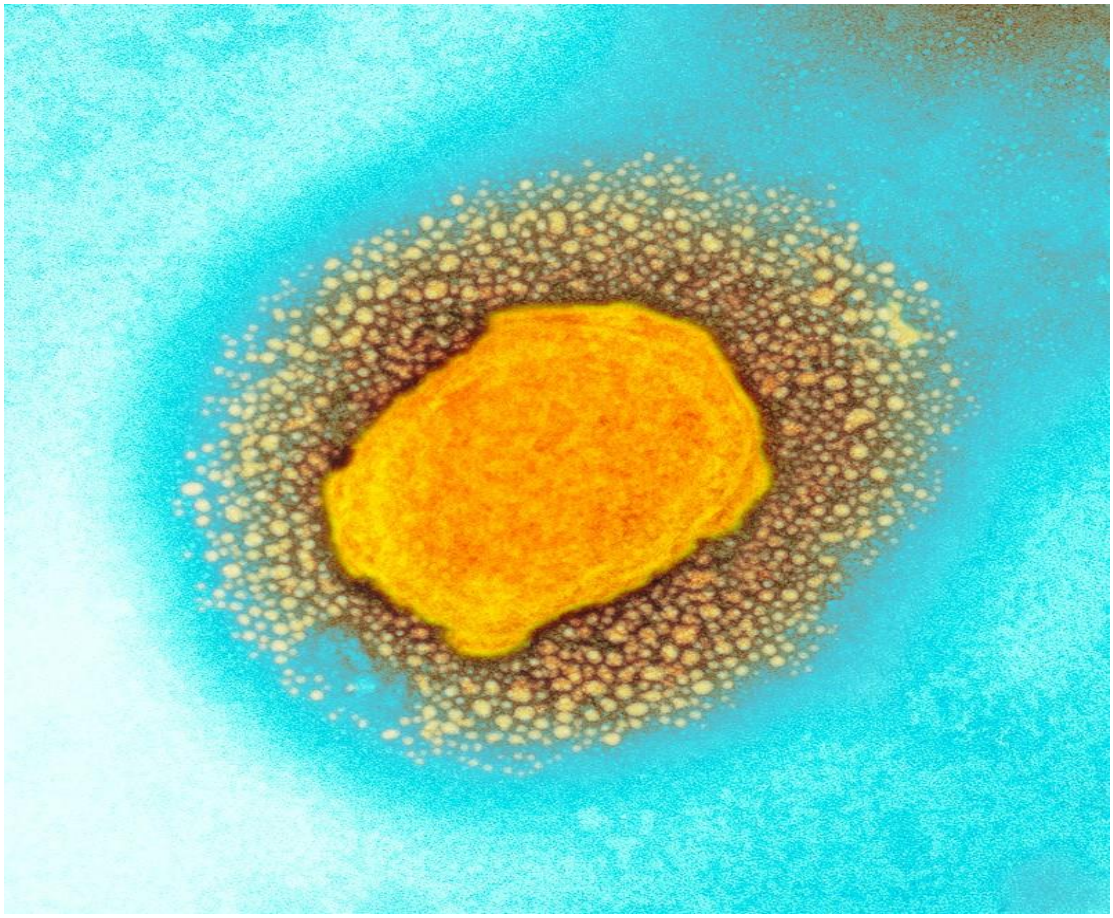
MONKEYPOX EPIDEMIOLOGICAL SURVEILLANCE PROTOCOL

Ministry of Health and Wellness, Jamaica
July 6, 2022
Version 1

☐ RKA Building, 10-16 Grenada Way ☐ 45-47 Barbados Avenue ☒ 24-26 Grenada Crescent ☐ 10A Chelsea Avenue
KINGSTON 5, JAMAICA, W.I.
Tel: (876) 633-7400/7433/7771/8172/8174
Website: www.moh.gov.jm

MONKEYPOX (MPX) SURVEILLANCE PROTOCOL



The monkeypox virus (shown here in a coloured transmission electron micrograph) is closely related to the smallpox virus. Credit: UK Health Security Agency/Science Photo Library

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SUMMARY

Human monkeypox (hMPX) is a zoonotic viral disease caused by the Monkeypox virus (MPXV) [1,2]. Human monkeypox infection, if occurring in Jamaica, would be considered an exotic or unusual communicable disease and should therefore be reported as a Class 1 notifiable disease.

The incubation period for monkeypox is between 5 and 21 days

The ideal test sample is a swab of skin lesion material, including swabs of lesion surface and/ or roof, or vesicular fluid/exudate. All specimens must be placed on ice at 4-8°C and transported immediately to the National Public Health Laboratory. A case is confirmed by real-time polymerase chain reaction (PCR).

Monkeypox must be notified by the healthcare worker (public and private) immediately on suspicion to the local Parish Health Department and National Surveillance Unit.

Clusters of visits for unusual rash must be notified by the healthcare worker (public and private) immediately. Clusters should be reported and investigated.

Contact Tracing: All close contacts of Probable and Suspected cases of monkeypox will be placed on home quarantine after the most recent contact and observed daily for the development of symptoms. Healthcare workers in all health care settings should be vigilant in identifying patients presenting with unusual rash, associated with lymphadenopathy, or fever. A detailed travel and vaccination history should be recorded.

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CASE DEFINITIONS

Suspected Case

A person of any age presenting with an unexplained acute rash

AND
One or more of the following signs or symptoms: headache, acute onset of fever (>38.5oC); lymphadenopathy (swollen lymph nodes), myalgia (muscle and body aches), back pain, and asthenia (profound weakness).

AND
for which the following common causes of acute rash do not explain the clinical picture: varicella zoster, herpes zoster, measles, Zika, dengue, chikungunya, herpes simplex, bacterial skin infections, disseminated gonococcus infection, primary or secondary syphilis, chancroid, lymphogranuloma venereum, granuloma inguinale, molluscum contagiosum, allergic reaction (e.g., to plants)

Probable case

A person meeting the case definition for a suspected case

AND

One or more of the following:

has an epidemiological link (face-to-face exposure, including health workers without eye and respiratory protection); direct physical contact with skin or skin lesions, including sexual contact.

OR

Contact with contaminated materials such as clothing, bedding, or utensils from a probable or confirmed case of monkeypox in the 21 days before symptom onset.

OR

Reported travel history to a monkeypox endemic country or to any country with an active monkeypox outbreak, in the 21 days before symptom onset

Confirmed case

A case meeting the definition of either a suspected or probable case and is laboratory confirmed for monkeypox virus by detection of unique sequences of viral DNA by real-time polymerase chain reaction (PCR).

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BACKGROUND

Monkeypox virus (MPXV) is an enveloped double-stranded DNA virus with a genome size of around 190 kb. It belongs to the *Orthopoxvirus* genus of the *Poxviridae* family. The *Orthopoxvirus* genus also includes Vaccinia virus, Cowpox virus, Variola virus and several other, animal-related, poxviruses [2]. Human monkeypox (MPX) was recognized as a human disease in 1970 [3,4]. The first outbreak of MPX reported outside of Africa [5,6] was an outbreak linked to an importation of infected mammals in 2003 in the United States. More recently, in 2018 and 2019, in the context of a large MPX outbreak in Nigeria, two travellers from the United Kingdom [7], one from Israel [8], and one from Singapore [9,10], all with travel history in Nigeria were diagnosed with MPX. A healthcare worker from the United Kingdom caring for one of the cases was secondarily infected [11]. This was the first time that travellers were associated with MPXV transmission outside of an outbreak setting. We need to remain vigilant about this and other zoonoses [12].

