

Monkey Pox Virus in the United States of America: A Sudden Public Health Emergency

Ogbonna Eugene Chikere

Public Health Department, Louisiana State University, Shreveport

Abstract: *Following the outbreak of the Monkeypox virus in 2022, it quickly spread in an astronomical way around the world, especially in non - traditional places where it was hitherto rarely found. It was more worrisome because the people affected had no recent history of travel to any of the endemic areas. The United States of America became the worst - hit country in the entire world compared to any other country. According to CDC (Center for Disease Control), as of February 1, 2023, the United States of America accounted for approximately 35% percent of all global cases and approximately 31% of all mortality worldwide. This again has laid bare the challenges faced by the U. S. in its surveillance system. This study looks at how monkeypox progressed to becoming a public health emergency in the U. S., and its burdens, and suggests possible preventive actions which include vaccination, social distancing, personal hygiene, and strengthening the surveillance system of the country.*

Keywords: Monkeypox, Infection, Epidemic, Endemic, Gay

1. Introduction, Epidemiology, and Clinical Features

Monkeypox virus, an Orthopoxvirus of the poxviridae family, is endemic in Western and Central Africa. It was first discovered in Copenhagen Denmark in 1958 as a skin eruption in the laboratory among macaques, a specie of monkey resident in the lab at the time [1]. There were subsequent outbreaks in 1959 (Philadelphia), 1962 (Washington D. C), and 1964 (Netherlands) all happening in a contained environment and involving only animals (mostly monkeys). However, the first human transmission was recorded in 1970 in the democratic republic of Congo (DRC) in a 9 - month - old child. That same year, five other persons were infected in Congo, Liberia, and Sierra Leone. Interestingly, all the infections at the time were misdiagnosed and were thought to be smallpox based on clinical features, but following extensive laboratory research, it was confirmed to be cases of monkeypox virus [2]. The first recorded human transmission beyond Africa happened in the United States of America in 2003 said to have been contracted from rodents that were shipped from Ghana [3].

Transmission of this disease occurs via close body contact, body fluids, semen, respiratory secretions, sharing of personal items, and aerosolization [4]. The incubation period of this virus is known to be between 7 - 14 days [5]. Some of the clinical features of this illness include rash, fever, weakness, lymphadenopathy, malaise, chills, body itching, bleeding per rectum, reddish discoloration of the eye, and headache. Amongst the possible features patients can exhibit on presentation, rash, and fever were the most consistent. [6], [7] Diagnosis of monkeypox starts clinically from history taking to the observation of the disease manifestation. The rash may be the most prominent feature and can present as pustules with clear liquid that sometimes rupture and form crust. Also, this rash may be mistaken for smallpox, but it is important to note that there is usually the presence of lymphadenopathy which is not present in smallpox. The confirmatory diagnosis is done using a

polymerase chain reaction (PCR) to sequence the viral DNA of samples taken from the skin lesion [5].

2. From Outbreak to Epidemic in the U. S. (Breakdown of the Data in the United States in Comparison With Countries around the Globe)

Prior to this current menace, there was an outbreak in the United States in 2003. Different species of rats had been imported from Ghana via Texas and were later taken to a facility in Illinois. Coincidentally, there were prairie dogs that were in close contact with these animals at the same facility and they became a channel of disease transmission when they were sold as pets to people. All the persons that had contact with them got infected. More recently, in 2021, two different cases were recorded in July and November, in Texas and Maryland respectively. In both instances, they were travel - related; coincidentally, they both arrived from Nigeria and landed in the United States [7]. However, this previously unimagined and most recent outbreak started in May 2022 and for the first time is taking its toll on a global scale and currently affecting the United States to the extent of impacting people with no recent history of travel to endemic areas [8]. The first case of the current outbreak in the United States was confirmed in Massachusetts on May 18th, 2022 in a man who had just recently returned from Canada, a non - endemic area [9]. Within weeks different outbreaks were noted in multiple states such that by August 22nd, 2022 all 50 states of the United States of America had already recorded at least one case [10]. It quickly became worrisome such that as of August 14th, 2020 the United States department of health and human services certified it a “public health emergency”. By July 22, 2022, there were about 2891 reported cases, and the CDC received case report forms for only 1, 195. Amongst the above - mentioned, over 90% were reported in men who are sexually involved with other men or had some form of intimacy with them indicating that it is affecting gay and bisexual men in an astronomical way [6].

