Reducing Vaccination Disparities During a National Emergency Response: The US Mpox Vaccine Equity Pilot Program

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ABSTRACT

Context: In response to the first reported mpox cases in May 2022, the US government implemented plans to bring testing, treatment, and vaccines to communities disproportionately affected by mpox—including the population of men who have sex with men (MSM) and Black/African American and Hispanic/Latino men, 2 subpopulations experiencing vaccination disparities. We describe the development and implementation of the US Mpox Vaccine Equity Pilot Program (MVEPP), characteristics of completed vaccination projects, and challenges that occurred. We also discuss opportunities for reducing vaccination disparities in future outbreaks.

Program: To address reported vaccination disparities, the US government launched MVEPP in 2 phases. Phase 1 centered around public events attended by large numbers of gay, bisexual, and other MSM, such as Pride festivals. Phase 2 asked health departments to propose mpox vaccination projects specifically aimed at reducing or eliminating racial/ethnic and other demographic disparities in mpox vaccination.

Implementation: MVEPP received 35 vaccination project proposals. We analyzed data from 22 completed projects that resulted in 25 675 doses of JYNNEOS administered. We note 3 innovative strategies that were implemented in several projects: direct collaboration with organizations providing services to MSM and transgender women; implementation of MVEPP projects in unique nonclinical community settings and at venues frequented by MSM and transgender women; and offering an array of services as part of mpox vaccination projects, rather than offering only mpox vaccination.

Evaluation: MVEPP highlighted the importance of recognizing and working to eliminate racial/ethnic and other disparities in access to medical countermeasures during a public health emergency. Jurisdictions developed and implemented innovative strategies to bring mpox vaccination and related services to communities disproportionately affected by mpox—including MSM and the subpopulations of Black/African American and Hispanic/Latino MSM. Lessons learned from MVEPP may inform efforts to reduce disparities during future public health responses.

KEY WORDS: disparities, mpox, vaccine equity

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Mpox, a smallpox-like infectious disease caused by an Orthopoxvirus, is endemic in several countries in the regions of Central and Western Africa.[1] Typically, a person with an mpox infection experiences a febrile prodrome—which might include headache, fatigue, and muscle aches—followed by a characteristic painful and visible rash that may spread throughout the body and may progress into scabs that facilitate person-to-person transmission.[2,3] Mpox outbreaks have been linked to direct exposure to infected animals and animal products.[3,4] In the US, the 2022-2023 mpox outbreak disproportionately affected cisgender men who have sex with men (MSM), Black/African American (Black) and Hispanic/Latino (Latino) subpopulations of MSM, and transgender and gender-diverse adults[5] and was characterized by the presentation of genital, anal, and oral skin lesions.[6]

The US government responded to the outbreak with a government-wide approach to getting testing, treatment, and vaccine to affected communities.[7] It immediately made 2400 doses of JYNNEOS—a vaccine indicated for prevention of smallpox and mpox—available to health departments (HDs) from the Strategic National Stockpile. Shipments of JYNNEOS were sent to jurisdictions within 5 days of the first reported cases in the nation.[8-10] Because of limited supplies, the US mpox vaccine strategy prioritized vaccination for people after exposure to someone with known or presumed mpox infection initially and later expanded to include people considered at high risk for exposure—such as people who had multiple sex partners, sex in a venue where there was known to be mpox exposure, or sex in an area where mpox was spreading.[11]