Monkeypox causes outbreaks in the tropical rainforest regions of Central and West Africa and the clinical presentation is similar to smallpox. There are two (2) phylogenetically distinct clades of MPXV that have been identified through genomic sequencing:

1. The Central African (Congo Basin) clade - more severe with case fatality ratio of10%
2. The West African clade self-limiting with a case fatality ratio of about 1%. -
   All cases to date in 2022 so far have been identified as this clade [2].

Typically, the Central African MPXV is associated with more severe disease, higher mortality, and more frequent human-to-human transmission [2,5,14,15]. Genetic differences between the viral genomes of the two clades might explain differences in viral clearance and pathogenesis [16-18]. Differences in disease severity may also be affected by transmission route, host susceptibility, and the quantity of virus inoculated [14].

The clinical presentation of MPX includes symptoms and lesions that may be difficult to distinguish from smallpox, other orthopoxvirus and parapoxvirus infections, and, to some extent, chickenpox. The main difference between smallpox and MPX is that MPXV causes lymphadenopathy (e.g., in the cervical or inguinal region) while smallpox virus and chickenpox virus usually do not [20]. Although the clinical manifestation of MPX is milder than that of smallpox, the case fatality can still reach up to 10%. Mortality is higher among children and young adults, and immunocompromised individuals are especially at risk of severe disease [22]. Complications such as respiratory distress, secondary bacterial infections and encephalitis, and sequelae were found to be less common in patients vaccinated against smallpox [2].

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EPIDEMIOLOGY

Monkeypox is regarded as the most important orthopoxvirus infection in humans since the eradication of smallpox [13]. Human monkeypox virus was first isolated in 1958 from pox lesions during an outbreak of vesicular disease among captive cynomologus macaques (monkeys) imported into Denmark for polio-vaccine-related research [22].

Although the disease name suggests that monkeys are the primary host, the specific animal reservoir of MPXV remains unknown [22]. Similar to humans, monkeys are considered disease hosts [22]. African rodents such as the Gambian giant rats *(Cricetomys gambianus)* and squirrels might be natural reservoirs of the virus [26,27].

In 1970, the first human isolate of MPXV was reported in a child in the equatorial region of the Democratic Republic of the Congo, (DRC), nine months after the eradication of smallpox in that country [4]. Subsequently, sporadic cases were reported from the rainforest areas of central and western Africa, and large outbreaks were identified mainly in the DRC where the disease is currently considered endemic [4,28].

Following the declaration of smallpox eradication in 1980 by the World Health Assembly, the World Health Organization sponsored enhanced MPX surveillance efforts in the central regions of the DRC and some limited animal and human ecologic studies were undertaken [5]. This led to a major increase in the reported incidence of MPX.

The increase in reported incidence of MPX may be partly attributable to decreasing herd immunity in the population following the cessation of the smallpox vaccination program in the early 1980s. Other explanatory factors might be changes in the virus itself and modifications of ecosystems that may have caused the natural reservoir's population density to rise [4].

The Class 1 Notification System of Jamaica will be used to detect and report cases of Monkeypox infection

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TRANSMISSION

- Monkeypox does not spread easily between people.
- Spread of monkeypox may occur when a person comes into close contact with an infected animal (rodents are believed to be the primary animal reservoir for transmission to humans), human, or materials contaminated with the virus.
- The virus enters the body through broken skin (even if not visible), the respiratory tract, or the mucous membranes (eyes, nose, or mouth).
- Person-to-person spread is uncommon, but may occur through:
    - contact with clothing or linen (such as bedding or towels) used by an infected person
    - direct contact with monkeypox skin lesions or scabs
    - coughing or sneezing of an individual with a monkeypox rash

CLINICAL FEATURES

- The incubation period is the duration/time between contact with the infected person and the time that the first symptoms appear.
- The **incubation period** for monkeypox is between **5 and 21 days**.
- The infection is usually mild-to-moderate in nature and can be divided into two periods.
    - **Invasion/prodromal period (0-5 days)** 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)
    - **Skin eruption period (within 1-3 days after appearance of fever)** where rashes appear in various stages often beginning on the face and then spreadingelsewhere 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 lesions)
        - Crust (dried blisters)

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- Monkeypox infection is usually a self-limiting illness, and most people recover within several weeks. However, severe illness can occur in some individuals (children & immunocompromised).

- Unlike SARS-CoV-2, which spreads through aerosols, monkeypox is thought to spread from close contact with bodily fluids, and from coughing. That means a person with monkeypox is likely to infect far fewer close contacts than someone with SARS-CoV-2. Both viruses can cause flu-like symptoms, but monkeypox also triggers enlarged lymph nodes and, eventually, distinctive fluid-filled lesions on the face, hands, and feet. Most people recover from monkeypox in a few weeks without treatment.

- An individual is **contagious until all the scabs have fallen off and there is intact skin** underneath. The scabs may also contain infectious virus material.

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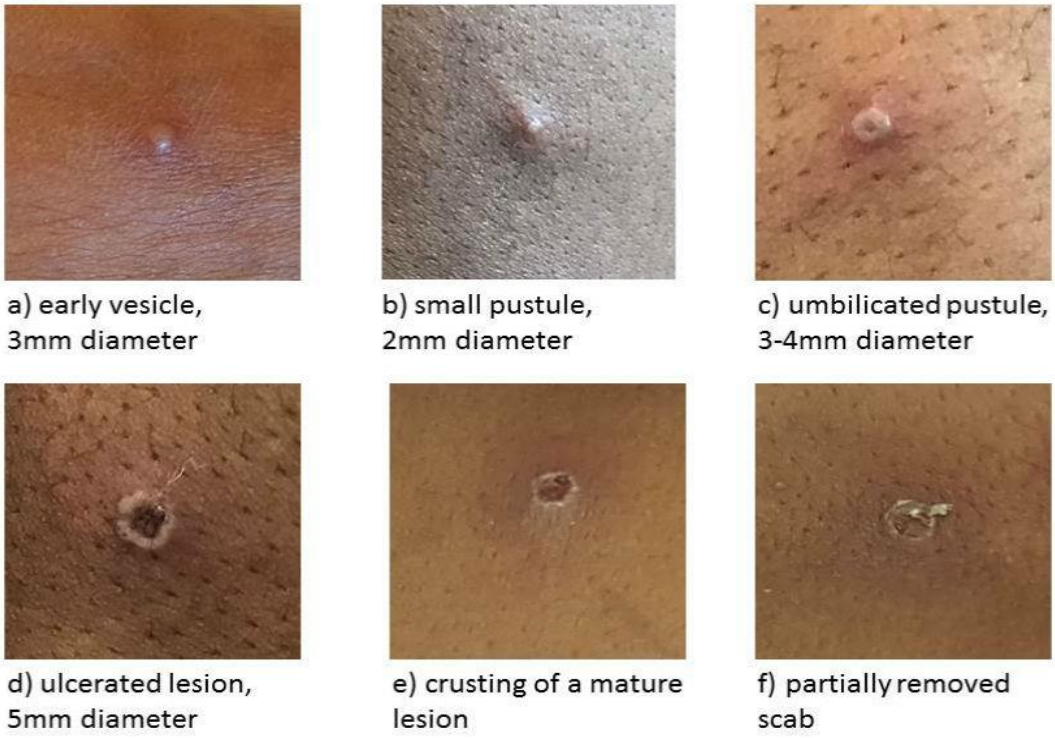

