Republic of Rwanda
Ministry of Health

Rwanda Biomedical Centre
Healthy People, Wealthy Nation

Rwanda National Guideline for Surveillance and Management of Mpox

August, 2024

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Foreword

The emergence and spread of Mpox (formerly known as monkeypox) has presented new challenges to public health systems worldwide. As a nation committed to safeguarding the health and well-being of our citizens, Rwanda recognizes the importance of being prepared to effectively detect, respond to, and manage Mpox cases.

This comprehensive guideline for the surveillance and management of Mpox represents our proactive approach to addressing this evolving public health concern. It has been developed through careful consideration of the latest scientific evidence, international best practices, and the specific context of Rwanda's healthcare system.

The purpose of this document is to equip our healthcare workers, public health officials, and other relevant stakeholders with the knowledge and tools necessary to: Implement robust surveillance measures to detect Mpox cases early; Accurately diagnose and manage Mpox infections; Prevent and control the spread of the virus within our communities; Coordinate an effective multi-sectoral response to the ongoing outbreak.

By providing clear, actionable guidelines, we aim to ensure a unified and efficient approach to Mpox across all levels of our health system. This document will be regularly updated to reflect new developments in Mpox research and global response strategies.

We call upon all health professionals and partners to familiarize themselves with these guidelines and to implement them diligently. Through our collective efforts, we can protect the health of our population and contribute to the global fight against Mpox.

Prof. Claude Mambo Muvunyi
Director General
Rwanda Biomedical Centre

Acknowledgement

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Abbreviations and Acronyms

Abbreviation/Acronym	Full Statement
CDC	Centers for Disease Control and Prevention
CFR	Case Fatality Rate
DNA	Deoxyribonucleic Acid
DRC	Democratic Republic of Congo
EBS	Event-Based Surveillance
e-CBS	Electronic Community-Based Surveillance
ECSA-HC	East, Central and Southern Africa Health Community
e-IDSR	Electronic Integrated Disease Surveillance and Response
EWAR	Early Warning and Response
FFP2	Filtering Facepiece Respirator 2
HCWs	Healthcare Workers
HHT	Human-to-Human Transmission
HIV	Human Immunodeficiency Virus
IBs	Indicator-Based Surveillance
IDSR	Integrated Disease Surveillance and Response
IHR-NFP	International Health Regulations - National Focal Point
IMS	Incident Management System
KABP	Knowledge, Attitudes, Beliefs, and Practices
MAM	Moderate Acute Malnutrition
MPVX	Mpox Virus

MUAC	Mid-Upper Arm Circumference
N-95	N-95 Respirator
NRL	National Reference Laboratory
PCR	Polymerase Chain Reaction
PHEIC	Public Health Emergency of International Concern
PHEMC	Public Health Emergency Management Committee
PHEOC	Public Health Emergency Operations Center
PHERCP	Public Health Emergency Response Coordination Plan
PoE	Points of Entry
PPE	Personal Protective Equipment
RAB	Rwanda Agriculture Board
RBC	Rwanda Biomedical Center
RCCE	Risk Communication and Community Engagement
RDB	Rwanda Development Board
RHCC	Regional Health Coordination Committee
RRT	Rapid Response Team
SAM	Severe Acute Malnutrition
UK	United Kingdom
VTM	Viral Transport Medium
WHO	World Health Organization

1. Introduction

1.1. Background

Mpox (formerly known as monkeypox) is a viral zoonotic disease caused by Mpox virus (MPXV), which belongs to the orthopoxvirus genus in the family Poxviridae. It has similar symptoms to that of smallpox. However, historically, it is milder, rarely fatal and less contagious than smallpox. Mpox was first discovered in 1958 in colonies of Monkeys kept for research, hence the name 'Mpox.' The disease was first identified in humans in 1970 in the Democratic Republic of Congo (DRC). Globally, Mpox has historically been confined to Central and West Africa, but a significant outbreak in 2022-2023 saw cases reported in non-endemic regions, including Europe, North America, and Asia. The first Mpox outbreak outside of Africa was reported in the United States of America and this was linked to contact with infected pet prairie dogs. These pets had been housed with Gambian pouched rats and dormice that had been imported into the country from Ghana.

Furthermore, this outbreak was notable for its spread among populations not previously considered at high risk, such as men who have sex with men. There are two distinct genetic clades of Mpox virus: the Central African (Congo Basin) clade I (which is associated with more severe illness) and the West African clade II (which is associated with milder disease). The Congo basin clade has historically caused more severe diseases with higher case fatality rate and was thought to be more transmissible. The animal reservoir is not yet known but is highly suspected to be small mammal species such as rodents. The virus, which is transmitted from its animal reservoir to a human host, is currently believed to have limited secondary spread through human-to-human transmission (HHT). The case fatality rate (CFR) is reported to vary widely (between 1% and 11% for various outbreaks), with the majority of deaths occurring in younger age groups. Vaccines for mpox are not readily available in many countries but prior smallpox vaccination has been reported to offer some degree of cross-protection to Mpox. The use of anti-viral medications, like Tecovirimat (TPOXX), has not been officially approved for treating, and its effectiveness and safety for managing any human orthopoxviral infections remain unestablished.

Since the start of 2022, cases of Mpox have been reported in seven endemic and three non-endemic African countries. Following this, there has been a continuous global increase in Mpox cases, leading the WHO to declare it a Public Health Emergency of International Concern (PHEIC) on July 23, 2022. This declaration underscores the global concern and the threat posed by the disease. By August 2, 2022, just a month after the PHEIC declaration, a total of 25,391 confirmed Mpox cases and 10 deaths (six from endemic and four from non-endemic countries) had been reported worldwide. Notably, 98.7% of these cases were from 76 countries that had not historically reported Mpox cases. This marks the first time in history that cases and continuous chains of transmission have been documented in countries without direct or indirect epidemiological links to Central or West African regions.

In Africa, Mpox has been endemic in several countries, particularly in the Central and West African regions. In the continent, the virus is believed to be maintained in nature through an animal reservoir, with rodents being the most likely candidates. WHO African region has reported an increase in Mpox virus (MPXV), and the annual number of cases of Mpox reported are linked with clade I. In addition to outbreaks in endemic areas often considered to be associated with zoonotic transmission with subsequent household and community spread, human-to-human transmission of Mpox due to clade I, MPXV has also continued to

increase. In the Democratic Republic of the Congo, there was a marked rise in cases reported in 2023. For the first time in 2023, sexual transmission of clade I MPXV was also documented where outbreaks associated with sexual contact are ongoing. Outbreaks linked to sexual transmission have occurred among sex workers in mining communities, in clusters of cases among men who have sex with men, and through heterosexual transmission in households. In July and August of 2024, more than 100 laboratory-confirmed cases of clade 1b have been reported in four neighboring countries—Burundi, Kenya, Rwanda, and Uganda that had previously not reported any mpox cases. Thus, on Augst 14th, 2024, the WHO Director-General declared mpox outbreak a public health emergency of international concern.

The cessation of smallpox vaccination, which provided cross-protection against Mpox, has contributed to the resurgence of the disease in these regions. Mpox outbreaks in Africa have been characterized by higher morbidity and mortality rates compared to those seen in non-endemic regions.

1.2. Mpox Outbreak Situation in Rwanda

Rwanda confirmed the first Mpox outbreak on 24th July, 2024 less than two weeks after neighboring country DR Congo reported 25 cases in the border city of Goma. Both the two first mpox cases that were reported had a recent travel history to the Democratic Republic of Congo (DRC) before the onset of symptoms.

Since then, Rwanda has undertaken numerous prevention and control activities like enhanced surveillance and case detection, strengthening border health screening measures, training of healthcare workers on Mpox management, enhancing laboratory capacity for testing and diagnosis and public awareness in high-risk districts. The epidemiology of Mpox can be influenced by factors such as population density and urbanization, population mobility and cross border movements, the availability and accessibility of healthcare facilities can impact the management and containment of Mpox cases, the implementation and effectiveness of public health interventions including contact tracing and isolation protocols, can significantly impact the spread of the virus.

The Rwandan Ministry of Health has collaborated with international organizations like the World Health Organization (WHO) and the Africa Centers for Disease Control and Prevention (Africa CDC) to enhance epidemic intelligence, diagnostic capabilities and public health preparedness. Additionally, efforts have been made to educate the public about the risks of Mpox and the importance of reporting suspected cases.

1.3. Clinical Features of Mpox

The pathogenesis, signs, and symptoms of Mpox are similar to those of smallpox; however, Mpox is distinguished by the presence of lymphadenopathy. Common symptoms of Mpox include a rash which may last for 2–4 weeks. This may start with, or be followed by fever, headache, muscle aches, back pain, low energy and swollen glands (lymph nodes). The rash looks like blisters or sores, and can affect the face, palms of the hands, soles of the feet, groin, genital and/or anal regions. Before entirely healing, the rash passes through several stages. A rash may appear first, followed by subsequent symptoms in some cases. Some people merely get a rash, this usually happens with the commencement of a fever, 1–2 days before the development of the rash, or very rarely with the onset of the rash. Lymph nodes in the neck (submandibular and cervical), armpits (axillary), and groin (inguinal) can expand on both sides of the body or just one.

The typical presentation of Mpox is well described and consists of a short febrile prodromal period followed by progressive development of a classic rash with indurated and umbilicated (centrally depressed) lesions, starting on the head or face and progressing to the limbs and trunk. Lesions progress all at the same stage from macules (lesions with a flat base), to papules (raised firm lesions), to vesicles (filled with clear fluid), to pustules (filled with yellowish fluid) and eventually to crusts which dry up and fall off after two to four weeks. There are often enanthem (sores or ulcers) in the mouth and lesions can affect the eyes and/or genital area. Swollen lymph nodes are typical of Mpox. However, lesions may be hemorrhagic or coalesce into large bullae. In this multi-country outbreak, there have been suggestions that the progression of the lesions may be atypical, beginning in the genital area. Many persons experiencing this condition may have been tested for other infectious diseases at the time of detection.

The analysis of case report obtained from member states and published by WHO among cases where at least one symptom is reported (n = 36,155), the most common symptom is any rash (88.6%), followed by fever (58.0%), and systemic rash or genital rash (54.8% and 49.6% respectively). The symptomatology of cases has been very consistent over time in this outbreak. Although information on clinical presentation from countries in East, West and Central Africa is missing in the global surveillance data, other sources of information support rash being the main Mpox symptom among cases there as well.

Mpox can cause a range of severity of signs and symptoms. While some people have less severe symptoms, others may develop more serious illness and need care in a health facility. Those typically at higher risk of more severe symptoms include people who are pregnant, children and persons that are immunocompromised, including people with untreated and advanced HIV disease. This evidence has also been confirmed from data from affected countries in which around half (18,425 / 35,512; 51.9%) of cases with available information on their HIV status are reported to be in persons living with HIV related to the common risk factor of sexual exposure between the two conditions. In most cases, the symptoms of Mpox go away on their own within a few weeks with supportive care, such as medication for pain or fever. However, in some people, the illness can be severe or lead to complications and even death. New-born babies, children, people who are pregnant and people with underlying immune deficiencies may be at higher risk of more serious Mpox disease and death.

Severe disease due to Mpox may include larger, more widespread lesions (especially in the mouth, eyes, and genitals), secondary bacterial infections of the skin or blood and lung infections. Complications can include severe bacterial infection from skin lesions, Mpox affecting the brain (encephalitis), heart (myocarditis) or lungs (pneumonia), and eye problems. People with severe Mpox may require hospitalization, supportive care and antiviral medicines to reduce the severity of lesions and shorten time to recovery. According to available data, between 0.1% and 11% of people with Mpox have died. It is important to note that death rates in different settings may differ due to several factors, such as access to health care and underlying immunosuppression.

1.4. Mode of Transmission

The virus can be transmitted through animal-to-human, human-to-human, and environment-to-human pathways. Initial cases identified in the Democratic Republic of Congo in 1958 were infected through direct contact with the blood, bodily fluids, or skin and mucosal lesions of infected animals, often via bites or scratches. In Africa, human infections have been linked to handling infected monkeys, Gambian giant

rats, and squirrels, as well as consuming inadequately cooked meat from these animals. Additionally, contact with materials contaminated with the virus can result in infection. The virus enters the body through broken skin (even if not visible), the respiratory tract, or mucous membranes (such as those of the eyes, nose, or mouth). Human-to-human transmission, or secondary transmission, primarily occurs through respiratory droplets requiring prolonged face-to-face contact, direct or indirect contact with skin lesions or bodily fluids of an infected person, or contact with objects recently contaminated by patient fluids or lesion material (such as clothing or linens).

Although evidence on the persistence of variola-related viruses on materials (which may act as fomites) under controlled environmental conditions is limited, vaccinia virus is known to persist for weeks to months, highlighting the importance of environmental decontamination. During human Mpox outbreaks, household members of active cases are at greater risk of infection due to their close proximity, and hospital-acquired infections have been reported in the Democratic Republic of Congo and the UK. Among reported transmission modes, sexual contact is the most commonly cited, accounting for 83.6% (18,860 out of 22,550) of cases, followed by non-sexual person-to-person contact. This pattern has persisted over the last six months, with 95.0% (597 out of 626) of new cases reporting sexual contact.

Detailed information on the transmission routes is not available for most cases in the African Region, meaning that the current data does not fully capture the virus's spread in this region, which involves a more diverse transmission pattern, including zoonotic exposure and human-to-human transmission. Furthermore, transmission can occur through inoculation or vertically via the placenta (congenital Mpox). Individuals affected by the virus are advised to avoid close contact with immunocompromised persons, including those with HIV infection, until all crusts from the lesions are gone.

Animal-to-Human Transmission:

- Direct contact with blood, bodily fluids, or lesions of infected animals
- Bites or scratches from infected animals
- Consuming inadequately cooked meat of infected animals

Human-to-Human Transmission:

- Direct contact with skin lesions or body fluids of an infected person, including sexual contact
- Transmission can also occur through droplet respiratory particles requiring prolonged face-to-face contact
- Household members of active cases are at greater risk of infection due to their proximity
- Hospital associated acquired infections have been noted in Democratic Republic of Congo as well as in the UK
- Contact with objects contaminated by patient fluids or lesion material (e.g., clothing, linens, dishes)

Environment-to-Human Transmission:

- Contact with materials contaminated with the virus, Variola-related viruses may persist on materials for weeks to months, emphasizing the need for environmental decontamination

Other Modes:

- Inoculation or vertical transmission via the placenta (congenital Mpox).

