

National Preparedness Plan for the Surveillance and Control of Zika Virus Disease in Mauritius

The contents of this document are subject to change and amendments contingent on WHO latest recommendation and the national situation in Mauritius.

Ministry of Health and Wellness

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ABBREVIATIONS

CDC	Centre for Disease Control and Prevention
CDCU	Communicable Disease Control Unit
CHKV	Chikungunya Virus
DENV	Dengue Virus
GBS	Guillain-Barre Syndrome
HSO	Health Surveillance Officer
MOHW	Ministry of Health and Wellness
RPHS	Regional Public Health Superintendent
RT-PCR	Reverse Transcriptase Polymerase Chain Reaction
VBCD	Vector Biology Control Division
WHO	World Health Organisation
ZIKV	Zika Virus

INTRODUCTION

Zika virus disease

Zika virus (ZIKV) is a flavivirus belonging to the same family as Dengue virus. It is transmitted by the bite of the tiger mosquito (*Aedes albopictus*), the same mosquito that transmits Dengue and Chikungunya. The Zika virus caused major outbreaks in French Polynesia in 2013 and has spread around the world to Latin America and the Caribbean islands, prompting WHO to summon an advisory committee on IHR and declaring Zika pandemic as a Public Health Emergency of International Concern (PHEIC). The World Health Organization has recommended the implementation of enhanced surveillance for Zika virus disease in all countries that are at risk for Zika virus disease. Since Mauritius is potentially at risk for the introduction and spread of the virus, it is critical to formulate a preparedness plan for the surveillance and containment of Zika virus in the event that the virus is introduced in Mauritius.

Rationale of the preparedness plan

Since Zika virus is primarily a mosquito-borne disease similar to Dengue and Chikungunya, the blue-print for the Zika virus plan is the Ministry of Health and Wellness multi-sectoral National plan for the control and prevention of Chikungunya and Dengue. Further details on all operational aspects are to be found in the National Chikungunya and Dengue plan. This present plan on Zika virus disease highlights the clinical and epidemiological features of Zika that is different.

Symptoms of Zika virus disease

Zika virus infection is commonly not symptomatic. It has been estimated that about one out of four people infected with Zika virus may develop symptoms. But when symptomatic, the typical symptoms are shown in the box below.

Common signs and symptoms of Zika

Rash (mostly maculo-papular)
Mild fever
- non-purulent conjunctivitis (red eyes)
- Arthralgia
- Myalgia
- Asthenia
- Headache

The illness is rarely fatal and severe disease requiring hospitalization is uncommon. The two possible complications due to Zika virus are:

- Guillain Barre Syndrome, and
- Neonatal Microcephaly

1. Guillain-Barre Syndrome (GBS)

Guillain Barre Syndrome is a serious immune mediated illness manifested as progressive paralysis over 1-3 weeks. According to WHO, an increased number of GBS has been observed in some countries including French Polynesia, Brazil and El Salvador. Persons with a history of multiple underlying chronic diseases are at higher risk of GBS. GBS can also be triggered by other flaviruses including Japanese encephalitis, Dengue virus and live attenuated yellow fever vaccine. Further details on GBS including case-management are given in Appendix 1.

1) Microcephaly in newborns

Retrospective analysis of newborn babies in Brazil has epidemiologically linked Microcephaly to mothers who had been exposed to Zika during pregnancy in French Polynesia and Brazil. This evidence has been corroborated from recovery of the virus in placental and brain tissues of Microcephalic children born to Zika positive mothers. The advisory committee of WHO has concluded that there is a strong association between Zika and Microcephaly, but its association has not been proven yet. A number of agents including Cytomegalovirus, Herpes virus, Toxoplasma gondii and chemical exposure can cause Microcephaly and need to be ruled out. CDC scientists announced that there is now enough evidence to conclude that Zika virus infection during pregnancy is a cause of microcephaly and other severe fetal brain defects and has been linked to problems in infants, including eye defects, hearing loss, and impaired growth. Further details on microcephaly including case-management are given in Appendix 2.

Transmission

Through mosquito bites: ZIKV is transmitted to humans primarily through the bite of an infected female mosquito of the genus *Aedes aegypti* and *albopictus*. When an infected mosquito bites a susceptible host, it takes about 3-12 days for the symptoms to appear.

From mother to child: Perinatal transmission can occur most probably by trans-placental transmission or during delivery when the mother is infected.

There have been no reports till date of infants getting Zika virus through breastfeeding. Therefore mothers are encouraged to breastfeed their babies even in areas where Zika virus is found, Recommendations for breastfeeding are detailed in Appendix 3.

Through sexual contact or infected blood: It is also possible for the Zika virus to spread via sexual contact and via blood transfusion, as reported by a few cases. Further details on ensuring blood safety are given in Appendix 4.

Epidemiology

The Zika virus was first isolated in a Rhesus monkey in 1947 in Uganda and in humans in 1952 (Uganda, Tanzania). Since then, Zika virus have been found to be circulating in Africa and South-East Asia in humans, animals and mosquitoes, but very few outbreaks have been documented.

The first major outbreak of Zika occurred on the island of Yap (Micronesia) in 2007. Subsequently other cases of Zika virus infection were found in French Polynesia, New Caledonia, Cook Islands, Cambodia, Indonesia and Chile.

