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## Mpox (Formally Known as Monkeypox)

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# Mpox (Formally Known as Monkeypox)



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## KEYWORDS

- Mpox (Monkeypox) • Smallpox • *Orthopoxvirus* • Transmission
- Clinical presentation • Prevention • Treatment • Outbreak

## KEY POINTS

- In late 2022, the WHO and CDC moved to change the name of Monkeypox to Mpox, to reduce racial stigma associated with the original name.
- Human Mpox, a zoonosis, originates from the Mpox virus, a double-stranded DNA virus, which belongs to the *Orthopoxvirus* genus of the Poxviridae family.
- The modes of transmission are currently limited to animal-to-human transmission and human-to-human transmission. It remains under investigation whether the virus can be transmitted through a sexual route via seminal or vaginal fluids; therefore, Mpox is not defined as a sexually transmitted infection.
- The clinical features of Mpox consists of a prodromal stage, consisting of fevers, headaches, myalgias, and lethargy; followed by a rash that evolves from macules, to papules, to vesicles, to pustules, to scabs, to depigmented scars; and with a distinguishing feature of severe lymphadenopathy.
- Since September 2022, there have been confirmed cases in 96 nonendemic countries with approximately 21,504 cases in the United States.

## INTRODUCTION: THE EPIDEMIOLOGY OF MPOX

Mpox originates from the Mpox virus, which belongs to the *Orthopoxvirus* genus of the Poxviridae family.<sup>1-3</sup> Other *Orthopoxvirus* species include the variola virus (the now eradicated smallpox virus), vaccinia virus (a virus used in the creation of the smallpox vaccine), and cowpox virus.<sup>1-3</sup> The identified clades consist of the West African clade and the Congo Basin clade, each with varying fatality rates of 1% and 10%, respectively.<sup>1-4</sup> Since the eradication of smallpox in 1980, the Mpox virus has emerged as the most relevant *Orthopoxvirus* infection in humans.

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The double-stranded DNA virus was first discovered in 1958 at a research facility in Denmark when a group of laboratory monkeys from Africa developed vesicular lesions, consequently terming the virus as "Mpox."<sup>1,2</sup> The name remains a misnomer because rodents, including squirrels and rats, account for the largest known reservoir for the disease, whereas monkeys are considered hosts for the disease, similar to humans.<sup>1</sup> The virus did not demonstrate animal-to-human zoonotic transmission until 1970, when a 9-month-old boy also developed vesicular lesions in Bukenda, now a province of the Democratic Republic of Congo.<sup>1-4</sup>

Since its discovery, the virus mainly had been contained within Central and West Africa with a limited number of cases elsewhere that were linked to either international travel through Africa or African animal imports.<sup>2</sup> The vaccinia virus provided cross-immunity to the recipients for Mpox. However, the cessation of vaccination efforts following the eradication of smallpox and zoonotic spillover contributed to the virus's continual re-emergence.<sup>3,4</sup> The once neglected zoonotic disease has recently garnered attention after outbreaks have been reported in 73 nonendemic countries, including the United States.<sup>5</sup>

## TRANSMISSION

The modes of transmission are currently limited to animal-to-human transmission and human-to-human transmission. Transmission from animal-to-human occurs through contact with an infected animal's skin lesions, bodily fluids, or respiratory droplets. The virus then enters the human body through a break in the skin barrier, the respiratory tract, or mucous membranes.<sup>1,2</sup> The virus then rapidly replicates at the inoculation site and disperses to nearby lymph nodes. Once infected, human-to-human transmission may subsequently follow. Direct transmission may occur through contact with skin lesions, bodily fluids, and respiratory droplets, whereas indirect transmission may occur through contact with infected materials, such as clothing or linens, because the virus survives outside the body for long periods of time.<sup>2,4</sup> There have also been cases of mother-to-child transmission through the placenta, known as congenital Mpox, contact during delivery, and close contact following the birth.<sup>2</sup>