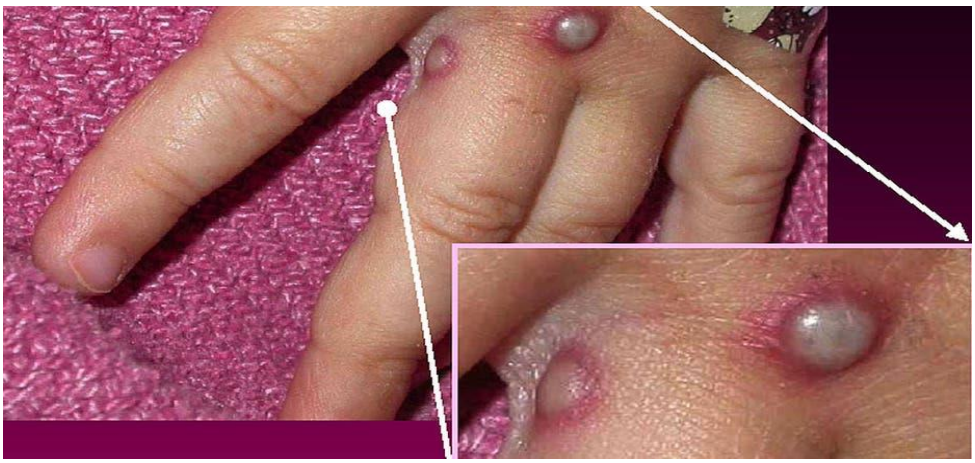

Images of monkeypox lesions

Notes

Areas of erythema and/or skin hyperpigmentation are often seen around discrete lesions.
Lesions can vary in size and may be larger than those shown.
Lesions of different appearances and stages may be seen at the same point in time.
Detached scabs may be considerably smaller than the original lesion.

Table 1: Differential Diagnosis of Monkeypox

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	DISEASE	CLINICAL DESCRIPTION
1	Monkeypox	- Illness is usually mild to moderate in severity but can be fatal. Illness presenting with fever, headache, lymphadenopathy, back pain, myalgia (soreness in muscle) and asthenia (decrease in muscle strength) - Rash which follows fever starts from face, then spreads usually in a centrifugal pattern to other parts of the body especially extremities - Rash progresses from maculopapular to vesicles, pustules (rash with pus) and crusts (dried blisters) - Rashes in a particular area are usually at the same stage of development
2	Chicken pox	- Mild/moderate childhood infection which can also affect adults in whom it tends to be more severe - Fever, tiredness, loss of appetite and headaches - Rash that turns into itchy, fluid-filled blisters that eventually turn into scabs - The rash may first show up on the face, chest, and back then spread to the rest of the body, including inside the mouth, eyelids, or genital area - Rash is usually not pustular - Rashes are usually at different stages of development - Lymphadenopathy is not a common feature
3	Measles	- High fever, cough, watery nose (coryza), and conjunctivitis (red, watery eyes). Tiny white (Kolpik) spots may appear inside mouth 2-3 days after symptoms - Flat red (maculo-papular) rashes appear on face around hairline, and spread downward to the neck, trunk, arms, legs, and feet - Small, raised bumps may also appear on top of the flat red spots
4	Syphilis	- Fever, swollen lymph glands, sore throat, patchy hair loss, headaches, weight loss, muscle aches, and fatigue - Painless chancre in primary stage of the disease - Skin rashes and/or mucous membrane lesions (sores in the mouth, vagina, or anus) mark the second stage

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SURVEILLANCE COMPONENTS

The protocol shall be adhered to for surveillance activities. **Monkeypox is an "exotic" communicable zoonotic disease and is therefore a Class 1 notifiable condition.**

There are five (5) components to be considered in surveillance for monkeypox:

1. Case identification
2. Case reporting and investigation (including contact tracing)
3. Specimen collection and testing
4. Data analysis and interpretation
5. Data dissemination and outputs

PURPOSE OF THE GUIDELINES

To establish standards for the surveillance of monkeypox.

OBJECTIVES

The objectives of epidemiological surveillance of monkeypox are:

1. To establish epidemiological characteristics of the monkeypox infection
2. To inform risk assessment and decision-making.

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SURVEILLANCE AND REPORTING

Surveillance

The key objectives of surveillance and case investigation for monkeypox in the current context are to: rapidly identify cases, clusters, and the sources of infection as soon as possible in order to provide optimal clinical care, isolate cases to prevent further transmission, identify and manage contacts, and tailor effective control and prevention methods based on most commonly identified routes of transmission.

In non-endemic countries, such as Jamaica, one case is considered an outbreak. Because of the public health risks associated with a single case of monkeypox, clinicians should report suspected cases immediately to **The Parish Health Department and The National Surveillance Unit** regardless of whether they are also exploring other potential diagnoses.

Reporting

Case reports should include at a minimum the following information:
(See Appendix 2: Monkeypox Case Investigation Form)

- date of report
- reporting location
- name, age, sex and residence of the case
- date of onset of first symptoms
- recent travel history, recent exposure to a probable or confirmed case
- relationship and nature of contact with probable or confirmed cases (where relevant)
- recent history of multiple or anonymous sexual partners
- smallpox vaccination status
- presence of fever occurring before rash/lesion identified
- presence of rash
- presence of other clinical signs or symptoms as per case definition
- other clinical or laboratory findings, particularly to exclude common causes of rash (see case definitions)
- hospitalization status
- date of hospitalization (if applicable)
- and outcome at time of reporting.

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Case Definitions

Suspected case[2]:

A person of any age presenting [2] with an unexplained acute rash

AND

One or more of the following signs or symptoms, since 15 March 2022:

- Headache; Acute onset of fever (>38.5ºC); Lymphadenopathy (swollen lymph nodes)
- Myalgia (muscle and body aches); Back pain; Asthenia (profound weakness)

AND

for which the following common causes of acute rash do not explain the clinical picture:

- varicella zoster, herpes zoster, measles, Zika, dengue, chikungunya, herpes simplex, bacterial skin infections, disseminated g*onococcus* infection, primary or secondary syphilis, chancroid, lymphogranuloma venereum, granuloma inguinale, molluscum contagiosum, allergic reaction (e.g., to plants)

N.B. It is not necessary to obtain negative laboratory results for listed common causes of rash illness in order to classify a case as suspected.

Probable case:

A person meeting the case definition for a suspected case

AND

One or more of the following:

- has an epidemiological link (face-to-face exposure, including health workers without eye and respiratory protection); direct physical contact with skin or skin lesions, including sexual contact;
- contact with contaminated materials such as clothing, bedding or utensils to a probable or confirmed case of monkeypox in the 21 days before symptom onset
- reported travel history to a monkeypox endemic country[1] in the 21 days before symptom onset
- reported travel history to non-endemic countries and or countries with recent local transmission.