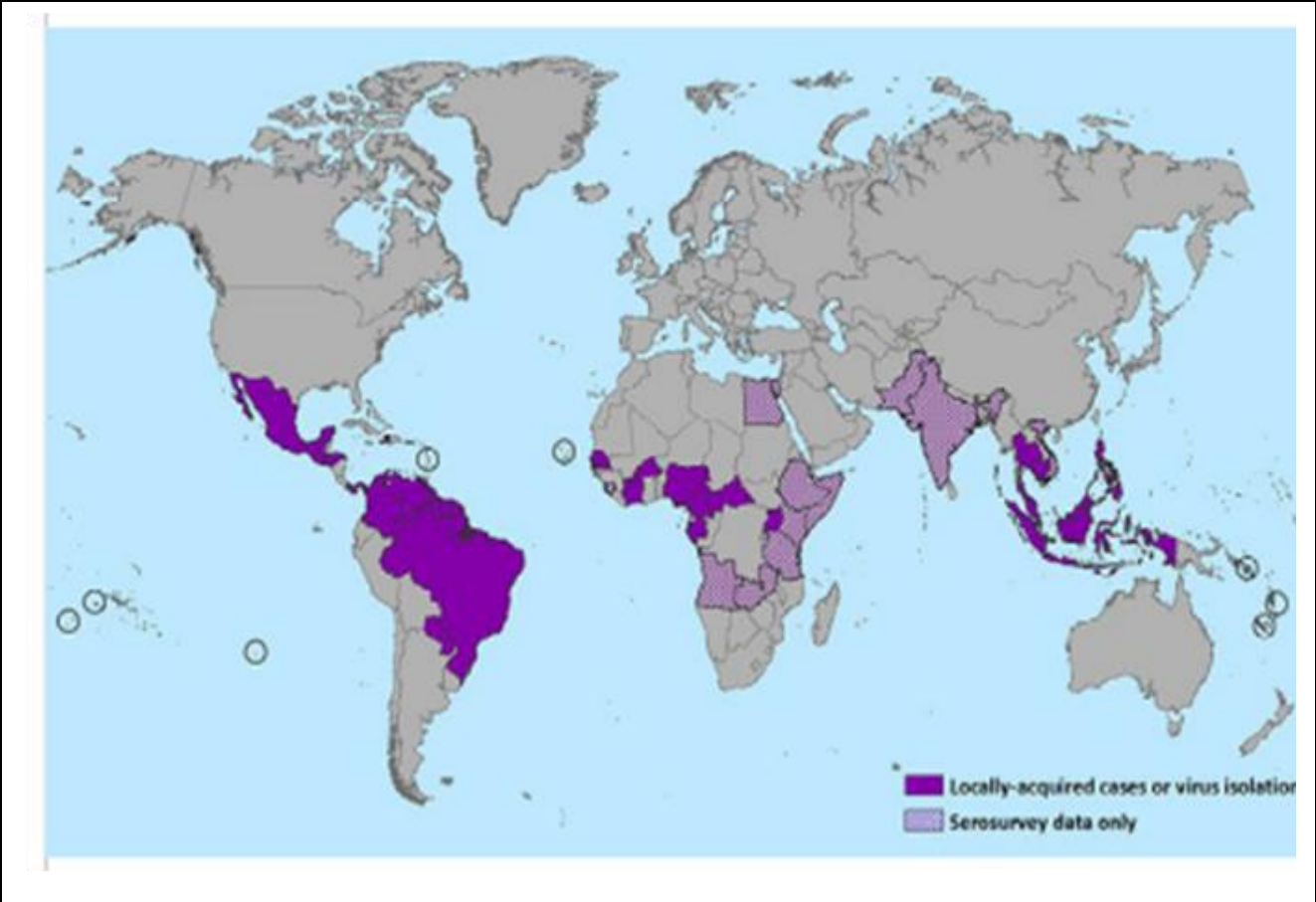
In May 2015, Brazil declared its first confirmed autochthonous transmission of Zika virus in the northeastern part of the country and Colombia reported the first locally-acquired case of Zika infection in October 2015. Since then Zika has spread to several Caribbean countries.

Most detailed epidemiological profiles of the infected patients have come from the sentinel surveillance in French Polynesia in the year 2014 where some 28,000 cases had been observed. Both males and females subjects were observed and the age group between 27 to 70 years was most affected.

Transmission from one country to another seems to occur via travel associated with mass events, as is postulated for the virus spread from New Caledonia to Brazil recently.

According to CDC, the countries and territories with autochthonous transmission of Zika are Aruba, Barbados, Bolivia, Bonaire, Brazil, Colombia, Commonwealth of Puerto Rico, Costa Rica, Curacao, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, French Guiana, Guadeloupe, Guatemala, Guyana, Haiti, Honduras, Jamaica, Martinique, Mexico, Nicaragua, Panama, Paraguay, Saint Martin, Saint Vincent and the Grenadines, Saint Maarten, Suriname, U.S. Virgin Islands, Venezuela, American Samoa, Marshall Islands, Samoa, Tonga, New Caledonia and Cape Verde.

The geographical distribution of countries with past and present Zikavirus infection is shown in map below.