It remains under investigation whether the virus is transmitted through a sexual route via seminal or vaginal fluids. Data do not definitively support this mode of transmission at this time.<sup>2,4</sup> Consequently, Mpox is not classified as a sexually transmitted infection. Lesions found on the perigenital, perianal, and perioral regions are a common occurrence in Mpox and skin-to-skin contact during sexual encounters can assist in transmission of the virus; however, it is important to emphasize that transmission can occur with nonsex-related lesions.<sup>4</sup>

## CLINICAL PRESENTATION

The disease characteristics of Mpox reflects that of the infamous smallpox in terms of symptom onset and dermatologic findings. Similarly to smallpox, the incubation period may last 7 to 21 days with a prodromal stage of pyrexia, cephalgias, myalgias, and lethargy.<sup>1,2</sup> The distinguishing feature from smallpox seems to be the associated lymphadenopathy. Lymphadenopathy affects more than 90% of patients with Mpox and presents either unilaterally or bilaterally, primarily affecting the postauricular, submandibular, cervical, axillary, and inguinal lymph nodes.<sup>1,4</sup> The smallpox-like rash appears 1 to 2 days following the onset of lymphadenopathy. The rash traditionally begins with an enanthem, a lesion that develops on the tongue or mouth.<sup>5</sup> Within 24 hours, a macular rash presents on the face and disseminates caudally to the rest of the body in a centrifugal distribution.<sup>1,5</sup> By the third day, the rash evolves into

maculopapular lesions, approximately 2 to 5 mm in diameter.<sup>4,5</sup> By the fourth and fifth day, the maculopapular lesions become vesicular.<sup>4,5</sup> The vesicles then turn into pustules over the course of 2 days and remain for approximately 5 to 7 days.<sup>4,5</sup> By the end of the second week, the pustules desquamate and scab. The scabs typically remain for 1 week before they resolve, leaving behind a depigmented scar.<sup>4,5</sup> The infectious period of Mpox remains until all of the scabs have fallen off.<sup>5</sup> However, the total duration of signs and symptoms may last 2 to 5 weeks in its entirety.<sup>1</sup>

Mpox presents more mildly with better-predicted outcomes compared with smallpox; however, the virus is not negligible. The fatality rate of Mpox ranges from 1% to 10% depending on the specific clade, primarily affecting children, young adults, and the immunocompromised.<sup>1,2,4</sup> In endemic countries, traditional risk factors for contracting the disease consist of being of the male sex, living in forested regions, being younger than 15 years of age, and never being inoculated with a smallpox vaccination.<sup>1</sup> In addition to fatality, numerous complications have been reported with Mpox, including secondary bacterial infections, sepsis, respiratory distress, bronchopneumonia, encephalitis, corneal infections with subsequent blindness, gastrointestinal involvement with emesis and diarrhea, and spontaneous abortions during pregnancy.<sup>1,3,4</sup>

## DIAGNOSIS

There are several factors to take into consideration when making the diagnosis. A few of the most important include the patient's risk factors, history, clinical manifestations, and possible exposures. By taking a thorough history and physical examination it can help focus on whether the patient is at high risk for having Mpox and can also help rule in or out other viral rashes. It is also important to consider the patient's vaccination history. This is helpful information in determining which laboratory test to perform and also determining their overall risk for developing the illness.<sup>6</sup>

Similar to other viral infections, there are several laboratory methods to diagnose the condition (**Table 1**). The most accurate diagnosis is performed from obtaining a culture of lesion material because the lesion material itself has the highest viral quantity. Fluid from a lesion or vesicle if available for collection is an efficient sample for testing, although dried crusts, the roof of a lesion, or blood are also acceptable options.<sup>7</sup> Once the lesion material is obtained, the most current guidelines recommend placing it in a dry, sterile tube as opposed to a viral transport media, and keeping the specimen cold.<sup>7</sup> Because of high accuracy and sensitivity, polymerase chain reaction is the preferable method of diagnosis. Several department guidelines require results to be reported to local and national health departments; as stated by the Centers for Disease Control and Prevention (CDC), positive results need to be reported within 24 hours.<sup>5</sup> It is extremely important that personnel handling specimens due so with caution to avoid accidental exposure.<sup>8</sup>

