



Perspective

Monkeypox — A Sobering Sentinel for Pandemic Preparedness and Sexual Health System Capacity

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Between May and mid-October 2022, clinicians diagnosed more than 72,000 cases of monkeypox in 102 countries that aren't typically affected by the virus (see map).¹ This new pandemic

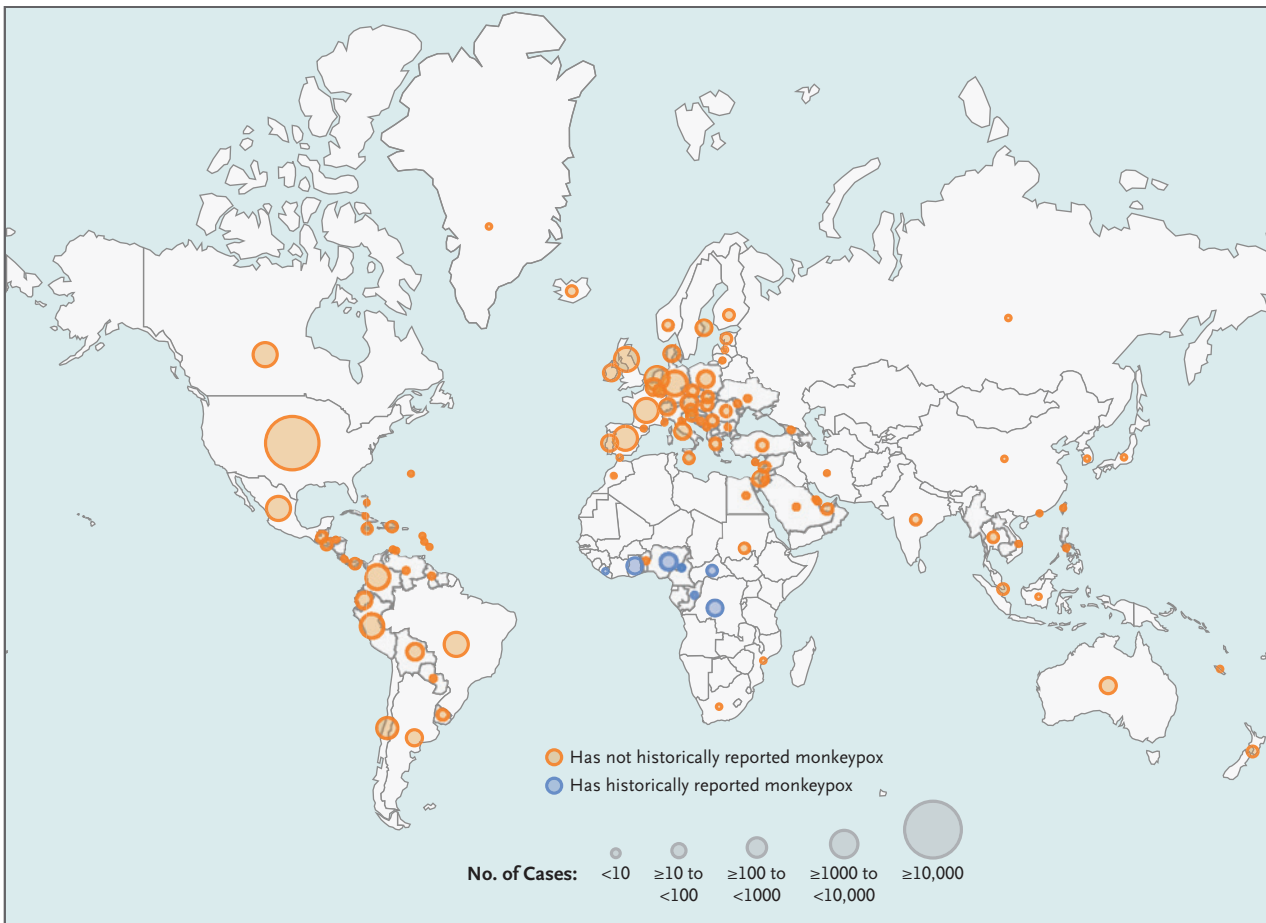
has strained public health and health care systems already battered by Covid-19. It has also highlighted lessons learned — and sometimes ignored — from HIV and Covid-19 and has illustrated the inadequacy of sexual health infrastructure and pandemic preparedness in the United States.

