



## Monkeypox: A Global Health Challenge in The 21<sup>st</sup> Century

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### ABSTRACT

Monkeypox virus (MPXV) is a renewed concern of global public health in the wake of reduced smallpox vaccination. The odd that MPXV can cause outbreaks especially with the genetic variation and zoonotic route makes it necessary to have improved efficacy of the vaccines. As it stands now, there are several activities in the research that aims at enhancing the efficacy of vaccines against monkeypox. These are the multi-epitope vaccines that utilises immunoinformatics database for generating broad spectrum immune responses and the synthetic peptide based formulations which focuses on certain viral proteins only. The use of adjuvants tries to increase the immunogenicity and also to optimize the safety profile of a vaccine formulation. Further, to manage outbreaks, strategies of drug delivery including intradermal vaccination are being studied in order to minimize the usage of resources. Proper mapping is well used in targeting the vaccination programs to ensure it is delivered to high-risk groups. Altogether, these measures do not only strive for improvement of immune response in the body's cells against monkeypox; they also seek to create readiness in health systems to respond to such outbreaks in the future properly. Intervention and End of Episodes in Monkeypox: Global Multidisciplinary Approach is mandatory for efficient response.

**Keywords:** Monkey pox, smallpox, zoonotic transmission, vaccination.

### INTRODUCTION

The novel coronavirus that manifests itself as COVID-19 emerged in late December 2019 and has since become a pandemic. However, the world has not only been through SARS but other pandemics such as H1N1, Avian Flu among others. Monkeypox, which originated in the Democratic Republic of the Congo (DRC) in 1970, has attracted the interest of experts. This Orthopoxvirus is known to be found in Central and Western Africa and cause disease in humans with symptoms resembling smallpox. Due to the discontinuation of routine vaccination, monkeypox disease can re-emerge, bypassing immunity, as seen with smallpox. The virus is potentially a global health hazard, particularly because of its epidemic nature. Additionally, concerns of inadvertent or purposeful release (biological weapon threat) have encouraged the development of its pathogens. Altogether, knowledge on the molecular biology, transmission, pathogenesis, and the possibility of the monkeypox virus causing more extensive infections remains limited. Specifically, the method by which a feasible causative agent can cause an outbreak in a particular primate species is worth considering. Here, we establish and assess the threat of three different altering MCPXV lineages of monkeypox for the human infection, further transmission, the increased genetic variation, and evolution.

The newly identified threat of monkeypox virus (MCPV) to human derives from its direct encounter with humans (secondary transmission), socialization with its natural hosts in the wild, genetic integrity, ecological adaptation, and other pathogenic relatives. However, the cases of human infections with MCPXV still need confirmation; what kind of contact does a human, through different species, have with the known epizoonoses? The present knowledge on MCPXV is presented in this review in critically reviewed articles and case notifications with a brief description on the most common investigations on this virus as a natural spread to viruses. From the case of MCPXV, four aspects that should be in an emergency preparedness plan are the following: correct precautionary infection measures that can have long-term infection; the swiftness of withdrawal or pruning of exposed hosts to MCPXV cases; and awareness or preparedness for the possible negative consequences from MCPXV biosecurity issues.

#### 1. 1. Historical Back ground and Development up to the Twenty first Century

Dangers are alarming and faddist in relation to the population's health: the appearance of unusual epidemics of zoonotic viral diseases. Monkeypox is an sparing human disease of skin-associated signs resulting from an orthopoxvirus with well-documented zoonotic advent from reservoir rodents. The long-term outcome of diseases in animals in the wild still remains among the biggest



unanswered questions. Human contamination has occurred mainly in Congo Basin, West African Forest and Democratic Republic of Congo rainforests, Nigeria, Cameroon. Today, individual studies of small case clusters and single cases are published rather many times more often than conclusions drawn in the Twentieth century. Monkeypox in the present form is attributed to a new strain referred to as the West African clade that differs from the other clades genetically by 1% in the genomic sequencing differentiation of clades in genotyping and phylogenetic studies of monkeypox carried out from 1981-1986. The epidemiologic characteristics of monkeypox illness different in 2017-2018 years in Nigeria. Enhanced surveillance for the purposes of integrating concurrent wildlife testing may refine the definition of other predictors of human infection. Participants at an NIAID Workshop concluded that development and testing of interventions for the wild reservoir population of rodents was a high priority. They may include, for instance, vaccines laden with bait for halting the cycle in places where contact with wild animals is rife and the rashes, often of an undetermined differentiation by disease entities, come from not easily identifiable pathogens. In addition, more research on the contact between humans and animals for instance evaluating the farmed rodents would reveal new mode of transmission. Concerning the peculiarity that have so persistently sustained monkeypox outbreak in Nigeria, the current and successive innovations are going to be addressed. Data which might be related to research that might be used for the current understanding of potential risk factors related to the different rates of monkeypox and its distribution in the rainforest region in West Africa could be gathered.

