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### RESEARCH ARTICLE

#### MONKEYPOX CASES ARE STILL INCREASING AROUND THE WORLD AMID THE COVID-19 PANDEMIC: COULD THIS HEALTH SITUATION BE A GLOBAL THREAT?

**Elham Mohammed Khatrawi**

Medical Microbiology and Immunology Department, Faculty of Medicine, Taibah University, Medina 42353, Saudi Arabia, [ekhatrawi@taibahu.edu.sa](mailto:ekhatrawi@taibahu.edu.sa)

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#### Abstract

Human monkeypox is a zoonotic disease resulting from the monkeypox virus (MPXV). During the coronavirus disease (COVID-19) pandemic, MPXV has become a global concern. From 1 January to 22 June of the current year, the World Health Organization (WHO) received reports of 3413 confirmed cases and one death. The most common cases (98%) have been recorded since May of this year (2022). The ongoing outbreak is largely affecting men who have sex with men (MSM). Most of the confirmed cases (86%, n=2933) have occurred in the WHO European countries. Other confirmed cases have been documented from the Americas (11%, n=381), Africa (2%, n=73), Western Pacific (less than 1%, n=11), and Eastern Mediterranean (less than 1%, n=15) regions. It is too early to decide whether the monkeypox outbreak is an independent phenomenon or has been exacerbated by the COVID-19 pandemic. Therefore, global healthcare organizations should apply precautionary measures to stop this outbreak.

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#### Introduction:-

Human monkeypox is a zoonotic infection resulting from the monkeypox virus. The human monkeypox virus (MPXV) is a double-stranded DNA virus belonging to the Orthopoxvirus species of the Poxviridae family. Two genetic clades of MPXV have been identified: Central African and West African (Marennikova et al., 1972).

Monkeypox was named after the virus was discovered in monkeys in 1958 in a Danish laboratory (Casey, Woodruff and Butcher, 1959). Originally, it was discovered in 1970 in Zaire (now known as the Democratic Republic of the Congo (DRC) in a 9-month-old male infant, which was the first case reported among humans (Cho and Wenner, 1973; JG et al., 1980). Since then, monkeypox has grown prevalent in the DRC and spread to other African nations, mostly in West and Central Africa. Monkeypox first appeared outside Africa in the United States (US) in 2003 (Learned et al., 2005; Reynolds et al., 2006; McCollum et al., 2015), when a zoonotic outbreak resulted in 47 suspected or confirmed cases (Reed et al., 2004; Huhn et al., 2005; Reynolds et al., 2006). This spread was associated with the import of squirrels, dormice, and Gambian giant rats, which infected prairie dogs. Only 14 patients were admitted to hospitals, and there was no confirmed history of infection transmission between humans.

#### Transmission

MPXV can be transmitted to individuals through close contact with animal blood, lesions or body secretions. Also, it can be transmitted to individuals via a bite or scratch from a diseased animal (Levine et al., 2007; Com Sciep et al.,

**Corresponding Author:- Elham Mohammed Khatrawi**

Address:- Medical Microbiology and Immunology Department, Faculty of Medicine, Taibah University, Medina 42353, Saudi Arabia, [ekhatrawi@taibahu.edu.sa](mailto:ekhatrawi@taibahu.edu.sa)

2017). Transmission between individuals usually happens via large droplets in the air, which usually necessitates lengthy face-to-face contact. The majority of recent cases have involved men who have sex with men (MSM), with a genital rash indicating that the infection was most probably transmitted by body secretions and direct body contact ((ECDC), no date c; Mahase, 2022). The UK Health Security Agency stated that, even though MPXV has not historically been transmitted by sex, it might be spread via touch with the bedlinen or clothing worn by an individual infected with MPXV or through intimate contact with an individual infected with this virus(Mahase, 2022).

### **Symptoms and complications**

The clinical manifestation of this infection is similar to smallpox but less virulent and is distinguished by maculopapular rash, lymphadenopathy, myalgia, backache, and fever. Monkeypox complications can involve encephalitis, vision-threatening keratitis, and pneumonitis in addition to subsequent bacterial infections (Jezek et al., 1988; Huhn et al., 2005; Learned et al., 2005). Recently, the European Centre for Disease Prevention and Control stated that MSM affected during the current outbreak have had a genital rash ((ECDC), no date a).

