

# Vaccinating the Masses During a Pandemic: Learning in Real Time for Tomorrow

Heather M. Brandt, PhD

## ABOUT THE AUTHOR

Heather M. Brandt is the director of the HPV Cancer Prevention Program and full member in the Department of Epidemiology and Cancer Control at St. Jude Children's Research Hospital, Memphis, TN.

See also [McColloch et al., p. 909](#).

Since March 2020, the COVID-19 pandemic has challenged the established public health infrastructure and systems in the United States and spurred innovation to meet the demands of the pandemic. The pandemic traversed phases of building awareness, securing personal protective equipment, ramping up of testing and surveillance, and launching treatment. The vaccination phase was rolled out beginning in late 2020 in the United States. We witnessed remarkable and exciting developments in efforts to slow and stop the pandemic in the form of COVID-19 vaccines. Many years of previous research, including past developments in mRNA vaccines and knowing how to sequence severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), led to the ability to develop and test vaccines for safety and effectiveness quickly in response. Distribution of COVID-19 vaccines was unprecedented on a global scale and posed implementation challenges that exceeded public health preparedness and planning.<sup>1</sup> There were several aspects of COVID-19 vaccination programs that should promote stronger preparation for the future.

McColloch et al. (p. 909) examined implementation of COVID-19 vaccinations at high-throughput—or mass—vaccination sites to understand how these sites implemented federal guidance and captured promising practices to inform similar sites now and in the future. The authors evaluated 134 high-throughput COVID-19 vaccination sites and community vaccination clinics across 30 immunization programs in the United States. The resulting promising practices centered on six themes:

1. addressing health equity,
2. leveraging partnerships,
3. optimizing site design and flow,
4. communicating through visual cues,
5. using quick response codes, and
6. prioritizing risk management and quality control.

These promising practices offer insight into the ways in which our implementation planning and execution can be improved in the future. However, we need more publications, reports, and sharing of lessons learned to be better prepared in the future. We also need to consider the role of vaccines, equity, and available, rigorous methods to ensure we are better prepared.

## UNLIKE PREVIOUS VACCINES

Effective and efficient vaccine implementation is contingent on supply, delivery, storage, and administration in consideration of the context and conditions of implementation. It was clear that we would be unable to rely on the usual health care delivery system for COVID-19 vaccines in the United States.<sup>2</sup> The first two available COVID-19 vaccines were not the same as seasonal influenza, smallpox vaccine, or polio vaccines of past mass vaccination campaigns. As one example, the storage requirements of the two mRNA vaccines initially limited the settings in which people could access vaccines and posed implementation challenges. However, these challenges were addressed through coordinated planning between the US Centers for Disease Control and Prevention (CDC), Federal Emergency Management Agency, and state and local public health departments and immunization programs. In addition, the administration requirements of COVID-19 vaccinations during this first phase of rollout fostered novel partnerships, such as with a fast-food chain manager in South Carolina<sup>3</sup> who was called in to assist with logistics of a mass vaccination site, and applications of Lean principles and tools in Florida to improve efficiency and productivity and accelerate vaccination coverage<sup>4</sup> through mass vaccination efforts. The circumstances demanded a level of creativity unlike previous vaccination campaigns.

## ENSURING VACCINATION FOR ALL

Vaccines in cold storage or a refrigerator do little good if people are unvaccinated. "Vaccines don't save lives; vaccinations save lives"<sup>5</sup> is a simple, yet powerful, way

to convey merely having a vaccine—or in this case vaccines—available does not equal receipt. The so-called “last mile” of vaccine development is actual delivery in the form of vaccinations. According to the most recent COVID-19 vaccinations in the US data from the CDC,<sup>6</sup> 81.4% of people have been vaccinated with at least one dose, 69.5% have completed the primary series, and 17.0% have had the updated (bivalent) booster dose. There is great variation by geographic region and among certain population groups. What has overwhelmingly been highlighted in each phase of the pandemic and since initial introduction of the vaccines is the inequitable burden members of groups and populations that have been minoritized, marginalized, and underserved have faced in terms of disease burden (including death), lack of access to risk mitigation, and now vaccination.<sup>7</sup> If we want to understand these observed differences in vaccination coverage, we must invest in understanding factors influencing vaccination and plan accordingly with our efforts.<sup>8</sup> Equity must be fundamental to every action we undertake to ensure vaccination for all.

## APPLYING IMPLEMENTATION SCIENCE TO THE LAST MILE

The National Cancer Institute definition of implementation science is “the study of methods to promote the adoption and integration of evidence-based practices, interventions, and policies into routine health care and public health settings to improve the impact on population health.”<sup>9</sup> COVID-19 vaccination, an evidence-based intervention, offered us a highly effective approach to prevent serious disease, hospitalizations, and deaths. We know what to do

and what health outcomes we can influence. However, going from “what” to outcomes is not linear and is not a path free of barriers.

We know myriad factors across multiple levels influence how we get from “what” to health outcomes. We may know “what” we want to implement, and we may know the outcome we want to achieve. It is what lies between “what” and health outcomes that is less well understood and studied—and it is the “how” part of the process or the strategies we use to get what we know works into widespread practice. The “how” is the piece that speaks to implementation strategies,<sup>10</sup> and the synergistic influences of inner and outer settings in which the “what” may be implemented. This is where implementation science comes into play. In this case, capacity, disinformation, vaccination hesitancy, and implementation processes and outcomes, such as supply of vaccines, funding and other resources, equity and inclusion, messaging and communication, and access points factored in to how we were able to deliver on the last mile.