POSSIBLE RISKS OF ZIKA VIRUS DISEASE FOR MAURITIUS

No Zika case has yet been detected in Mauritius but the risk of importation of Zikavirus is real and of concern to Mauritius for the following reasons:

1. The common vector mosquito *Aedes albopictus* for the transmission of Zika and Dengue is present in Mauritius.
2. There has been no previous exposure to the Zika virus and Mauritian people are presently susceptible to the virus.
3. Mauritius is visited by foreigners and has trade and travel links with Zika endemic countries.
4. There are high risk environmental pockets in the island favoring spread of imported viruses of the diseases in the local mosquito population.
5. It is highly probable that pregnant women infected with Zika virus have newborns with neurological malformations such as Microcephaly.

ACTIONS TAKEN BY THE MINISTRY OF HEALTH AND WELLNESS TO REDUCE THE RISK OF DISEASE IN MAURITIUS

Since Zika is a mosquito-borne disease similar to Dengue and Chikungunya, the existing plan of action of Dengue of MOHQL will be used as prototype for all operational actions. The main components of the plan are:

1. Surveillance of incoming passengers from Zika endemic countries
2. Laboratory diagnosis of Zika
3. Management of patient with Zika
4. Investigation and control of outbreaks due to Zika
5. Social mobilization and communication

Active Surveillance of incoming passengers from Zika-endemic countries

At points of entry in Mauritius, all passengers arriving from the list of Zika endemic countries¹ are put under surveillance and the following procedures will be followed:

¹*Currently Aruba, Barbados, Bolivia, Bonaire, Brazil, Colombia, Commonwealth of Puerto Rico, Costa Rica, Curacao, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, French Guiana, Guadeloupe, Guatemala, Guyana, Haiti, Honduras, Jamaica, Martinique, Mexico, Nicaragua, Panama, Paraguay, , Saint Martin, Saint Vincent and the Grenadines, Saint Maarten, Suriname, U.S. Virgin Islands, Venezuela, American Samoa, Marshall Islands, Samoa, Tonga ,New Caledonia and Cape Verde.

- 1) A list of such passengers will be submitted to the respective health offices and to the Communicable Disease Control Unit (CDCU).
- 2) Visiting of incoming passengers will be done within 24 hours of arrival by HSO according to protocol.
- 3) Suspected cases will be tested by finger prick blotting paper technique by health surveillance officers. If found to be positive, the Regional Public Health Superintendent (RPHS) of the concerned region will be informed and arrangements to admit the patient for isolation and care will be undertaken.
- 4) Specimens of blood will be taken and sent for laboratory confirmation of Zika virus.
- 5) A list of such passengers is to be submitted to health inspectorate offices throughout the island, CDCU office Beau Bassin and to Vector Biology and Control Division for monitoring surveillance.
- 6) Contact tracing will be done by Public Health and Food Safety Inspectors. Prompt actions for isolation and management will be taken in case of appearance of any Zika symptoms.

Case definition of Zika virus infection

The proposed case definition is based on WHO/PAHO recommendations and has been endorsed by a panel of pediatricians, physicians and gynaecologists at the Ministry of Health and Wellness.

Case definition classically follows a hierarchy of suspected, probable and confirmed case. However, since currently there is no detectable case of Zika virus disease in Mauritius, the category of suspected case will be too broad and may include many viral and microbial agents such as: leptospirosis, malaria, rickettsia, group A streptococcus, rubella, measles and parvovirus, enterovirus, adenovirus, Chikungunya and dengue viruses.

Definition to be used before autochthonous transmission of the virus in Mauritius

Suspected Case:

A suspected case is a patient with rash and/ or elevated body temperature ($t > 37.2$ °C) with history of travel to a Zika active country in the last two weeks presenting with one or more of the following symptoms, not explained by other medical conditions:

- Non-purulent conjunctivitis or conjunctival hyperaemia
- Arthralgia
- Myalgia

Confirmed case:

A confirmed case is either a suspected or probable case with positive laboratory result of Zika virus by RT-PCR (Reverse Transcriptase Polymerase Chain Reaction).

Definition to be used during an established outbreak

Once an outbreak has been established a three -tiered case definition consisting of suspected, probable and confirmed case will be used.

Suspected case:

A suspected case is a patient presenting with rash and/ or elevated body temperature ($t > 37.2$ °C) with one or more of the following symptoms, not explained by other medical conditions:

- Non-purulent conjunctivitis or conjunctival hyperemia
- Arthralgia or Arthritis
- Myalgia

Probable case

A probable case is a patient presenting with the above symptoms and having an epidemiological link, that is , contact with a confirmed case, or having a history of residing and or travelled to an area with local transmission of Zika virus within the last two weeks prior to onset of symptoms.

Confirmed case:

A confirmed case is either a suspected or probable case with positive laboratory result of Zika virus by RT-PCR (Reverse Transcriptase Polymerase Chain Reaction).

Laboratory diagnosis

Virology Unit of the Central Health Laboratory has the capability to perform RT-PCR for Zika to confirm the first and initial suspected cases.(Annex 8)

Type of samples required

For incoming passengers from Zika risk countries:

All incoming flight passengers from regions where Zika is circulating, blood from finger pricks in the same manner as for malarial parasites on blotting paper (Dry Blood Spots) by field officers is recommended.

For hospitalized patients:

Five (5) ml blood is collected in either EDTA tube (Lavender Top) or plain tube (Red Top) within the first five days of the onset of symptoms and sent to the virology unit for RT-PCR. Further details are given in Appendix 5.