Table 1: Showing the Number of Cases and Mortality Rate across the Globe as of February 1ST, 2023 [10].

Countries in Red: countries that have historically reported monkeypox

Countries in Black: Countries That Have Not Historically Reported Monkeypox (Non - Endemic Areas)

Location	Cases	Deaths
ANDORRA	4	0
ARGENTINA	1, 075	2
ARUBA	3	0
AUSTRALIA	144	0
AUSTRIA	327	0
BAHAMAS	2	0
BAHRAIN	1	0
BARBADOS	1	0
BELGIUM	793	1
BENIN	3	0
BERMUDA	1	0
BOLIVIA	264	0
BOSNIA AND HERZEGOVINA	9	15
BRAZIL	10, 745	0
BULGARIA	6	0
CAMEROON	18	3
CANADA	1, 460	0
CENTRAL AFRICAN REPUBLIC	20	0
CHILE	1, 416	2
CHINA	1	0
COLOMBIA	4, 072	0
COSTA RICA	140	0
CROATIA	33	0
CUBA	8	0
CURACAO	3	0
CYPRUS	5	0
CZECHIA	71	1
DEMOCRATIC REPUBLIC OF THE CONGO	348	0
DENMARK	196	0
DOMINICAN REPUBLIC	52	0
ECUADOR	483	2
EGYPT	3	0
EL SALVADOR	88	0
ESTONIA	11	0
FINLAND	42	0
FRANCE	4, 128	0
GEORGIA	2	0
GERMANY	3, 692	0
GHANA	121	4
GIBRALTAR	6	0
GREECE	86	0
GREENLAND	2	0
GUADELOUPE	1	0
GUATEMALA	348	0
GUYANA	2	0
HONDURAS	13	0
HONGKONG	1	0
HUNGARY	80	0
ICELAND	16	0
INDIA	22	1
INDONESIA	1	0
IRAN	1	0
IRELAND	228	0
ISREAL	262	0
ITALY	954	0
JAMAICA	18	0
JAPAN	15	0
JORDAN	1	0
LATVIA	6	0

LEBANON	26	0
LIBERIA	6	0
LITHUANIA	5	0
LUXEMBOURG	57	0
MALTA	33	0
MARTINIQUE	7	0
MEXICO	3, 768	4
MOLDOVA	2	0
MONACO	3	0
MONTENEGRO	2	0
MOROCCO	3	0
MOZAMBIQUE	1	1
NETHERLANDS	1, 260	0
NEW CALEDONIA	1	0
NEW ZEALAND	41	0
NIGERIA	775	7
NORWAY	95	0
PANAMA	118	0
PARAGUAY	82	0
PERU	3, 727	15
PHILIPPINES	4	0
POLAND	215	0
PORTUGAL	951	0
QATAR	5	0
REPUBLIC OF THE CONGO	5	0
ROMANIA	47	0
RUSSIA	2	0
SAN MARINO	1	0
SAUDI ARABIA	8	0
SERBIA	40	0
SINGAPORE	21	0
SLOVAKIA	14	0
SLOVENIA	47	0
SOUTH AFRICA	5	0
SOUTH KOREA	4	0
SPAIN	7, 528	3
SRI LANKA	2	0
SUDAN	18	1
SWEDEN	260	0
SWITZERLAND	551	0
TAIWAN	4	0
THAILAND	13	0
TURKEY	12	0
UKRAINE	5	0
UNITED ARAB EMIRATES	16	0
UNITED KINGDOM	3, 735	0
UNITED STATES OF AMERICA	30, 123	28
URUGUAY	19	0
VENEZUELA	12	0
VIETNAM	2	0

