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Perspective

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Mass-Vaccination Sites — An Essential Innovation to Curb the Covid-19 Pandemic

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Although the speed of development and evaluation of SARS-CoV-2 vaccines has far exceeded expectations, initial deployment lagged. By January 11, 2021, for instance, the United States had distributed 22.1 million doses but administered only 6.7 million vaccinations; most countries that have obtained vaccines have had similar struggles with delivery.[1] Many mass-vaccination plans relied on leveraging existing community-based health care sites to administer vaccines: clinics, pharmacies, and local governmental public health clinicians. The use of conventional health care sites, however, is not sufficient to achieve rapid enough vaccination to stop the pandemic. A hybrid approach using conventional vaccination sites and high-throughput, large-venue mass-vaccination sites — stadiums, arenas, convention centers — has proven essential.

Covid-19 vaccination poses several specific challenges that complicate the traditional reliance on primary care delivery. First, vaccinating the entire population requires mass outreach, but in many countries, such outreach is not a primary care capability, and in the United States, at least a quarter of residents lack a primary care provider.[2] Second, an unprecedented volume of patient enrollment and scheduling is required to open access to the public, but few electronic health record systems are enabled for patient-friendly self-enrollment. And rapidly integrating new vaccine-administration software systems site by site is exceedingly challenging.

Third, routine medical vaccinations rely on having a shelf-stable standby supply in order to permit providing vaccination as a convenient add-on to existing appointments. The current scarcity of vaccine supply means every last dose in multidose vials must be used, and limited allocations need to be directed to high-priority groups. Fourth, recipients of two-dose vaccines all need to have their second dose scheduled, and there must be follow-up for no-shows.

Fifth, the need for physically distanced observation for 15 to 30 minutes after vaccination, including maintaining capacity for treatment of acute anaphylaxis, challenges smaller practices that have limited space and clinical staffing. Sixth, cold storage requirements for the first approved vaccines (–20°C for Moderna and, originally, –70°C for Pfizer) and security against theft are major challenges for most physician practices.

Seventh, the limited reimburse-

ment for vaccinations may prevent smaller practices from developing financially viable models for administering these vaccines outside existing visits. For instance, the current Medicare reimbursement rates, $17 for a first dose and $28 for a second, are not enough to cover the setup costs of meeting these requirements if volume is limited.

Mass-vaccination sites offer a logical solution that addresses each of these challenges. In recent weeks, many such venues have opened in the United States — such as at Gillette Stadium in Massachusetts, Dodger Stadium in California, and State Farm Stadium in Arizona. Israel, Italy, the United Kingdom, and Germany have set up mass-vaccination sites in locations such as stadiums, arenas, skating rinks, cathedrals, town squares, and museums. These early adopters have yielded several lessons that are critical to achieving population-wide vaccination.

One lesson is that partnerships that draw on innovation and expertise from outside health care are valuable. For example, the mass-vaccination site at Gillette that we are involved with brings together experts who can address all aspects of vaccine delivery: customer journey and experience designers, systems engineers, medical directors, informaticists, clinical and nonclinical staffing and scheduling experts, emergency medical services professionals, infection-prevention officers, and communications specialists. The work of all these experts is coordinated by a health care logistics and operations start-up, CIC Health, that launched at the pandemic's outset to accelerate mass coronavirus testing capacity.[3] When a South Carolina drive-through vaccine clinic became backed up, leaving people waiting for hours, a fast-food drive-through manager was contacted to rapidly assess and improve vaccination-site throughput.[4] Washington State has partnered with Starbucks, Microsoft, and Costco to enhance operations, including by building a mock vaccination site to test flows and identify bottlenecks.[5] These unusual partnerships should be closely coordinated with long-standing community stakeholders and receive appropriate oversight from public health officials.

In addition, high-throughput sites provide opportunities for rapid iteration and improvement, with all stakeholders learning together as they build and implement vaccination sites. At the CIC sites at Gillette Stadium, Fenway Park, and the Reggie Lewis Athletic Center, for example, teams include observers and unit leaders dedicated to capturing real-time issues, identifying trends, and brainstorming solutions that can be integrated immediately. Varied staffing sources and patterns necessitate frequent, consistent communication to mitigate risk. Regular debriefing sessions are essential for incorporating workflow changes using a rapid-improvement-cycle framework. Modest changes can have substantial effects on queuing, vaccinee experience, staffing needs, and supply utilization. For example, at Gillette Stadium, by simply turning registration desks 45 degrees to allow registrars to see queuing guests and vaccinators simultaneously, operators shortened the average time from registration to vaccination and reduced staffing needs for line captains to direct guest flow.

Community acceptance, accessibility, and equity must be addressed from the outset. Trusted community leaders can be engaged through existing coalitions and open town hall–style forums to both improve planning and disseminate key initiatives. Call centers, for both incoming and outgoing calls, have enabled scheduling of appointments for people with technology or language barriers. Site planning can result in vaccine delivery at a diverse range of locations; in the Boston metropolitan area, for instance, large venues were opened in various communities to enable access by highway, public transportation, bicycle, and walking. Concerted efforts can be made to coordinate with local communities and public officials to reach underserved populations, ensure that these populations have access to scheduling, and increase equity. Publicity campaigns that are coordinated with public health officials and that include trust brokers — community leaders, elected officials, clergy, athletes, and celebrities getting vaccinated — may help overcome vaccine hesitancy in higher-risk communities. In addition, opening up familiar, sometimes iconic venues for vaccination can make for a positive experience, as vaccinees walk the grounds and take selfies that, when posted on social media, can amplify a message of vaccine confidence.

Staffing must be addressed from the outset. Clinicians, administrators, and essential workers in many health care systems have been stretched beyond their breaking points. Alternative sources of staff — home nursing agencies, the National Guard, ambulance companies, students, and other allied health professionals — are being used at various sites.

These groups can and should be called on to serve as vaccinators and support staff.

Finally, mass-vaccination sites should be part of an overall plan, rather than operating independently. State, regional, and local officials should convene public and private stakeholders for vaccine-site planning meetings aimed at a coordinated, effective, and comprehensive vaccination deployment plan. These stakeholders should include community liaisons and publicly appointed officials from various sectors — public health, health care systems, and operators of mass-gathering sites. Planning meetings should produce tactics for managing variations in vaccine supply and a coordinated vaccination-site approach that supports equitable vaccination deployment throughout a designated catchment area.

We have no recent precedent for our current need to vaccinate entire countries and ultimately the world in order to end a global public health emergency. Although mass-vaccination centers require new partnerships to provide skills and staff that health systems rarely have, they are proving to be an essential component of the effort. Eventually, as the pandemic comes under control, such sites will shut down. Nonetheless, planning should begin now to secure the capacities, infrastructure, and lessons learned for future pandemics and potential application to aspects of broader health care delivery.

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