## MANAGEMENT/TREATMENTS

There are currently two vaccines approved for preexposure prophylaxis: ACAM2000 and JYNNEOS. These vaccines were initially created to combat smallpox but have been found to reduce the rate of contracting Mpox by 85%.<sup>4</sup> ACAM2000 is a live replication-competent *Vaccinia virus*, which means that the vaccine contains virus particles capable of infecting cells and replicating. It was derived from the same strain used to manufacture the Dryvac vaccine, the vaccine previously used to eradicate smallpox.<sup>9</sup> The vaccine requires one percutaneous dose and is administered with a bifurcated needle through multiple punctures. The replication-competent component of the vaccine is associated with increased adverse events, including progressive

<b>Test</b>	<b>Advantages</b>	<b>Disadvantages</b>
Viral culture (obtained from patient specimen)	<ul style="list-style-type: none"> <li>• Most reliable method</li> <li>• Can provide definitive classification</li> </ul>	<ul style="list-style-type: none"> <li>• Slow turnaround time</li> <li>• Risk of contaminated specimen</li> <li>• Further viral characterization required</li> </ul>
Electron microscopy (produces a “brick-shaped particle”)	<ul style="list-style-type: none"> <li>• Can identify viral particles in specimens obtained via biopsy, viral culture, fluid from vesicles</li> <li>• Ability to differentiate between <i>Orthopoxvirus</i> and herpes virus</li> </ul>	<ul style="list-style-type: none"> <li>• Inability to differentiate between <i>orthopoxviruses</i></li> </ul>
Immunohistochemistry	Identifies antigens in biopsy specimens to rule out other agents	<ul style="list-style-type: none"> <li>• Unable to identify Mpx specifically</li> </ul>
Polymerase chain reaction	If the specimen is handled properly, it can diagnose Mpx virus specifically from taking material from a lesion on a patient with an active infection	<ul style="list-style-type: none"> <li>• Risk of contamination</li> </ul>
Anti- <i>Orthopoxvirus</i> IgG	Can identify previous <i>Orthopoxvirus</i> infection or smallpox vaccination	<ul style="list-style-type: none"> <li>• Not specific to Mpx virus</li> <li>• False-positive if previously vaccinated against smallpox</li> </ul>
Anti- <i>Orthopoxvirus</i> IgM	<ul style="list-style-type: none"> <li>• Can identify recent <i>Orthopoxvirus</i> exposure</li> <li>• Useful diagnostic tool for patients with a prior smallpox vaccination</li> </ul>	<ul style="list-style-type: none"> <li>• Not specific to Mpx virus</li> </ul>
Tetracore <i>Orthopox</i> Biothreat Alert	Can identify an active case when obtained from lesion specimen	<ul style="list-style-type: none"> <li>• Not specific to Mpx</li> <li>• Less sensitive than polymerase chain reaction</li> </ul>

vaccinia, eczema vaccinatum, and myocarditis.<sup>9</sup> These detrimental adverse events lead to death among 1 of every 1 million persons vaccinated.<sup>4</sup> Therefore, contraindications for this vaccine include patients with a severe allergy to a vaccine component, a history of eczema or similar variant, cardiac disease, immunocompromising conditions, pregnancy, or breastfeeding.<sup>9</sup> However, JYNNEOS is a live replication-deficient vaccine that does not replicate in cells. The vaccine requires two subcutaneous doses administered 28 days apart from each other.<sup>4,9</sup> Unlike ACAM2000, JYNNEOS has a limited number of adverse effects, and it is only contraindicated in patients with a severe allergy to a vaccine component. It can safely be used in patients with eczema and those who are immunocompromised.<sup>9</sup>