Mpox Vaccination Disparities

Health disparities are defined as "preventable differences in the burden of disease, injury, violence, or opportunities to achieve optimal health that are experienced by populations that have been disadvantaged by their social or economic status, geographic location, and environment."[12] An analysis of mpox cases in the United States from May 17, 2022, to July 22, 2022, showed that men accounted for 99% of cases and MSM accounted for 94% of cases among men.[13] Data on race and ethnicity were available for 93.7% of the 30 531 cases reported to the Centers for Disease Control and Prevention (CDC) as of June 28, 2023, and 91.6% of the 1 237 235 first and second doses reported to CDC as of June 27, 2023.[14] Black persons accounted for 33% of cases but only 12% of first and second doses administered. Hispanic persons accounted for 31% of cases but only 23% of first doses and 21% of second doses administered. A comparison of the vaccination-to-case ratios for White, Black, and Hispanic males also showed a disparity: White males had 43 vaccine doses for every 1 reported mpox case, but Black males had only 9 per case and Hispanic males had only 17 per case.[15] The vaccine coverage shortfall (difference between 100% coverage and reported first-dose coverage) was largest among Black persons (78%), with slow progress to close this gap through April 2023.[16]

Physical access, mistrust, racism, stigma, misinformation, and other structural and attitudinal barriers that have contributed to disparities in COVID-19 vaccination rates[17,18] may have also contributed to mpox vaccination disparities experienced by Black and Hispanic men.

Approach

To address vaccination disparities, the US government launched the first phase of the Mpox Vaccine Equity Pilot Program (MVEPP) on August 18, 2022, with an invitation for HDs to request vaccine for mpox vaccination projects at public events attended by large numbers of MSM, such as Pride festivals. The second phase of MVEPP was launched on September 16 with an invitation for HDs to request vaccine supply for mpox vaccination projects aimed at reducing specific racial, ethnic, and other demographic disparities in mpox vaccination. Vaccine obtained through MVEPP supplemented the US government's allocation of vaccine to HDs from its Strategic National Stockpile.

CDC led the development, promotion, and coordination of MVEPP in collaboration with the White House National Mpox Response Team, the US Department of Health and Human Services, the Administration for Strategic Preparedness and Response (ASPR), and the Indian Health Service (IHS). In this article, we describe the development and implementation of MVEPP, characteristics of completed vaccination projects, challenges that occurred, and opportunities for reducing vaccination disparities in future outbreaks.

Overview of MVEPP

The 50 state HDs and the HDs of Chicago, Houston, Los Angeles, New York City, Philadelphia, the District of Columbia, and Puerto Rico were eligible to request vaccine from MVEPP, and the program also sought and accepted proposals from tribal nations. Eligibility was limited to these entities because they were able to order vaccine directly from the Strategic National Stockpile. They could then distribute vaccine to

local HDs, community-based organizations (CBOs), and other partners who signed provider agreements. HDs are responsible for planning jurisdictional strategies for vaccine distribution based on data about the populations most affected by mpox in their local area. Also, HDs are often well-positioned to develop and maintain effective working relationships with potential partners for vaccination such as CBOs, business owners, health care providers, and other groups that serve populations affected by mpox.

HDs learned about MVEPP primarily through CDC staff who serve as liaisons with HDs on COVID-19 and other public health emergencies, as well as CDC e-mail distribution lists to partner organizations, webinars, standing calls, and social media. CDC staff often emphasized the importance of addressing disparities among Black and Hispanic gay, bisexual, and other MSM as well as transgender persons who have sex with men.

Although HDs were not required to partner with CBOs to submit proposals for vaccination projects, CDC emphasized the benefits of collaboration in numerous communications. CBOs and other local partners are often well-positioned to provide effective support for planning and implementing health promotion activities because of their rapport with disproportionately affected populations. When CBOs and other local partners contacted CDC to express interest in receiving vaccine, we connected them to contact persons in their respective HDs and deferred to HDs on decisions about whether to provide vaccine supply to those partners.

In addition to providing comprehensive information about MVEPP eligibility and the application process on its Web site, CDC created an Mpox Vaccine Equity Toolkit with a section of health equity considerations and information about the importance of nonstigmatizing and culturally appropriate communication.[19] Health equity considerations included engaging with diverse partners that have a history of trust among affected populations to plan, promote, and implement vaccination projects; offering multiple convenient opportunities and times to be vaccinated, including evenings and weekends; minimizing the use of systems that are first come, first served; and implementing interventions that prioritize populations less able to access vaccines.