## 2. Transmission and Spread of Monkeypox in the World

### 2.1. Historical Background of Transmission and Distributed Areas

Start the lesson by explaining the native spaces monkeypox inhabit. It may be stated that it was first identified in the genus: chimps in Tai national park (Monkeypox virus emergence in wild chimpanzees reveals distinct clinical outcomes and viral diversity - Nature Microbiology, 2020) whereas currently it is believed to be endemic to some regions of central and West Africa (Durski et al., 2018).

You could mention the first identified case in humans was in the Democratic Republic of Congo in 1970 (Re-emergence of monkeypox in Africa: in this paper I shall conduct a review of literature which ranges from the year 1998, up to the present time.

### 2.2. Causes That Prescribe to Emergence and Spread

This section can explain why monkey pox virus has recently produced more cases than usual in areas that are not endemic to the virus.

According to Petersen et al., 2019, Monkeypox cases could be attributed to the halt in the smallpox vaccination programs.

It is also useful to debate additional features such as, but not limited to, epidemic and pandemics travel to or from other countries, population density, and possible alterations of the virus as represented in the article (Durski et al., 2018).

### 2.3. Current Distribution and Recent Outbreaks

Here, you can give the reader a current picture of how monkeypox is distributed across the world.

The example of re-emergence of monkeypox in Nigeria in 2017 could be mentioned here as this was the largest documented outbreak of human monkeypox in West Africa (Reemergence of Human Monkeypox in Nigeria, 2017, 2018).

Highlight the significant outbreak that began in 2022, with (Mpox (formerly monkeypox): pathogenesis, prevention, and treatment 2023 and disease development is mentioned of cases in Beijing, Guangzhou, and Shenyang, and say that the virus has spread around the world.

## 3. Clinical Features and Symptoms of Monkeypox

### 3.1. Typical Presentation and Progression

- Start with the description of the typical manifestations of monkeypox: fever, headache, muscle aches, swollen lymph nodes, and a skin rash. These common symptoms are described quite well in Boora et al, 2023.
- Describe the sequential development of the illness, beginning with the prodromal phase, which is characterized by fever, headache, back pain, and fatigue, then the appearance of the rash. You can find more details on the typical progression in (Monkeypox: An epidemiologic and clinical comparison of African and US disease, 2006).



### 3.2. Rash Characteristics and Distribution

- Concentrate most of your attention to the rash because it is the sole hallmark of monkeypox that sets it apart from other viral illnesses. Breman et al. In their article Coula and Norris (1980) describe that the rash is bilaterally symmetrical and occurs in a step like fashion going through stages of papular rash, vesicular rash, pustular rash and umbilicated rash, scale and desquamation.
- Instead of that, it is possible to indicate where on the body the rash is generally present. Analysis of literature reveal that the rash is mostly peripheral in distribution as described by (Breman et al, 1980).

### 3.3. Variations in Severity and Complications

- Do not ignore the fact that monkeypox has the potential to manifest itself in different ways. Clinical manifestations escalates from mild to severe; further, it can result to pneumonitis, encephalitis, sight-threatening keratitis, and secondary bacterial infections (Adler et al, 2022).
- You could also explain factors that affect the severity of the disease like the age and other health conditions due to information from previous sources like Ježek, Z, et al 1987 indicating that different levels of severity are exhibited depending one's vaccination status.

### 3.4. Comparison with Smallpox and Other Diseases

- As seen in your structure, ensure that you include a section on how monkeypox is similar to smallpox. (Ježek, Z. ,et al 1987) actually makes a comparison between monkeypox and smallpox stating that while the disease is mild in most cases the clinical picture of monkeypox is similar to the ordinary and modified small pox.
- Point out the differences such as in monkeypox, affected lymph nodes are swollen as noted in Ježek, Z,et.al 1987.
- It may also be useful to review other diseases which may have similar symptoms as yours, such as chickenpox.