The Advisory Committee on Immunization Practices (ACIP) initially recommended inoculation with ACAM2000 as preexposure prophylaxis in 2015, when that vaccine was the only vaccine on the market. However, ACIP changed its stance in 2021 when evidence suggested that JYNNEOS provided a slight increase in disease

prevention compared with ACAM2000. The ACIP now recommends JYNNEOS for primary vaccination and booster doses and 461,049 doses have been reported to be administered in the United States as of September 6, 2022.<sup>9,10</sup>

The current recommendations state that preexposure vaccination should be administered to certain laboratorians studying orthopoxviruses, health care personnel at risk for occupational exposure, veterinarians, animal controllers, designated *Orthopoxvirus* response teams, certain US military personnel, and those who care for patients infected with orthopoxviruses.<sup>4,9</sup> At this time, there are currently insufficient data on the effectiveness of the vaccines on the current Mpox outbreak. However, the Strategic National Stockpile currently possesses both vaccines. It has been distributing the vaccines to various jurisdictions throughout the United States to combat Mpox and protect those currently at risk.

In addition to preexposure prophylaxis, the vaccines can also be administered for postexposure prophylaxis to stop the Mpox virus from causing illness. The CDC recommends administering the vaccine within 4 days of exposure to prevent the disease. If given between 4 and 14 days from exposure, the vaccine may reduce the symptoms of the disease, but it may not prevent it entirely.<sup>4,10</sup> The current outbreak has led public health officials to extend the reach of postexposure prophylaxis to slow the disease's widespread progression with an approach called "PEP++." PEP++ intends to protect individuals with certain risk factors through vaccination, whether or not they have had a documented exposure to Mpox.<sup>10</sup> Coupled with self-isolation, postexposure prophylaxis would assist in providing optimal outcomes and preventing the spread of the disease.

Supportive care currently remains the treatment of choice for Mpox to manage symptoms, treat secondary bacterial infections and other complications, and prevent the virus's spread.<sup>1</sup> In addition to supportive care, tecovirimat and brincidofovir may be recommended for patients with severe cases of Mpox.<sup>4</sup> These antivirals were designed to protect against smallpox; however, the genetic similarities of the smallpox virus and Mpox virus allow protection against both diseases.

The Food and Drug Administration (FDA) approved tecovirimat for the treatment of smallpox in June 2018 for adults and children weighing more than 13 kg.<sup>11</sup> The FDA Animal Rule authorized the use of the drug based on the efficacy observed in animal trials.<sup>11-13</sup> The effectiveness in humans has not yet been determined because trials have not been feasible, and inducing smallpox in humans to study the drug would be considered unethical. However, clinical trials of the drug on people without *Orthopoxvirus* proved safe with minimal side effects.<sup>12,14</sup> As a result, the CDC granted expanded access protocol to allow the administration of tecovirimat to treat Mpox.<sup>13</sup> Tecovirimat inhibits the *Orthopoxvirus* VP37 protein, consequently impeding the production of egress-competent enveloped virions necessary for the virus's circulation within the host.<sup>11,14</sup> The purpose of the drug is to ultimately reduce viremia, leading to quicker recovery, specifically for patients with weakened immune systems.

The FDA additionally approved brincidofovir for the treatment of smallpox in adults and children, including neonates, in June 2021.<sup>12,13</sup> Brincidofovir works by converting to cidofovir intracellularly, which then phosphorylates to cidofovir diphosphate. Cidofovir diphosphate inhibits *Orthopoxvirus* DNA polymerase, reducing the rate of viral DNA synthesis.<sup>15</sup> Similarly to tecovirimat, the FDA approved the drug under the Animal Rule because it proved to be efficacious in treating orthopoxviruses in animals and because studies in human trials were neither feasible nor ethical.<sup>12,16</sup> During a 24-week trial, brincidofovir demonstrated an increased incidence of mortality compared with the placebo when it was evaluated using a different disease, cytomegalovirus.<sup>13,15,16</sup> Consequently, brincidofovir comes with a black box warning, and it is solely approved for the treatment



of smallpox.<sup>15</sup> There are currently no data on the effectiveness of brincidofovir in the treatment of Mpox; however, it has proven to be efficacious against orthopoxviruses in *in vitro* and animal studies.<sup>13</sup> Consequently, the CDC is working on granting expanded access for the use of brincidofovir in the treatment of Mpox.<sup>13</sup>