1.5. Signs and Symptoms

A range of clinical signs and symptoms can be caused by MPXV. Clinical manifestations of Mpox usually develop within 5–21 days of infection (incubation period), with infection usually mild-to-moderate in nature and can be divided into two periods.

- **Invasion/prodromal period** (1-5 days after the incubation period) with clinical manifestations of fever, intense headache, lymphadenopathy (swelling of the lymph node), back pain, myalgia (muscle ache) and an intense asthenia (lack of energy)
- **Rash Phase**: Skin eruption period (within 1-3 days after appearance of fever) where rashes appear in various stages often beginning on the face and then spreading elsewhere on the body. The face (in 95% of cases), and palms of the hands and soles of the feet (in 75% of cases) are most affected. The evolution of the rash which occurs over a period of 10 days, progresses through the following stages:
    - Maculopapular (lesions with a flat base)
    - Vesicles (small fluid filled blisters)
    - Pustules (pus-containing rash)
    - Crust (dried blisters)

The evolving outbreak in Rwanda indicates that all parts of the body can be affected by Mpox. However, the parts of the body most affected by rashes are in the following order from most affected to the least affected:

- Face
- Legs
- Trunk
- Arms
- Palms
- Genitalia
- Soles

The oral mucous membranes and the conjunctivae as well as the cornea (eyeball) were also recorded among cases during this outbreak. The crusts may not completely disappear for three weeks. Individuals are no longer contagious once all crusts have dried into scabs and have fallen off. Even though the symptoms of Mpox are known to be milder than smallpox, the disease can be fatal.

1.6. Risk Factor for Mpox

Human-to-human transmission of Mpox is linked to risk behaviors such as sharing a room or bed, living in the same house, and sharing dishes for eating or drinking. Animal-to-human transmission risk is reportedly increased by sleeping outside or on the ground, living near or visiting forests, and regular exposure to sick animals or cleaning their cages/bedding.

According to a WHO report, many of the cases in the current outbreak have been identified among men who have sex with men, and female sex workers. Since the virus is spreading within these social networks, men who have sex with men, and sex workers may currently be at higher risk of exposure if they have close contact with an infectious person.

Males account for the majority of cases in most outbreaks. Over 80% of cases in the 1970-79, 1981-86, and 1996-97 cohorts were under the age of 15, but the median age of cases has been steadily increasing since the 1970s. Commonly affected occupations include traders, students, artisans, healthcare professionals, farmers, hunters, and transportation workers. High-risk groups for severe outcomes from Mpox include infants, young children, pregnant women, patients with complications, and immunocompromised individuals.

Individuals who received a smallpox vaccination have a lower overall attack rate (0.95/1000) compared to those who did not receive the vaccination (3.6/1000). In particular, Mpox risk factors in Rwanda are still unknown and need to be identified, although the identified cases so far indicate a heterosexual human-to-human transmission in addition to the other risk factors seen in the Western World

1.7. Prevention of Mpox

Measures that can be taken to prevent infection with Mpox virus include:

By the community

- Avoiding direct contact with animals that could harbor the virus including sick or dead animals especially in areas where Mpox occurs
- Avoiding direct contact with ill patients
- Regular hand washing after caring for, or visiting sick people
- Thoroughly cooking all animal products before eating
- Hand washing with soap and water after contact with infected animals
- Avoiding contact with any material that has been in contact with a sick animal

By the health care workers (Animal and human health)

- Isolation of infected patients from others who could be at risk for infection
- Wearing gloves and protective equipment when taking care of ill people
- Immediate initiation of contact tracing to identify exposure during travel
- Establish robust screening protocols at all points of entry
- Implementation of standard and transmission-based infection control precautions in emergency rooms, isolation units, dermatology clinics and other areas where infected people might present
- Isolating potentially infected animals from other animals

1.8. Prognosis

Mpox is normally a self-limiting disease with symptoms lasting from two to four weeks. It typically resolves on its own without medical intervention. Mpox complications can include secondary infections, bronchopneumonia, sepsis, encephalitis, and corneal infections with subsequent vision loss. According to the WHO Mpox, the current case fatality rate (CFR) is around 1–11%. The CFR for the Central African clade I (11%) was significantly higher than that of the West African clade II (6 %). A review reported the secondary attack rate (SAR) for Mpox to range between 0-11 % (Beer and Bhargavi Rao, 2019). Another report from systematic review revealed the SAR to range from 0.3–10.2% in five decades (1970s to 2010-2019).

2. Mpox Outbreak Response and Control Strategies

Response to human Mpox outbreak requires suspicion, early diagnosis and early management of cases and their contacts to prevent spread of the disease. Control measures include but not limited to:

a) Intensified surveillance and active case finding using established standard case definitions

b) Isolation and care of suspected or confirmed cases

c) Prompt sample collection (lesion specimens for active cases and serum for retrospective cases) for laboratory diagnosis

d) Strict adherence to standard, contact precautions and droplet precautions

e) Risk Communication and Social Mobilization of the community on preventive measures

2.1. Response Coordination

Effective response to, and control of Mpox outbreak involves the participation of all stakeholders. Members of the community; health care workers; District, Province and National Public Health officials (including the Medical Officers of Health facilities at all levels, Environmental Health officers, animal surveillance officers); veterinarians, the academia; development partners and the media and security organs all have a role to play in the response to, and control of Mpox.

Donors/partners support the government of Rwanda at all levels in the response to, and control of diseases. This may involve the capacity building in ensuring the readiness of Public Health Emergency Operations Centre (PHEOC) and other capacity building based on the demand.

2.2. Roles and Responsibilities

A. Members of the Public

- Take all necessary precautions to prevent the spread of infection from animals and persons suspected to be infected such as avoiding direct contact.
- Report suspected cases of Mpox to health care workers, Community Health Officers, or call the RBC toll free call center (toll free number: 114) based on the community case definition.

B. Health Care Workers

- Identify suspected cases of Mpox using the standard case definitions (see below)
- Practice standard precaution in the management of all suspected cases and confirmed patients
- Isolate and manage all suspected and confirmed Mpox cases away from other patients per the prevailing protocol
- Collect appropriate samples for laboratory diagnosis
- Report all suspected/confirmed cases to the appropriate level and

- Support field investigation and complete all required investigation forms
- Educate patients and their relatives on Mpox infection prevention protocols and management
- Others

C. District Public Health Officers

- Investigate all reported Mpox suspected cases and rumors
- List and follow-up contacts of cases in both community and healthcare settings
- Facilitate the transport sample to the National Reference Laboratories for diagnostic testing
- Facilitate movement of cases from the community to health facilities
- Report all cases through e-IDSR reporting system
- Create awareness of Mpox preventive and infection control actions in the community (including during funerals) and in health facilities
- Carry out epidemiological analysis of cases to identify and inform needed targeted actions
- Coordinate the overall Mpox response at district level and support the sector through activated IMS or through routine modalities.
- Others

D. The Rwanda Biomedical Center

- Coordinate and support all Provinces in the response to, and control of the outbreak
- Deploy Rapid Response Teams (RRT) where necessary to support outbreak investigation and management
- Perform laboratory diagnostic testing
- Develop guidelines and Standard Operating Procedures (SOPs) for Mpox response and control
- Carry out epidemiological analysis of cases to identify and inform needed targeted actions
- Provide the nation-wide guidance on the prevention and control of Mpox
- Coordinate the overall Mpox response at province level and support the district through activated IMS or through routine modalities.
- Coordinate national level control (i.e. acquisition of Mpox therapeutics under trial and vaccines) and related research activities
- Others

3. Early Warning and Surveillance for Mpox

Surveillance of Mpox should be conducted through the indicator-based surveillance (IBS) and event-based surveillance (EBS) as components of the early warning and response system (EWAR). Actively monitor for Mpox signals across all health system levels, including public and private facilities. Engage and train Community Health Workers (CHWs) to detect and report potential Mpox cases in their communities.

At Points of Entry (PoE), maintain heightened vigilance for Mpox risks before, during, and after travel. Promptly report any suspected cases, even if travelers have already departed. Health staff at all levels must immediately verify, investigate, and respond to potential Mpox signals to prevent community spread. Establish clear reporting channels and ensure all stakeholders, from community members to healthcare professionals, understand their role in the surveillance process.

Regularly update and disseminate Mpox case definitions and reporting protocols, conduct periodic training and drills to maintain surveillance readiness. Integrate Mpox surveillance data from all sources for comprehensive analysis and timely response coordination. Remember, early detection and rapid response are crucial in controlling Mpox outbreaks.

3.1. Event Based Surveillance

For EBS, suspected Mpox cases can be identified through regular surveillance activities in the community, at Points of Entry (POEs), among patients presenting at the health facilities, through media scanning, and hotlines. Proper management of Mpox signals, alerts, and events should be ensured through signal verification to differentiate genuine cases from false alarms and risk assessment to characterize the nature and severity of the situation. This helps to reduce false alarms; determine if a public health response is warranted; and guides the appropriate scale and type of intervention required to mitigate the impact of Mpox outbreak effectively as put under figure 1.

3.1.1. Signal Detection

Implement a comprehensive signal detection system for Mpox across all levels. Community Health Workers (“Lookouts”) and Points of Entry (PoE) screeners must actively monitor for unusual public health events, illnesses, or deaths that might signal a Mpox outbreak using established community or facility case definitions. Besides, utilize the EIOS Media scanning platform to monitor online information about Mpox cases in Rwanda, neighboring regions, and globally and Operate the Hotline EBS via the toll-free number 114 as a public helpline for reporting unusual events or diseases, including suspected Mpox cases.

All detected signals must be immediately reported to IDSR focal persons and Provincial Public Health Emergency Operations Center (PHEOC) and reported using the electronic community-based surveillance platform (e-CBS) or Impuruza system, hosted on the electronic Integrated Disease Surveillance and Response (e-IDSR).

District IDSR focal persons and PHEOC are responsible for conducting triage and verification of all reported signals. Ensure all relevant personnel are trained on current Mpox case definitions and reporting procedures.

3.1.2. Triage and Verification of Signal

- Verify all identified Mpox signals within 24 hours of reporting. Triage incoming signals to eliminate duplicates, hoaxes, false rumors, and artifacts.
- Conduct structured verification by contacting the primary source, involving additional sources, or performing field investigations as needed.
- Use phone calls or in-person visits to the reporting individual. Maintain a signal log to review information about the event's origin and nature, establishing a basic epidemiological description.
- Guide verification with key questions like Where, when, and who is affected? Does the description suggest a potential Mpox event? How valid is the information? Based on verification results, determine if the signal constitutes an actual event or should be discarded. Document all verification steps, including methods used, sources contacted, and conclusions reached.
- Ensure the verification team is trained in Mpox case definitions and investigation protocols. Maintain confidentiality throughout the process. If verified as a potential Mpox event, immediately activate appropriate response protocols. This rigorous verification process helps distinguish genuine Mpox threats from false alarms, enabling rapid and appropriate public health responses.

3.1.3. Risk Assessment of the Event.

Conduct a risk assessment of confirmed Mpox events within 24 hours of verification, led by the District Public Health Emergency Management Committee (PHEMC) with support from the Public Health Emergency Operations Center (PHEOC) or Rwanda Biomedical Centre (RBC) at the central level.

Use the risk assessment algorithm (Figure 1) to rapidly evaluate and assign the risk level, determine the appropriate response, and inform management decisions. Consider hazard, exposure, and context assessments.

Manage the event according to the assigned response level, either by the district Rapid Response Team (RRT) or with national RRT support. Repeat the assessment as new information emerges until the response ends, as risk levels may change. Initially designate the risk level based on potential impact and likelihood, raising an alert accordingly.

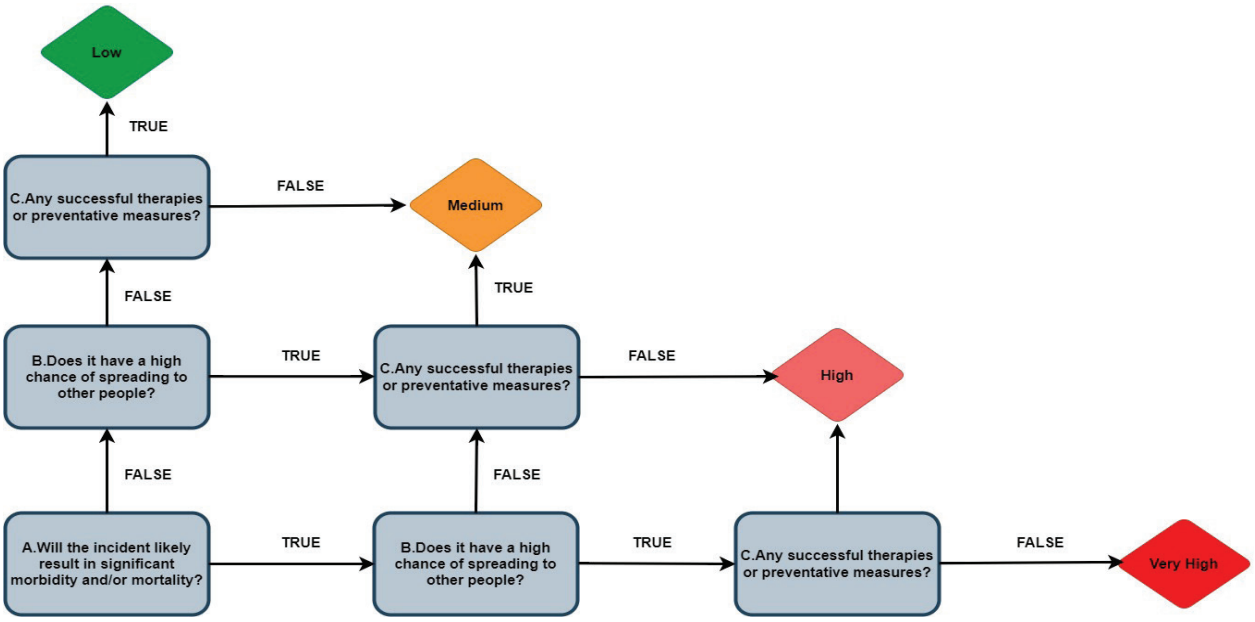

Figure 1: Risk assessment algorithm

3.2. Indicator Based Surveillance

IBS data for Mpox should be reported through the electronic Integrated Disease Surveillance and Response (e-IDSR) and utilizes various strategies, including existing routine surveillance in health facilities. Mpox related data should be systematically collected, analyzed, and interpreted by trained health facilities staff. All trained healthcare providers (nurses and doctors) that encounter patients are required to identify and immediately report suspected cases of Mpox that meet the case definition to the surveillance officers (IDSR Focal Person / Data manager).