### **Prevention and treatment**

Formerly, smallpox immunization using the vaccinia virus, another Orthopoxvirus, was able to provide about 85% protection against MPXV(Fine et al., 1988). However, when smallpox was eradicated in 1980 through routine immunization, the vaccine was no longer recommended (Jezek, Khodakevich and Wickett, 1987). To date, no specific treatment has been licensed for MPXV. However, the smallpox virus and MPXV have similar genetic structures, which means that smallpox treatment (antiviral medicines such as tecovirimat and cidofovir) and vaccines can be utilized to treat and prevent MPXV cases (CDC, 2019). Moreover, precautionary measures such as hand washing and avoiding contact with infected individuals or animals are still considered the best way to prevent this infection (Parker et al., 2014).

### **MPXV outbreak during the coronavirus disease(COVID-19) pandemic**

During the COVID-19 pandemic, MPXV has become a global concern and threat, and the world health community has been vigilant (Graham, 2022; Rudan, 2022; Yang, 2022). Even though it is believed that MPXV is different from severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), in that, unusually, it spreads asymptotically, current rapid outbreaks in numerous nations have increased awareness that possible genetic changes might alter the virus's characteristics (Parker et al., 2014). This might indicate greater viral transmissibility or gradual, sluggish dissemination that is more difficult to trace. However, both presumptions raise worries in terms of further burdening the already overburdened global healthcare system; in particular, data have demonstrated that respiratory failure was the most prevalent complication, and 25% of critical confirmed cases died. Nonetheless, the mortality rate of the Central African clade is lower than 10%, while the West African Clade virus, which has recently spread outside Africa, has a lower than 5% mortality rate (Meyer et al., 2002).

It is important to assess the new expansion of MPXV amid the COVID-19 pandemic, as well as coinfection between MPXV and SARS-CoV-2, which could cause variations in disease severity, infectivity characteristics, and treatment or vaccination response in one or both illnesses (Lai, Wang and Hsueh, 2020). Moreover, it might have negative effects on the effectiveness of diagnostic tests utilized to diagnose both infections (Aghbash et al., 2021). The interaction between those two viruses may also accelerate the development of a novel variant of concern of SARS-CoV-2 with traits that might impair the management techniques of the existing pandemic, for example, greater immune escape or evasion as well as overloading the already stretched global healthcare system(Farahat et al., 2022). Therefore, the increase in monkeypox cases is a worldwide issue that calls for more study and research (León-Figueroa et al., 2022).

Human infections resulting from imported monkeys were recorded following travel in Israel(Erez et al., 2019), Singapore(Ng et al., 2019), the United Kingdom (UK) (Vaughan et al., 2018),and the USA in 2021(CDC, no date).As of May 2022, MPXV had spread to non-endemic nations(Antinori et al., 2022).In the ongoing outbreak, 1158 confirmed cases of MPXV have been recorded from 22 European Union (EU) and European economic area (EEA) countries as well as 724 verified cases in 13 outside EU/EEA nations((ECDC), no date b).

It is an alarming sign that epidemiological studies have, to date, shown no travel history of cases to MPXV-endemic countries in Africa(WHO, no date; Petersen et al., 2019). This may suggest that MPXV has been spreading silently throughout Europe for some time, involving person-to-person transmission as a result of intimate body contact with an infective symptomatic or asymptomatic individual.