In the current pandemic, we strongly believe monkeypox should be considered a sexually transmitted infection (STI).² The virus can be isolated from semen and rectal and oral fluids, and most patients have presented with anogenital or oropharyngeal lesions, frequently in association with HIV or other STIs.^{2,3} Whether to categorize monkeypox as

an STI has been a controversial question. Although recent monkeypox epidemics in sub-Saharan Africa have been characterized by genital ulcers in some patients and a shift in the affected population from children to young adults, little attention has been focused on sexual transmission, despite calls from African investigators to explore this issue.⁴ The virus is also transmissible through nonsexual contact with lesions, possibly through contact with the mucosa of infected persons without lesions, and, much less commonly, through fomites and perhaps respiratory secretions.

The common tendency to categorize infections as either STIs or not STIs is overly simplistic.

Many common STIs can be transmitted through nonsexual contact, and people with some STIs, such as syphilis, commonly present with nongenital lesions. Human papillomavirus, HIV, herpes, syphilis, and potentially gonorrhea are transmissible through modes of contact other than vaginal, anal, and oral sex. Conversely, many infections that aren't typically classified as STIs can be transmitted through sex (e.g., shigella, Zika, and Ebola). The current monkeypox pandemic probably wouldn't have occurred in the absence of sexual transmission — unlike the recent Ebola or Zika epidemics, for example — and people can substantially reduce their risk of monkeypox by changing their sexual behavior. We therefore believe it's appropriate to consider monkeypox an STI while acknowledging that not every case is sexually transmitted and not



Distribution of Monkeypox Cases by Country in the 2022 Pandemic.

From the Centers for Disease Control and Prevention.¹ Data are as of October 17, 2022. The size of the circles reflects the relative number of cases in each country.

every monkeypox epidemic is driven primarily by sex.

Monkeypox-related public health communications have proven similarly controversial. The current pandemic is concentrated among men who have sex with men (MSM), including those who have HIV or are using preexposure prophylaxis for HIV. Among U.S. cases for which data are available, 98% have been in people assigned male sex at birth, and 93% have been in gay or bisexual men.⁵ Some public health officials and community representatives have expressed concern that communications high-

lighting the concentration of monkeypox in this population are stigmatizing. This fear is well founded, given widespread discrimination against MSM. Both the HIV and Covid-19 pandemics, however, have demonstrated the necessity of providing the public with clear and accurate information, which equips people and communities at increased risk to protect themselves. Moreover, the commitment to providing complete, accurate information in partnership with affected communities is essential to maintaining the public's trust. The fight against HIV was shaped by

leaders in the MSM community who demanded truth and transparency. We believe the monkeypox pandemic similarly demands clear communication. Scientists should also be humble and communicate uncertainty. We don't know how this pandemic will evolve. Monkeypox could expand to other populations, including women from marginalized groups, or become endemic. The public needs to know about these possibilities and their implications.

Lessons from Covid-19 have informed the monkeypox response. Early in the monkeypox pandemic, access to care was

limited by inadequate supplies of tests and vaccines, burdensome approval processes for testing, and onerous paperwork requirements to obtain treatment. Progress in addressing these problems has been rapid. Commercial laboratories scaled up monkeypox PCR testing, and federal agencies reduced the barriers to tecovirimat access. Many regions have strengthened components of their public health systems in the wake of Covid-19. Surveillance systems are better; communication within health departments and among health departments, the Centers for Disease Control and Prevention, health care organizations, and the public has improved; many health care organizations are better prepared for public health emergencies; and infrastructure for managing and administering vaccines is stronger. Although the U.S. monkeypox vaccine supply was initially inadequate, scale-up of intradermal immunizations, which require smaller quantities of vaccine than subcutaneous injections, has expanded the effective supply.