3. Discussion

Out of 109 nations affected, only seven were from countries that historically reported monkeypox outbreaks, and 102 nations were non - endemic areas (including the U. S.) indicating a major paradigm shift. As of December 7th, 2022 2: 00 PM Eastern daylight time (EDT), there were 29, 711 cases and 20 deaths in the United States with the highest number of cases in California. Notably, the peak period was between July and September 2022, and there has been a steady decline in the number of new cases since then. Considering this outbreak from a global perspective, as of February 2nd, 2023 5: 30 PM EDT, there were 85, 536 cases and 91 mortalities worldwide. Out of these figures, 84, 243 cases and 77 mortalities occurred in previously non -

endemic regions representing a percentage of 98.4% and 84.6% respectively, highlighting a shift in the epidemiology of the disease. It also then means that the United States with a current case number of 30, 123 persons and 28 deaths, has had about 35% of the cases and about 31% of the recorded deaths making it the worst - hit country globally. In the United States, the majority of the people affected were people who identified as men accounting for about 28, 199 cases which translated to over 90% of all the cases, while other genders accounted for the remaining cases. The statistics were not favorable for men, raising more questions bothering around the reasons for these lopsided figures. According to CDC, in a survey conducted amongst men who have sex with other men, about 48% agreed that since the outbreak of monkeypox, they reduced the number of their sexual partners to one. This suggested that they were following the trend and clearly understood their vulnerability vis - a - vis the monkeypox virus [10].

4. Conclusion

Interventions so far and current approach to prevention

Health Education: This emphasizes the need for hand washing, wearing of masks, isolation, and prerequisite knowledge about signs to report to healthcare providers [11].

Isolation and Quarantine: There is a need for the isolation of confirmed cases and also to quarantine persons that may have had contact with confirmed [12].

Vaccine: Between 2015 - 2019, ACAM 2000 was approved by the FDA and was used for orthopoxviruses, however, the most recent vaccine JYNNEOS was produced in 2019 and is very effective against both smallpox and monkeypox virus. Two doses of this are usually given and the second dose is taken 26 days after the first [13]. According to CDC as of February 1st, 2023, a total of 656, 361 and 415, 834 men in the U. S. have received 1st and 2nd doses respectively while a total of 61, 576 and 27, 675 women in the U. S. have received 1st and 2nd doses respectively of JYNNEOS vaccine. Meanwhile, 12, 618 and 5, 604 persons of unknown sex have received 1st and 2nd doses respectively. Also, more Whites and Latinos have received the vaccines in comparison to Blacks and Asians [10].

Management: This is mainly symptomatic and usually involves supportive care. These include using some forms of antihistamine for the rashes, antipyretics for the fever, possible fluid administration, or any management approach that may be considered best by the health team based on the present state of the index case. However, two drugs in use can also be administered to sufferers and they include tecovirimat and brincidofovir [14].

Way Forward: Some schools of thought are suggesting that there is so much discrimination surrounding the disease, including but not limited to the nomenclature, linking it to homosexuality, and African origin, and discriminating against persons that have contracted this illness. They suggested that one of the steps that should be employed would be to de - escalate these stereotypes, hence, making it easier to reach out to affected individuals [15].

From the foregoing, the United States healthcare and surveillance system has once again been exposed akin to the menace and devastation left by the Covid - 19 pandemic which unveiled its vulnerabilities. Hence it is imperative to approach this matter in a collaborative manner bearing in mind that the well - being and healthcare of the country are every resident's business and all hands must be on deck. There is a need to strategize and strengthen the surveillance system because it is not just enough to vaccinate and engage in health education. Also, there is a need to ramp up vaccination especially amongst minorities so that it can get to as many persons as possible. Also, health education must be done in such a manner as to make an impact by using local influencers and relevant stakeholders and more importantly, there should be plans to consistently reinforce it at intervals for a lasting effect.

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AUTHOR

Ogbonna Eugene Chikere, MPH,
Louisiana State University, Shreveport, LA, U. S. A,
chikereugene[at]gmail.com
Corresponding Author – Ogbonna Eugene Chikere,
chikereugene[at]gmail.com, 3464905719.