## PREVENTION

Prevention strategies for the general public are similar to other common illnesses and infectious diseases. People should avoid close contact with anybody that has a rash resembling Mpox. They should also avoid close contact with possible fomites of those who have Mpox; this includes bedding, blankets, towels, and clothing. Frequent hand-washing using warm water and soap or an alcohol-based hand sanitizer also assists in preventing the spread of the virus.<sup>17</sup> In such places as Central and West Africa, it is recommended to avoid contact with certain animals, such as rodents and primates, to avoid the risk of animal-to-human transmission.<sup>18</sup>

Guidelines regarding infection prevention within the health care setting are frequently changing and often vary depending on local and hospital-based protocols. Many general recommendations can be applied and are discussed here. When a patient presents with suspected Mpox, infection prevention should be notified as soon as possible.<sup>18</sup> Patients with confirmed and/or suspected Mpox should be placed in a single room with a private bathroom. Confirmed cases are placed together if a single room is unavailable. When transported outside of the room, patients should wear a well-fitted surgical mask with all lesions covered with a blanket or clothing to avoid spreading. Because of the risk of resuspension and spread of dried lesion materials, such tasks as vacuuming, sweeping, dusting, and portable fan use must be avoided in rooms where a patient with suspected Mpox was present. All intubation and extubation procedures should take place in an isolation room designated for airborne infection.<sup>17</sup>

Regarding appropriate personal protective equipment, health care personnel and caregivers providing care to suspected or confirmed Mpox patients should be wearing a gown, gloves, goggles or face shield, and an N95 mask or similarly approved respirator.<sup>17</sup> All US Department of Transportation Hazardous Materials Regulations should be followed regarding disposal of patient materials, soiled personal protective equipment, dressing, storage, and handling. Current guidelines vary depending on the virus strain. Materials of the West African clade should be disposed of and managed as UN3291 Regulated Medical Waste and handled as potentially infectious medical waste. The Congo Basin clade should be handled as Hazardous Material Regulations Category A.<sup>18</sup> As of current guidelines in the 2022 outbreak, patients must be assessed by a clinical provider and a public health figure to determine if the patient has any epidemiologic risk factors for the Congo Basin clade. If it is determined that the patient does not, then the waste should be managed as regulated medical waste. Cleaning and disinfection should be performed using the facilities' standard disinfection procedures.<sup>18</sup>

For nonhospitalized patients, isolation is the recommended procedure for those with suspected or confirmed Mpox. The precautions' duration varies and depends on state and local health department guidelines. In general, precautions and isolation should be in place until all lesions have crusted over, separated, and new skin has formed. Droplet and contact precautions are recommended. If varicella zoster virus is also suspected, then airborne precautions should be initiated until varicella is ruled out.<sup>18</sup> Additionally, for sexually active populations, patients with Mpox must avoid any sexual encounters until all skin lesions have crusted, fallen off, and new skin has formed. It is recommended that on resolution of symptoms, condoms should be

used for all sexual activity for 12 weeks. Patients should also be evaluated for coinfection with sexually transmitted infections. Suspected Mpox patients who also have HIV should be closely monitored because of the risk of more severe infection.<sup>17</sup>

In addition to the prevention strategies previously discussed for the general public and health care workers collaborating with individuals who have suspected or confirmed Mpox, primary prevention and proper education are also extremely important. With skin-to-skin contact being the driving form of transmission, people should be advised to avoid and, at the least, practice caution in crowded areas of close contact with others. People should also be advised to practice frequent hand washing and avoid sharing blankets, pillows, clothing, and towels with others.<sup>5</sup> High-risk populations, such as men who have sex with men (MSM), people with multiple sexual partners, and individuals that attend large close contact gatherings, such as concerts, raves, and festivals, should exercise an even higher level of caution. Individuals partaking in these activities should increase their handwashing, wear long pants and sleeves to avoid exposed skin, avoid kissing, and avoid sharing beverages or other items.<sup>19</sup> Further information on secondary and tertiary prevention is discussed regarding vaccines in the treatment section.