3.2.1. Case Definitions

The case definition to be used in Rwanda has been adopted from WHO's surveillance, contact tracing and case investigation interim guideline and they are as follow as:

Surveillance Point	Case Definition
Suspect Cases	A person of any age who presents with an unexplained acute skin rash or lesions** alone or with one or more of the following signs or symptoms: ▪ Headache ▪ Acute onset of fever (>38.5°C), ▪ Lymphadenopathy (swollen lymph nodes) ▪ Myalgia (muscle and body aches) ▪ Back pain ▪ Profound weakness ▪ Fatigue ▪ Pharyngitis (sore throat) ▪ Proctitis (rectal inflammation/pain) **lesion include genital, perianal, anorectal and/or perioral, oral, or oropharyngeal

Probable Case	A person of any age who meets the suspect case definition **AND** has one or more of the following: 1. Has an epidemiological link to a probable / confirmed Mpox case / travel to an endemic area in the 21 days before symptom onset. 2. Has had multiple and/or casual sexual partners in the last 21 days before symptom onset. An epidemiological Link can be: ▪ Face-to-face exposure, including health workers without appropriate personal protective equipment (PPE). ▪ Direct physical contact, including sexual contact; or contact with contaminated materials such as clothing or bedding
Confirmed Case	▪ A suspect or probable laboratory confirmed for Mpox virus by detection of unique sequences of viral DNA by real-time polymerase chain reaction (PCR).
Discarded Case	▪ A suspected or probable case for which laboratory testing of lesion fluid, skin specimens or crusts by PCR is negative for Mpox.
Community case definition	▪ Any person with skin rashes

3.2.2. Alert and Action Thresholds for Mpox

The following are the defined thresholds for Mpox outbreaks:

A. Alert threshold

The Alert threshold is the point at which a single case is suspected

- Report case-based information to appropriate levels
- Collect and send specimen (preferably swab of rash) under strict safety conditions to National Reference Laboratory (NRL) to confirm diagnosis
- Ensure patient is isolated per the prevailing protocol ensuring the necessary precautions
- Treat and manage the patient with supportive care and symptom specific management
- Enhance surveillance and start necessary preparedness

B. Action threshold

The Action threshold is the point at which a single case is confirmed. The actions to be taken for each threshold are as follows:

- Maintain strict infection control measures throughout the duration of the outbreak
- Mobilize the community for early detection and care
- Conduct community education about the confirmed case, how the disease is transmitted and how to implement infection prevention and control in home care settings and during funerals
- Conduct active search for additional cases
- Request additional help from the national/international levels as needed
- Establish isolation ward to handle additional cases that may be admitted to the health facility.

3.2.3. Cross-border Surveillance for Mpox

Point-of-entry (PoE) surveillance is a crucial aspect of public health measures aimed at preventing the spread of Mpox across international borders as recommended by IHR. This surveillance strategy primarily focuses on temperature screening for individuals entering the country through different points of entry, including Airports, various land borders and ports. Travelers should routinely be screened for identification of suspected travelers with symptoms and referred to designated nearest healthcare facilities.

PoE personnel should play a crucial role in preventing the spread of Mpox across international borders. The following guidelines outline their responsibilities and actions:

1. Screening Protocols:

- Conduct primary screening using thermos-flash or thermos-scan on all travelers.
- Identify travelers with temperature ≥ 38°C or who appear unwell.
- Screen for other Mpox symptoms, using standard case definition.
- Review travelers' health declaration forms and travel history.
- Provide necessary orientation for cabin crews/stakeholders to be able to detect the suspect during flight or upon arrival.

2. Handling Suspected Cases:

- Separate travelers with temperature ≥ 38°C or symptoms from others.
- Direct them to a designated holding area for rest and further assessment.
- Conduct secondary screening by trained health personnel after a brief rest period.
- Use the PoE health assessment tool **(annex 3)** to record detailed information.
- If symptoms persist, fill out PoE Health Notification and verification forms.
- Notify the IDSR focal person at the nearest health facility for referral.

3. **Contact Tracing:**
    - List and record potential contacts and all persons traveling with the suspected case.
    - Use the Contact Listing form and attach the travel manifest when available.
    - Collect detailed information about the patient's travel itinerary, seating arrangements, and interactions with other passengers.
4. **Documentation and Reporting:**
    - Ensure all travelers complete health declaration forms.
    - Maintain accurate records of all screenings, suspected cases, and actions taken.
    - Report suspected or confirmed cases to RBC and report into e-IDSR
5. **Public Health Education:**
    - Provide educational materials about Mpox symptoms, transmission, and prevention.
    - Use posters, brochures, and digital displays to disseminate information effectively.
    - Inform travelers about the importance of reporting any signs of illness.
6. **Collaboration and Communication:**
    - Establish and maintain communication channels with local health authorities and neighboring countries.
    - Share information about Mpox cases and outbreaks in real-time.
    - Coordinate response strategies and public health measures with other stakeholders.
7. **Resource Management:**
    - Ensure adequate supply and proper use of PPE for all PoE staff.
    - Maintain diagnostic tools and screening equipment.
    - Keep isolation and quarantine facilities ready for suspected cases.
8. **Training and Preparedness:**
    - Participate in regular training on Mpox prevention, control, transmission, and symptom identification.
    - Be familiar with protocols for handling suspected cases on aircraft or other conveyances.
    - Know how to activate the public health emergency response contingency plan (PHERCP) if needed.

9. Special Considerations:

- Monitor transit passengers closely for signs and symptoms of Mpox.
- For transportation of human remains, ensure adherence to infection prevention and control measures.
- Collaborate with transport authorities and other stakeholders for safe handling procedures.

10. Continuous Monitoring:

- Stay vigilant for potential Mpox cases, especially in areas with high traveler movement.
- Adapt procedures as necessary based on updated guidelines from health authorities.

3.3. Mpox Case/Outbreak Investigation

The first step in investigating a Mpox outbreak is preparation and initial response. This involves assembling a multidisciplinary team of experts as outlined in table. The team should be equipped with the necessary tools and resources, such as personal protective equipment (PPE), diagnostic kits, and data collection forms.

Table 1: Proposed Membership Mpox Rapid Response Team

Profession/expertise	Roles and Responsibilities
Clinician	Provides medical care to patients, assesses symptoms, and implements treatment protocols
Surveillance officer/ Epidemiologist	Responsible for monitoring and tracking the spread of the virus, collecting data, and identifying new cases and analyses data
RCCE Specialist	Manages communication with the public and media, provides updates on the outbreak, and educates the community about preventive measures
Environmental Health specialist	Assesses and mitigates environmental factors that may contribute to the spread of the virus
Laboratory Technician	Conducts diagnostic tests to confirm Mpox cases and monitors the effectiveness of treatments
PoE officer/Port Health	Ensures that screening and preventive measures are in place at airports, seaports, and land borders to prevent the spread of the virus
Animal Health Officer	Monitors and investigates the role of animal reservoirs in the transmission of Mpox, particularly important for zoonotic diseases
Others**	

**as necessary by the situation on the ground

Initial response activities include confirming the outbreak by verifying the diagnosis of suspected cases through laboratory testing, and assessing the magnitude and scope of the outbreak. This step also involves establishing communication channels with local health authorities, healthcare facilities, and the community to ensure coordinated efforts

Once the outbreak is confirmed, the next step is to identify and define cases using the case definitions that have been developed for this outbreak (see Section 3.2.1). Case definitions help in standardizing the identification of cases and ensuring consistency in data collection. Active case finding is then conducted by reviewing medical records, interviewing healthcare providers, and conducting community surveys. This step is crucial for identifying all potential cases and understanding the extent of the outbreak.

Data collection and analysis are critical components of outbreak investigation. Detailed information about each case, including demographic data, clinical symptoms, exposure history, and laboratory results, is collected using standardized forms. This data is then analyzed to identify patterns and trends, such as the age and sex distribution of cases, geographic spread, and potential sources of infection. Epidemiological tools, such as epidemic curves and spot maps, are used to visualize the data and identify clusters of cases. This analysis helps in understanding the transmission dynamics of the virus and identifying high-risk groups and areas.

Based on the findings from data analysis, appropriate control measures are implemented to contain the outbreak. These measures include isolating confirmed cases, providing clinical care, and implementing infection prevention and control (IPC) practices in healthcare settings. Contact tracing is conducted to identify and monitor individuals who have been exposed to confirmed cases, and quarantine measures may be implemented if necessary. Public health education campaigns are also conducted to inform the community about the outbreak, promote preventive behaviors, and reduce stigma. Continuous monitoring and evaluation of the implemented measures are essential to assess their effectiveness and make necessary adjustments.

3.3.1. Approach to Detailed Case Investigation

This guidance provides recommendations for case investigation and contact tracing for human Mpox in the context of an outbreak. The overall goal of case investigation and contact tracing in this context is to break chains of human-to-human transmission and stop the epidemic.

During human Mpox outbreaks, close physical contact with infected persons is the most significant risk factor for Mpox virus infection. If Mpox is suspected, case investigation should consist of a clinical examination of the patient with appropriate PPE, enquiring the patient about possible sources of infection, and safe collection and dispatch of specimens for MPXV laboratory examination.

Contact identification and contact tracing should be initiated. Contacts should be monitored daily for 21 days from the last exposure date and tested if they develop symptoms. The quarantine of contacts is not recommended.

The Case investigation should cover 21 days before symptoms onset. A severe suspect Mpox case should be isolated at health facilities while a mild or uncomplicated suspect can be isolated at home.

Retrospective cases found by the active search may no longer have the clinical symptoms of Mpox (they have recovered from acute illness) but may exhibit scarring and other sequelae. It is important to collect epidemiological information from retrospective cases in addition to active ones. Retrospective cases cannot be laboratory-confirmed; however, serum from retrospective cases can be collected and tested for anti-orthopoxvirus antibodies to aid in their case classification.

Process of Mpox outbreak investigation in Rwanda involves:

1. Surveillance staff receive alerts through both indicator-based surveillance and/or event-based surveillance, the Rapid Response team (RRT) should be then sent to the field to verify the alert.
2. Based on case definition, the case will be discarded or classified either as a suspect or probable case of Mpox; samples should then be taken, contact addresses and demographic information will be collected.
3. Once a case is confirmed, an investigation should be conducted including contact tracing.
4. Contacts identified will be followed up (daily physical visit or by phone call) on a daily basis for a period of 21 days and be tested if they develop symptoms.

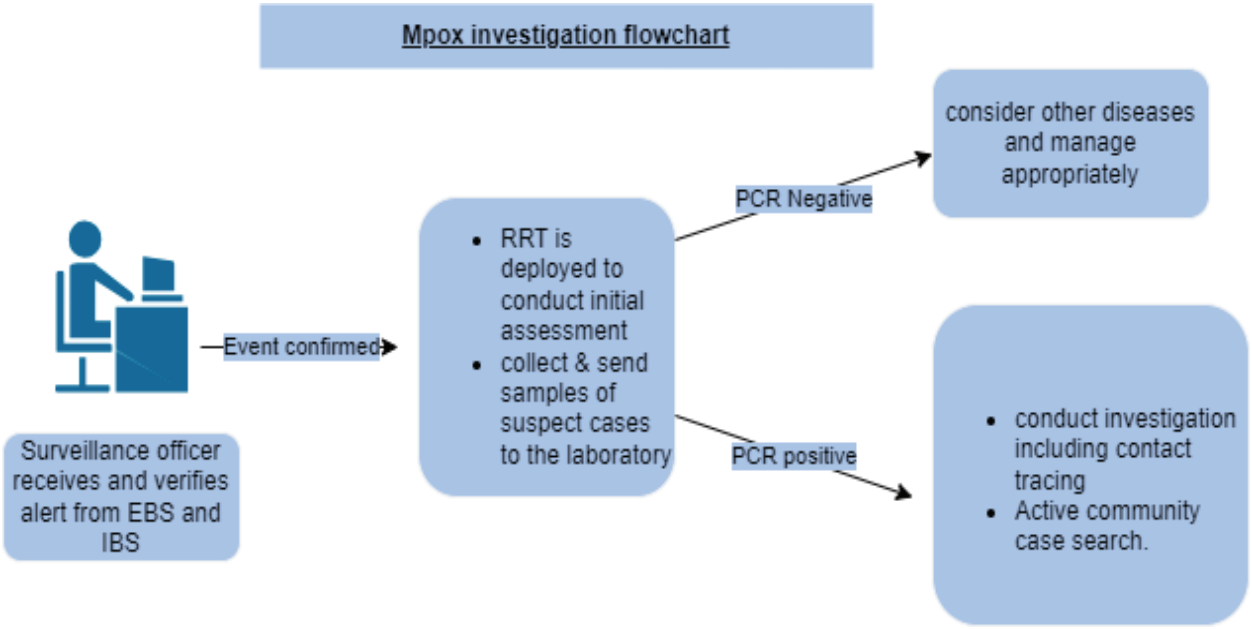

Figure 2: Mpox Investigation flowchart

3.4. Contact Tracing

Contact tracing is a public health strategy used to control the spread of infectious diseases. It involves identifying people who have been in close contact with a confirmed case and allows for the interruption of the chain of transmission. It can also help people at a higher risk of developing severe disease to more quickly identify their exposure so that their health status can be monitored and they can seek medical care quickly if they become symptomatic.