The request form should contain the

- a) Full name
- b) Sex
- c) Age, Date of Birth
- d) Address
- e) Phone number
- f) Any pertinent travel history including date of travel (two weeks prior to the date of symptom onset), country visited, date of arrival in Mauritius.
- g) Date of onset of symptoms
- h) Details of Clinical Presentation (consult case definition)
- i) Date of specimen collection

Management of the Zika cases

Proper patient management is critical for limiting the spread of the Zika virus in the community at large. The strategy for management shall comprise of:

- Isolation of cases
- Clinical management

Isolation of cases

1. Patients suffering from Zika will be admitted and isolated under mosquito net.
2. Additional beds will be provided for in hospitals
3. Mosquito nets will be made available in all hospitals

During the first week of illness, several precautions will be taken to prevent the Zika infected person to be bitten by Aedes mosquitoes to prevent the transmission of Zika to other people. The Zika virus infected person will be placed under a bed net (treated or without insecticide) and will stay in a place with intact window/door screens.

Furthermore the hospital staff will be advised to use insect repellents and wear long sleeves and pants to prevent being bitten by mosquitoes. The VBCD will also work to reduce the mosquito level around the residence of the confirmed case and the hospital where the case will be receiving treatment, (same as protocol for Dengue)

Clinical Management of ZIKA cases

Until now there is no specific treatment or vaccine for people infected with Zika virus. Therefore, the treatment for Zika is mainly symptomatic and supportive.

The patient is advised to take rest and drink plenty of fluids.

Acetaminophen or paracetamol is recommended to relieve fever. The use of aspirin and ibuprofen is not advised due to the risk of bleeding and of developing Reye's syndrome in children.

Antihistamines are used to relieve the patient of pruritus arising due to the maculopapular rash.

Pregnant women suspected of having been exposed to Zikavirus during the first or second trimester should be referred to a gynaecologist for advice and management, as outlined in Annex 2.

Measuring possible sequelae associated with Zika virus disease

Measures are put in place for the assessing the possible consequences of Zika virus infections by using existing baseline indicators for the two following conditions in Mauritius.

- Microcephaly
- Guillain Barre Syndrome

Investigation and control of outbreaks due to Zika

All outbreaks or rumours of Zika outbreaks will be systematically investigated in order to contain the spread of the disease.

Epidemiological Investigation

The epidemiological investigation will be based on the collection of data as follows:

Person: age, sex, co-morbidity, pregnancy status (for women)

Place: Travel history last two weeks, residence, place of work

Time: Date of onset of symptoms

Information dissemination

As soon as a Zika case will be confirmed by the laboratory in Mauritius, the information will be fed to the CDCU who will launch a series of actions to coordinate, direct, monitor the outbreaks and disseminate information to other stakeholders namely the Vector Biology and Control Division, Health Inspectorate, other ministries and departments. Daily information from the regional hospitals and health centers will be fed back to the CDCU operation center that will disseminate the information to all parties concerned.

Diagnosis confirmation

All suspected or probable Zika cases will have a 5 ml blood sample collected in either plain or EDTA-tube/DBS (Dry Blood Spots) or blotting paper and sent to virology laboratory for the Zika (RT-PCR) test. At the same time, blood will be sent to exclude Dengue and Chikungunya virus.

Contact tracing

The confirmed case will be interviewed to identify all immediate contacts of the case and a blood test will be performed in those high risk groups to exclude Zika virus. Information will be collected on the following points for the case and the contacts:

Person: age, sex, co-morbidity, pregnancy status (for women)

Place: Travel history in the last two weeks, residence, place of work

Time: Date of onset of symptoms

Epidemiological Control measures

Case isolation

The case will be admitted and isolated under mosquito net for a period of one week in a Government Regional Hospital, using same procedure as mentioned above.

Active case detection in the community

A fever survey will be carried in the immediate vicinity of the index case, as in the Malaria and Dengue protocol. Whole blood samples will be collected and sent to

laboratory for probable Zika cases in order to detect person infected with Zika virus in Mauritius

Environmental management of adult mosquito and larvae

Fogging and larviciding as well as environmental control of breeding sites will be undertaken for the control of mosquitoes. Fogging will be carried out to control the population of adult mosquitoes and larviciding to control the population of larvae, using the established Ministry of Health Chikungunya and Dengue Operational Plan.

The Ministry of Health will activate the existing intersectoral committee in the campaign against mosquitoes.

Intersectoral collaboration

The Ministry of Health and Wellness has already constituted an intersectoral committee to control Dengue and Chikungunya. It is composed of the following stakeholders: 1) the Ministry of Environment 2) Ministry of Local Government 3) Ministry of Agro Industry, Food Production and Security 4) Ministry of Education 5) Ministry of Tourism 6) Ministry of Women's Right Child Development and Family Welfares and 7) Representatives of Private Sector such as (i) Mauritius Chamber of Commerce and Industry, (ii) The Chamber of Agriculture and (iii) L'HRIM. This intersectoral committee will also be responsible to control Zika virus disease. To coordinate the roles of different stakeholders of the intersectoral group, the same protocol and procedures will be used as for the existing Chikungunya and Dengue National Operational Plan.

Social mobilization and communication

The existing social mobilization strategy for the control of Dengue will be used to control Zika virus disease and will consist of:

- a) Container management to reduce the sources of mosquitoes breeding habitats
- b) Elimination or alteration of breeding sites including rubbish disposal including tyres etc.
- c) Proper management of water storage device
- d) Environmental protection through larviciding and use of repellents etc.

