



Perspective

HISTORY OF MEDICINE

Vaccinating Children against Covid-19 — The Lessons of Measles

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Imagine a highly contagious virus circulating in the community. Many infected children have fever and some general misery but recover without incident. Rarely, devastating complications occur,

leading to hospitalization, severe illness, and occasional deaths. Susceptible adults fare worse, with higher rates of poor outcomes. Would you want your child vaccinated against this disease?

You guessed we were talking about measles, right?

As the first SARS-CoV-2 vaccines are rolled out to the highest-risk groups, the current stage of the Covid-19 pandemic is pregnant with possibility. Even as cases multiply and new restrictions loom, we gaze longingly toward the next few months, hoping vaccines will deliver us. Vaccination could liberate us to return to school or work, celebrate holidays, eat in restaurants, travel, run marathons, and [fill in your own

deprivations]. Early announcements of vaccine efficacy send stocks soaring, and suddenly everyone knows about phase 3 trials and cold-chain logistics. We look to vaccines to give us back our world.

Children back in classrooms, on soccer fields, and at birthday parties are essential elements of that normal world — and we need children to help us get there. Since nearly a quarter of the U.S. population is under 18 years old — and the percentage is significantly higher in many other countries — effective herd immunity will require pediatric vaccination. Vaccinating children is likely to have benefits both direct (protecting children against rare

severe pediatric cases of Covid-19 and postinfectious conditions such as multisystem inflammatory syndrome in children [MIS-C]) and indirect (protecting others by reducing spread).¹ Those “indirect” benefits also reduce the family toll of parental illness, failing economies, and chronic stress.

So we need to think creatively and empathically about what motivates parents to accept vaccination for their offspring. How do the conversation and the stakes change when children are not themselves at highest risk? What do we owe children and their families for helping to protect the rest of us?

Robust safety data, including pediatric-focused studies and postlicensure monitoring for potential rare outcomes such as vaccine-associated MIS-C, are a bare minimum, as is ensuring just and equitable access to vaccination. Societal decision making that

prioritizes children's needs, including keeping schools open and safe, would be another step in the right direction. Flexible sick-leave policies, widespread access to testing, and financial support for parents, teachers, and other caregivers would help protect families in this stressful time. We must minimize children's risk, maximize their chances of returning to school, and mitigate the pandemic's effects on their families.

Measles and measles vaccination campaigns may offer relevant insights about parents' decisions regarding vaccinating children they don't believe are at serious risk; about trust, access, and equity; about using education campaigns and vaccination mandates to advance public health goals; and about how targeted disinformation about a safe and effective vaccine can endanger public health.

Measles is so highly infectious that it was once nearly universal in childhood. The Centers for Disease Control and Prevention (CDC) estimates that before a vaccine was available, the U.S. measles burden was several million cases a year, with 400 to 500 deaths, 48,000 hospitalizations, and 1000 cases of encephalitis. A measles vaccine developed by John Enders and colleagues was licensed in 1963. Because measles has no nonhuman reservoir, it seemed a feasible target for eradication, and in 1966 U.S. Surgeon General William Huffman Stewart called for eliminating measles in the United States by 1967 as a step toward global eradication. A CDC publication, *Measles Eradication 1967*, suggested that a public health victory of historic proportions was at hand: "Never before has the eradication of an important communicable disease been

readily within reach." President Lyndon Johnson publicly supported the campaign, as did medical and school health organizations, and Ann Landers columns and *Peanuts* cartoons urged the public to vaccinate.

Parents had volunteered their children as "polio pioneers" in 1950s vaccine trials, and the result — that the Salk vaccine was safe and effective — was celebrated as a national victory over a dread disease. But most children survived measles without serious sequelae. So the National Association for Retarded Children emphasized rare, severe complications with their 1966–1967 poster child, Kim Fisher, a 10-year-old who had developed measles encephalitis at 2 and been left "mentally retarded, hard of hearing, unable to walk, talk, or hold up her head." It wasn't only parents who needed convincing; a 1965 editorial in *JAMA* worried that many physicians didn't take the disease seriously.²

The campaign reduced the incidence of measles but did not eradicate it. With the vaccine more readily available to children cared for by physicians in private practice, measles became disproportionately a disease of Black and Hispanic children. CDC officials blamed insufficient federal funding under President Richard Nixon, and there was growing support for stronger laws requiring immunization for school entry.³

The measles–mumps–rubella (MMR) vaccine was licensed in 1971, replacing monovalent vaccines for the three diseases. Mumps and rubella posed the same challenge of convincing parents (and some physicians) to vaccinate children against diseases that didn't pose deadly dangers to most children. One of us vividly remembers the "rubella um-

brella" campaign of the late 1960s and early 1970s, which advertised directly to children using television "commercials" formulated by Dr. Vincent Guinée of the New York City Health Department. It encouraged children to get protected so they wouldn't spread the virus to pregnant women who were vulnerable to rubella's serious teratogenic effects; the message to children was so effective that more than 17,000 parents called, and the approach was extrapolated for use in other public health campaigns.⁴

Using MMR, and buoyed by the success of school vaccination mandates in controlling measles outbreaks, in 1978 the CDC set a goal of eliminating measles in the United States by 1982. Again, the campaign reduced cases dramatically but didn't meet the target date. Outbreaks among vaccinated children led to a recommendation for an MMR booster, and by 2000, endemic measles had been eliminated in the United States. Yet that victory has not held; the famous 2014–2015 Disneyland outbreak was followed by others, including a series of 2019 outbreaks involving more than 1000 cases in 28 states.

Since a now-discredited and retracted article suggesting a link between MMR vaccine and autism was published in the *Lancet* in 1998, media attention and parental anxiety have been deliberately exacerbated by antivaccine activists and organizations, despite extensive research that has failed to find any verifiable link to neurodevelopmental disorders. Many recent outbreaks have involved children left unvaccinated by parents who had been targeted with propaganda, including antivaccine messages developed to target specific ethnic communities. This

disinformation entails both lies about dangers and impurities of the vaccine and false reassurance about the benign nature of measles. The downstream effects are global, with plateauing vaccination rates and rising measles mortality after decades of progress. Ongoing measles transmission in regions with fragile immunization systems can seed outbreaks elsewhere, including in countries like the United States, with pockets of under-vaccination despite high overall vaccination rates.

Today, many Americans express mistrust regarding the safety of Covid-19 vaccines. This attitude is unsurprising in an environment where mask wearing is politicized and loud voices on social media express doubt about the severity — or even existence — of SARS-CoV-2. But the measles vaccine story reminds us that we have an obligation to provide equitable access and clear information; that coordinated, federally supported efforts are essential; and that doubt, distrust, and disinformation can undermine safe, effective vaccines and worthy public

health initiatives. Planning for the implementation of SARS-CoV-2 vaccination requires not only working out details of distribution, priority, and cold chains, but also strategies for reaching people who are distrustful, hesitant, dubious, or frankly opposed.⁵

Protecting children against SARS-CoV-2 infection is both an ethical obligation and a practical necessity. We need data from pediatric trials to reassure parents about the safety and wisdom of this approach. We must prepare for disinformation campaigns that prey on parental fears and target communities made vulnerable through histories of medical neglect, health disparities, and racism. Trusted messengers may help deliver truth and reassurance. And we need to consider lessons from recent measles epidemics — not only about the power of legislative mandates, but also about their potential for sowing distrust if delivered without careful, sensitive, accurate public health messaging. Dare we imagine a campaign that would actually thank children and parents

for helping to protect others, as the rubella campaign did, perhaps suggesting that they proudly display their SARS Stars or Corona Diplomas?

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