HDs submitted MVEPP proposals using an online form to specify proposed project dates and venues, the goal number of persons to vaccinate, marketing plans, vaccine administration plans, partners, and whether the HD was proposing to focus on 1 or more populations experiencing vaccination disparities, which we referred to as priority populations. CDC required that HDs agree to comply with the Mpox Vaccination Program Provider Agreement, manage their vaccine supply securely, and promptly enter administration data into the jurisdiction's Immunization Information System (IIS), which was then shared with CDC for analysis. Reported IIS demographic variables included sex, race, ethnicity, and date of birth. To minimize burden and for program monitoring purposes, after completion of each vaccination project, CDC encouraged but did not require HDs to email the number of doses administered by age, sex, race, and ethnicity.

MVEPP staff reviewed proposals for completeness, feasibility, collaboration, and how well the proposal addressed jurisdiction-specific priority populations. In some instances, staff offered suggestions aimed at strengthening the proposed approach. Staff approved most proposals within 48 hours. Given the ongoing need to reduce disparities, MVEPP did not have a deadline, a maximum number of proposals that could be submitted by a jurisdiction, or a maximum number of doses that could be allocated to a jurisdiction. MVEPP was limited to providing vaccine supply and technical assistance because dedicated grant funds for mpox vaccine administration were not available at the time. However, the MVEPP Web site provided information about federal agencies' approvals for HDs to integrate mpox-related activities into existing grant budgets for programs such as COVID-19 vaccination and prevention of HIV and other sexually transmitted infections.

Results

From August 2022 to February 2023, when the program was closed, MVEPP received 35 proposals. All were approved except one proposal, which was for a project that concluded before the application was submitted. Of the 34 approved projects, 5 were subsequently withdrawn because of event cancellations or other reasons, 3 were implemented but the HD later decided not to receive vaccine from MVEPP, 2 were not yet completed at the time of this report, and 2 did not result in vaccinations. Data from the 22 remaining projects—2 led by tribal organizations and 20 led by HDs—are included in the Table. We grouped these 22 projects into 3 categories based on the priority populations described in each proposal. Category 1 includes all projects with Black and/or Hispanic MSM as the priority population (n = 7). Category 2 (n = 12) includes all projects that had a focus on lesbian, gay, bisexual, transgender, and more (LGBT+) persons, except those that had already been assigned to category 1. All remaining projects were assigned to category 3 (n = 3). We acknowledge that these categories do not capture the diversity of jurisdictions' priority populations. For example,

TABLE

Completed Mpox Vaccination Projects That Received a Supply of JYNNEOS Vaccine as Part of the US Mpox Vaccine Equity Pilot Program in Response to the 2022-2023 Multicountry Mpox Outbreak, by Selected Characteristics

	Total			Category 1: Projects With a Focus on Black/African American MSM and/or Hispanic/Latino MSM		Category 2: Projects for Mpox Vaccination in the LGBT+ Population Generally		Category 3: All Other Mpox Vaccination Projects	
	Number of Projects	Doses[a]	Doses per Project	Number of Projects	Doses[a]	Number of Projects	Doses[a]	Number of Projects	Doses[a]
Total	22	25 675	1 167	7	5 914	12	18 884	3	877
By venue type									
Bar, club, or community center	4	91	23	1	44	3	47		
Clinic or hospital	2	814	407					2	814
Festival or Pride event	11	24 160	2 196	3	5 326	8	18 834		
Other or more than one type	5	610	122	3	544	1	3	1	63
By geographic region[b]									
West	11	13 637	1 240	3	1 374	6	11 449	2	814
South	9	12 007	1 334	4	4 540	4	7 404	1	63
Midwest	2	31	16			2	31		
Northeast									
By project starting month in 2022									
Aug	2	4 826	2 413	1	4 282	1	544		
Sep	11	19 973	1 816	5	1 574	4	17 585	2	814
Oct	8	818	102			7	755	1	63
Nov	1	58	58	1	58				

Abbreviations: LGBT+, lesbian, gay, bisexual, transgender, and more; MSM, men who have sex with men.