Confirmed cases should be interviewed to identify all individuals that they have had contact with in the last 21 days before the onset of signs and symptoms. Contacts should be notified within 24 hours of identification and education on the illness symptoms and mode of transmission and precautions to take should be provided to prevent community transmission.

If a suspect case is found at PoE, surveillance officers in collaboration with port health officers and migration staff should initiate the contacts listing especially among travelers and if the case is confirmed, the neighboring or the country where the case is coming from will be notified through IHR-National Focal Point for Rwanda (IHR-NFP).

3.4.1. Contact Definition for Mpox

A “contact” is defined as an individual who has been exposed to confirmed Mpox case through:

1. **Direct Physical Contact**: This involves touching the skin lesions or bodily fluids of an infected person or sexual contact.
2. **Prolonged Face-to-Face Contact**: This can include being within a close distance (1 meter) of an infected person for an extended period, which increases the risk of respiratory droplet transmission.
3. **Contact with Contaminated Materials**: This includes handling or being in proximity to materials such as bedding, clothing, or surfaces that are contaminated with the virus from an infected person.

3.4.2. Contact Identification and Listing

Case patients can be prompted to identify contacts across a number of contexts, including household, workplace, school/nursery, sexual contacts, healthcare (including laboratory exposure), houses of worship, transportation, sports, bars/restaurants, social gatherings, festivals, and any other recalled interactions.

In case of suspects detected on board flights or in other conveyances, the seat arrangement can be considered to label who is in contact and who is not. Furthermore, supportive documents like attendance lists, travel manifests, passenger lists, and cabin crew can be used as a source for contact listing. If the contact has already departed/transited to other countries, robust communication needs to be made to the countries of destination through Rwandan IHR-NFP for their further action.

3.4.3. Contact Monitoring

Contacts should be monitored daily for the onset of signs/symptoms for 21 days from the last contact with a probable or confirmed case-patient or their contaminated materials during the infectious period. The contact monitoring sheet should be available for all contacts and all the daily follow-up status needs to be filled out.

Signs/symptoms of concern include:

- Headache
- Fever
- Chills
- Sore throat
- Malaise
- Fatigue
- Rash
- Lymphadenopathy.

Contacts should monitor their temperature twice daily.

Asymptomatic contacts:

- Should not donate blood, cells, tissue, organs, breast milk, or semen while they are under symptom surveillance.
- They can continue routine daily activities such as going to work and attending school (i.e., no quarantine is necessary), but should remain close to home for the duration of surveillance.
- However, it may be prudent to exclude pre-school children from day care, nursery or other group settings

Some people may be unable to communicate onset of symptoms, such as newborns, young children, or people with cognitive disorders. Parents and other caregivers should watch for changes in behavior and temperament that could signal that the person is experiencing uncomfortable symptoms such as fatigue or headache.

- Exposed people do not need to be quarantined, but on a case-by-case basis, clinicians or public health officials can consider restricting programs, activities, or events that would pose high risk of transmission to other people (e.g., group play/education environments).
- Decisions about whether to limit activities in people who have been exposed to Mpox but are unable to communicate onset of symptoms should consider the risk of their exposure incident (how likely they are to develop Mpox infection) and the risk that transmission would pose to other people (e.g., immunocompromised family members, young children).

4. Laboratory Diagnosis of Mpox

4.1. Indication for testing In Rwanda

Due to the range of conditions that cause skin rashes and the atypical clinical presentations in this outbreak, differentiating Mpox solely based on clinical presentation can be challenging, especially for atypical cases. Hence, in agreement with WHO suggestion as outlined in the interim guide for Laboratory testing for the Mpox virus for Mpox, in Rwanda any individual meeting the case definition for a suspected case should be tested.

Examples of other etiologies for similar-appearing skin lesions at different stages of development include

- Herpes simplex virus,
- Varicella-zoster virus,
- Molluscum contagiosum virus,
- Enterovirus,
- Measles,
- Scabies, Treponema pallidum (syphilis),
- Bacterial skin infections,
- Medication allergies,
- Parapoxviruses (causing orf and related conditions), and chancroid(8).

4.2. Specimen Collection

Strict adherence to the standard operating procedures (SOPs) must be ensured, and laboratory personnel must be trained on relevant topics including the use of personal protective equipment (PPE), as well as in specimen collection, storage, packaging, and transport. It needs to be noted that all specimens collected for laboratory investigations should be regarded as potentially infectious and handled with caution. Measures to minimize the risk of laboratory transmission of Mpox should be based on risk assessment when testing clinical specimens from Mpox patients.

These measures include:

- Strict adherence to the SOPs
- Limiting the number of staff testing specimens to only those with trained and proven competency.
- Wearing appropriate PPEs.
- Applying standard precautions rigorously
- Avoiding any procedures that could generate infectious aerosols.

- Where appropriate and available, vaccination among staff should be considered. Effective disinfectants include quaternary ammonium compounds and 0.5% (or 200 ppm) bleach (freshly made). Rigorous adherence to infection prevention and control guidelines must be ensured during specimen collection and handling specimen to be collected.

The recommended specimen type for laboratory confirmation of Mpox is skin lesion material and this includes

- Swabs of the lesion surface and/or exudate, roofs from more than one lesion, or lesion crusts.
    - To ensure adequate viral DNA is collected, swab the lesion vigorously. Both dry swabs and swabs placed in viral transport media (VTM) can be used.
    - Two lesions of the same type should be collected in a single tube, preferably from different locations on the body and differing in appearance.
    - Lesions, crusts, and vesicular fluids should not be mixed in the same tube.
    - If resources permit, two tubes may be collected to minimize the risk of poor sampling or inhibitors; however, only one should be tested initially, with the second tested only if the first provides inconclusive results.
- In addition to a lesion specimen, collecting an oropharyngeal swab is encouraged. However, data on the accuracy of this specimen type for Mpox diagnosis is limited, so a negative throat swab should be interpreted with caution.
- For those patients who are not presenting the skin lesions, saliva collected in sterile tube should be a good sample.

Antibody detection from plasma or serum should not be used alone for diagnosis of Mpox. However, IgM detection from recent acutely ill patients or IgG in paired serum samples, collected at least 21 days apart, with the first being collected during the first week of illness, can aid diagnosis if tested samples yield inconclusive results. Recent vaccination may interfere with serological testing.

Antigen rapid tests based on qualitative colloidal gold-base lateral flow immunochromatography assay for the detection of Mpox Virus in human serum, plasma, whole blood and lesion exudate samples should be used as a screening test for the diagnosis of Mpox.

4.3. Packaging and Shipment of Clinical Specimens

Correct handling and storage of specimens during transportation is essential for accurate diagnostic testing. In Rwanda currently only NRL is capable of testing the specimen, but in the future more laboratories are expected to be onboarded for this Mpox test.

- Specimens should be stored refrigerated or frozen within an hour of collection and transported to the laboratory as soon as possible after collection.
- Transport of specimens should comply with any applicable national and/or international regulations related to biosafety and biosecurity and others including the UN Model Regulations and any other

applicable regulations depending on the mode of transport being used.

- For international transport, specimens from suspected probable or confirmed cases of MPXV, including clinical samples, viral isolates and cultures should be transported as Category A, UN2814 “infectious substance, affecting humans”.
- All specimens being transported should have appropriate triple packaging, labelling and documentation.
- Shipping requires a dangerous goods certified shipper.

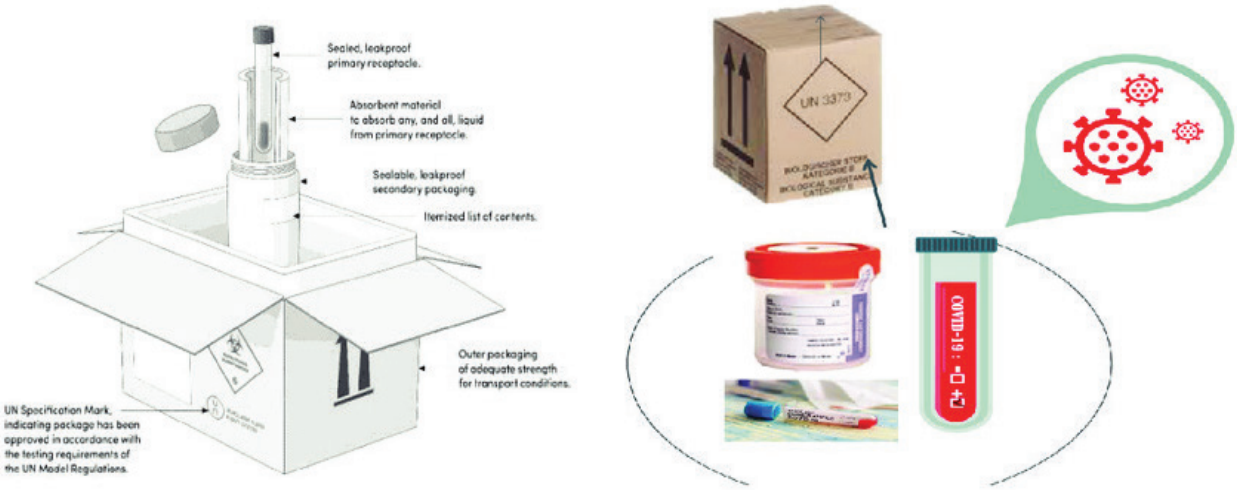

Figure 3: The triple packaging

Source: WHO guidelines and regulations for the Shipment of Infectious Materials 2019-2020).

4.4. Specimen Storage.

Specimens collected for MPXV investigation should be refrigerated (2– 8 °C) or frozen (-20 °C or lower) within one hour after collection. If transport exceeds 7 days for the sample to be tested, specimens should be stored at -20 °C or lower. Longer term specimen storage (>60 days from collection) is recommended at -70°C. Viral DNA present in skin lesion material is relatively stable if kept in a dark, cool environment, which can be considered when cold chain is not readily available, but room temperature shipment is not recommended. Repeated freeze-thaw cycles should be avoided because they can reduce the quality of specimens. Aside from specific collection materials indicated in the table 2 below, other requisite materials and equipment may include: transport containers and specimen collection bags and triple packaging, coolers and cold packs or dry ice, sterile blood-drawing equipment (e.g. needles, syringes and tubes), labels and permanent markers, PPE, and materials for decontamination of surfaces.

Table 2: Requirements for Mpox Specimen collection and storage

Specimen type	Collection materials	Storage Temp	Collection purpose
Skin lesion material (Swabs of lesion exudate, Lesion roofs, Lesion crusts)	Dacron or polyester flocked swabs with VTM or dry swab	Refrigerate (2–8 °C) or freeze (-20 °C or lower) within 1 hour of collection; -20°C or lower after 7 days	Recommended for diagnosis
Saliva	Sterile tube	Refrigerate (2–8 °C) or freeze (-20 °C or lower) within 1 hour of collection; -20°C or lower after 7 days	Recommended for diagnosis
Opharyngeal swab Dacron or polyester flocked	swabs with VTM or dry swab	See above	Recommended for diagnosis if feasible, in addition to skin lesion material
Rectal and or genital swabs	Dacron or polyester flocked swabs with VTM or dry swab	See above	To be considered for research
Urine Sterile	collection tube	See above	To be considered for research
Semen	Sterile collection tube	Room temperature for <1h (then -20 °C or lower)	To be considered for research (following ethics guidelines)
Whole blood	Sterile collection tube with EDTA	See above	To be considered for research
Serum	Serum-separating tubes	Refrigerate (2–8 °C) or freeze (-20 °C or lower) within 1 hour of collection; -20°C or lower after 7 days	To be considered for serology to aid diagnosis or research
Plasma	collection tube with EDTA	See above	To be considered for serology to aid diagnosis or research

Source: WHO Interim Guideline for Mpox Laboratory Diagnosis (5)

4.5. Laboratory Testing Methods and Algorithm

Confirmation of MPXV infection is based on nucleic acid amplification testing (NAAT), using real-time or conventional polymerase chain reaction (PCR), for detection of unique sequences of viral DNA.

- PCR can be used alone, or in combination with sequencing.
- The first step PCR reaction detects OPXV, but does not identify which species and hence it needs to be followed by a second step, which can be PCR-based or utilize sequencing, to specifically detect MPXV.
- Before an assay is utilized to test human clinical specimens within a laboratory, it should be validated and/or verified within the laboratory by appropriately trained staff.
- Reagents should be stored according to manufacturer recommendations.

4.6. Interpretation of Laboratory Results

- Confirmation of **MPXV using PCR** in suspected cases indicates confirmation of MPXV infection.
- However, detection using OPXV PCR assay can be used as a screening test and a positive test for OPXV needs to be confirmed by MPXV PCR.
- When the clinical presentation and epidemiology suggest an infection with MPXV despite negative PCR results, serological testing may be useful to further investigate prior infection for epidemiological purposes. A number of factors could contribute to false-negative results, such as poor quality of specimen, wrong handling or shipping, or technical reasons inherent to the test, e.g. DNA extraction failure.
- In addition to the use of sequencing for diagnosis, genetic sequence data (GSD) may also provide valuable information to help understand the origins, epidemiology and characteristics of the virus, for example whether cases arise from a single introduction or multiple introductions from other locations.
- Sequencing of MPXV from as many positive specimens from different patients as possible, is recommended.