## CURRENT OUTBREAK

Over the years, the United States has not been immune to the Mpox virus. In 2003, several Midwesterners contracted Mpox after exposure to infected pet prairie dogs. The virus then spread expeditiously with cases identified in six states, including Illinois, Indiana, Kansas, Missouri, Ohio, and Wisconsin.<sup>1</sup> An investigation discovered that the virus was imported to the United States from Ghana through a shipment containing infected African rodents. During the shipment, the infected rodents were residing near the prairie dogs, later sold as pets.<sup>1</sup> In 2021, the Mpox virus revealed itself twice in the United States. It re-emerged in two individuals who returned from trips to Nigeria, one who returned to Texas in July 2021 and the other who returned to Washington, DC, in November 2021.<sup>2</sup> Unfortunately, that was not the last that the United States would see of Mpox.

In May 2022, an individual returning from Nigeria exhibiting signs and symptoms of Mpox was the first confirmed case in the United Kingdom. Soon after, five different continents confirmed cases unrelated to the case in the United Kingdom. It soon became apparent that there had been multiple introductions from Africa.<sup>4</sup> Since August 2022, there have been confirmed cases in 73 nonendemic countries, with approximately 5811 cases in the United States.<sup>5</sup> Its widespread presence has now made itself known as the largest Mpox outbreak outside of endemic Africa. As a result, the World Health Organization (WHO) Director-General declared that the Mpox outbreak constitutes a Public Health Emergency of International Concern on July 23, 2022.<sup>20</sup>

The current outbreak demonstrates a high prevalence of Mpox in men, particularly MSM. For instance, 336 laboratory cases of Mpox in the United Kingdom were confirmed by June 8, 2022, and 311 of the confirmed cases were determined to be male, with three confirmed cases determined to be female (gender information was not available for the remaining 25 cases).<sup>21</sup> Researchers at the UK Health Security Agency conducted questionnaires, received responses from 152 confirmed cases, and published a technical briefing on June 10, 2022. The briefing revealed that out of the 152 responses, 151 patients stated that they belonged to the MSM community and the remaining patients chose not to answer the question.<sup>21</sup> The UK Health Security Agency retrospectively reinterviewed in an attempt to understand transmission patterns

better. Of the 42 participants, 44% reported more than 10 sexual partners in the previous 3 months, and 44% reported group sex during incubation.<sup>21</sup> Although this briefing includes only a small subset of those infected, Mpox seems to be spreading through the sexual and social networks of the MSM community. The virus found this particular niche during Pride month, when the LGBTQ+ community gathers for large events in celebration, possibly allowing the virus to take advantage of this specific group opportunistically. However, the risk of contracting Mpox is not limited to MSM because viruses do not infect people based on sexuality. The virus can infect men, women, transgender, nonbinary people, and others alike.<sup>22</sup> Therefore, it is of the utmost importance not to stigmatize a community based on sexual practices and repeat past mistakes when addressing certain diseases.