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Clinicians are advised to note the following [see *list of endemic countries and those with local transmission of monkeypox* below]

Monkeypox endemic countries are: Benin, Cameroon, the Central African Republic, the Democratic Republic of the Congo, Gabon, Ghana (identified in animals only), Côte d'Ivoire, Liberia, Nigeria, the Republic of the Congo, and Sierra Leone. Benin and South Sudan. Countries currently reporting cases of the West African clade are Cameroon and Nigeria.

WHO list of countries with local case transmission of Monkeypox as at 15 June 2022: See Appendix 6.

Confirmed case:

A case meeting the definition of either a suspected or probable case and is laboratory confirmed for monkeypox virus by detection of unique sequences of viral DNA either by real-time polymerase chain reaction (PCR) and/or sequencing.

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ACTIONS TO BE TAKEN

- Reporting/Notification
- Isolation of case
- Case investigation
- Contact tracing
- Quarantine of contacts [as necessary]

Case Reporting and Investigation

Notification

Monkeypox is a Class 1 notifiable condition which means it must be notified by the healthcare worker (public and private) immediately on suspicion to the local Parish Health Department and/ or National Surveillance Unit.
The Parish Medical Officer (Health) and National Surveillance Unit, upon receiving said notification must immediately activate the call-out cascade for health emergencies. The Ministry of Health and Wellness National Emergency Operations Centre (MOHW NEOC) should be alerted immediately, via the National Epidemiological Surveillance System to all notifications for Monkeypox.
Clusters of visits for unusual rash must be notified by the healthcare worker (public and private) immediately. Clusters should be investigated and reported.

Investigation

The Parish Medical Officer (Health) leads the case investigation team and must:

- Initiate case investigation within 24 hours of notification. A preliminary case or cluster investigation report must be submitted within 24 hours of this notification

- Immediately conduct contact tracing activities and initiate isolation and or quarantine where appropriate.

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SPECIMEN COLLECTION AND TESTING

Samples must be taken from all suspected and probable cases of monkeypox.

- **The recommended specimen type for laboratory confirmation of monkeypox is skin lesion material, including swabs of lesion surface and/or exudate, or roofs from more than one lesion, or lesion crusts.**

- Swabs should be collected with Dacron or polyester flocked swabs and placed in sterile containers on ice. **Avoid using cotton tipped swabs for specimen collection.**

- The confirmatory test is the Polymerase Chain Reaction (PCR)

All specimens must be labelled with:

1. Patient Name
2. Patient Address
3. Date of Birth
4. Referring Facility
5. Diagnosis: Suspected monkeypox
6. Date and time of sample collection
7. Type of Sample Collected

All Specimens must be placed on ice at 4-8°C and transported immediately to the National Public Health Laboratory.

All specimens must be accompanied by a completed Jamaica Laboratory Investigation Form (see attached Appendix 5). Contact the Consultant Microbiologist immediately to inform them of the sample.

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PUBLIC HEALTH CONTROL MEASURES

Public health control measures are aimed to reduce human-to-human transmission through:

- Early recognition by specialist assessment and laboratory investigation
- Isolation of infected patients
- Implementation of appropriate infection prevention and control measures in healthcare settings (**standard, contact, and droplet precautions**)
- Early detection of possible new cases by contact tracing in outbreak settings.
- General precautionary measures recommended against COVID-19 are expected to largely protect from monkeypox virus transmission.

Contact Tracing[1]

- All close contacts of Probable and Suspected cases of monkeypox will be placed on home quarantine after most recent contact and observed daily for the development of symptoms. The period of quarantine and observation will end when a negative result for monkeypox is received for the Probable or Suspected case.

- All close contacts will be given explicit instructions (verbal and written) regarding the steps to be taken if symptoms develop.

- A record of the daily observation checks for contacts should be maintained at the Parish Health Department and daily reports submitted to the MOHW NEOC.

[1] A contact is a person who, in the period beginning with the onset of the source case's first symptoms, and ending when all scabs have fallen off, has had one or more of the following exposures with a probable or confirmed case of monkeypox:

- face-to-face exposure (including health care workers without appropriate PPE)
- direct physical contact, including sexual contact
- contact with contaminated materials such as clothing or bedding

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Considerations related to contact tracing

Contact tracing is key to control the spread of infectious disease pathogens such as monkeypox virus. It allows for the interruption of transmission and can also help people at a higher risk of developing severe disease to identify their exposure more quickly, so that their health status can be monitored, and they can seek medical care faster if they become symptomatic. In the current context, as soon as a suspected case is identified, contact identification and contact tracing should be initiated. Case patients should be interviewed to elicit the names and contact information of all such persons. Contacts should be notified within 24 hours of identification.

- If the contact develops a rash, they need to be isolated and evaluated as a suspected case, and a specimen should be collected for laboratory analysis to test for monkeypox.

- A contact who develops initial signs/symptoms other than rash should be isolated and closely watched for signs of rash for the next seven days. If no rash develops, the contact can return to monitoring under quarantine conditions.

Epidemiological Assessment, Data Analysis and Interpretation

Epidemiological assessment and analysis of surveillance data must be completed at all levels.

The Parish Medical Officer (Health) must ensure that Class 1 Notification Forms and Case Investigation Forms are forwarded simultaneously to the Regional Health Authorities and the National Surveillance Unit, within the timelines specified above. A line listing of all reported cases should be maintained at the parish health department along with contact listings for each case. Epidemic curves as well as age, sex and geographic distribution of cases must be maintained at the parish level.

The Regional Technical Director, in collaboration with the Regional Medical Epidemiologist, must ensure that the line and contact listings are maintained for each parish. The age, sex, and geographic distribution, as well as the severity of cases should be monitored. Depending on the situation, daily or weekly reports may be required.

The National Surveillance Unit will conduct analysis of national data, including the epidemiological profile of cases and the epidemic curves as the situation evolves. The National Surveillance Unit will prepare appropriate reports showing information on the patterns of disease within the population.

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Dissemination and Outputs

The National Surveillance Unit will be responsible for forwarding the information obtained from national level analysis to the Ministry of Health and Wellness National Emergency Operations Centre (MOHW NEOC).

The National Surveillance Unit will inform the Call-Out Cascade/MOHW NEOC of any notified, suspected, probable and confirmed cases of Monkeypox virus infection immediately upon identification of a suspected, probable, or confirmed case.