## 4. Diagnostic Methods and Laboratory Testing for Monkeypox

### 4.1. Clinical Diagnosis and Challenges

- Start by pointing out that diagnosing monkeypox strictly from clinical signs may be difficult because it has similar symptoms to other diseases such as chickenpox.
- Stress on the confirmation coming from laboratory tests.

### 4.2. Laboratory Testing Methods

- PCR Testing: Explain how PCR testing as illustrated in (Nörz et al , 2022) is the most effective diagnostic tool for monkeypox. Let them know that it encompasses identification of viral DNA in clinical specimens, including those from lesions.
- Serological Tests: Explain how serological tests, used not for the initial diagnosis of the disease, can identify antibodies to the monkeypox virus and assess prior exposure. You can briefly mention that (Monkeypox virus-infected individuals mount comparable humoral immune responses as Smallpox-vaccinated individuals - Nature Communications, 2023) talks about the antibody response in monkeypox.

### 4.3. Sample Collection and Handling

- Describe the nature of clinical samples submitted for monkeypox testing, including lesion swabs, blood, urine, and others.
- Emphasize the need for proper sample collection and handling, sample storage, and sample transportation to avoid erroneous test outcomes.



#### 4.4. Challenges and Future Directions

- Discussed any of the challenges existing in monkeypox diagnostics including for laboratory diagnostic where some regions have poor access.
- You could also briefly mention the requirement of more rapid diagnostic tests to enhance the preparedness for outbreak response.

### 5. Treatment and Management Strategies for Monkeypox

#### 5.1. Supportive Care and Symptom Management

- Start by informing them that medicinal management of monkeypox is mostly supportive in nature since they mean to alleviate the signs and prevent the development of complications. (Improving the Care and Treatment of Monkeypox Patients in Low-Resource Settings: Supportive care is highlighted as crucial, particularly given the context of low-resource environments, in the literature on both contemporary biomedical and smallpox biodefense research (Grabbar, 2017).
- Include such interventions like pain management, antipyretics, treatment for skin lesions, and fluid interventions.

#### 5.2. Antiviral Therapy

- Explain the role of antiviral drugs and tecovirimat in particular that could help treat the monkeypox virus, which is an orthopoxvirus. The 2023 article titled Challenges in the treatment and prevention of monkeypox infection: A comprehensive review offers a detailed overview of the challenges of treatment and prevention and also contains information on antiviral therapy.
- Name other drugs of the anti-viral category such as cidofovir or brincidofovir but explain that these drugs are not easily available and come with side effects.

#### 5.3. Vaccination as Post-Exposure Prophylaxis

- Inform that although smallpox vaccine is no longer given routinely, it can be administered for post exposure prophylaxis in individuals who have been in direct contact with monkeypox. Zhang et al. in their article published in eBioMedicine in the year 2022 also explain that due to the relationship between monkeypox and smallpox, vaccines for smallpox can be used.
- Include information regarding newer vaccines that have been specifically fabricated for monkeypox, like the JYNNEOS, and the possible means of managing the current outbreak.

#### 5.4. Challenges and Future Directions

- Discuss the limitations of managing monkeypox, especially concerning the availability of antiviral drugs and vaccines in developing countries. (Improving the Care and Treatment of Monkeypox Patients in Low-Resource Settings: In his manuscript titled 'Laceration Management Protocol Based on Biomedical Literature from Non Combating Zone Civilians and Smallpox Biodefense Research conducted in 2017', the author has described the need for better treatment in bioterrorism scenarios.
- Make recommendations for future studies on the best treatment protocols, the creation of newer and more affordable antiviral drugs, and fair distribution of vaccines.

### 6. Public Health Interventions and Control Measures

#### 6.1. Surveillance and Early Detection

- Begin by highlighting the need for enhanced surveillance systems that can quickly detect and monitor monkeypox outbreaks. One of the issues underlined by (Durski et al , 2018) concerns surveillance and laboratory agility, primarily in the region of West Africa.
- Explain how healthcare providers need to report suspected cases and the need for raising awareness to encourage early presentation to clinics.



## **6.2. Isolation and Contact Tracing**

- The reason why the health administration focuses on separating patients with confirmed monkeypox is explained. (Introduction of Monkeypox into a Community and Household: Monkeypox transmission characteristics suggested by the case reports in the DRC include understanding the patterns of transmission within the community and the household setting; isolation is a key untapped strategy based on these facts.
- Explain the purpose of contact tracing when it comes to tracking people who had close contact with the confirmed case.