[a] *JYNNEOS vaccine is administered in 2 doses.*

[b] *Vaccination projects were grouped into the 4 regions of the US Census. Because Puerto Rico is not included in the 4 US Census regions, we assigned it to the South region. The Northeast region includes Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont. The Midwest region includes Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin. The South region includes Alabama, Arkansas, Delaware, the District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Virginia, West Virginia, Tennessee, and Texas. The West region includes Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.*

one project involved vaccination in a detention center. The Table does not present demographic characteristics of vaccine recipients because several HDs did not provide these data to MVEPP. An analysis of these characteristics using IIS data is planned.

A total of 25 675 doses of JYNNEOS were administered through these 22 projects. Most doses were administered from projects in category 1 (5914 doses or 23% of total) and category 2 (18 884 doses or 74% of total). Festivals and Pride events accounted for 94% of the total (24 160 doses), followed by projects in clinic or hospital settings (814 doses or 3% of total). Bars, clubs, and community centers accounted for less than 1% of the total (91 doses). Projects in other venue types and projects with more than 1 venue type accounted for 2% of the total (610 doses).

We grouped MVEPP projects into the 4 US Census regions and assigned Puerto Rico to the South region. Projects in the West region accounted for 53% of all doses administered (13 637 doses), followed by projects in the South region (12 007 doses or 47% of total). Two projects were implemented in the Midwest region (31 doses or <1% of total), and none in the Northeast region.

Half of the MVEPP projects began in September, and these 11 projects accounted for 78% of doses administered (19 973 doses). This coincided with large festivals and Pride events that occurred that month, as demand for vaccine was high following the peak of the outbreak in early August 2022.

We highlight 3 noteworthy strategies that several HDs implemented to address issues of equity and disparity. First, several HDs collaborated with organizations that provide services to MSM and transgender women including community centers, organizations that provide HIV testing services, volunteer groups, and more. Staff of such organizations often have firsthand knowledge about how best to mitigate barriers that MSM and transgender women face in accessing needed services. In a webinar CDC hosted about mpox and vaccination disparities, staff at a county HD that did not participate in MVEPP described how they vaccinated hundreds of Black and Hispanic MSM by partnering with CBOs that serve these populations. The HD allowed the CBOs to make vaccination appointments directly for their clients, rather than requiring clients to go through the "first come, first served" appointment scheduling system.

Second, it is noteworthy that several HDs proposed implementing MVEPP projects in unique nonclinical community settings and at venues frequented by MSM and transgender women. In addition to festivals and Pride events, this included plans for vaccination at a ballroom community event, venues where there is intimate contact, bars, community centers, drag pageants, leather competitions, and hangout spots.

Finally, several HDs offered an array of services as part of their mpox vaccination projects, rather than mpox vaccination alone. This includes projects that offered vaccination for COVID-19, influenza, and hepatitis A and B; on-site testing for HIV; information about how to access pre-exposure prophylaxis for prevention of HIV; and free resources such as condoms, at-home HIV test kits, and COVID-19 test kits.

MVEPP projects implemented as part of the Atlanta Black Pride Weekend[20] and the Southern Decadence festival[21] are described in detail elsewhere. In addition to those projects, CDC's Web site includes a section of "Stories from the Mpox Response," with information about MVEPP projects implemented in Hawaii, Puerto Rico, Washington, and North Carolina.[22]

Challenges, Opportunities, and Suggestions

We note 5 challenges faced during implementation of MVEPP and offer suggestions for mitigating those challenges in anticipation of future mpox outbreaks. We identified these challenges based on feedback, vaccine administration aggregate totals, and other information received from HDs and other partners; our analysis of MVEPP project proposals; and our notes from HD post-event debriefing presentations to CDC.