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APPENDIX 1: Class 1 Notification Form

CLASS 1 REPORTING FORM - INDIVIDUAL NOTIFICATION (ON SUSPICION)

Date of Report: ____ /____/ ____ (DD/MM/YY) NEW CASE / PREVIOUSLY REPORTED CASE (Circle One)

Diagnosis: _____

Case Demographic Information

Name
(including pet name): _____ Sex: _____ Age: _____ D.O.B ____ /____ / ____ (dd/mm/yy)

Address: Lot #: _____ Street _____ Street Type: _____
(Include Landmark) (Name) (Drive, Road, Close etc)

Community _____ Neighbouring Community/District: _____ Parish: _____

Workplace/School: _____ Occupation: _____

History of overseas travel in past 4-6 weeks? Y / N

(H) Phone #: _____ (Wk) Phone #: _____ Specify area/country: _____

Name of NOK/Parent: _____ Relationship to case: _____

Address of NOK/Parent: _____ Phone No.: _____

Clinical Information:

Symptoms: _____

_____

Date of onset: ____ /____/ ____ (dd/mm/yy) Date seen: ____ /____/ ____ (dd/mm/yy)

Specimen Taken Y / N Type: _____

Specimen Date: ____ /____/ ____ (dd/mm/yy) Laboratory: _____

Result (s): _____

Hosp./Facility Name: _____

Medical Record #: _____

Case admitted to Hosp?: Y / N (Circle one)

Date of Admission: ____ /____/ ____ (dd/mm/yy)

Ward: _____

If dead, Date of Death: ____ /____/ ____ (dd/mm/yy)

Notifier Information

Name of notifier: _____ Phone #: _____

Address: _____ Email: _____

Comments: _____

_____

Received by MO(H) ____ /____/ ____ (dd/mm/yy)

Parish MO(H) Signature _____

Forwarded to R.S.O ____ /____/ ____ (dd/mm/yy)

Forwarded to Surveillance Unit ____ /____/ ____ (dd/mm/yy)

Ministry of Health, Surveillance Unit, July 2018

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APPENDIX 2: Monkeypox Case Investigation Form

NATIONAL SURVEILLANCE UNIT
24-26 Grenada Crescent, Kingston 5
Jamaica, West Indies
Tel: (876) 633-7934 / 8191
Email: surveillance@moh.gov.jm

Monkeypox (MPX) Surveillance Case Investigation Form

Date of Reporting: _____ Region: _____ Parish: _____
Doctor: _____ Hospital / Site: _____ Ward: _____
Email: _____ Phone #: _____

Hospital Medical Record Number: _____ NEW CASE ☐ UPDATE ☐
Last Name: _____ First Name: _____
Date of Birth: _____ Age: _____ Sex: MALE ☐ FEMALE ☐
Country of Residence: _____ Parish: _____ Community: _____
Street #: _____ Street Name: _____

Date of Onset of Illness: _____ Admitted ☐ Y ☐ N ☐ If Yes, Admission Date: _____

CLINICAL PROFILE

SYMPTOMS

Symptoms	Yes	No	Date of Onset	Symptoms	Yes	No	Date of Onset
Rash	Yes	No		Asthenia (profound weakness)	Yes	No	
Type of rash: Maculopapular ☐ Vesicular ☐ Pustular ☐ Crusted ☐ Other, please specify:							
Fever over 38.5°C	Yes	No		Arthralgia	Yes	No	
Headache	Yes	No		Cough	Yes	No	
Lymphadenopathy	Yes	No		Other, please specify:			
Myalgia	Yes	No					
Back pain	Yes	No					

COMORBIDITIES

Pregnancy	Yes	No	Lung Disease including COPD	Yes	No	Immunocompromised due to disease or treatment	Yes	No
If yes, Trimester	1	2	3 Asthma	Yes	No	HIV / AIDS	Yes	No
Diabetes Mellitus	Yes	No	Neurological Disease	Yes	No	Malignancy	Yes	No
Sickle Cell Disease	Yes	No	Liver Disease	Yes	No	Obesity	Yes	No
Heart Disease	Yes	No	Renal Disease	Yes	No	Other, please specify:		
Hypertension	Yes	No						

EPIDEMIOLOGICAL PROFILE

Occupation Health Care Worker ☐ Health Laboratory Worker ☐ Working with Animals ☐ Student ☐ Other, please specify:

Vaccination History:
Smallpox (scar seen) ☐ MMR ☐ Dates _____ Varicella ☐ Dates _____ ~~Monkeypox~~ ☐ Dates _____

CONTACT HISTORY

In the 21 days before symptom onset, did the individual:	
Have close contact[1] with a probable or confirmed case of monkeypox?	☐ Y ☐ N ☐ Unknown
Have contact with contaminated materials e.g. clothing, bedding or utensils of a probable or confirmed case of monkeypox?	☐ Y ☐ N ☐ Unknown
Have contact with animals?	☐ Y ☐ N ☐ Unknown
If yes, please specify: Where: Home ☐ Work ☐ Health Care Setting ☐ Other, please specify: _____	
Sexual contact	☐ Y ☐ N ☐ Unknown
Was the contact ill at the time of contact?	☐ Y ☐ N ☐ Unknown
In which country was the contact diagnosed with monkeypox? _____	

Contact's Name: _____

Fever (> 38 °C) may not be present in some patients, such as those who are very young, elderly, immunosuppressed, or taking certain medications. Clinical judgement should be used to guide testing of patients in such situations

A contact is a person who experienced any one of the following exposures face-to-face, direct physical contact, or direct care for a patient during the 21 days after the onset of symptoms of a probable or confirmed case.

National Surveillance Unit, Ministry of Health & Wellness *Revised – July 6, 2022*

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TRAVEL HISTORY

In the 21 days before symptom onset, did the individual:

Travel to Jamaica from another Country: ☐ Y ☐ N ☐ Unknown

If Yes,

Country ..... Province/City..... Departure Date .....

Country ..... Province/City..... Departure Date .....

LABORATORY DATA

MOLECULAR TESTING

Sample Type	Collection Date	Test Type	Results	Result Date
Swab of lesion ☐	Date	PCR ☐ Other (specify)	Monkeypox +ve ☐ Monkeypox -ve ☐ Other+ve ☐	
Lesion/Tissue Sample ☐	Date	PCR ☐ Other (specify)	Monkeypox +ve ☐ Monkeypox -ve ☐ Other+ve ☐	
Aspirate/Exudate Swab ☐	Date	PCR ☐ Other (specify)	Monkeypox +ve ☐ Monkeypox -ve ☐ Other+ve ☐	
Other (specify)				

CONTACT TRACING

Name of Contact	Contact Type (bedroom, household, conveyance, health facility, other)	Contacts Sampled	
		Yes	No
		Yes	No
		Yes	No
		Yes	No
		Yes	No

Treatment Received (In hospital): Antiviral Yes ☐ No ☐ Type: _____

Antibiotics Yes ☐ No ☐ Type: _____

Admitted to ICU: Yes ☐ No ☐ If Yes, Date admitted to ICU _____ Date discharged from ICU _____

Recovered: Yes ☐ No ☐ **Date of Recovery:** ____/____/____

Died: Yes ☐ No ☐ **Date of Death:** ____/____/____

FINAL DIAGNOSIS: _____

MO(H) Signature: _____ **Date:** _____

A contact is a person who experienced any one of the following exposures face-to-face, direct physical contact, or direct care for a patient during the 21 days after the onset of symptoms of a probable or confirmed case.

