications for chronic conditions, and ensuring routine vaccines and screenings for students. The cost of school-based testing programs should include dedicated personnel so that testing does not take away from the care that school nurses provide.

All school-based testing programs require additional resources, time, and finances. As we move into the next school year, we recommend that policy makers consider the real-world costs of COVID-19 school-based testing programs in decision-making.

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In Reply We thank Schuster et al for providing important context about school testing programs in response to our article.[1] We wholeheartedly agree that schools, particularly those with English-language-learning and low-income student populations, have faced logistical barriers in implementing testing programs and that these challenges need to be considered in schools' decisions about the role of testing.

Members of our study team have worked closely with school districts and state programs to implement and evaluate school-based SARS-CoV-2 testing and screening programs throughout the COVID-19 pandemic. We have observed many of the challenges highlighted by Schuster et al, including high costs and staff time commitment associated with screening programs,[2] limited assay sensitivity or specificity and difficulties in reflex testing of pooled samples with fast turnaround time,[3] and reduced return on investment when community COVID-19 cases are low.[4] Nevertheless, in our experience, some schools, including those with diverse student bodies, smoothly navigated testing logistics during the 2021 to 2022 school year with intensive efforts from parents, administrators, and nursing teams. In other settings, we used the article's[1] modeling results to advise against a focus on screening testing when expected uptake was low. Looking forward, to the extent that there remains a need for school testing in the coming year—for example, to minimize disruption during future waves, especially if new variants of concern arise—we

are optimistic that widespread availability of rapid tests can substantially simplify school testing efforts, allowing home-based testing without laboratory involvement.

In the context of these challenges, we believe that modeling studies play an important role in understanding the potential impact of health interventions, both direct and downstream, if implemented at varying levels of uptake, and weighing whether health intervention benefits may be worth financial and human resource costs. However, model results provide only part of the information needed for decision-making, with other considerations including equity, feasibility, prioritization of key populations, and political will. We believe that the results of our study[1] and the experience of Schuster et al both lend support to well-founded pleas for better resources to support school-based health interventions.

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Misconceptions About Youth Weight Lifting

To the Editor We read the article entitled "Physical Activity in Children" by Michel et al[1] with great interest. The authors described troubling trends in youth physical activity that have worsened with the recent COVID-19 pandemic. We concur with the authors that different types of physical activity, including aerobic exercise (eg, jumping rope), muscle strengthening exercise (eg, push-ups), and bone strengthening exercises (eg, playing hopscotch), offer unique health and fitness benefits to children. Among several recommendations, the authors rightly emphasize the need to include all 3 types of exercise in a child's routine for at least 60 minutes per day. However, the authors state that weight lifting (eg, strength training with dumbbells and barbells) is "not appropriate for younger children because the strain may be too high for developing muscles, tendons, and bones."[1] This is far from the truth.

Abundant and growing evidence from the American Academy of Pediatrics and other organizations underscores the safety and efficacy of weight lifting for children.[2,3] Well-designed weight lifting programs have no apparent negative effect on linear growth and may actually have a favorable influence on musculoskeletal health.[2,3] Notably, ground reaction forces that children are exposed to during simple jumping activities may be far greater in both exposure time and magnitude than weight lifting exercises.[4] Misinformation propagates the traditional myth that weight lifting is inappropriate for children and may discourage some parents from supporting their child's participation in weight lifting activities at a time when today's youth are weaker than previous generations.[5]

Since muscle strength underpins many of the biomotor qualities that are needed to engage regularly in exercise and sport activities, an approach to youth physical activity that begins early in life (about age 5 to 7 years) and includes muscle strengthening exercises using different modes of resistance training can help to prepare children for the demands of active play, recreation, physical education, and sport.[2,3] The planned manipulation of program variables (eg, exercises, sets, repetitions, and load) along with developmentally appropriate instruction from qualified fitness professionals can help optimize adaptations and reduce activity-related injuries. There is a need to build consensus between pediatric caregivers and pediatric exercise professionals about weight lifting for children. This effort should be guided by a shared vision on how to tackle worrisome trends in youth physical inactivity and dispel the myths associated with youth weight lifting.

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