The first challenge was that most MVEPP proposals did not prioritize Black MSM and/or Hispanic MSM—the populations most disproportionately affected by the outbreak—although these were emphasized throughout program communications. Acknowledging the diversity of each state, staff reviewed all proposals with an eye toward approval regardless of whether they focused specifically on these populations. We suggest that partners anticipate and prioritize disparities in all aspects of public health emergency preparedness and response. For example, training for outbreak preparedness could include information about the importance of quantifying and monitoring racial/ethnic and other disparities throughout all stages of outbreak response, identifying the drivers of those disparities, and partnering with trusted members of affected populations to implement strategies aimed at eliminating those disparities. Also, CDC project officers may be able to connect grantees with capacity-building service providers that have expertise reaching populations that are disproportionately affected during an outbreak.

The second challenge was that many CBOs and other local partners wanted to implement vaccination projects, but only HDs were eligible to submit

MVEPP proposals. We encourage federal partners and HDs to consider developing straightforward and efficient processes through which CBOs and other organizations may request mpox vaccine from their jurisdiction during future outbreaks, subject to local needs, capacity, and circumstances. Planning ahead for such outbreaks, CDC could collaborate with HDs and other partners to address the technical assistance needs of organizations that may want to offer mpox vaccines to their clients.

The third challenge is that some projects resulted in far fewer persons vaccinated than what the HD had anticipated. This includes 3 projects with fewer than 18 recipients conducted primarily in bars, clubs, and community centers and 2 festival projects with fewer than 5 recipients. Some of these HDs reported challenges with scheduling vaccinators to work afterhours, limited space for vaccination in some venues, and declining demand for vaccine. We recommend that CDC work with HDs and other partners to identify effective strategies for vaccinating populations that are experiencing disparities and encourage partners to integrate such strategies into their emergency preparedness plans.

The fourth challenge involves concerns expressed by some HDs, CBOs, and other partners about injection site skin reactions that may result from intradermal administration of JYNNEOS[23,24] and how these reactions could stigmatize recipients if their acquaintances make assumptions about their sexual behavior. In response, CDC communicated that, although intradermal administration was preferred in the context of the outbreak because it increased the number of available doses of JYNNEOS up to 5-fold, subcutaneous administration should be used if patients have a history of keloid scarring. CDC also updated its guidance to provide 2 alternative, less conspicuous sites for intradermal administration—the deltoid area and the upper back below the scapula—for patients who prefer not to get vaccinated at the standard site, which is the inner side of the forearm.[25] As stated in the Mpox Vaccination Program Provider Agreement, "Public health jurisdictions and health care providers should decide whether to offer the intradermal or subcutaneous regimen based on balancing optimal vaccine use and acceptance, feasibility of administration, and available vaccine supply."[26] Recognizing that stigma contributes to health disparities, we recommend that CDC and partners continue efforts to minimize stigma in all aspects of public health emergency preparedness and response.

The fifth challenge is that several HDs decided not to submit proposals because MVEPP did not provide funding for vaccination activities and because integrating vaccination costs into their existing budgets was not feasible. In a survey conducted by the National Association of County and City Health Officials with 106 respondents, approximately 1 in 3 local HDs listed mpox-specific funding as one of the challenges they were facing in responding to the outbreak.[27] The CDC Foundation responded to this challenge with a November 10, 2022, request for applications for the "Reducing Disparities in Mpox Vaccination" program to fund mpox vaccination projects aimed at reducing disparities.[28] Also, CDC activated its 2022 Public Health Crisis Response Cooperative Agreement to award funding to 21 jurisdictions on December 16, 2022, and 53 jurisdictions on January 31, 2023.[29] In anticipation of future outbreaks, CDC could promote awareness of the strategies that some HDs used to integrate mpox activities successfully into their existing program budgets and the barriers faced by HDs that could not do so. Also, partners could consider strengthening their public health emergency preparedness plans with contingencies for situations where outbreak-specific funds are not available—such as working with funders to integrate medical countermeasures into existing program budgets.