## **6.3. Vaccination Strategies**

- Explain how vaccination can be used in the prevention of monkeypox. In a literature, 'Monkeypox: enhancing public health preparedness for an emerging lethal human zoonotic epidemic threat in the post-smallpox era' published in PubMed in 2018, the authors describe the approach of using 'One Human-Environmental-Animal Health' approach to define an outbreak in Nigeria, which would have possibly included vaccination.
- Different vaccination strategies include ring vaccination, which refers to the process of targeting persons that have been in close contact with a confirmed case of the virus, and post exposure prophylaxis.

## **6.4. Community Engagement and Education**

- Emphasize the role of community mobilization and outreach to increase awareness of monkeypox, decrease prejudice, and encourage precautions. The article, Spectrum of Infection and Risk Factors for Human Monkeypox, United States, 2003, 2010, also describes contacting the possible case-patients and getting their permission for picking body samples and other important investigations.
- Explain the use of public health communication to disentangle relevant information about how the illness spreads, its signs, and measures to be taken to prevent its spread.

## **6.5. International Collaboration and Response**

- Stress on the importance of cooperation among nations to mitigate the circulation of monkeypox around the world. This article from the LI, titled 'The Pathology of Experimental Aerosolized Monkeypox Virus Infection in Cynomolgus Monkeys (*Macaca fascicularis*) - Laboratory Investigation, 2001' talks about monkeypox as a human health risk, suggesting the possibility of its recurrence.

## **7. One Health Approach: Connecting Human, Animal, and Environmental Health**

### **7.1. One Health Framework**

One Health is knowledge and practice from health disciplines such as human medicine, veterinary medicine, and environmental medicine. The idea here is to reduce the potential threats associated with zoonoses by integrating findings of human, animal, and ecological health. This highlights the fact that human health is interconnected with animal and ecosystem health especially in regard to zoonotic diseases including monkeypox. (Kelly et al.2020)

### **7.2. Zoonotic Nature of Monkeypox**

Monkeypox virus (MPXV) has been mainly reported to have a zoonotic nature that implies the movement of the virus from animals to humans. The disease is zoonotic and is largely prevalent in areas in the Central and West African sub regions with rodents and primates as probable animal reservoirs. Transmission can be direct through the act of biting and scratching by infected animals or indirectly through consumption of meat parts from infected animals. (Kimani et al.2017)

### **7.3. Reservoir Hosts and Transmission Pathways**

The reservoir hosts and vehicles of transmission that are recognized by the World Health Organization include animals and insects, respectively.



Thus, rodents including squirrels and Gambian pouched rats are considered to be the natural hosts for monkeypox virus. These animal reservoirs promote the constant cycles of the virus and are responsible for zoonotic spillover through contact with humans directly or indirectly. Also, it is a common factor that closeness of human activities with wildlife areas enhances the chance of the spread. (Reynolds et al.2019)

#### **7.4. The Role of Environmental Factors**

This implies that following the alteration of their natural habitats through factors such as deforestation, humans get closer to these animals, thus increasing the chances of disease transmission. Increasing human-animal contacts due to habitat destruction elevate the risk of spillover occasions, providing details on the necessity of a more comprehensive approach to environmental health when developing public health strategies. (Cunningham et al. 2017)

### **8. Socioeconomic Impacts and Health Equity Issues**

#### **8.1. Socioeconomic Impacts of Monkeypox**

The current outbreak of monkeypox has brought into sharp focus the way that inequalities shape population health. People of certain preconditions and lower income levels are affected more when it comes to their health concerns because they have restricted access to healthcare related items and vaccinations. These socioeconomic factors are responsible for high prevalence and severity of the disease in these population groups. (Bishwajit et al.2014)

#### **8.2. Vulnerable Populations**

The extra-preferred groups of the monkeypox virus include the Blacks and ethnic minorities, MSM, gay, bisexual, and other related individuals with risky behaviors. These groups encounter structural discriminations when it comes to accessing healthcare and experience high levels of stigma and institutional racism, which makes it even harder for them to get tested and treated. (McKnight-Eily et al.2021)

#### **8.3. Access to Healthcare**

There have been disparities in health care during the monkeypox outbreak, with minorities suffering inadequate access to vaccines and health care for their diseases. Other barriers include the fact that the homeless have to access their services and those with health-related stigma cannot easily go for the services. Effective health care access is crucial for outbreak containment and minimizing transmission in high-risk populations (Perri et al.2020)(Badiaga et al.2008).