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APPENDIX 3: Contact Listing

List of Fields for Contact Line Listing

A. Date Seen
B. Type of Contact
C. Date of most recent contact
D. First name
E. Last name
F. Date of Birth
G. Current Age
H. Sex at Birth
I. Telephone number 1
J. Telephone number 2
K. Next of Kin name
L. Next of Kin telephone number
M. Street Number
N. Street Name
O. District
P. Community
Q. Parish
R. Landmark
S. Travel History
T. Date of onset of symptoms
U. Fever
V. Lymphadenopathy
W. Rash, Skin lesions
X. Weakness,
Y. Flu like symptoms

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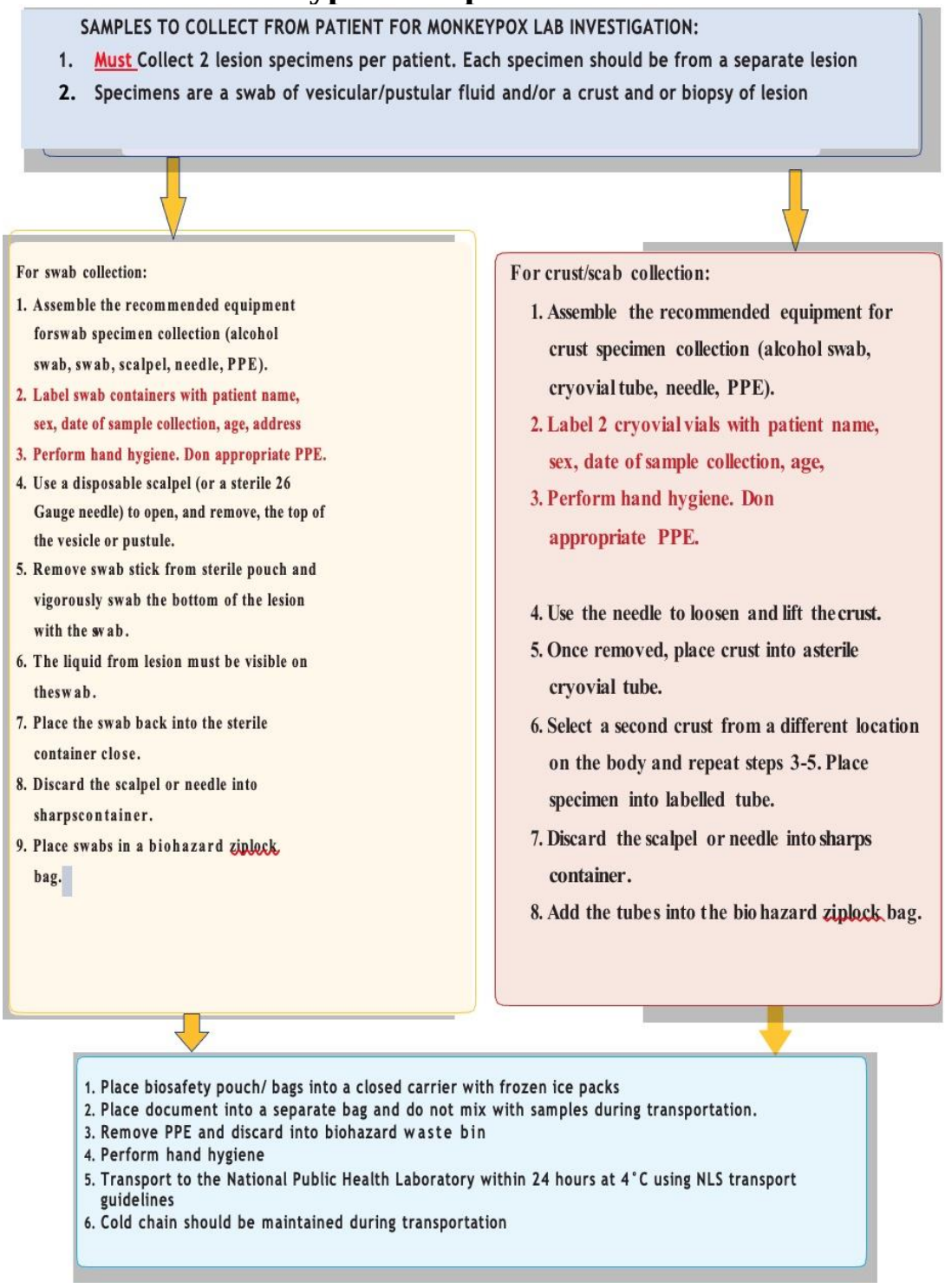
APPENDIX 4: Monkeypox Sample Collection



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APPENDIX 5: Jamaica Laboratory Investigation Form

JAMAICA: Laboratory Surveillance Investigation Form

APPENDIX 14 – September 2017

1. Patient Information

Last Name
First Name
Patient ID
Gender ☐ M ☐ F Age ☐ years ☐ months
Date of Birth YYYY/MM/DD
Street ##-
City/Parish
Postal Code Tel:
Travel History ☐Y ☐N Country Visited:

2. Referring Doctor

Consultant:
Attending Dr.:
Signature:
Reporting Address: HOSPITAL / WARD
Tel: Fax:
Date Specimen Taken: YYYY/MM/DD

3. Provisional Diagnosis

(eg. Malaria, Influenza, Measles)

4. Food/Animal/Environment Sample Details *(if relevant)*

Specimen ID
Name of food/env sample
Where specimen(s) collected
☐ Outbreak ☐ Traceback ☐ Survey ☐ Other

5. Case/Specimen Status

☐ Single case ☐ Outbreak ☐ Survey ☐ Unknown

6. Date of Onset of Illness

YYYY/MM/DD

7. Outcome

Hospitalized? ☐ Y ☐ N ☐ DK
Died? ☐ Y ☐ N ☐ DK

8. Signs and Symptoms

☐ Fever → Temp: → Onset: YYYY/MM/DD
☐ Rash → Location: → Onset: YYYY/MM/DD
☐ Pain → Location
☐ Haemorrhagic symptoms → describe
☐ Paralysis→ Location: → Onset: YYYY/MM/DD

☐ Altered mental state ☐ Chills ☐ Circulatory collapse ☐ Conjunctivitis ☐ Convulsions ☐ Coryza ☐ Cough ☐ Diarrhoea ☐ Failure to thrive
☐ Hepatomegaly ☐ Jaundice ☐ Neck stiffness ☐ Lymphadenopathy ☐ Kernig's sign ☐ Vomiting ☐ Weakness of limbs ☐ Weight loss ☐ Other → specify

Chronic Conditions
☐ Asthma ☐ Autoimmune disease ☐ Cancer ☐ Diabetes Mellitus ☐ HIV / AIDS

9. Syndromic Classification

☐ Acute Flaccid Paralysis ☐ Fever & Rash ☐ Gastroenteritis ☐ Fever & Respiratory ☐ Fever & Hemorrhagic ☐ Fever & Neurologic ☐ Fever (undifferentiated)

10. Immunization History EPI No:

BCG: ☐ Y ☐ N YYYY/MM/DD MR: ☐ Y ☐ N YYYY/MM/DD
DPT: ☐ Y ☐ N YYYY/MM/DD Polio: ☐ Y ☐ N YYYY/MM/DD
HBV: ☐ Y ☐ N YYYY/MM/DD YF: ☐ Y ☐ N YYYY/MM/DD
MMR: ☐ Y ☐ N YYYY/MM/DD Other‡: ☐ Y ☐ N YYYY/MM/DD
‡Specify

Physician / EHO Use

*Serum; EDTA blood; Blood smear; Sputum; CSF; Swab; Urine; Stool; Tissue; Plasma (PPT); Food;Water;Animal;Environment; If other specify