Sustained advertising and promotion

1. The existing protocols for Dengue control will be used for Zika control and will consist of massive repetitive, intense and persistent advertising via all media,

including radio, TV, news papers, pamphlets, door to door visits and focus groups, as required.

- a. TV scrolls will be used
 - b. The pamphlets used for Dengue control have been updated to include information on Zika.
 - c. The RPHS and Community Nurses will sensitize the community, using the modified pamphlets
 - d. Information on Zika will be also be given by the NCD and Health Promotion Unit.
 - e. A travel advisory has been issued to all travellers to countries with active Zika virus infections (Appendix 8)
2. Community especially pregnant women will be sensitized in the need to restrain themselves from travelling to high risk zones and to visit Zika affected patients.
 3. All gynaecologists must be made fully aware of the possible link between Zika virus and neurological complications in newborn and should therefore screen for malformations such as Microcephaly, if the pregnant women is a probable case even if she has no symptoms of Zika (Annex 2). Pregnant women are advised to consult their treating doctors for screening in case of doubt.
 4. Concerned public and private Health Care Professionals will be provided with information on Zika Virus Disease. (Annex 6)
 5. Blood donors will be sensitized on the risk of blood borne transmission of Zika and they will be screened with the help of a questionnaire prior to blood donation (Annex 7).

Appendix 1: Management of Guillain Barre Syndrome in the context of Zika virus

WHO interim recommendations for the management of Guillain Barre Syndrome are being respected in Mauritius

1. Health care providers are well trained to recognize, evaluate and manage patients with GBS. Neurological examination skills and training in the acute management of GBS are being strengthened.
2. The Brighton criteria are being used for the case definition of GBS. Neurological examinations are being performed on all patients with suspected GBS. Lumbar puncture and CSF analysis are also being performed on all patients with suspected GBS. **Note:** CSF analysis for Zika Virus detection is also available in all hospitals.
3. Hospitals in Mauritius have well equipped ICUs, HDUs which can cater for cases of GBS which may require supportive care. The risk of death in patients with GBS associated with complications including respiratory failure, cardiac arrhythmias, and thrombosis; are kept very low. Optimal supportive care including frequent neurological assessments, vital sign and respiratory function monitoring are provided to patients with GBS.
4. Intravenous immunoglobulin therapy is provided to all patients with suspected GBS. Accesses to medications and training for their appropriate administration are available and free of charge in all public hospitals.
5. Hospital beds for patients with mild, moderate and severe manifestations of GBS are available, and patients with severe manifestations of GBS will receive optimal supportive care in HDUs and ICUs which are very well equipped.

Appendix 2: Guidelines and Recommendation for the management of microcephaly

Microcephaly is a condition where a baby's head is much smaller than expected.

It can be an isolated condition, or it can occur in combination with other major birth defect.

It may be associated with other problems like

- Seizures
- Developmental delay
- Intellectual disability
- Hearing loss
- Vision problems

Microcephaly is not a common condition.

The incidence ranges from 2 per 10,000 live births to about 12 per 10,000 live births in the United States.

The causes of microcephaly in most babies are unknown.

It may be - Genetic

-Certain infections, like rubella, toxoplasmosis, or cytomegalovirus

-Severe malnutrition

-Exposure to harmful substances, such as alcohol, certain drugs, or toxic chemicals

Some babies with microcephaly have been reported among mothers who were infected with Zika virus while pregnant. Researchers are studying the possible link between Zika virus infection and microcephaly.

Diagnosis

During pregnancy, microcephaly can sometimes be diagnosed with an ultrasound, late in the 2nd trimester or early in the third trimester.

After birth, the head circumference, the largest diameter around the head also known as the occipito frontal diameter is measured during a physical exam. This measurement is compared to population standards by sex and age.

Microcephaly is defined as a head circumference that is smaller than 2 standard deviations (SDs) below the average for babies of the same age and sex.

Severe microcephaly is defined as a head circumference that is less than 3 standard deviations (SDs) below the average for babies of the same age and sex.

The head circumference may be taken when the baby is at least 24 hours old when compression due to delivery through the birth canal (molding) has resolved.

Treatments

Microcephaly is a lifelong condition. There is no known cure or standard treatment for microcephaly.

Because microcephaly can range from mild to severe, treatment options can range as well.

Babies with mild microcephaly often don't experience any other problems besides small head size. These babies will need routine check-ups to monitor their growth and development.

For more severe microcephaly, babies will need care and treatment focused on managing their other health problems.

Developmental services early in life will often help babies with microcephaly to improve and maximize their physical and intellectual abilities. These services include speech, occupational, and physical therapies.