**Reported confirmed cases and deaths in the current outbreak**

**Table1:-** Confirmed cases and deaths reported by the WHO between January 1 and June 22, 2022 (WHO, no date).

Region	Country	Confirmed cases	Deaths	Country	Confirmed cases	Deaths
America	Argentina	3		Brazil	11	
	Canada	210		Mexico	11	
	United States of America	142		Venezuela	1	
	Chile	3				
European	Austria	12		Belgium	77	
	Czechia	6		Denmark	13	
	Finland	4		France	277	
	Georgia	1		Germany	521	
	Gibraltar	1		Greece	3	
	Hungary	7		Iceland	3	
	Ireland	24		Israel	13	
	Italy	85		Romania	5	
	Latvia	2		Serbia	1	
	Luxembourg	1		Slovenia	8	
	Malta	2		Spain	520	
	Netherlands	167		Sweden	13	
	Norway	4		Switzerland	46	
	Poland	7		The United Kingdom	793	
	Portugal	317				
Africa	Benin	3		Democratic Republic of the Congo	10	
	Cameroon	3		Ghana	5	
	Central African Republic	8		Nigeria	41	1
	Congo	2		South Africa	1	
Eastern Mediterranean	Lebanon	1		United Arab Emirates	13	
	Morocco	1				
Western Pacific	Australia	9		Singapore	1	
	Republic of Korea	1				
Total		3413	1			

According to the World Health Organization (WHO), as of 1 January 22, MPXV cases had been reported to the WHO by 50 member countries throughout the five WHO areas (Europe, Western Pacific, Africa, States of America, Western Pacific, and Eastern Mediterranean). From 1 January to 22 June of the current year, the WHO received reports of 3413 confirmed cases by laboratory investigation and one death was recorded in the African region, particularly in Nigeria. Most cases (98%) have been recorded since May of this year (2022) (Table 1). The ongoing outbreak is largely affecting MSM who have had recent sexual activity with new or several partners. The most common lab-confirmed cases (86%, n=2933) have occurred in the WHO European countries. Furthermore, lab-confirmed cases have been documented from the Americas (11%, n=381), Africa (2%, n=73), Western Pacific (less than 1%, n=11), and Eastern Mediterranean (less than 1%, n=15) regions. Personal characteristics and demographic data have been recorded in only 468 of the total reported cases. Approximately 99% are men aged between 0 and 65 years (the median age is 37 years, and the interquartile age is 32 to 43 years), the majority of whom are MSM (WHO, no date).

**Description of the current MPXV outbreak**

The symptoms of MPXV in the current outbreak are different from the virus's classic clinical presentation. To date, its clinical presentation has been characterized by a single or few skin lesions that start in the perianal/perineal or genital region and do not disseminate. Skin lesions manifest at various (asynchronous) phases of development. Moreover, the development of skin lesions occurs before myalgia, fever, and other typical physical manifestations of the virus (WHO, no date; Antinori et al., 2022). The mechanisms of infection transmission during sexual activity are still unclear. Whereas close face-to-face or close skin-to-skin contact can transmit the infection, the role of sexual bodily secretions, for instance, vaginal fluids and semen, in MPXV are still unknown. Therefore, more studies should be conducted to understand the role of vaginal fluids and semen in transmitting the virus and to know if other bodily fluids can transmit the virus.

To date, all reported cases in recently affected countries have been infected with the West African genotype of MPXV (Adler et al., 2022; Antinori et al., 2022). Their samples were confirmed via polymerase chain reaction (PCR). The West African genotype can result in milder symptoms and has a lower mortality rate (less than 3%) than the Central Africa genotype of the virus (Beer and Bhargavi Rao, 2019; Yinka-Ogunleye et al., 2019). Currently, the majority of recorded deaths have been among HIV-positive patients and small children (WHO, no date; Beer and Bhargavi Rao, 2019; Yinka-Ogunleye et al., 2019; Ogoina et al., 2020). To control the ongoing outbreak of the virus, second and third-generation smallpox immunizations are used in the USA and Canada to prevent MPXV infection; furthermore, the European Union has approved the usage of tecovirimat to treat extremely ill patients (WHO, no date).

The WHO has assembled a panel of experts to assess the most recent evidence on monkeypox and smallpox vaccination and give guidelines on when and how they should be administered (WHO, no date).

**Conclusion:-**

MPXV has become recently a worldwide concern and threat. It is very early to determine whether the recent outbreak of monkeypox is an independent phenomenon or has been aggravated by the COVID-19 pandemic. Given this ambiguity, global healthcare organizations must consider precautionary measures to limit the spread of this virus before the emergency alarm truly begins to ring and the number of cases surges, as interaction with other pathogenic organisms, including SARS-CoV-2, can result in the development of highly virulent variants.

**Financial Disclosure**

None to declare.

**Conflict of Interest**

The author declares no conflict of interests.

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