	Specimen 1	Specimen 2	Specimen 3
*Type of Specimen			
Date Specimen Collected			
Lab Test(s) Requested			

Laboratory Use

Date Received at Nat Lab			
Nat Lab Specimen ID			
Test(s) Performed			
Date(s) Tested			
Laboratory diagnosis			
Date Referred to CAREC			
Name of Testing Lab			

Approved by (Testing. Lab): Date:

CARPHA USE: Specimen ID (1) (2) (3)

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APPENDIX 6: Confirmed Cases of Monkeypox by WHO Region - January 2022 to June 15, 2022

Region	Country
	Cameroon
	Central African Republic
	Congo
	Democratic Republic of the Congo
	Ghana
	Nigeria
Americas	Argentina
	Brazil
	Canada
	Mexico
	United States of America
	Venezuela (Bolivarian Republic of)
Eastern Mediterranean	Morocco
	United Arab Emirates
European	Austria
	Belgium
	Czechia
	Denmark
	Finland
	France
	Georgia
	Germany
	Greece
	Hungary
	Iceland
	Ireland
	Israel
	Italy
	Latvia
	Malta
	Netherlands
	Norway
	Poland
	Portugal
	Romania
	Slovenia
	Spain
	Sweden
	Switzerland
	The United Kingdom
Western Pacific	Australia

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REFERENCES

1. McCollum A, Damon I. Human Monkeypox. Clin Infect Dis. 2014; Author manuscript; available in PMC 2018 Apr 11.
2. World Health Organization (WHO) Alert: Multi-country monkeypox outbreak in non-endemic countries (Internet). https://www.who.int/emergencies/disease-outbreak-news/item/2022-DON385; 21 May 2022.
3. Ladnyj ID, Ziegler P, Kima E. A human infection caused by monkeypox virus in Basankusu Territory, Democratic Republic of the Congo. Bull World Health Organ. 1972;46(5):593-7.
4. Di Giulio DB, Eckburg PB. Human monkeypox: an emerging zoonosis. Lancet Infect Dis. 2004 Jan;4(1):15-25.
5. Damon IK. Status of human monkeypox: clinical disease, epidemiology and research. Vaccine. 2011 Dec 30;29 Suppl 4: D54-9.
6. Centers for Disease Control and Prevention. 2003 United States Outbreak of Monkeypox [Internet]. Atlanta: CDC; 2018 [updated 28 September 2018; cited 2019 Jul 22].
7. Vaughan A, Aarons E, Astbury J, Balasegaram S, Beadsworth M, Beck CR, et al. Two cases of monkeypox imported to the United Kingdom, September 2018. Euro Surveill. 2018 Sep;23(38).
8. Erez N, Achdout H, Milrot E, Schwartz Y, Wiener-Well Y, Paran N, et al. Diagnosis of Imported Monkeypox, Israel, 2018. Emerging infectious diseases. 2019;25(5):980.
9. ProMED-mail. Monkeypox - Singapore ex Nigeria. ProMED-mail 2019; 11 May: 20190511.6464598. 2019.
10. World Health Organization. Disease Outbreak News - Moneypox - Singapore [Internet]. 2019 [updated 16 May 2019 cited May 24 2022].
11. Public Health England. Cases of monkeypox confirmed in England [Internet]. 2019 [updated 5 December 2018; cited 2019 Jul 25]. Available from: https://www.gov.uk/government/news/monkeypox-case-in-england.
12. Angelo KM, Petersen BW, Hamer DH, Schwartz E, Brunette G. Monkeypox transmission among international travelers—serious monkey business? Journal of travel medicine. 2019.

13. World Health Organization. The global eradication of smallpox: final report of the Global Commission for the Certification of Smallpox Eradication, Geneva, December 1979 [Internet]. Geneva: WHO; 1980.

14. Brown K, Leggat PA. Human Monkeypox: Current State of Knowledge and Implications for the Future. Tropical medicine and infectious disease. 2016 Dec 20;1(1).

15. Yinka-Ogunleye A, Aruna O, Ogoina D, Aworabhi N, Eteng W, Badaru S, et al. Reemergence of Human Monkeypox in Nigeria, 2017. Emerg Infect Dis. 2018 Jun;24(6):1149-51.

16. Chen N, Li G, Liszewski MK, Atkinson JP, Jahrling PB, Feng Z, et al. Virulence differences between monkeypox virus isolates from West Africa and the Congo basin. Virology. 2005 Sep 15;340(1):46-63.

17. Likos AM, Sammons SA, Olson VA, Frace AM, Li Y, Olsen-Rasmussen M, et al. A tale of two clades: monkeypox viruses. J Gen Virol. 2005 Oct;86(Pt 10):2661-72.

18. Saijo M, Ami Y, Suzaki Y, Nagata N, Iwata N, Hasegawa H, et al. Virulence and pathophysiology of the Congo Basin and West African strains of monkeypox virus in non-human primates. J Gen Virol. 2009 Sep;90(Pt 9):2266-71.

19. Public Health England. Monkeypox: Information for primary care [Internet]. London: PHE publications; 2018 [updated 5 December 2018; cited 2019].

20. Centers for Disease Control and Prevention. Monkeypox - Signs and Symptoms [Internet]. Atlanta: CDC; 2015 [updated 11 May 2015; cited 2019 Jul 22].

21. World Health Organization. Fact sheet - Monkeypox [Internet]. Geneva: WHO; 2018 [updated 6 June 2018].

22. Petersen E, Kantele A, Koopmans M, Asogun D, Yinka-Ogunleye A, Ihekweazu C, et al. Human Monkeypox: Epidemiologic and Clinical Characteristics, Diagnosis, and Prevention. Infectious Disease Clinics. 2019.

23. Jezek Z, Szczeniowski M, Paluku KM, Mutombo M. Human monkeypox: clinical features of 282 patients. J Infect Dis. 1987 Aug;156(2):293-8.

24. Jezek Z, Grab B, Szczeniowski MV, Paluku KM, Mutombo M. Human monkeypox: secondary attack rates. Bull World Health Organ. 1988;66(4):465-70.

25. Lederman ER, Reynolds MG, Karem K, Braden Z, Learned-Orozco LA, Wassa-Wassa D, et al. Prevalence of antibodies against orthopoxviruses among residents of Likouala region,

Republic of Congo: evidence for monkeypox virus exposure. Am J Trop Med Hyg. 2007 Dec;77(6):1150-6.

26. Centers for Disease Control and Prevention. From the Centers for Disease Control and Prevention. Multistate outbreak of monkeypox-- Illinois, Indiana, and Wisconsin, 2003. JAMA. 2003 Jul 2;290(1):30-1.

27. Nolen LD, Osadebe L, Katomba J, Likofata J, Mukadi D, Monroe B, et al. Introduction of Monkeypox into a Community and Household: Risk Factors and Zoonotic Reservoirs in the Democratic Republic of the Congo. Am J Trop Med Hyg. 2015 Aug;93(2):410-5.

28. World Health Organization. African countries reporting human monkeypox cases, 1970-2017 [Internet]. 2018 [updated 26 February 2018].

29. Centers for Disease Control Prevention. Human monkeypox--Kasai Oriental, Democratic Republic of Congo, February 1996-October 1997. MMWR Morbidity and mortality weekly report. 1997;46(49):1168.