RECOMMENDATION

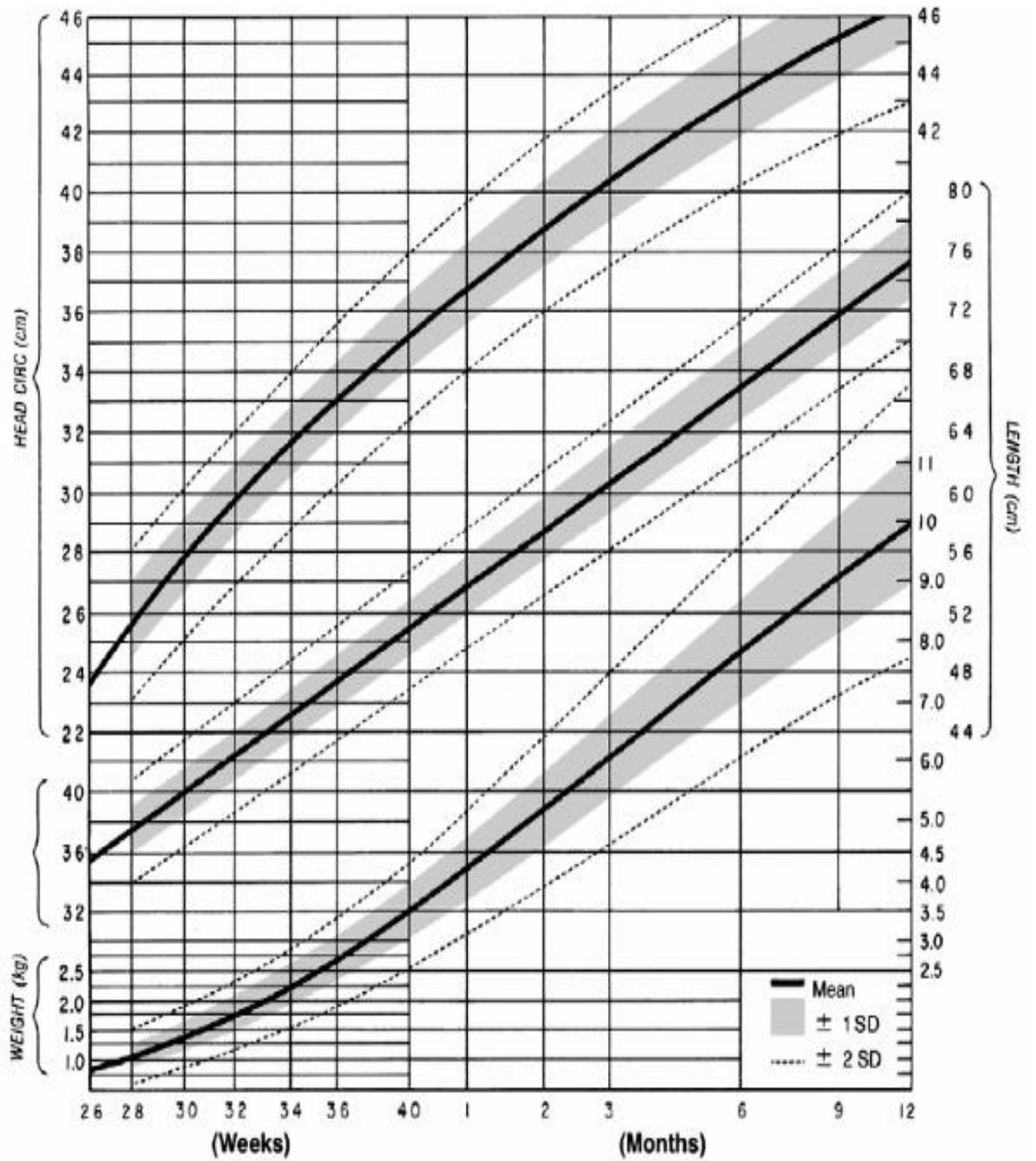
A. Head circumference should be measured using standardized technique and equipment at least 24 hours after birth and within the first week of life.

B. Head circumference should be interpreted using SD scores specific for sex and gestational age.

C. WHO Growth Standards for term neonates and Intergrowth standards for preterm neonates should be used.

Midwives and nurses should be trained to measure and interpret head circumference measurements according to these standards.

D. Neonates with a head circumference of less than -2 SD i.e. more than 2 standard deviations below the mean should be considered to have microcephaly



Appendix 3: Recommendations on Breast Feeding

The World Health Organization (WHO) recommends that infants start breastfeeding within one hour of birth, are exclusively breastfed for six months, with timely introduction of adequate, safe and properly fed complementary foods while continuing breastfeeding for up to two years of age or beyond.

Current WHO breastfeeding recommendations remain valid in the current context of Zika virus transmission.

Mothers with suspected, probable or confirmed Zika virus infection, during pregnancy or postnatally, should receive skilled support from health care workers to initiate and sustain breastfeeding, like all other mothers.

Likewise, mothers and families of infants with suspected, probable or confirmed Zika virus infection should receive skilled support to adequately breastfeed their infants.

Mothers and families of infants born with congenital anomalies (e.g. microcephaly) should be supported to breastfeed their infants in line with WHO recommendations. Feeding support by skilled breastfeeding counsellors should be provided, if required.

Breastfeeding has significant benefits for mothers and children, in low-and middle-income countries as well as high-income countries. Breastfeeding contributes towards sustainable development goals related to maternal and child health, nutrition, education, poverty reduction and economic growth.

Zika virus RNA has been detected in breast milk from two mothers with confirmed Zika virus infection, but no replicative virus was identified in cell culture.

The breast milk samples where Zika virus RNA was found were collected at a time when the mothers were RT-PCR positive for Zika virus in serum samples and had clinical disease.

There are currently no documented reports of Zika virus being transmitted to infants through breastfeeding.

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Appendix 4: Ensuring blood safety during zika epidemic

ZIKA outbreak poses a problem to blood safety due to possible transmission of virus through blood. There have been few reported cases of ZIKA transmission through blood donation in Brazil and French Polynesia. The Rapid Risk Assessment document released by ECDC on 19th January 2016 states that:

- ZIKA Virus epidemic in Americas is likely to continue may spread
- Transfusion of ZIKA virus through blood transfusion may have serious consequences for the recipient.