### LESSONS LEARNED FROM PREVIOUS DISEASE-ASSOCIATED STIGMATIZATION

The WHO defines health-related stigma as a negative association between a group of people and a specific disease.<sup>23,24</sup> Stigma has unfortunately been a common theme related to disease outbreaks throughout history, causing people to place blame on a foreign “other.”<sup>25,26</sup> It has precipitated animosity, crime, health disparities, financial inequities, and social inequalities for centuries.<sup>27</sup> Stigmatization can even be traced back to one of the oldest infectious diseases known to human history: leprosy (otherwise known as Hansen disease). During ancient times, people believed Hansen disease was a repercussion for sinful ways. Afflicted persons were consequently treated inhumanely, isolated from society, and exiled to quarantine colonies to avoid contagion.<sup>28</sup> The powerful stigma associated with Hansen disease forced infected persons to wear noisy bells and cautionary garments to alert the public of their presence in society.<sup>28</sup> The disease also caused infected persons to lose their families and jobs and destroyed their property and homes.<sup>28</sup> Hansen disease provides an archaic example of how misconceptions and fear have fueled stigmatizing acts against groups of people, leading to detrimental consequences that affect employment opportunities, housing, and access to medical care.<sup>27</sup> Although Hansen disease may have been one of the first stigmatized diseases, it certainly has not been the last. As a result, it is essential to reflect on past disease-associated stigmas to derive their origin and decimate their formation.

The COVID-19 pandemic currently exemplifies the blatant stigmatization and discriminatory behaviors brought on by a present-day viral outbreak. During the height of COVID-19, the Asian community, people of low socioeconomic status, and health care workers were commonly stereotyped as disease carriers, leading to avoidance and social ostracization.<sup>29</sup> Stigmatization was particularly evident toward the Asian community because they were forced to endure acts of violence and intolerance because of the coronavirus being titled the “Chinese” or “Wuhan” virus.<sup>25</sup> In March 2020, a national survey of 1141 US residents revealed that 40% of Americans participated in at least one discriminatory behavior toward an Asian person.<sup>30</sup> In June 2020, the Pew Research Center conducted surveys involving 9654 US residents that revealed that 31% of Asians had been subjected to slurs because of their ethnicity, 26% of Asian Americans confirmed that they were fearful of someone threatening or physically attacking them, and 40% of US residents agreed that it had become more commonplace for people to express racist views toward Asians.<sup>30</sup>

Unfortunately, the spread of COVID-19 does not mark the first time the Asian community has been unfairly targeted and vilified. Throughout history, people of Asian ethnicity have been stereotyped as the “perpetual foreigner” and caricatured as the “yellow peril,” which portrays people of Asian descent as a threat to European-

American norms with the inability to conform to society.<sup>31</sup> These xenophobic stereotypes have historically contributed to discriminatory immigration policies geared toward Asian Americans and the establishment of internment camps during World War II.<sup>31</sup> These longstanding anti-Asian sentiments were only exacerbated by the fear and uncertainty brought on by the novel coronavirus, the possible origin of the COVID-19 virus, the misleading media coverage, and the derogatory language used by public leaders.<sup>30</sup> The measures used to contain the virus, such as social distancing, lockdowns, travel restrictions, and misinformation, contributed to xenophobia and prejudice.

Social distancing and quarantines were enforced as part of the contagion mitigation strategies; however, these practices also reduced interactions with the stigmatized persons and instilled the idea of “others” being the disease carriers.<sup>26</sup> In addition, the travel restrictions implemented to prevent the spread of COVID-19 helped facilitate the idea that the virus was a foreign invader, reinforcing the fear of the “other.”<sup>26</sup> The psychological impact of being a disease carrier significantly impacts public health. For instance, evidence indicates that the rate of suicidal ideation and attempts were heightened because of stigma during the COVID-19 pandemic.<sup>23</sup> Along with increased suicidality, stigma also led to the concealment of illness and avoiding medical treatment. The implications associated with COVID-19 caused people to hide their symptoms and relevant medical history to prevent stigmatization. This avoidant behavior resulted in delayed health care, poor outcomes, and fatalities.<sup>23</sup> Stigmatization only assists the spread of the pandemic and does nothing to thwart it, ultimately affecting people socially, mentally, and physically.