#### **8.4. Health Equity Issues**

Health equity entails acknowledging and responding to unfair health differences. There needs to be much more than just a particular approach to guarantee that all individuals will be able to access these healthcare facilities soon, especially affected populations with limited monkeypox access. Intervention strategies that include the involvement of public health sectors, community-based organizations, and policy-making committees and boards will consequently play a preventive role in ensuring the productivity and well-being of the targeted populations. (Tusabe et al.2022)(Roess et al.2011)

### **9. Risk Communication and Media Responses to Monkeypox Outbreaks**

#### **9.1. The Impact of social media on Information Dissemination**

Therefore, social networks play a critical role in the provision of real-time information during monkeypox infection. Through these channels, health authorities employed them to promptly spread information about vaccinations, precautions, and general news about the disease. Therefore, social media's immediacy of posting and spread of information can thus enhance public knowledge and participation in health programs. (Jafar et al.2023)

#### **9.3. Case Studies of Social Media Responses**

However, the rapid flow of misinformation is one of the main disadvantages during monkeypox outbreaks despite the benefits of social media. Wrong information concerning the transmission channels and cure has been rife, replacing factual public health information. Such an 'infodemic' results in negative consequences such as confusion, panic, and even stigmatization of the groups affected especially members of marginalized groups in the society. (Cha et al.2021)(Emovwodo et al.2017)



#### **9.4. Case Studies of Social Media Responses**

Some previous analyses have highlighted how misleading information spread through social networks, which exemplifies the motifs seen in the present analysis, concerning monkeypox. For example, conspiracy theories associating monkeypox with vaccines or with other approaches that pertained to public health surfaced on TikTok and Twitter. These narratives not only mislead the public, but they also undermine efforts of containing the virus by promoting distrust in health authorities. (Basch et al.2022)

#### **9.5. Strategies to Combat Misinformation**

Controlling misinformation requires strong risk communication measures that harness the advantages of social media. Measures include constant patrolling of the social media for fake news, correction of the fake news as soon as possible, and answering the questions of the community. The targets of these interventions need to be made receptive to public health messages and the adverse effects of misperception need to be minimized. (Villoria-Mendieta 2020)

### **10. Research Challenges and Future Directions in Monkeypox Control**

#### **10.1. Challenges in Vaccine Development**

Several important issues contribute to the difficulties in developing vaccines for monkeypox, including a lack of adequate vaccine availability and the need for specific preparations. At the moment, several people are in need of the monkeypox vaccines, but the number of vaccines available is limited, which makes it challenging to vaccinate the high-risk population. Furthermore, the existing vaccines require rigorous trial to gain the evidence of safety and efficacy of the vaccine when used for monkeypox alone and due to the ethical issues and constraints in conducting a clinical trial in the endemic and non-endemic areas of the world (Gruber 2022)

#### **10.2. Innovations in Vaccine Technology**

More research is being done on new vaccine platforms including those that are based on mRNA and those based on viral vectors. Application of such sophisticated strategies would improve the immunogenicity and safety of the monkeypox vaccines. Formulating a general vaccination approach before actual pandemics is imperative, implementing insights from Covid-19 and similar diseases, so that precautionary measures can be taken without delay in case of subsequent emerging viruses (Gruber2022).

#### **10.3. Importance of Effective Surveillance Systems**

Surveillance is a critical function in identifying monkeypox outbreak and collecting data about vaccine implementation. Proper handling should also be enhanced in the current systems to ensure early identification and reporting of cases. This involves pursuing population-level measures in the form of extensive epidemiologic mapping and real-time risk assessment tools that could direct immunization campaigns. Cooperation with other countries has also been crucial in the sharing of data and other resources; especially concerning countries and regions where monkeypox is more prevalent. (Kraemer et al.2022)

#### **10.4. Future Directions in Research and Collaboration**

Further studies should include the following questions: the time for which existing vaccines can provide immunity and the characteristics of monkeypox transmission among different populations. Therefore, multi-country trials are necessary to capture how these vaccines work, as well as assess other dosing regimens, including half doses and routes other than intramuscular. They could optimise available vaccine amounts to increase such public health efficacy in both persistent and fresh epidemic areas. (Águas et al.2021)