In Mauritius so far no case of ZIKA has been reported. However, in the event that ZIKAVirus is introduced in Mauritius, NBTS proposes the following protocol to prevent ZIKA transmission through blood transfusion:

1. Donor Surveillance and Deferral:-

- Defer any asymptomatic donor for 28 days with a history of recent (within 4 weeks) travel to ZIKA affected countries.
- Test the donors with recent travel to ZIKA affected countries for ZIKA Virus RNA.
- Defer a donor suffering from symptomatic ZIKA infection for six months after recovery.
- Counsel the donors

2. Donors to Inform BTS:

Donors, who develop symptoms of ZIKA virus infection within a week following their blood donation will be asked to inform Blood Transfusion Service (In such cases, the blood pint will be rejected as it is intended, as far as possible, to “quarantine” blood collected for a period of one week before release for transfusion).

Donors shall be provided with telephone numbers of NBTS and Blood Collection Centres at regional hospitals.

3. Screening of Blood Donors

All blood units / units intended for transfusion to pregnant women will be screened for ZIKA Virus.

4. Clinical Use of blood and strengthening of Hemovigilance:

As ZIKA Virus may be transmitted through blood transfusion, in view of a blood unit being collected from donors with asymptomatic infection and which may potentially infect the blood recipients, **clinicians should be advised to refrain from unnecessary transfusions.** They should also report to NBTS Candos, if they come across, any incident of Microcephaly or GBS in patients with a recent history of blood transfusion.

Public Health Surveillance unit will update the NBTS of countries affected by ZIKA Virus on a regular basis

DONOR INFORMATION ON ZIKA VIRUS

ZIKA Virus is mostly transmitted through the bite of an infected mosquito, *Aedes aegypti*, same mosquito which also transmits Chikungunya and Dengue. However in affected countries there have been some reports of the virus being transmitted through blood transfusion and sexually.

There have been reports that ZIKA Virus can cause babies to be born with small head and mental retardation if a pregnant woman is infected. Also it may cause paralytic disorder in those who are infected.

Transmission of ZIKA virus through an infected blood can therefore have serious consequences for the person receiving this blood.

In view of above, we kindly ask you to answer the following questions, in order to ensure blood safety

- | | Yes | No |
|-----------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------|
| 1. Have you visited any of the following countries in past four weeks | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Have you had any sexual contact with a person who is a resident of these countries or visited these countries in the past four weeks | <input type="checkbox"/> | <input type="checkbox"/> |

Names of the ZIKA affected countries

Currently Aruba, Barbados, Bolivia, Bonaire, Brazil, Colombia, Commonwealth of Puerto Rico, Costa Rica, Curacao, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, French Guiana, Guadeloupe, Guatemala, Guyana, Haiti, Honduras, Jamaica, Martinique, Mexico, Nicaragua, Panama, Paraguay, , Saint Martin, Saint Vincent and the Grenadines, Saint Maarten, Suriname, U.S. Virgin Islands, Venezuela, American Samoa, Marshall Islands, Samoa, Tonga, New Caledonia . Consult WHO and the Ministry of Health for latest list of countries.

Appendix 5: Screening for ZikaVirus byPCR

S.O.P Title: Detection of Zika Virus by PCR.

S.O.P Number: VSOP: DBS- Zika1.

Effective Date: 28th march 2016

Revision Number: 1

Pages: 2

Controlled Copy No: 1

Introduction

All incoming flight passengers from regions where Zika is circulating, blood from finger pricks in the same manner as for malarial parasites on blotting paper (Dry Blood Spots) by field officers will greatly improve the turnaround time for the sample to reach the laboratory for diagnosis to be made. This means that the patient will immediately be taken care of and the necessary public health measure started earlier, thereby preventing any further transmission.

Patients in Hospitalized settings will require 5 ml blood collected in either EDTA Tube (Lavender Top) or in plain tube (Red top).

PLEASE NOTE THAT THE TEST HAS ONLY BEEN VALIDATED ON THESE SAMPLES AND NO ALTERNATIVE SAMPLE WILL BE ACCEPTED.

Forwarding samples to the Molecular Biology and Virology Laboratory for testing

If there is a suspected case of Zika infection the laboratory must be informed immediately so that arrangements can be made to test the sample as soon as possible.

The request form should include any clinical presentation and also history of travel including date of travel.

The laboratory can be contacted directly on 4246375 or via the switchboard of Victoria hospital 4020800.

Once the sample has been taken, it should be sent to

Molecular Biology and Virology Department

Central Health Laboratory

Victoria Hospital

Candos

The sample should be accompanied by a request form containing the following details of the person from whom sample has been taken:

Surname:

Name:

Sex: M/F

Age:

Date of Birth:

Address

Contact number

History of travel:

Country visited:

Date arrived

Any clinical presentation: (see case definition):

LIMITATIONS OF THE PROCEDURE

- (a) The test result for Zika infections can only be reliable if the blood sample has been collected properly on either a DBS or in EDTA or plain tubes.

A negative result does not preclude a Zika infection. If the sample taken is not adequate or not taken at the right interval, if there is clear suspicion of infection, the individual should be requested to provide a venous sample within 24h.