Similar to the Asian community, the Mpox outbreak is not the first time the MSM community has been stigmatized. In the 1980s, the HIV/AIDS epidemic swept the nation, primarily affecting the MSM community. At the time, HIV/AIDS represented a perplexing and misunderstood disease, leading to the stigmatization that resulted in violence, avoidance, and discrimination. Despite progress in managing and treating HIV/AIDS, stigma continues to act as a barrier to accessing prevention, care, and treatment services.<sup>32–34</sup> Within 40 years since the beginning of the epidemic, more than 700,000 people have died of AIDS. Thirty-four quantitative and qualitative studies analyzing MSM living with HIV showed that HIV stigma corresponded with increased HIV-transmission risk behaviors and poorer self-reported health.<sup>32</sup> As a result, stigma instigates the transmission of the virus and consequently forges adverse health outcomes.

With the current Mpox outbreak, it is time to encourage infected individuals to safely quarantine, encourage preexposure and postexposure vaccinations as needed, and implement contact tracing programs to contain the virus and prevent its spread. With the current outbreak predominantly affecting the MSM community, strategies need to be implemented immediately to prevent the spread of misinformation. This requires social mobilization and community engagement.<sup>13</sup> Community leaders and health care providers can accomplish this by using inclusive language when discussing the virus not to stigmatize the MSM community and not create a false sense of immunity in members outside the MSM community.<sup>35</sup> They should become well-versed in the epidemiology, clinical presentation, and treatment of the virus to ensure the health of all and not promote discriminatory practices. Images shared of the rash by community leaders and health care providers should illustrate the appearance of the current outbreak and avoid images depicting extreme cases to negate fear and avoid homophobic or racist stereotypes.<sup>35</sup> They should also work to get information out to their citizens and patients regarding how to seek help and where they can access preexposure and postexposure vaccinations. In previous pandemics, the media

reported misinformation, spread fear, promoted xenophobia, created stigma, and pointed fingers. It is vital to hold the media accountable to disentangle the stigma from particular groups. This is achieved by circulating authentic information and conducting fact-checks on false information.<sup>24</sup> Along with the media, the public should also be educated on the consequences of consuming and sharing illegitimate information.<sup>24</sup> Although sometimes contributing to misinformation, social media is a powerful tool to destigmatize the virus and provide helpful resources. It is a platform that allows people to express their personal experiences with Mpox, making the virus more relatable and eradicating unnecessary fear.<sup>35</sup> Social media also works as an avenue to reach a broader audience and inform the public of vaccination sites and other preventative measures. As seen in previous viral outbreaks, stigmatization can worsen the spread of a virus. As a result, people need to be conscious of inequities and preexisting stereotypes to combat them.<sup>24</sup> Most importantly, the public needs to learn from previous mistakes to prevent the past from repeating itself.

## SUMMARY

As of September 2022, the current Mpox outbreak has established itself as a public health emergency by the WHO. Currently affecting 96 nonendemic countries, now is the time to act to stop the spread of the virus. However, as the world moves to prevent the spread of Mpox, it is imperative to fight stigma. When reflecting on past pandemics, the creation of stigma by the public almost seems to be a visceral reaction. The world now belongs to the twenty-first century, making it time to practice critical thinking, empathy, and self-awareness. In this way, the world has the potential to eradicate Mpox and improve health care for all. Although new to nonendemic countries, Mpox is not a new virus. Existing for nearly half a century, Mpox has an advantage compared with previous viral outbreaks in the way that it is already equipped with vaccines and treatments. It is hoped that this can help mitigate the fear and panic associated with viral outbreaks and allow the world to come together to stop the spread of the virus.

## CLINICS CARE POINTS

- When evaluating a patient with a vesicular viral exanthem preceded by generalized lymphadenopathy, a thorough travel history, sick contact, and/or known exposure to Mpox is necessary.
- In suspected cases of Mpox, initiate immediate droplet and contact precautions; cover exposed, open lesions; and mask the patient to prevent additional spread.
- Confirmed exposure to Mpox requires a 21-day monitoring period (overseen by public health authorities) for symptom development.

## DISCLOSURE

The authors declare no competing interests.

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