Other lessons haven't been learned. Pandemics have increased in frequency, severity, and scale, yet public- and private-sector institutions remain inadequately prepared for them. Research shows that the effects of pandemics typically concentrate over time in vulnerable and marginalized populations, thereby amplifying inequities. U.S. monkeypox cases have increasingly been concentrated among Black and Latinx people, yet the United States hasn't adequately invested in developing and implementing innovative strategies for reaching these groups early — the wise approach from economic, political,

moral, and disease-control perspectives. Moreover, it's clear that the best biomedical tools, such as vaccines and antivirals, must be implemented alongside policies and programs that help people reduce their risk and use these tools effectively. Yet policymakers and communities are often slow to adopt these interventions.

Research and experience also show that protecting Americans requires supporting pandemic prevention and control in low- and middle-income countries, where most pandemic pathogens emerge. But the United States has done little to strengthen surveillance systems and provide equitable access to monkeypox (and Covid-19) testing, treatment, and vaccines in such countries. Although high-quality data are necessary to inform clinical and public health decision making, the United States hasn't done enough to integrate research efforts with pandemic preparedness and response — a conclusion supported by the lack of definitive efficacy data for both the JYNNEOS vaccine and tecovirimat, the primary biomedical interventions for monkeypox.

Finally, the U.S. monkeypox response has been hampered by inadequate public health infrastructure. Public health agencies don't have sources of funding that can be deployed rapidly in an emergency for case investigation, contact tracing, disease surveillance, community vaccination events, and related activities. Emergency response requires an adequately resourced, stable, well-trained public health workforce that can be activated rapidly.

The new pandemic has also highlighted the inadequacy of

the country's sexual health infrastructure. Before the Covid-19 pandemic, the three most common reportable diseases in the United States were STIs. STIs resulted in nearly \$16 billion in direct medical costs in 2018. In King County, our sexual health clinic — the only one in the state — is the largest clinical site for diagnosing and treating monkeypox in Washington State. We rapidly scaled up vaccination activities to immunize approximately 350 patients per day, nearly all of them MSM or transgender people. Many sexual health clinics throughout the country have taken similar initiatives. But many cities have virtually no specialty sexual health services. This gap has implications that extend beyond monkeypox. It undermines our ability to address rapidly increasing rates of congenital syphilis in the United States and prevents us from fully capitalizing on scientific advances to control HIV.

Sexual health clinics are essential, but effective STI control requires integrating public health systems and approaches, the wider health care system, and the efforts of affected communities. Although women and children bear the brunt of long-term consequences from STIs, infections such as HIV, syphilis, gonorrhea, and monkeypox disproportionately affect MSM and transgender people. Addressing this disparity requires systematically asking all patients about their gender identity, sexual orientation, and sexual behavior; recording this information in fields that can be queried in secure electronic health records; and using the resulting data to provide high-quality STI care, including

delivery of vaccines, testing, treatment, and preexposure prophylaxis to people who need them. It also requires engaging with communities to reach Black and Latinx MSM and forming partnerships to develop outreach activities and clinical infrastructure that meet the needs of the most affected populations.

The number of new monkeypox cases in the United States and many other countries is now decreasing. But it's too early to declare victory. Public- and private-sector leaders must also learn from this new pandemic. Coming on the heels of Covid-19 and more than 40 years of HIV-control efforts, the monkeypox pandemic is another sentinel

event that highlights the urgent need to build and sustain public health and clinical infrastructure that strengthens pandemic prevention and response and enables us to confront the growing STI epidemics effectively.

Disclosure forms provided by the authors are available at [NEJM.org](https://www.nejm.org).

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