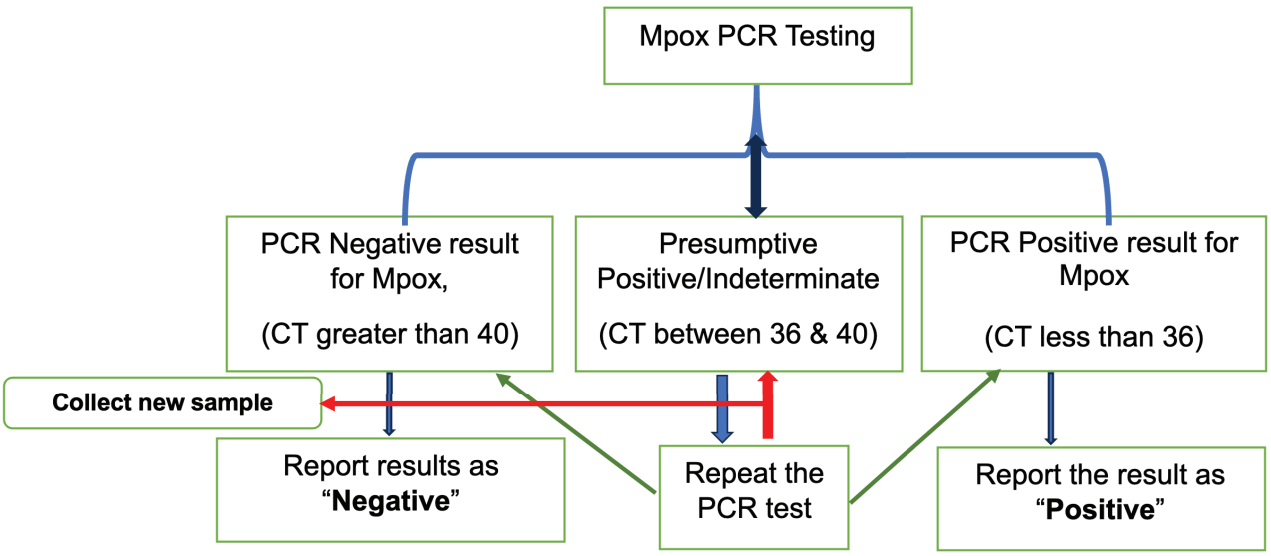

Figure 4: Algorithm for the PCR Diagnostics of Mpox

5. Infection Prevention and Control

Implementing robust Infection Prevention and Control (IPC) measures is vital to prevent and manage the spread of Mpox in healthcare and community settings. Adhering to IPC precautions safeguard healthcare workers, patients, and the broader community, ensuring an effective response to Mpox outbreaks and minimizing transmission risks.

5.1. Infection Prevention and Control: Health Facility Setting

A combination of standard, contact, and droplet precautions should be applied in all healthcare settings when a patient is suspected or confirmed with Mpox infection.

5.1.1. Standard Precautions

Health workers should always follow standard precautions and perform a risk assessment to evaluate the need to use additional precautions.

Standard precautions include:

a) Hand hygiene
b) Respiratory hygiene and cough etiquette
c) Patient placement
d) Personal protective equipment
e) Safe injections and sharps injury prevention
f) Environmental cleaning and disinfection
g) Handling of laundry and linen
h) Decontamination and reprocessing or reusable patient care items and equipment
i) Waste management.

A. Hand Hygiene

Hand hygiene is a cornerstone in the prevention and control of diseases, playing a critical role in minimizing the risk of transmission.

- Proper hand hygiene practices, including regular handwashing with soap and water for 40–60 seconds or using alcohol-based hand sanitizers containing 60–85% alcohol for 20–30 seconds is critical.
- If hands are soiled, soap and water should precede the use of alcohol-based hand sanitizers.
- In healthcare settings, proper hand hygiene needs be performed according to WHO Five moments for hand hygiene a) before touching a patient, b) before clean or aseptic procedure, c) after touching a patient, d) after risk of exposure to body fluids, and e) after touching patient's surroundings (Figure 5).

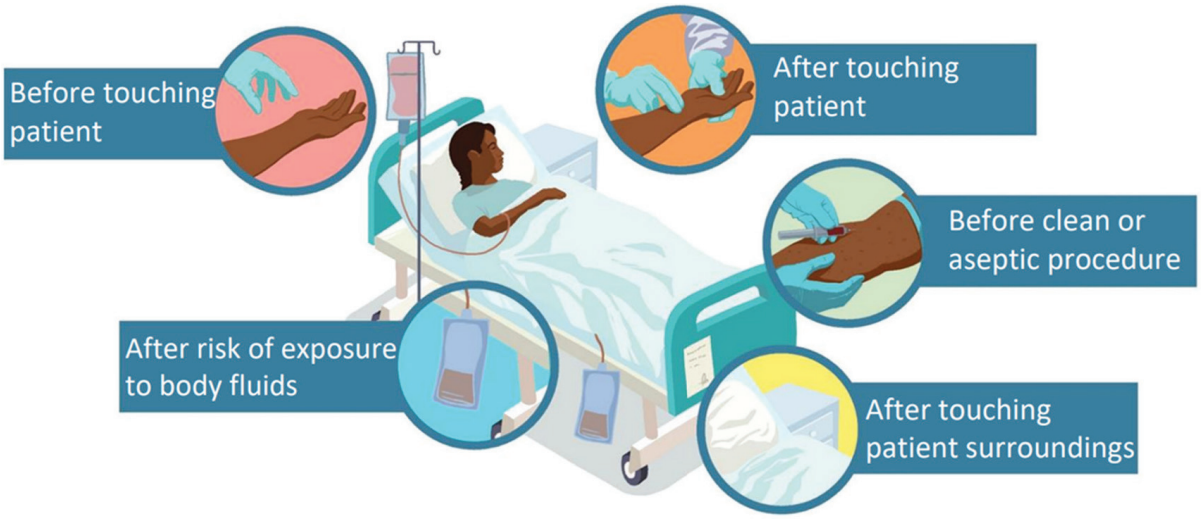

Figure 5: Diagrammatic presentation of five moments for hand hygiene

B. Respiratory hygiene and cough etiquette

Cough etiquette involves covering the mouth and nose with a tissue or cloth when coughing or sneezing to reduce the spread of droplets between people.

- Public health guidelines universally recommend practicing cough etiquette in all settings at all times.
- It is important to ensure the availability of necessary materials, such as tissues and no-touch waste bins.
- Used tissues should be disposed of immediately, and hands should be washed with soap and water, as outlined in the hand hygiene section. If tissues are unavailable, it is advisable to cough or sneeze into the elbow and then wash hands. Additionally, maintaining a distance of at least one meter from others is recommended whenever possible.

C. Patient Placement

Whenever possible, patients should be placed in a well-ventilated, single patient room with a dedicated bathroom or toilet to minimize the risk of Mpox transmission. If single-patient rooms are not available, positive cases should be cohorted together maintaining a distance of at least 1 meter between patients.

Transporting patients outside of their rooms should be limited to medically essential purposes only. If a patient must leave the room, they should wear a mask and cover any exposed skin lesions with a long sleeve clothes or sheet or gown.

D. Personal Protective Equipment

Health care facilities should have the following basic PPE: gloves, gown, surgical mask /respirator and eye protection available at all times.

- Health care workers should assess the risk of infection at all points of encounter with suspected or confirmed patients. The appropriate PPEs to use will be determined by the risk present.
- The patient should wear a well-fitting medical mask and follow respiratory hygiene and cough etiquette when transport/transfer is necessary.

E. Environmental Infection Control

Environmental cleaning and disinfection are essential components of infection control in Mpox isolation facilities. The following must be considered during environmental cleaning and decontamination:

- **PPE:** gloves (heavy duty), gown, respirator (e.g. surgical mask or N95) and eye protection, should be worn by health workers and or other personnel while cleaning and disinfecting patient care equipment and patient care areas or isolation rooms where patients were suspected or confirmed to have MPX.
- Disposable shoe covers are not recommended
- Surfaces and equipment that may have been exposed to the virus should be regularly cleaned with water and disinfected using freshly prepared 0.5% chlorine solution.
- To prevent cross-contamination, cleaning must always be carried out from the cleanest area first and finish in the dirtiest area last, and always clean from top to bottom.
- Particular attention should be paid to toilets and high- touch surfaces.
- Clean and disinfect equipment before use on other patients.
- To prevent the spread of infectious particles, activities that could resuspend dried material from lesions, such as dry dusting, sweeping, or vacuuming, should be avoided. Instead, wet cleaning methods should be employed to minimize the risk of aerosolization.

F. Waste Management

- Proper waste management is essential to prevent environmental contamination and secondary infections as all bodily fluids and solid waste of patients with Mpox are infectious.
- Waste should be sorted into categories (infectious waste and sharps) and placed in the correct bins at the point of use.
- Drop all sharps in labeled, puncture-proof boxes
- All health workers and cleaners must wear appropriate PPE (e.g. Heavy-duty gloves, gown, respirator [e.g. N95], eye protection, boots) during handling of waste.
- Waste generated from the care of Mpox patients, including soiled PPE and patient dressings/ Bandages, should be treated as infectious medical waste and should be placed in strong/durable RED/YELLOW biohazard bags and securely tied before disposal and eventual collection.
- Facilities must ensure that waste is securely stored, transported, and disposed of using incineration.

G. Handling of Laundry and Linen

Linens, hospital gowns, towels and any other fabric items used in care of Mpox patients should be handled and collected carefully as follow:

- Wear appropriate PPEs: gloves, apron or gown, a respirator (e.g., N95, FFP2) and eye protection.
- Carefully lift and roll linens. Do not shake linen or laundry to avoid dispersion of infectious particles
- These items should be carefully placed into designated biohazard containers or bags for transport to laundry services.
- Linens should be machine washed with hot water at > 60°C with laundry detergent and dried at high heat.
- If machine washing is not possible and hot water is not available, linens can be soaked in chlorine (0.05%), and rinsed with clean water.
- Workers in the laundry area should follow standard and transmission-based precautions including: minimizing handling, in particular avoiding shaking of linen and laundry; and wear gloves, apron or gown, a respirator (e.g., N95, FFP2) and eye protection.

H. Decontamination and Reprocessing or Reusable Patient Care Items and Equipment

Decontamination of medical devices plays an important role in the prevention of health care-associated infections. It includes cleaning, disinfection and/or sterilization. Referring to Spaulding's classification an appropriate method of decontamination shall be performed before using the device on another patient as indicated in table 3.

Table 3: Spaulding's classification

Classification	Definition	Decontamination method	Examples
High risk (critical)	Medical devices that are involved with a break in the skin or mucous membrane or enter a sterile body cavity	Sterilization	Surgical instruments, delivery sets, dental instruments
Intermediate risk (semi-critical)	Medical devices in contact with mucous membranes or non-intact skin.	High-level disinfection. Example: (cidex, steranios)	Respiratory and anaesthetic equipment, reusable vaginal specula, endoscopes
Low risk (non-critical)	Items that come in contact with intact skin	Low-level disinfection [(i.e., cleaning with detergent and disinfectant (use 70% alcohol)].	Blood pressure cuffs, stethoscopes, and electrocardiogram lead.

I. Safe injections and injury prevention

Compliance with safe injection practices is a key element in preventing the spread of infection during health care delivery.

- Injections should be administered only by qualified personnel
- Sharps should be handled with caution and disposed of immediately after use
- Needles should not be recapped.
- Safely dispose of all sharps in labeled, puncture-proof boxes
- Safety boxes should be disposed when they are ⊠ FULL
- Wash hands before and after a procedure/Injection

5.1.2. Transmission Based Precautions

In addition to standard precautions contact and droplet precautions should be used while caring for a patient with known or suspected Mpox infection.

Contact precautions include:

a) Patient placement in single patient space or room

b) Use of PPE: gloves and gown

c) Use disposable or dedicated patient care equipment

d) Prioritize cleaning and disinfection of patient space or room

Droplet precautions:

a) Patient placement in single patient space or room (maximize space between patients)

b) PPE: mask upon entry into patient space

c) Source control: patient wears a mask if outside the room

d) Prioritize cleaning and disinfection of patient space or room

A. Isolation of Patients

- The isolation should be divided into 2 separate zones with clear signage
    - Green zone: Clean
    - Red zone: Dirty
- Confirmed cases should be segregated from suspected cases.
- Suspected or confirmed Mpox cases with lesions should be isolated in a room separate from other patients. Isolated patients with extensive lesions and exudates should be covered gently with a sheet or light gowns when others are in the room.

- The isolation room should have signage posted at the door indicating that the patient is under contact and droplet precautions.
- Precautions should be taken by Health Care Workers to minimize exposure to surrounding persons by restricting access to the isolation room except when absolutely necessary.
- Have hand hygiene facilities in the isolation patient care area/room with either a sensor based/ elbow/foot operated taps.
- All records and charts should be placed outside the isolation ward/room
- All reusable items coming in contact with the patient should be disinfected.
- Where possible, the isolation should have its dedicated equipment; use separate items such as urinals, bedpans, thermometers for each patient, otherwise, disinfect them before use on another patient

B. Visit to Mpox Patients in Isolation

- Visitors (family and friends) should not be allowed into the isolation ward.
- There may be exceptions only for visitors necessary for the patient's well-being and care, such as a child's parent. All visitors who enter the patient's room should sign a log book. Visits should be scheduled and prior to each visit, the visitor should be assessed for signs and symptoms consistent with Mpox, risk to the health of the visitor and ability to comply with infection prevention and control precautions.
- All visitors must wear personal protective equipment and perform hand hygiene when entering the isolation ward.
- The patient must wear a surgical face mask and maintain 1 m distance when in contact with visitors.
- Unauthorized Visitor's entry is not allowed to enter isolation

C. Personal protective equipment

- Healthcare personnel entering the Mpox patient's room must wear appropriate personal protective equipment (PPE) to prevent exposure to the virus.
- The recommended PPE includes a disposable gown, surgical mask, gloves, eye protection (goggles or a face shield)
- Use of N95 (or comparable) filtering disposable respirator especially for extended contact in the inpatient setting, where not available, a surgical mask should be worn when accessing the isolation room.
- PPE should be donned before entering the patient's room and used for all patient contact.
- Proper donning and doffing procedures for PPE should be followed to avoid self-contamination.
- All PPE should be disposed of prior to leaving the isolation room where the patient is admitted.