SAFETY PRECAUTIONS

Treat all samples as potentially hazardous. Wash hands before collecting blood. Always wear gloves. You should not handle mobile phones, cosmetics, drinks, eat or chew gums while collecting blood samples. Use 70% alcohol to disinfect. Take precaution to avoid needle injury • Dispose of contaminated sharps and waste appropriately.

REFERENCES

Name	Designation	Signature	Date
Written by the then Advisor on Virology and Molecular	Central Health Laboratory		

Biology			
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Appendix 6: Management of Pregnant Women for Zika Virus Disease

In order to have a better surveillance of pregnant woman in the context of Zika Virus infections, it is advised that all gynaecologists follow such guidelines for uniformity of action.


- Antenatal Follow-up
 1. Counselling of pregnant woman in terms of protection against mosquito bite.
 2. To stay away from any person travelling from high risk country with fever.
 3. To immediately report if had fever following contact with a person who had any history of travel from high risk country.
- During any ultra sound screening to already mention the gestational age and the ultrasound findings in relation to measurement.
- To inform if any patient with ultrasound findings where Head circumference and
- biparietal diameter is smaller than gestational age where other parameters are within normal.
- To have blood investigations done in case of discrepancy noted on ultrasound screening.
- To inform any case post-delivery if Microcephaly noted or any substantive anomaly noted after delivery.
- To have a set protocol on the investigations needed to state the reason for any anomaly.
- To have a retrograde assessment on exposure history for patient where any anomaly noted post-delivery.

Appendix 7: Information for health care personnel on Zika Virus Disease

Annex 4

CDCU
Communicable
Disease Control Unit

ZIKA VIRUS DISEASE
This document is intended for health care professionals



Epidemiological Report

Virus Zika (ZIKV) is a Flavivirus. Human to human transmission occurs via the bite of Aedes species mosquitoes. Cases infected through (trans-placental or during delivery) blood transfusion and sexual contact have been reported. These modes of transmission are still under investigation.

SYMPTOMS AND EVOLUTION

Zika virus infection is symptomatic in 18% of cases. In symptomatic patients, the clinical signs appear after an incubation period of 3 to 12 days. In most cases, patient recovers within 3 to 7 days.

The main clinical signs presented by patients are:

- **Maculo-papular rash**, pruritic in nature, most often arises on the face before spreading to the rest of the body (90% to 95% of cases);
- **Fever** often mild to moderate (70%);
- **Conjunctivitis** without pruritus nor discharge / hyperaemic (50%);
- **Arthralgia or Arthritis of extremities** (hands, feet, wrists, knees - 65%) or combined with oedema;
- **Myalgia** (45%).

Other accompanying signs may include intense fatigue (up to 80%), headache (45%), dry cough, nausea, vomiting, diarrhea, (10-30%), retro-orbital pain (15 to 40%). Rarely mouth ulcers and joint pain may persist for a period of one month.


POSSIBLE NEUROLOGICAL MANIFESTATIONS

Two types of neurological complications were recently observed, Guillain Barre Syndrome in adults and others and Microcephaly in the foetus.

⇒ **In adults**

Other neurological manifestations and post infection complications have also been reported (encephalitis, meningo-encephalitis, myelitis, optic neuritis and idiopathic thrombocytopenia purpura).

Although the causal relationship between Zika virus infection and the above-mentioned manifestations has not been clearly established, the epidemiological data strongly suggests possible associations.



Appendix 8: Travel Advisory on ZIKA Virus Disease

The Zika virus is spread through the bite of an infected mosquito, the same mosquitoes that spread Dengue and Chikungunya viruses.

The list of countries where Zika has been reported include Aruba, Barbados, Bolivia, Bonaire, Brazil, Colombia, Commonwealth of Puerto Rico, Costa Rica, Curacao, Cuba, Dominican Republic, Ecuador, El Salvador, French Guiana, Guadeloupe, Guatemala, Guyana, Haiti, Honduras, Jamaica, Martinique, Mexico, Nicaragua, Panama, Paraguay, Saint Martin, Saint Vincent and the Grenadines, Saint Maarten, Suriname, U.S. Virgin Islands, Venezuela, American Samoa, Marshall Islands, Samoa, Tonga, New Caledonia and Cape Verde. This list may change as the infection spreads to other countries, and travellers are requested to consult the WHO website on www.who.int

The symptoms of Zika virus disease include mild fever, rash, conjunctivitis and muscle or joint pain. There are concerns that the virus may be responsible for severe birth defects following Zika in pregnant women. There is no specific treatment against the virus.

Travellers to countries with active Zika transmission are advised to:

Avoid mosquito bites by covering as much of the body as possible with long, light-coloured clothing and also by using mosquito repellent creams

Avoid unnecessary outings at dawn and at dusk

Sleep under a mosquito net and /or in an air-conditioned room as far as possible

It is not recommended at present that a woman who is pregnant or is trying to become pregnant to travel to any of the countries listed above. If travel to these countries cannot be avoided, it is recommended to seek advice from a medical professional and strictly follow the steps to avoid mosquito bites during the trip. In the event of fever with one or more of the symptoms of Zika developing during travel, it is recommended to consult a doctor.

There is no vaccine against Zika virus. Protection against mosquito bites and control of mosquito proliferation remain the two main pillars of prevention.

Following return from the countries listed above, if symptoms are present, it is advisable to contact the nearest health office, health centre or hospital.

REFERENCE AND BIBLIOGRAPHY

WHO/PAHO, Zika virus

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