30. Kalthan E, Tenguere J, Ndjapou SG, Koyazengbe TA, Mbomba J, Marada RM, et al. Investigation of an outbreak of monkeypox in an area occupied by armed groups, Central African Republic. Med Mal Infect. 2018 Jun;48(4):263-8.

31. Reynolds MG, Wauquier N, Li Y, Satheshkumar PS, Kanneh LD, Monroe B, et al. Human Monkeypox in Sierra Leone after 44-Year Absence of Reported Cases. Emerg Infect Dis. 2019 May;25(5):1023-5.

32. Ogoina D, Izibewule JH, Ogunleye A, Ederiane E, Anebonam U, Neni A, et al. The 2017 human monkeypox outbreak in Nigeria-Report of outbreak experience and response in the Niger Delta University Teaching Hospital, Bayelsa State, Nigeria. PloS one. 2019;14(4):e0214229-e.

33. Kabuga AI, El Zowalaty ME. A review of the monkeypox virus and a recent outbreak of skin rash disease in Nigeria. J Med Virol. 2019 Apr;91(4):533-40.

34. Nigeria Centre For Disease Control. Nigeria Monkeypox Monthly Situation Report: January 2019 Jabi Abuja: NCDC; 2019 [cited 2019 16 September].

35. Yinka-Ogunleye A, Aruna O, Dalhat M, Ogoina D, McCollum A, Disu Y, et al. Outbreak of human monkeypox in Nigeria in 2017-18: a clinical and epidemiological report. Lancet Infect Dis. 2019 Aug;19(8):872-9.

36. European Centre for Disease Prevention and Control. Rapid Risk Assessment: Monkeypox cases in the UK imported by travellers returning from Nigeria, 2018 [Internet]. Stockholm: ECDC; 2018 [updated 21 Sept 2018].

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37. Centers for Disease Control and Prevention. Monkeypox - Transmission [Internet]. Atlanta: CDC; 2015 [updated 11 May 2015; cited 2019 Jul 22].

38. Karem KL, Reynolds M, Hughes C, Braden Z, Nigam P, Crotty S, et al. Monkeypox-induced immunity and failure of childhood smallpox vaccination to provide complete protection. Clin Vaccine Immunol. 2007 Oct;14(10):1318-27.

39. Lewis MW, Graham MB, Hammarlund E, Hanifin J, Slifka MK. Monkeypox without exanthem. N Engl J Med. 2007 May 17;356(20):2112-4.

40. Doshi RH, Guagliardo SAJ, Doty JB, Babeaux AD, Matheny A, Burgado J, et al. Epidemiologic and Ecologic Investigations of Monkeypox, Likouala Department, Republic of the Congo, 2017. Emerg Infect Dis. 2019 Feb;25(2):281-9.

41. Mbala PK, Huggins JW, Riu-Rovira T, Ahuka SM, Mulembakani P, Rimoin AW, et al. Maternal and Fetal Outcomes Among Pregnant Women With Human Monkeypox Infection in the Democratic Republic of Congo. J Infect Dis. 2017 Oct 17;216(7):824-8.

42. Learned LA, Reynolds MG, Wassa DW, Li Y, Olson VA, Karem K, et al. Extended interhuman transmission of monkeypox in a hospital community in the Republic of the Congo, 2003. Am J Trop Med Hyg. 2005 Aug;73(2):428-34.

43. Reynolds MG, Yorita KL, Kuehnert MJ, Davidson WB, Huhn GD, Holman RC, et al. Clinical manifestations of human monkeypox influenced by route of infection. J Infect Dis. 2006 Sep 15;194(6):773-80.

44. EVD-LabNet. EVD-LabNet directory search - Monekypox virus [Internet]. [cited 2019 Jul 23]. Available from: https://www.evd-labnet.eu/evd-labnet-directory-search?species=1020-monkeypox-virus.

45. World Health Organization. Laboratory Biosafety Manual. Geneva: World Health Organization; 2004.

46. European Commission. DIRECTIVE 2000/54/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 18 September 2000 on the protection of workers from risks related to exposure to biological agents at work (seventh individual directive within the meaning of Article 16(1) of Directive 89/391/EEC).

47. Hammarlund E, Lewis MW, Carter SV, Amanna I, Hansen SG, Strelow LI, et al. Multiple diagnostic techniques identify previously vaccinated individuals with protective immunity against monkeypox. Nat Med. 2005 Sep;11(9):1005-11.

48. Cono J, Casey CG, Bell DM. Smallpox vaccination and adverse reactions; guidance for clinicians. 2003.

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49. Lane JM, Ruben FL, Neff JM, Millar JD. Complications of smallpox vaccination, 1968: national surveillance in the United States. New England Journal of Medicine. 1969;281(22):1201-8.

50. Centers for Disease Control and Prevention. Update: multistate outbreak of monkeypox--Illinois, Indiana, Kansas, Missouri, Ohio, and Wisconsin, 2003. MMWR Morb Mortal Wkly Rep. 2003 Jul 11;52(27):642-6.

51. Erez N, Achdout H, Milrot E, Schwartz Y, Wiener-Well Y, Paran N, et al. Diagnosis of Imported Monkeypox, Israel, 2018. Emerg Infect Dis. 2019 May;25(5):980-3.

52. Ministry of Health Singapore. First imported case of monkeypox in Singapore: MOH [Internet]. Singapore: Government of Singapore; 2019 [updated 12 May 2019].

53. Petersen BW, Harms TJ, Reynolds MG, Harrison LH. Use of Vaccinia Virus Smallpox Vaccine in Laboratory and Health Care Personnel at Risk for Occupational Exposure to Orthopoxviruses - Recommendations of the Advisory Committee on Immunization Practices (ACIP), 2015. MMWR Morb Mortal Wkly Rep. 2016 Mar 18;65(10):257-62.

54. Centers for Disease Control and Prevention. Smallpox Vaccine Guidance [Internet]. Atlanta: CDC; 2015 [updated 11 May 2015; cited 2019 Jul 23].

55. Centers for Disease Control and Prevention. Monkeypox - Treatment [Internet]. Atlanta: CDC; 2015 [updated 11 May 2015; cited 2019 Jul 22].

56. World Health Organization. Operational framework for deployment of the World Health Organization smallpox vaccine emergency stockpile in response to a smallpox event [Internet]. Geneva: WHO; 2017 [cited 2019 Jul 23].

57. Public Health England. Monkeypox: Guidance for environmental cleaning and decontamination [Internet]. London: PHE publications; 2018 [updated 5 December 2018; cited 2019].

58. Centers for Disease Control and Prevention. Monkeypox - Prevention [Internet]. Atlanta: CDC; 2015 [updated 11 May 2015; cited 2019 Jul 22].

59. European Commission. COMMISSION DIRECTIVE 2004/33/EC of 22 March 2004 implementing Directive 2002/98/EC of the European Parliament and of the Council as regards certain technical requirements for blood and blood components [cited 2019 Jul 23].

60. European Commission. COMMISSION DIRECTIVE 2006/17/EC of 8 February 2006 implementing Directive 2004/23/EC of the European Parliament and of the Council as

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regards certain technical requirements for the donation, procurement and testing of human tissues and cells [cited 2019 Jul 23].