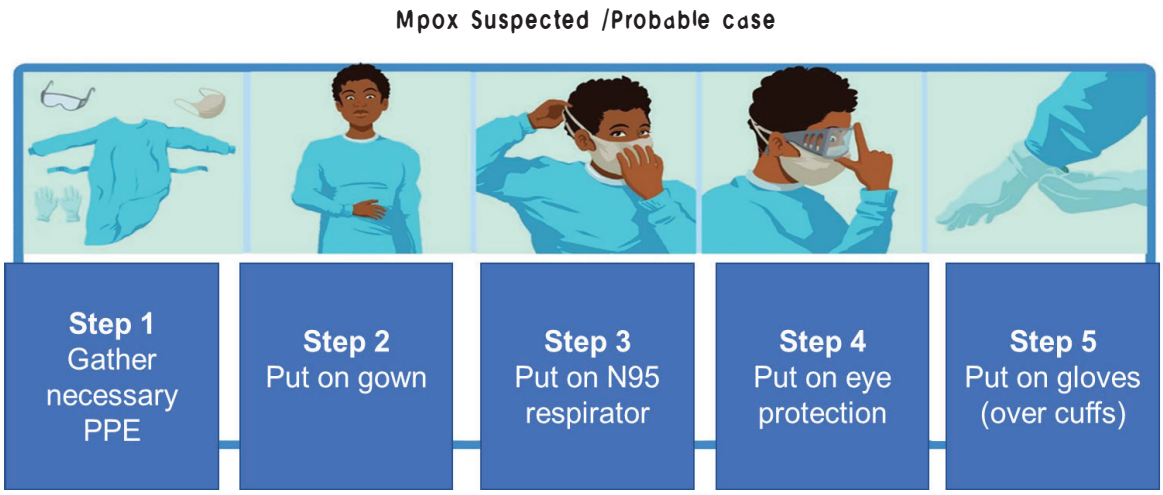

Figure 6: Steps for donning of Personal Protective Equipment (PPE)

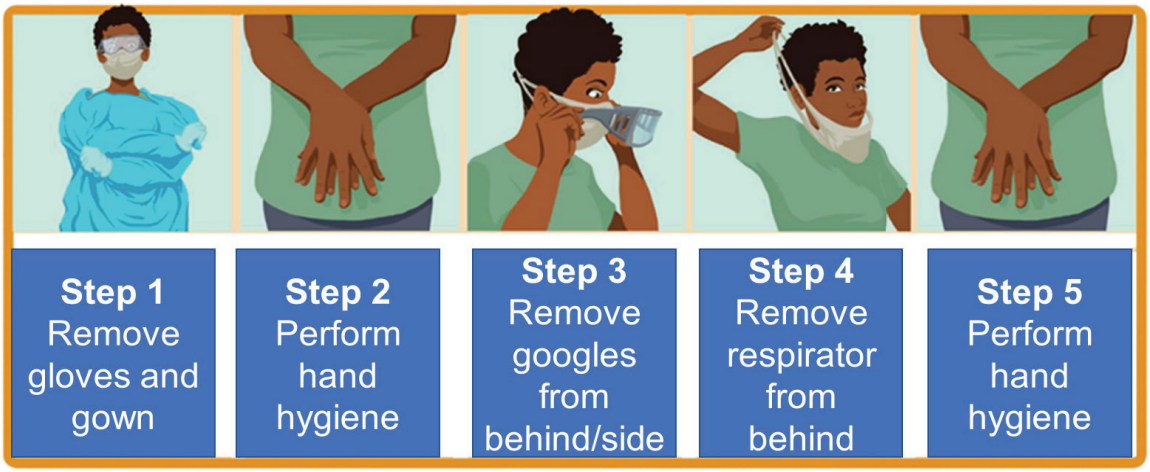

Figure 7: Steps for Doffing Personal Protective Equipment

5.2. Infection Prevention and Control: Community Setting

Patients who do not require hospitalization for medical indications may be isolated at home using protective measures. The ability to implement isolation and infection control measures in a home setting is likely to vary depending on the following factors:

- The age of the patient (i.e. a child or adult)
- The presence of additional infected or uninfected persons or pets in the home
- The nature and extent of lesions in each case

The following principles should be considered and adopted to the extent possible in the home setting:

5.2.1. Isolation of Patients

Persons with extensive lesions that cannot be easily covered (excluding facial lesions), draining / weeping lesions, or respiratory symptoms (e.g., cough, sore throat, and runny nose) should be isolated in a room or area separate from other family members when possible.

- Persons with suspected/confirmed Mpox should not leave the home except as required for follow-up medical care.
- Avoid contact with wild or domestic mammals if possible.
- Unexposed persons who do not have an essential need to be in the home should not visit.
- Household members who are not ill should limit contact with the person with Mpox.
- Caregivers should maintain at least 1-meter distance from the patient. When close contact is unavoidable, they should wear a well-fitting medical mask and disposable gloves.
- Pets/Mammals should be excluded from the ill person's environment.

5.2.2. Use of Personal Protective Equipment

- Persons with Mpox should wear a surgical mask, especially those who have respiratory symptoms (e.g., cough, shortness of breath, sore throat). If this is not feasible (e.g., a child with Mpox), other household members should consider wearing a surgical mask when in the presence of the person with Mpox.
- Disposable gloves should be worn for direct contact with lesions and disposed of after use.
- Skin lesions should be covered to the best extent possible (e.g., long sleeves, long pants) to minimize risk of contact with others.
- Contain and dispose of contaminated waste (such as dressings, mask, gloves and bandages) in provided biohazard bags and bring them back to the health facility for incineration
- Do not dispose of waste in landfills or dumps.

5.2.3. Proper Hand Hygiene and Cleaning Procedures

- Hand hygiene (i.e., hand washing with soap and water for 40-60 seconds or use of an alcohol-based hand rub for 20-30 seconds) should be performed by infected persons and household contacts after touching lesion material, clothing, linens, or environmental surfaces that may have had contact with lesion material.
- Laundry (e.g., bedding, towels, and clothing) may be washed with warm water and detergent; bleach may be added if available
- Care should be taken when handling soiled laundry to avoid direct contact with contaminated material

- Soiled laundry should not be shaken or otherwise handled in a manner that may disperse infectious particles
- Dishes and other eating utensils should not be shared. It is not necessary for the infected person to use separate utensils if properly washed. Soiled dishes and eating utensils should be washed with warm water and soap

5.2.4. Transportation of Mpox Patient

Unless medically necessary, transportation and movement of Mpox patients outside of their rooms should be limited.

Before transport:

- The patient must wear a surgical facemask, if their medical condition allows, and be instructed to follow respiratory hygiene and cough etiquette i.e. covering the mouth/ nose with a tissue when coughing and prompt disposal of used tissues.
- Ensure that the staff assisting with the transfer wears PPE (gloves, gown, boots and face shield).
- Avoid transporting the patient through high patient flow or public access areas.
- Avoid use of public transport if necessary.

During transport:

- The driver should avoid contact with the patient
- Health Care Workers need a surgical face mask or respirator even if the patient is wearing a surgical facemask and infectious skin lesions are covered.
- The accompanying crew members should maintain at least 1 meter distance from the patient.
- Passages should be kept clear during transit of the patient.

After transport:

- Ambulances should be decontaminated with 0.5% hypochlorite solution.
- All waste leaving the ambulance should be sent for incineration under supervision
- Reusable items should be appropriately decontaminated.

5.2.5. Mpox Dead body Management

5.2.5.1. Post Mortem Care/Autopsy

Personnel who care for dead patients should wear PPE recommended for Standard, Contact and Airborne Precautions as detailed above. Body remains preparation should follow routine relevant healthcare facility procedures for cleaning and containing body fluids and the body then bagged in a body bag. The bagged body should be placed on a mortuary stretcher and for transportation to the mortuary.

Persons transporting prepared and covered human remains should wear gloves but other PPE is not required.

Persons who transfer remains from a mortuary stretcher onto the autopsy table should wear a gown and heavy-duty gloves. Personnel who perform or assist with an autopsy should wear PPE required for Standard, Contact and Airborne Precautions. Protective outer garments must be removed when leaving the immediate autopsy area and discarded in appropriate laundry or waste receptacles, either in an antechamber to the autopsy suite or immediately inside the entrance if an antechamber is not available. Hands should be washed upon glove removal.

5.2.5.2. Safe and Dignified Burial of Persons Died of Mpox

During outbreaks, any unprotected handling of the dead bodies of infected patients constitutes a biosafety hazard. This poses a major risk of transmission, as the dead body remains contagious after death.

During outbreaks, any unprotected handling of the dead bodies of infected patients constitutes a biosafety hazard. This poses a major risk of transmission, as the dead body remains contagious several days after death. The management of the burial is therefore the responsibility of the safe burial teams. The family and members of the community are also at risk, if the burial rites involve manipulation and cleaning of the body.

- Handling of the deceased should be kept to a minimum.
- Perform hand hygiene and wear PPE according to contact and droplet precautions (gloves, gown, respirator [e.g. N95, FFP2] and eye protection) as patients with rashes that have not healed may still have infectious virus.
- Ensure that any leakage of body fluids is contained.
- The body should be wrapped in a cloth or shroud and transferred to the mortuary as soon as possible.
- The dignity of the dead, their cultural and religious traditions, and their families should be respected and protected.
- Family and friends may view the body after it has been prepared for burial, in accordance with local customs. They should not touch or kiss the body and should clean their hands with soap and water or alcohol-based hand sanitizer after the viewing

The burial team is to oversee the safe burial of the victims. This team must adhere to the following key principles:

- Verbally convey condolences and sympathy to the victim's family
- Clearly but emphatically explain the procedure for handling of remains and outline how and why the procedure for body preparation and burial will differ from the normal/local tradition.
- If a psychologist is available, collaborate with him/her in engaging with the family.
- If necessary, employ the support of security agents.

- Avoid conduct of funeral ceremonies during the burial
- Ensure that the patient's home is disinfected. The burial must take place as soon as possible after preparation of the remains at the hospital. The Safe Burial team should:
- Prepare the body with care to avoid the risk of transmission.
- Strive to respect the cultural practices and religious beliefs of the family, as long as they do not result in a risk of transmission. Let the family understand that certain practices that entail a risk of transmission will be abandoned.
- Advise the family and the community on actions to take in order to protect themselves against the disease.
- If the body is prepared without information or support to the family and the community, the members of the community would not be willing to bring other relatives to the hospital for fear of not receiving the dead body once the patient has died.
- Find and use an influential member of the family in ensuring that dangerous practices like touching and washing.

6. Vaccination

Smallpox vaccine has demonstrated cross protection (approximately 85%) against Mpox virus infection. The vaccine has however been known to cause both local and systemic complications including eczema vaccinatum progressive vaccinia (uncontrolled vaccinia virus replication commonly resulting in death), contact transmission of vaccine virus, and fetal vaccinia. Advances in vaccine technology have led to the development of second-generation smallpox vaccines (e.g. ACAM2000 which is currently licensed for use in the United States) which though improved still carry some risk. ACAM2000 is used for select laboratory and healthcare workers in the United States.

A third-generation vaccine (Imvamune/Imvanex) developed from attenuated vaccinia viruses and which has favorable safety profiles has been granted marketing authorization in the European Union under exceptional circumstances for immunization against smallpox, and was used (off-label) for pre- and post-exposure prophylaxis in the management of the two imported Mpox cases in the UK

A prospective vaccination study is ongoing in the DRC with Imvamune administered to HCWs, including laboratory workers, aged 18 years and older with the primary objectives of determining the number of suspected and confirmed cases of MPX and the number of MPXV exposures among vaccinated HCWs over a period of observation of two year.

WHO recommends that healthcare workers and those treating or exposed to patients with Mpox or their samples should consider being immunized against smallpox through their national health authorities.

In Rwanda, no vaccine is available at the time of the guideline preparation. However, detailed guidance will be given on use of the vaccine, if any.

7. Case Management

Mpox is an infectious disease caused by Mpox virus and it is characterized by rashes. Typically, the majority of cases may self-resolve completely (even in the absence of specific treatment) in 3 to 4 weeks but some can lead to severe illness or death. Thus, patients with Mpox may require supportive or symptomatic care to prevent and/or manage severe and distressful disease and complications.

The presence of comorbidities such as immunosuppression (e.g. HIV infection) and other underlying systemic disease(s) may contribute to severe disease, clinical sequelae and increased risk of mortality. This section covers the management of suspected and/or confirmed Mpox.

7.1. Initial Assessment

Clinical assessment involves a thorough evaluation of the patient's symptoms, medical history, and potential exposure to the virus.

A. Symptoms

The symptoms for Mpox disease are characterized by an incubation period, prodrome, and rash.

Incubation Period: Infection with Mpox virus begins with an incubation period where the person does not have symptoms and may feel fine. The incubation period is roughly 5 to 21 days. A person is not contagious during this period. But need to be monitored by healthcare providers.

Prodrome: People with Mpox infection may develop an early set of symptoms (prodrome) including: -

- Fever,
- Malaise,
- Headache,
- Sore throat,
- Cough,
- Swollen lymph nodes (characteristic feature of Mpox). Lymph nodes may swell in the neck, armpits (axillary), or groin (inguinal) and can occur on both sides of the body or just one.

Rash: Rash comes slowly after prodrome symptoms but in some people, rash may present without recognized prodrome. The Mpox rash may begin on the face and spread over the body, extending to the palms of the hands and soles of the feet and evolves over 2-4 weeks. People with Mpox infection develop lesions that typically progress from papules, macules, vesicles, pustules, and then scabs. Notice: A person may be contagious from Prodrome until after all the scabs on the skin have fallen off and a fresh layer of intact skin has formed underneath.

B. Medical History

- Detailed Full medical history includes history of current illness,
- Pregnancy status
- Past medical history,
- Sexual history,
- Travel history and any possible previous exposure to Mpox.
- Immunocompromised patients have a high risk of mortality and morbidity due to Mpox.