Discussion

MVEPP demonstrated the ability of federal agencies and partners to identify and respond to disparities during a public health emergency. MVEPP was launched nationally to improve vaccine equity by increasing the availability of vaccine supply to HDs, providing technical support to implement vaccination projects, and promoting collaborations with community groups that serve populations most affected by mpox. MVEPP projects had a diverse range of demographic groups prioritized for vaccination throughout several regions of the country.

Some MVEPP projects involved noteworthy strategies for dissemination of mpox vaccination services and prevention information. This includes working with trusted members of the LGBTQ+ community and the organizations that serve this population to promote awareness of the importance of vaccination and administer vaccine in a nonstigmatizing manner.[30] Projects at events attended by the LGBTQ+ population were unique opportunities for vaccinating a substantial number of people, although Black and Hispanic MSM were not the primary attendees at all such events.

As part of outbreak preparedness and emergency planning, public health partners should continue to anticipate disparities, work to understand their drivers, and develop plans to reduce those disparities through equitable allocation of medical

countermeasures and effective engagement with a diverse group of vaccine providers including CBOs, where feasible. This includes continuing to form mutually beneficial working relationships with local partners who are trusted by members of disproportionately affected populations, especially leaders of CBOs, social networks, and venues that are frequented by the population. Since disparities typically arise during outbreaks and other public health emergencies, partners are encouraged to have strategies in place to ensure needed health services, including vaccines when available, will reach disproportionately affected populations. Federal agencies can also anticipate that local, state, territorial, and tribal HDs and CBOs will need additional resources—such as funding to implement vaccination projects—delivered to them quickly through mechanisms that are easy to navigate. CDC can also support HDs by collaborating on strategies for communicating how CBOs and other local partners are able to receive a rapid shipment of mpox vaccine.

One of the primary strengths of the program was its quick development and implementation within a national public health response. The innovative approaches designed and led by participating HDs demonstrated potential for addressing vaccination disparities. For example, providing vaccines at large public events was a sound strategy for reaching a substantial number of people and remains a promising option for future public health emergencies. Although MVEPP was a relatively small program with only 35 proposals received, 22 projects completed, and 25 675 doses administered, projects often had indirect positive characteristics such as the ability to promote awareness about mpox in settings frequented by MSM and transgender women. Because of the small number of project proposals received, findings from this program cannot be generalized to the many other mpox vaccination activities that HDs implemented during this outbreak. Whether projects implemented as part of MVEPP impacted rates of mpox vaccination among disproportionately affected populations in each jurisdiction is also not known.

Conclusion

MVEPP highlighted the importance of recognizing and working to eliminate racial/ethnic and other disparities in access to medical countermeasures in the context of a public health emergency. Jurisdictions developed and implemented innovative strategies to bring mpox vaccination and related services to communities disproportionately affected by mpox—including MSM and the subpopulations of Black and Latino MSM. In anticipation of future outbreaks, it will be important for CDC and its partners to continue strengthening collaborations with CBOs, HDs, and other local and national organizations and continue addressing unmet needs for capacity-building services for public health emergency preparation.

Implications for Policy & Practice

- During the 2022-2023 mpox outbreak, HDs collaborated with diverse public health partners to reduce disparities in mpox vaccine administration using a variety of strategies aimed at serving disproportionately affected populations—especially African American/Black and Hispanic/Latino gay, bisexual, and other MSM.
- Public health partners that participated in MVEPP communicated challenges they were facing and provided helpful feedback that can inform approaches for mitigating vaccination disparities during future infectious disease outbreaks.
- In anticipation of future outbreaks, public health partners can strengthen collaborations and work to address unmet needs for capacity-building services for public health emergency preparedness.

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