### **11. What specific strategies are being researched to enhance monkeypox vaccine efficacy**

#### **11.1. Multi-Epitope Vaccine Development**

Another study direction is the development of polyepitopic vaccines that combine several antigens of the monkeypox virus. This method entails joining the various epitopes from viral proteins using immunoinformatics, which greatly enhances the immune response as compared to normal immunology. These types of vaccines combine various epitopes of MPXV, making it more effective in protecting against other strains, down to the fact that the larger the immune recognition, the better the vaccines are likely to work (Rcheulishvili et al.2023)



## 11.2. Peptide-Based Vaccine Formulations

Another potential approach of interest is the use of synthetic peptide-based vaccines. These vaccines intend to employ only small fragments of monkeypox virus proteins to trigger immune reactions, without having to employ the whole virus. Early studies indicate that these formulations could produce specific B and T cells that are useful in combating MPXV rapid development cycle for vaccines in the wake of an outbreak<sup>34</sup>.

## 11.3. Use of Adjuvants

The inclusion of adjuvants in the vaccine formulation is a key approach towards improving vaccination outcomes. Adjuvants can enhance the reactogenicity and immunogenicity of a vaccine by provoking a more robust and sustained response of the immune system. The adjuvants that are being studied could provide additional advantages to monkeypox vaccines, achieving the maximum effect while incorporating the lowest amount of the material needed to stimulate immunity<sup>34</sup>. (Hatch et al.2013)

## 11.4. Alternative Vaccination Routes

Another approach that is currently under study in extending vaccine effectiveness involves the proper placements of the vaccines. Research shows that it is perhaps possible to use smaller volumes for eliciting immune responses, which is an advantage over the IM technique. This approach not only saves vaccines during outbreaks but also helps reach more people in a shorter space of time<sup>1012</sup>. (Bullock et al 2022)

## 11.5. Epidemiological Mapping and Targeted Vaccination

Another factor is the possibility of aiming the vaccination campaigns more selectively by means of epidemiological mapping that, in turn, might improve the vaccination outcomes globally. Potential monkeypox patients and areas with high prevalence of the disease can also be easily detected, allowing health officials to direct vaccine administration to such provinces. This approach helps in avoiding excessive usage and thus enhances the effectiveness of vaccination crusades against the virus<sup>57</sup>. Overall, it is clear that significant progress is being made in developing more effective and accessible monkeypox vaccines, with innovative approaches showing promise. (Huang et al.2022)

## Conclusion

Lastly, monkeypox is endemic to central and west Africa, with the first reported human case occurring in 1970 in the Democratic Republic of Congo. Some of the causes and reasons that have led to the development and spread of this virus include the discontinuation of small pox immunization, globalization and migration, and population growth especially in cities. More recent cases have been recorded in different parts of the world; Chinese cities of Beijing and Guangzhou are among them. Some of the symptoms of monkeypox include fever and rash where rashes are usually peripheral. Risk can range, with possible consequences like pneumonitis and encephalitis. This includes polymerase chain reaction diagnostic tests and serological tests for diagnosis and antiviral drugs, supportive care, and vaccination for management. Population control measures include surveillance, quarantine, and vaccination. One Health is a security approach that combines human, animal, and environmental health for disease prevention. Socioeconomic effects expose the areas of inequality in health care provision and calls for health equity. containment and management of misinformation is central during outbreak, with risk communication and media response playing a critical part. Emerging research questions include; increasing the effectiveness of vaccines to address muting through new strategies like expressing multiple epitopes in vaccines, using peptides in formulations, use of adjuvants, different methods of administering vaccine, and targeted vaccination that is according to the epidemiological location of the disease in relation to the population. Possible ideas for further studies and partnership concern the enhancement of surveillance systems and identification of gaps in existing knowledge to promote effective vaccine use.

Monkeypox is a serious global public health threat in the twenty-first century. The fact that it has appeared outside Africa, its transmissibility, the absence of specific antiviral treatments make the call for strong public health measures, research, and international collaboration imperative. Hence, knowledge of the epidemiology, clinical features, diagnostic methods, treatment, and disease transmission involving humans, animals and the environment to be important to combat this new emerging disease efficiently. Measures such as control, research, and promotion of health equity can help reduce the effects of monkeypox on global health.





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