C. Physical Examination

- Vital signs
- Full body assessment

D. Differential Diagnosis

- Disseminated zoster
- Chickenpox
- Eczema herpeticum
- Disseminated herpes simplex
- Syphilis
- Yaws
- Scabies
- Rickettsia
- Measles
- Bacterial skin infections
- Drug-associated eruption

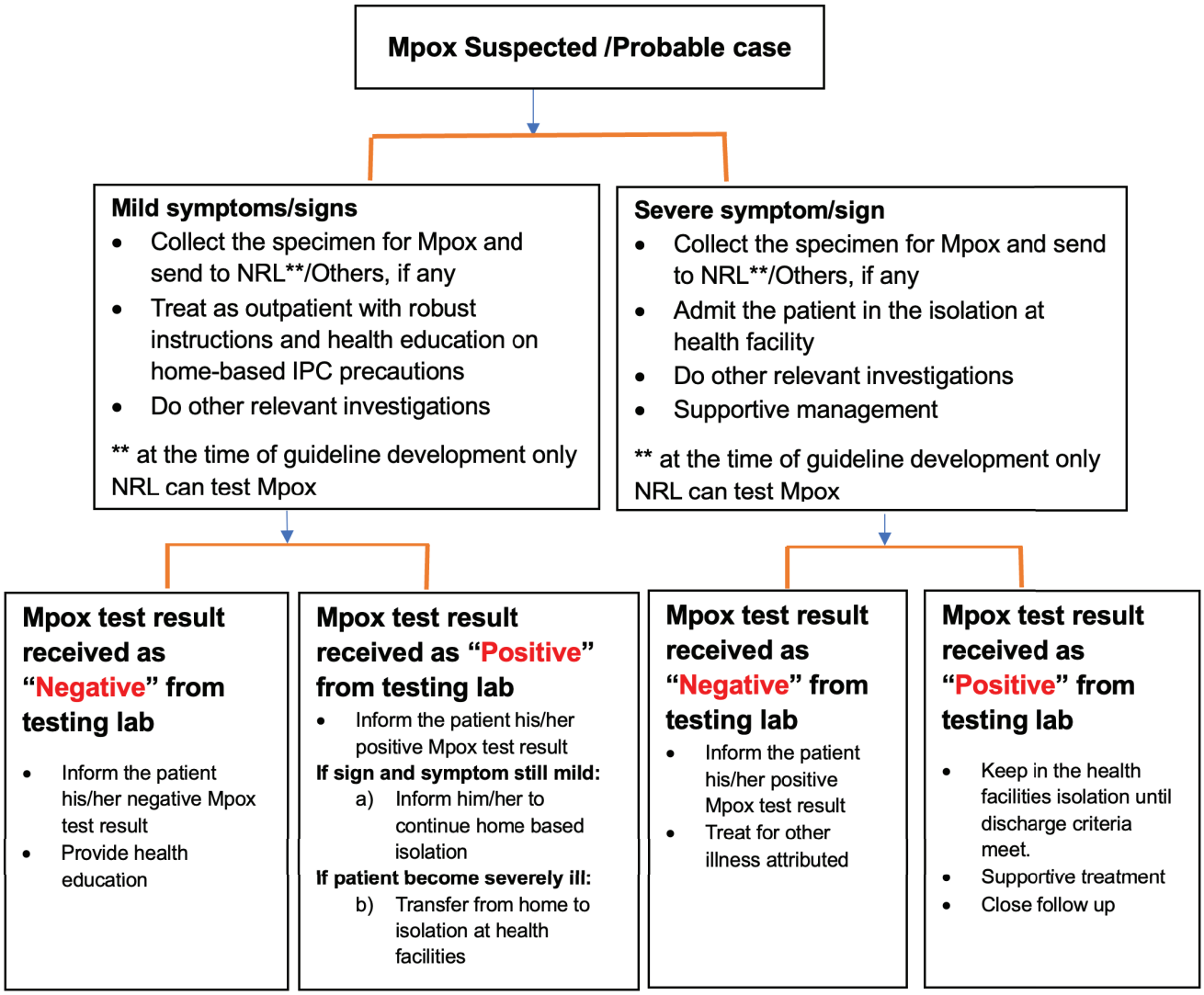

Fig 8: Flow chart for Mpox suspected / Probable case management

7.2. Plan of Care

- Laboratory investigation (FBC, CRP, ESR, Liver Enzymes, Renal Function tests, HIV and other STI screening, **PCR for Mpox**)
- Based on the clinical presentation and co-morbid conditions, other relevant tests must be timely requested. Being a suspect case for Mpox must not hinder or delay receiving a full assessment and treatment for any other concurrent condition
- Symptomatic treatment (antipyretic for fever, analgesia for pain, cough mixture etc.)
- Post-Exposure Prophylaxis if high-risk unprotected sex with fear of HIV infection
- Psychological support

7.3. Principles of Management

Mpox is a self-limiting viral infection. The major principles of its case management include:

A. Protection of compromised skin and/or mucous membranes;
B. Rehydration therapy;
C. Alleviation of distressful symptoms;
D. Provision of nutritional support;
E. Treatment of complications;
F. Psychosocial support;
G. Treatment of comorbidities

7.3.1. Management of Mild or Uncomplicated Mpox

- Patients with suspected or confirmed Mpox with mild, uncomplicated disease and not at high risk for complications can be isolated at home if home assessment determines IPC criteria can be fulfilled.
- Patients at risk of developing severe diseases are admitted. These include Children, Pregnant women and Immunosuppressed patients.
- Patients isolating at home should be ambulatory, have good food and water intake, be able to feed, bathe and dress themselves, and require minimal to no assistance from a caregiver
- Symptomatic management includes:
    - Antipyretic for fevers.
    - Painkillers for pain.
    - Encourage oral fluid intake to avoid dehydration.
    - Assess the nutritional status and give adequate nutrition and counseling.
    - Monitor for secondary bacterial infection (i.e. cellulitis, abscess) and if present treated with antibiotics (Cloxacillin or erythromycin in case of penicillin allergy).
    - Do not prescribe Antibiotic therapy or prophylaxis in patients with uncomplicated Mpox.
- Health education related to:
    - Counsel patients with mild Mpox about danger signs that should prompt urgent care.
    - Danger signs:
        - Secondary bacterial infection.
        - Ocular infection (involvement of the eye).
        - Persistent fevers.

- Inability to feed and/or drink.
- Difficulty in breathing.
- Retrosternal chest pain.
- Altered mental status.

- IPC principles related to home care.

7.3.2. Management of Severe Mpox

Criteria for severe disease:

- Hemodynamic instability (Hypotension, tachycardia and/ or moderate/severe dehydration).
- Involvement of multiple organ systems and associated comorbidities (e.g., sepsis, encephalitis, myocarditis, ocular or periorbital infections, pulmonary involvement with nodular lesions).
- Inability to eat and drink due to the lesions.
- Advanced HIV or unknown status with signs of immunosuppression may require admission.
- Respiratory distress/ Pneumonia.
- Confusion.

Treatments for severe Mpox:

- Admit the patient for inpatient care
- Treatment is based on signs / underlying condition of severity.
- Under the local regulatory guidance (i.e. MoH, R-FDA), the use of the therapeutics under trial is recommended.

7.3.3. Mpox and Malnutrition

Persons with malnutrition, and immune suppression due to medication or medical conditions are at higher risk of serious illness and death due to Mpox. People living with HIV that is not well-controlled or treated more often develop severe disease.

The goal of treating Mpox is to take care of the rash, manage pain, and prevent complications. Early and supportive care is important to help manage symptoms and avoid further problems. This includes early diagnosis, nutritional care, and support as per the national guideline https://www.unicef.org/rwanda/reports/protocol-management-acute-malnutrition-rwanda.

Pathophysiologic basis: Malnutrition affects all body organs and systems. Specific to Mpox, it affects the skin, muscles, and glands. The skin and subcutaneous fat are atrophied, which leads to lose folds of skin. Many signs of dehydration are unreliable; eyes may be sunken because of loss of subcutaneous fat in the orbit. Many glands. including the sweat, tear, and salivary glands are atrophied exacerbating the Mpox infection, poor prognosis, and could lead to death.

Hence, it's strongly recommended to assess and/or screen for malnutrition (under strict IPC measures in place to avoid contact) and provide appropriate nutritional care and support for cases suspected, probable and/or confirmed cases of Mpox.

Assessment/screening includes MUAC (Mid Upper Arm Circumference) measurement, Weight-for-Height Z Score (Standard Deviation), and BMI (Body Mass Index). The assessment would enable us to classify the nutritional status and lead to appropriate action in line with national guidelines for treating acute malnutrition.

Rapid Screening technique (MUAC) measurement and interpretation. All health facilities in Rwanda have both child and adult MUAC tapes. If missing one, please request RBC immediately.

Table 4: Interpretation of MUAC measurement for age group 6 month-18 years and adult

Interpretation of MUAC measurement for age group 6 month-18 years	Interpretation of MUAC measurement in adult
1. MUAC < 115 mm (11.5 cm): Severe Acute Malnutrition (SAM)	1. MUAC < 17 cm and MUAC< 18 cm with recent history of weight loss = SAM
2. MUAC > 115 mm and < 125 cm: Moderate Acute Malnutrition (MAM)	2. MUAC 17-21 cm=MAM
3. MUAC > 125: Normal	3. MUAC >=21 cm Normal

Notice: A person could be considered malnourished if one fulfills either of the criteria for MUAC **or** Bilateral pitting edema **or** WHZ **or** BMI. Not necessarily all the criteria.

7.3.4. Criteria for Patient Discharge

- Severe Mpox cases can be discharged to a supportive home environment to continue isolation if complications are resolved.
- Discharge from isolation (Home/Health facility):
    - When there have been no new lesions for 5 days.
    - Once all symptoms have resolved and all lesions (for both exposed and unexposed areas) have crusted over, all scabs have dropped off, and intact skin remains underneath

8. Risk Communication and Community Engagement

The COVID-19 pandemic and subsequent outbreaks have reaffirmed the importance of Risk Communication and Community Engagement (RCCE) as a crucial public health intervention in emergency responses. For Mpox, RCCE is essential across all response areas, including laboratory testing, contact tracing, isolation, treatment, and preventive measures like vaccination. The success of these measure hinges on the support of affected individuals and communities.

RCCE interventions can be developed and executed by various stakeholders, such as public health authorities, civil society organizations, other non-governmental organizations (NGOs), academic institutions, and event organizers. When public health authorities design these interventions, it is vital to consult with stakeholders and subject matter experts during the development phase. This consultation should cover communication channels, appropriate communicators, and messages tailored for outreach to target audiences.

In the context of a Mpox outbreak, defining the target audience is critical for focused and effective RCCE. For example, if transmission dynamics indicate a higher prevalence among a defined group of people, RCCE efforts should specifically target this segment of the population.

8.1. Trusted Communicators

During an Mpox outbreak, building and establishing trust with the affected community is extremely important for the acceptance and uptake of measures. Therefore, the use of trusted communicators for RCCE is critical. The selection of the appropriate communicators depends on the groups affected and can include: During an Mpox outbreak, building and establishing trust with the affected community is extremely important for the acceptance and uptake of measures. Therefore, the use of trusted communicators for RCCE is critical. The selection of the appropriate communicators depends on the groups affected and can include:

- Trusted government spokespersons;
- Health professionals,
- Community champions;
- Pre-existing health sector and civil society platforms/networks and marginalized groups
- Civil society organizations (e.g. those working in the areas of sexual and reproductive health);
- Leaders of different advocacy groups, working in health generally or in sexual health;
- Event companies/organizers and/or hosts;
- Managers of bars night clubs, saunas etc..

8.2. Communication Channels

There are different communication channels addressing the general public. Those include:

1. Mass media

Media interviews or broadcasts of live or recorded messages, talk shows with trusted spokespersons/ health care workers etc.

2. National and local health authority websites:

National and local public health websites and their social media accounts are important for publishing regular reports and updates on the situation and they are regularly used by health journalists as a source for further reporting and can be a good reference for managing rumors and misinformation.

Besides, in addition, these accounts regularly publish material containing health information and advice (e.g. leaflets, infographics, etc.) which can be used for risk communication interventions. Those can include: -

- Rwandan Biomedical Center (RBC's) website
- TikTok and other platforms with large number of followers in Rwanda
- Rwandan Ministry of Health Website
- National and local health authority social media accounts (RBC's Facebook page, X, Rwanda Ministry of Health's Facebook page, X)

8.3. Targeted Channels in RCCE for Mpox Outbreak

The Rwanda Health Communication Centre Division (RHCC) is responsible for working with the media and social media who are major stakeholders and partners in the response efforts of Mpox.

In addition, other available and effective target channels can be mapped and used in delivering the Risk Communication and community engagement in the context of Mpox and those can potentially be:

a) Civil society and non-governmental organizations, including websites

b) Mass gathering and events (e.g. music festivals, including webpages and social media accounts).

c) University websites and social media accounts.

8.4. Risks to be targeted by RCCE

The RHCC updates on regular basis the messages and the communication materials according to the dynamic of the outbreak.

Public health educational messages should focus on the following risks:

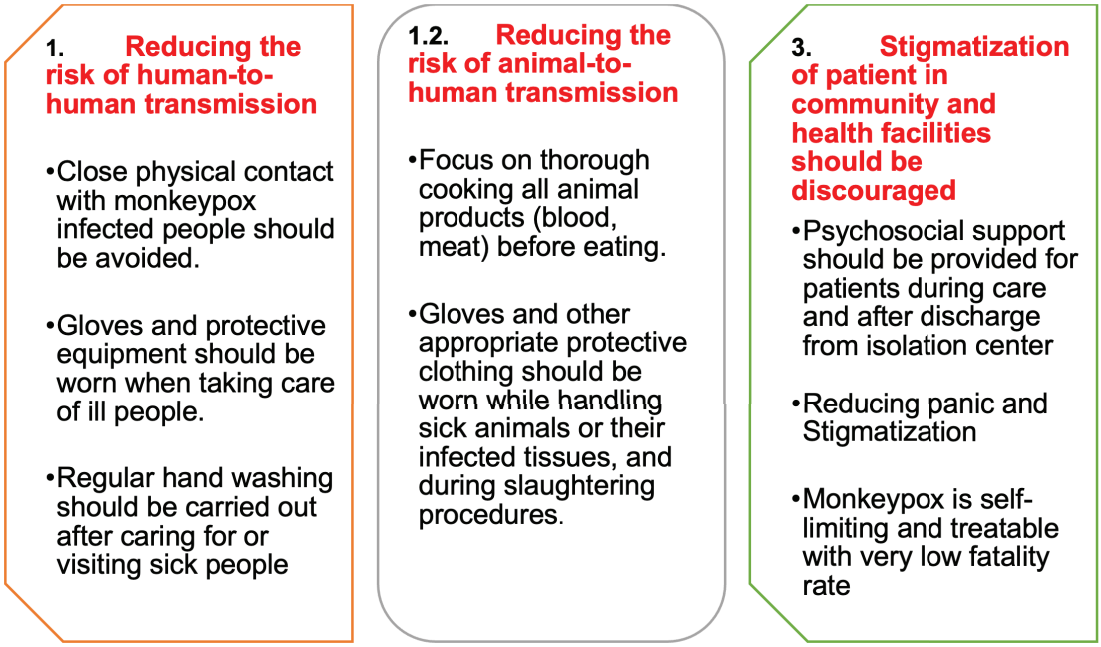

Figure 9: The three risks that needs to be targeted by RCCE

RHCC use scientific information from trusted sources (MOH, WHO, UNICEF, IFRC, AFRICA CDC, CDC Atlanta and etc.) and messages with the scientific experts (epidemiologists, IPC, case management, etc.).