The COVID-19 pandemic significantly stressed public health systems around the world and exposed gaps in health care for underserved and vulnerable populations. Public health system preparedness is paramount for protecting the health of all. This will require intentionality and advanced planning, including engaging those who have not historically been a part of the process and employing ingenuity. Mass vaccination approaches were highly acceptable<sup>11</sup> and have largely disappeared two years after introduction in the United States. Implementation science offers us a rigorous way to understand and accommodate key determinants in our implementation

strategies to yield optimal levels of vaccination for all. We must invest resources to ensure we have the public health capacity to convert vaccines to vaccinations rapidly in the future. We can do this by acting now to improve access to vaccinations during the booster phase (and first dose for some) by meeting people where they are, helping people make informed decisions, and building confidence and trust in vaccinations through effective and trusted messaging. It is a matter of when, not if, we will face the next pandemic. It is up to us—as a global public health community—to facilitate and support information sharing and engage in courageous conversations about what worked well and what did not and who was left behind in the process. **AJPH**

## CORRESPONDENCE

Correspondence should be sent to Heather M. Brandt, PhD, Director, HPV Cancer Prevention Program, St. Jude Children's Research Hospital, 262 Danny Thomas Place, Memphis, TN 38105 (e-mail: heather.brandt@stjude.org). Reprints can be ordered at <http://ajph.org> by clicking the “Reprints” link.

## PUBLICATION INFORMATION

Full Citation: Brandt HM. Vaccinating the masses during a pandemic: learning in real time for tomorrow. *Am J Public Health*. 2023;113(8):836–838. Acceptance Date: May 23, 2023. DOI: <https://doi.org/10.2105/AJPH.2023.307358>

## ACKNOWLEDGMENTS

This publication was supported by the American Lebanese and Syrian Associated Charities (ALSAC) of St. Jude Children's Research Hospital.

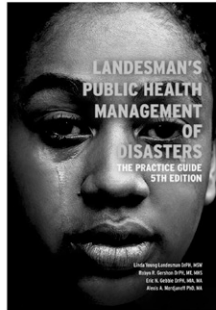
## CONFLICTS OF INTEREST

The author reports no conflicts of interest.

## REFERENCES

1. Wilensky GR. 2020 revealed how poorly the US was prepared for COVID-19 and future pandemics. *JAMA*. 2021;325(11):1029–1030. <https://doi.org/10.1001/jama.2021.1046>
2. Goralnick E, Kaufmann C, Gawande AA. Mass-vaccination sites—an essential innovation to curb the COVID-19 pandemic. *N Engl J Med*. 2021;384(18):e67. <https://doi.org/10.1056/NEJMp2102535>

3. Fowler H. Chick-Fil-A manager lends drive-thru skills to COVID vaccine site in South Carolina. *The State*. January 27, 2021. Available at: <https://www.thestate.com/news/state/south-carolina/article-248803035.html>. Accessed May 21, 2023.
4. Froman MN, Walser MP, Lauzardo M, Graban M, Southwick FS. Applying Lean principles to create a high throughput mass COVID-19 vaccination site. *BMJ Open Qual*. 2022;11(1):e001617. <https://doi.org/10.1136/bmjopen-2021-001617>
5. Orenstein W. Vaccines don't save lives. Vaccinations save lives. *Hum Vaccin Immunother*. 2019; 15(12):2786–2789. <https://doi.org/10.1080/21645515.2019.1682360>
6. Centers for Disease Control and Prevention. COVID data tracker. US Department of Health and Human Services. Available at: <https://covid.cdc.gov/covid-data-tracker>. Accessed May 21, 2023.
7. Labgold K, Hamid S, Shah S, et al. Estimating the unknown: greater racial and ethnic disparities in COVID-19 burden after accounting for missing race and ethnicity data. *Epidemiology*. 2021;32(2): 157–161. <https://doi.org/10.1097/EDE.0000000000001314>
8. Cunningham-Erves J, George W, Stewart EC, et al. COVID-19 vaccination: comparison of attitudes, decision-making processes, and communication among vaccinated and unvaccinated Black Americans. *Int J Environ Res Public Health*. 2023;20(4): 3481. <https://doi.org/10.3390/ijerph20043481>
9. National Cancer Institute. About implementation science. Available at: [https://cancercontrol.cancer.gov/is/about#:~:text=Implementation%20science%20\(IS\)%20is%20the,our%20impact%20on%20population%20health](https://cancercontrol.cancer.gov/is/about#:~:text=Implementation%20science%20(IS)%20is%20the,our%20impact%20on%20population%20health). Accessed May 21, 2023.
10. Proctor EK, Landsverk J, Aarons G, Chambers D, Glisson C, Mittman B. Implementation research in mental health services: an emerging science with conceptual, methodological, and training challenges. *Adm Policy Ment Health*. 2009;36(1): 24–34. <https://doi.org/10.1007/s10488-008-0197-4>
11. Danek S, Büttner M, Krois J, Schwendicke F. How do users respond to mass vaccination centers? A cross-sectional study using natural language processing on online reviews to explore user experience and satisfaction with COVID-19 vaccination centers. *Vaccines (Basel)*. 2023;11(1):144. <https://doi.org/10.3390/vaccines11010144>



SOFTCOVER, 100 PAGES, 2021  
ISBN 978-0-87553-312-6

 APHABOOKSTORE.ORG

## Landesman's Public Health Management of Disasters: The Practice Guide, 5th Edition

By: Linda Young Landesman, DrPH, MSW; Robyn R. Gershon, DrPH, MT, MHS; Eric N. Gebbie, DrPH, MIA, MA; Alexis A. Merdjanoff, PhD, MA

This new edition is both a comprehensive textbook and an essential tool for those who have a role in disaster management. Every chapter now includes extensive sections on Covid-19 covering all of public health's responsibility as it relates to a pandemic.

 **APHA PRESS**  
AN IMPRINT OF AMERICAN PUBLIC HEALTH ASSOCIATION