8.5. Delivering outbreak information to the public through the Mass Media

During the outbreak, there is a lot of confusion, panic, rumors, misconceptions and uncoordinated issuance of information through the media from various sources.

To properly manage the media and social media during Mpox outbreak, RHCC should:

- Identify the media houses, social media networks and journalists to work with. If a media contact list exists, update it, and ensure all the contact details such as telephone numbers and emails are up-to-date.
- Contact the identified media houses/journalists, social media networks and inform them about the Mpox outbreak.
- Secure their accreditation and remind them how their participation and accurate coverage are critical to containing the Mpox outbreak.

- Give the journalists or media houses the most current contact details including emergency numbers if needed.
- Prepare an information kit on the Mpox outbreak (a folder containing background information on the Mpox outbreak, a press release, a poster, leaflets, a list of key messages, a list of important information sources with their contacts).
- Workshops for the accredited journalists on the Mpox outbreak covering topics such as:
    - Current situation – who is affected? How many cases? what patterns/trends etc.?
    - Definition of Mpox, signs and symptoms
    - How is Mpox spread?
    - Infection prevention and control
    - Principles of Mpox outbreak communication
    - Roles and responsibilities of the media and social media networks in Mpox outbreak control
    - Credible information sources during the Mpox outbreak
- Give each journalist the Mpox outbreak information kit;
- Prepare and conduct regular press briefings on the Mpox outbreak. The regularity of the briefings depends on the magnitude of the Mpox outbreak and on necessity to communicate new and urgent information to the public;
- Prepare and issue a press release after each press briefing. The press releases should be based on the official situation reports (Sitreps) or any other current information.
- Conduct social listening to collect all information on what people are saying about the Outbreak through communities, local leaders and any other sources of information.
- Undertake rapid assessments to understand what the community knows and believes about the disease and what are their sources of information.
- Share all rumors with other technical subcommittees for their management;
- Capture and compile all updates coming in and discuss it within the subcommittee for community mobilization.
- Preposition validated communication materials for dissemination;
- Utilize the channels identified in the rapid Knowledge Attitude, Behavior and Practice (KABP) assessment to correct behavioral evidence affecting Mpox responses.
- Prepare a press release responding or clarifying the rumors and share it with all the media houses and journalists on your contact list.

- Share all correct information on rumors with CHWs, Media, Local leaders with the capacity to disseminate information and who are respected in the communities.
- Share the findings with the local leaders and ask them to help by disseminating the correct information on some rumors.

In conclusion, During the current outbreak, and due to the large number of planned mass gathering events, the use of multiple channels should be exploited to the maximum to increase knowledge of the outbreak and provide credible and actionable information and advice to the groups most at risk.

9. One Health Approach in Prevention and Control of Mpox Outbreak

Mpox virus is a zoonotic orthopoxvirus. There is no sufficient knowledge neither about which animal is a reservoir nor which can be infected with the Mpox virus, but so far, any mammal is assumed that it might be infected.

Even if the risk of transmission from animals to humans cannot be excluded, the probability of a zoonotic spillover event in Rwanda is very low. The risk of spillover is scored low basing on the behavior of Rwandans that in such way bushmeat is not among the common meals, together with zero grazing farming system that is commonly adopted as a recommended farming system.

Despite the Mpox outbreak in Rwanda being found to be linked to community transmission, the mechanism to monitor the risk of zoonotic spillover events should kept strong and efficient.

In Rwanda, the One Health approach involves several key sectors working together to address the interconnected health of humans, animals, and the environment. Here are some potential One Health sectors in Rwanda and it is requiring onboarding all or some of those one health sectors in prevention and control of Mpox outbreak through existing one health coordination platform

1. **Human Health Sector**: This includes the Ministry of Health, hospitals, clinics, and public health institutes/RBC. They focus on monitoring and controlling human diseases, conducting health education, and implementing public health policies.
2. **Animal Health Sector**: This sector involves the Ministry of Agriculture and Animal Resources, veterinary services, and livestock management organizations. They work on preventing and controlling zoonotic diseases, ensuring animal health, and promoting safe animal husbandry practices
3. **Environmental Health Sector**: This includes the Ministry of Environment, environmental protection agencies, and organizations focused on biodiversity and ecosystem health. They address environmental factors that affect health, such as pollution, deforestation, and climate change.
4. **Food Safety and Security Sector**: This sector involves the Rwanda Food and Drug Authority, agricultural extension services, and food safety organizations. They ensure the safety and quality of food products, prevent foodborne illnesses, and promote food security.
5. **Academic and Research Institutions**: Universities and research centers, such as the University of Rwanda and the University of Global Health Equity, play a crucial role in conducting research, providing education, and developing innovative solutions for One Health challenges.
6. **Community Health Workers**: Rwanda has an extensive network of community health workers who play a vital role in disease surveillance, health education, and linking communities with health services.

Table 5: the proposed areas of collaboration among one health entities in the context of Mpox

Pillar	Response Mechanism
Coordination	▪ RDB needs to develop and distribute guidelines for safely handling and managing wildlife to prevent Mpox transmission, ▪ RAB needs to avail awareness material on the risk of Mpox zoonotic spillover, ▪ One Health Unit hosted in RBC to facilitate information sharing among relevant sectors (Animal, Human & environment), ▪ Surveillance agents should be trained with the appropriate PPE while handling animals and collecting samples.
Surveillance and Information Sharing	**Suspected case in animals** ▪ Any non-human primate or apes (or other animal species) that exhibit a clinical sign of a pox-like lesion on the body (face, head, limb, tail). **Confirmed cases in animals** ▪ Any non-human primate or Apes (or other animal) that is PCR positive for the Mpox virus ▪ RDB to monitor wildlife especially rodents, Apes and M for signs of Mpox ▪ RAB to collaborate with field veterinarians and other animal health professionals working on the field for early detection in case Mpox get presented in domestic animals
RCCE	▪ RBC to disseminate accurate and timely information about Mpox to the public, ▪ RAB to educate livestock farmers and pet owners about Mpox risks and prevention, ▪ RDB to enforce laws against hunting, ▪ Provide training for veterinarians and animal health workers on Mpox surveillance, sample collection, and transportation.
Research	▪ RDB, RAB, and RBC should conduct integrated assessments to monitor the risk of zoonotic spillover from animals to humans and vice-versa.

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Annexes

Annex 1: Mpox Case Investigation Form

Unique Case ID					
Cluster number/ID (if applicable)					
I. CASE CLASSIFICATION					
❑ Suspected		❑ Confirmed		❑ Probable	
II. CURRENT STATUS					
❑ Alive		❑ Dead		❑ Unknown/lost to follow up	
III. CASE IDENTIFICATION INFORMATION					
Name					
Age in years					
Sex	❑ Male		❑ Female		
Sexual orientation	❑ MSM	❑ Lesbian	❑ Heterosexual		
	❑ Bisexual	❑ None			
Province					
District					
Sector					
Cell					
Village					
Phone number					
Occupation					
Healthcare worker?	❑ Yes		❑ No		
Sex worker?	❑ Yes		❑ No		
IV. ATTENDING HEALTH FACILITY					
Health Facility name					
District of the HF					
Date of consultation	DD/ MM/ YYYY				
Date of admission(If admitted)	DD/ MM/ YYYY				
V. CURRENT MEDICAL HISTORY					
Sexually Transmitted Infections (STIs)	❑ Yes ❑ No	If yes, specify:			

HIV Status	❑ Yes	❑ No	
Pregnancy	❑ Yes	❑ No	
VI. SIGNS AND SYMPTOMS			
Date of symptoms onset			
Clinical features (Tick appropriate box: yes, no, unknown			
Fever	❑ Yes ❑ No	Rash	❑ Yes ❑ No
Headache	❑ Yes ❑ No	Date of rash onset	
Muscle pain	❑ Yes ❑ No	Distribution of rash	
Fatigue	❑ Yes ❑ No	❑ Face ❑ Oral ❑ Arms ❑ All over trunk ❑ Genitals ❑ Legs ❑ Body ❑ Thorax ❑ Soles of hands ❑ Soles of feet	
Sorethroat	❑ Yes ❑ No		
Nausea/vomiting	❑ Yes ❑ No		
Cough	❑ Yes ❑ No		
Chills/sweats	❑ Yes ❑ No		
Light sensitivity	❑ Yes ❑ No		
Other specify:			
VII. EXPOSURE HISTORY			
Did the patient travel outside of the country in the past 21 days?			❑ Yes ❑ No
Country	Region	Last date in the country visited:	
1.		DD/ MM/ YYYY	
2.		DD/ MM/ YYYY	
3.		DD/ MM/ YYYY	
Patient had contact with anyone presenting similar illness or symptoms; or with a known probable or confirmed case up to 3 weeks prior to symptom onset or diagnosis?			❑ Yes ❑ No ❑ Unknown
Date of last contact	DD/ MM/ YYYY		
Relationship to the case ❑ Spouse/partner ❑ Household member ❑ Non-household relative ❑ Friend ❑ Sexual partner ❑ Colleague ❑ Healthcare exposure ❑ Other (specify) ……			

Type of contact with the case (Select all that apply) ❑ Prolonged face-to-face respiratory exposure in close proximity, but no physical contact ❑ Direct skin to skin contact (such as touching, hugging), but no mucosal contact and no sexual intercourse ❑ Sexual intercourse contact ❑ Contact with contaminated material (such as clothing or bedding, including material dislodged from bedding or surfaces during handling of laundry or cleaning of contaminated rooms, sharing sex toys), but no direct contact with the case ❑ Health worker in contact with a case ❑ Other, specify_____

VIII. DIAGNOSTIC/PATHOGEN TESTING			
Date of sampling	Specimen type		Test performed
DD/ MM/ YYYY	❑ Skin lesion material (including swabs of lesion surface, and/or exudate, roofs from more than one lesion) ❑ Lesion crust ❑ Serum ❑ Genital swab ❑ Oropharyngeal swab ❑ Urine ❑ Semen ❑ Rectal swab ❑ Cerebrospinal fluid ❑ Other, Specify:_____		❑ PCR ❑ Sequencing ❑ Serology ❑ Other (specify) _____
Result	❑ Positive ❑ Negative ❑ Inconclusive		
Genomic characterization undertaken?		❑ Yes ❑ No	
If yes, clade:	❑ Clade I ❑ Clade II ❑ Clade IIb ❑ Other, specify:		

Annex 2: Mpox contact listing form

Case name	No.	Names of contact	age	Sex	Phone Number	District	Sector	Cell	Village	Occupation	Name of Chief of Household	Phone nb of household Chief	Pregnancy (Yes, No)	Presence of Chronic disease: HIV, Diabetes, Cancer, (Yes/No)	If Yes, what chronic disease?	Type of contact (Sexual, Meeting, etc)	Date of last contact with case	Mpox exposure category (None, Low, Med, High)	Comment
a.	1																		
	2																		
	3																		
	4																		
	5																		
	6																		
b.	1																		
	2																		
	3																		
c.	1																		
	2																		
	3																		
	4																		

Annex 3: Mpox PoE Health Assessment Form

Section A: Screening (To be completed by screener)

POE Information

PoE _____District_____ Province_____

Name of screener _____Position _____Phone Number(s) _____

Time and Date of Report ____(HH) ____(MM) _____/ DD _____/ MM _____/ YYYY

POE case number (POE /Code number/Year/Patient Serial number): _____

Traveler Information

Name Surname: _____

Date of birth (DD/MM/YYYY) ____/____/____ Gender: M F

Residence/address: _____

Phone Number(s) _____

Passport/ National ID No. _____

Emergency Contact (name, phone number) _____

Country of Departure_____

Transit Country/ies (if applicable) _____

Traveler's Companion/s (if applicable)

Name	Age	Relationship	Address In Rwanda

Traveler with signs & symptoms s of Mpox

To be completed by the point of entry health screener	
□	an unexplained acute skin rash or lesions alone
□	Temperature of ≥38.5°C
□	Headache
□	Lymphadenopathy (swollen lymph nodes)
□	Myalgia (Muscle and Body aches)
□	Back Pain
□	Prostration / asthenia (profound weakness)
□	Fatigue
□	Pharyngitis (sore throat)
□	Proctitis (rectal inflammation /Pain)

Section B: Verification/Assessment

Travel exposures and risk factors

Did you provide direct care to any person Mpox while the person was sick?	□ Yes □ No □ Unk
In the past three weeks, have you done any of the following?	
Were you exposed to the blood or other body fluids of a person with Mpox	□ Yes □ No □ Unk
Have u had multiple and/or casual sexual partners in the 21 days	□ Yes □ No □ Unk
Have you traveled in endemic area	□ Yes □ No □ Unk
Have you had a contact with probable or confirmed Mpox case??	□ Yes □ No □ Unk

Meets case definition. Yes No

Case Classification:

- Alert
- Suspected
- Probable

Summary of Actions Taken (select as applicable)

- ☐ Traveler examined for verification of symptoms
- ☐ District Hospital & POE Manager notified
- ☐ Referral to higher level of care

Was the traveler referred to the nearest healthcare facility (HCF)?

Yes if yes, write the name of the HCF/HCW

No if the traveler did not go to the HCF and there is no HCW to examine him/her, mention the reason _____
_____
_____
_____

Annex 4: Algorithm for case investigation and interface of case investigation with PHEOC/IMS