

Zika Virus (ZIKV): Emerging Threat for Bangladesh?



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INTRODUCTION

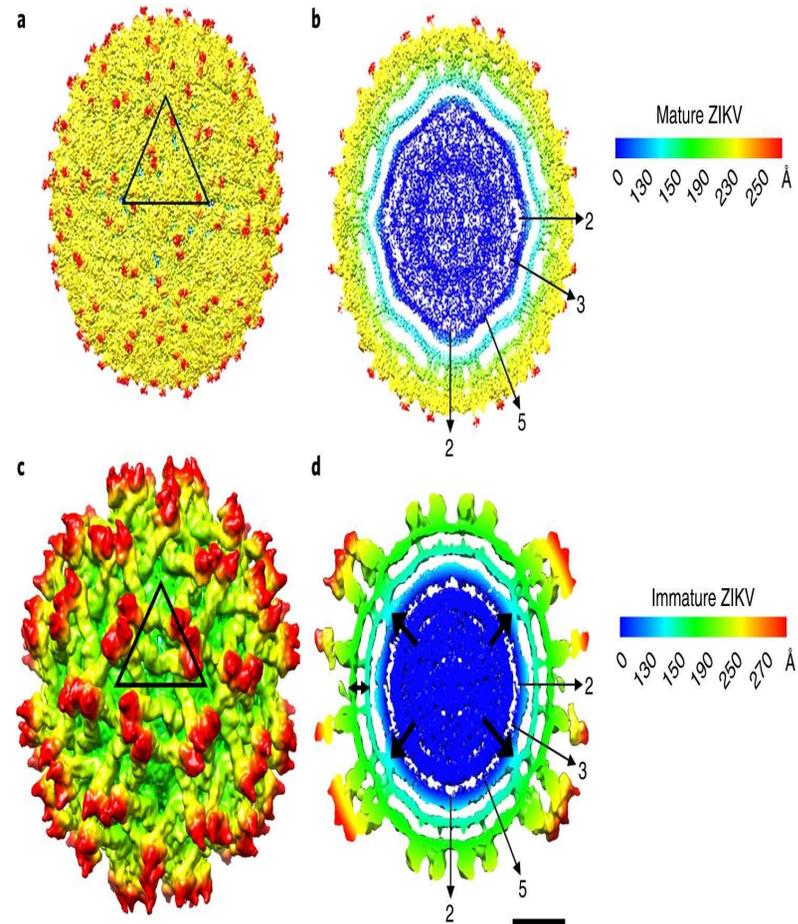


Zika virus was first discovered in 1947 and is named after the Zika Forest in Uganda.

Zika virus (ZIKV)

Zika virus (ZIKV) belongs to the Flaviviridae. It is an-

- Arthropod-borne
- Enveloped
- Non-segmented
- Icosahedral
- Single-stranded
- Negative-sense RNA virus.

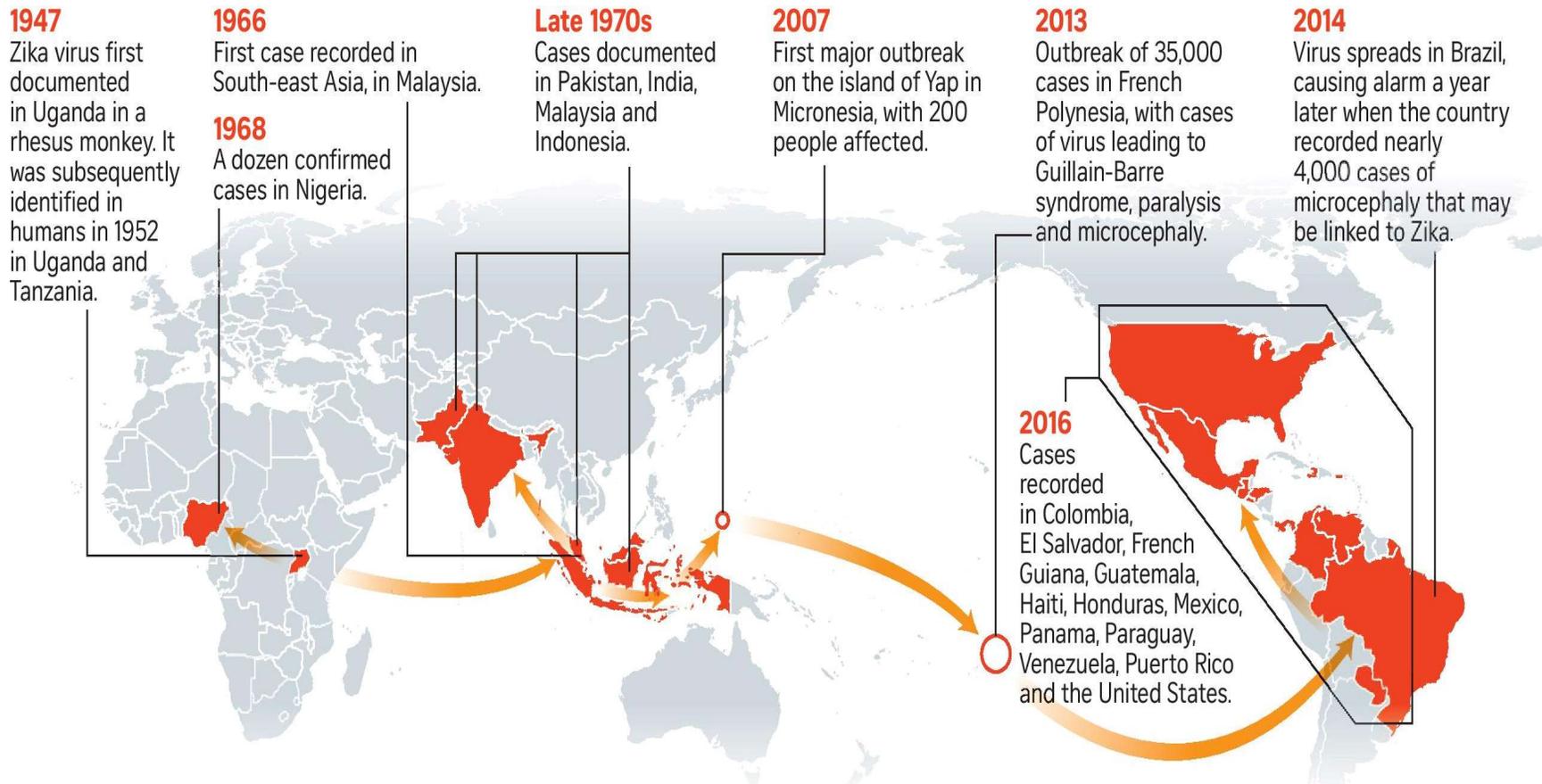


ZikV History & Evolution

- It emerged in Africa as sporadic benign-human infections during the early **1960s**
- Later, in **1969**, ZIKV appeared as a potential pathogen in Asian-continent
- The first ZIKV was isolated from Aedes mosquitoes in Malaysia and human cases were confirmed in Indonesia and Pakistan in the early **1980s**.
- In May **2015**, the Pan American Health Organisation (PAHO) issued an alert regarding the first confirmed Zika virus infection in Brazil.

How Zika virus spread

The mosquito-borne virus was first found in a monkey in Uganda in 1947, and very few cases of human infection were reported before 2007.



Sources: LANCASTER UNIVERSITY, WHO, CENTRES FOR DISEASE CONTROL AND PREVENTION ST GRAPHICS



World Health
Organization

ZIKA EPIDEMIOLOGY UPDATE

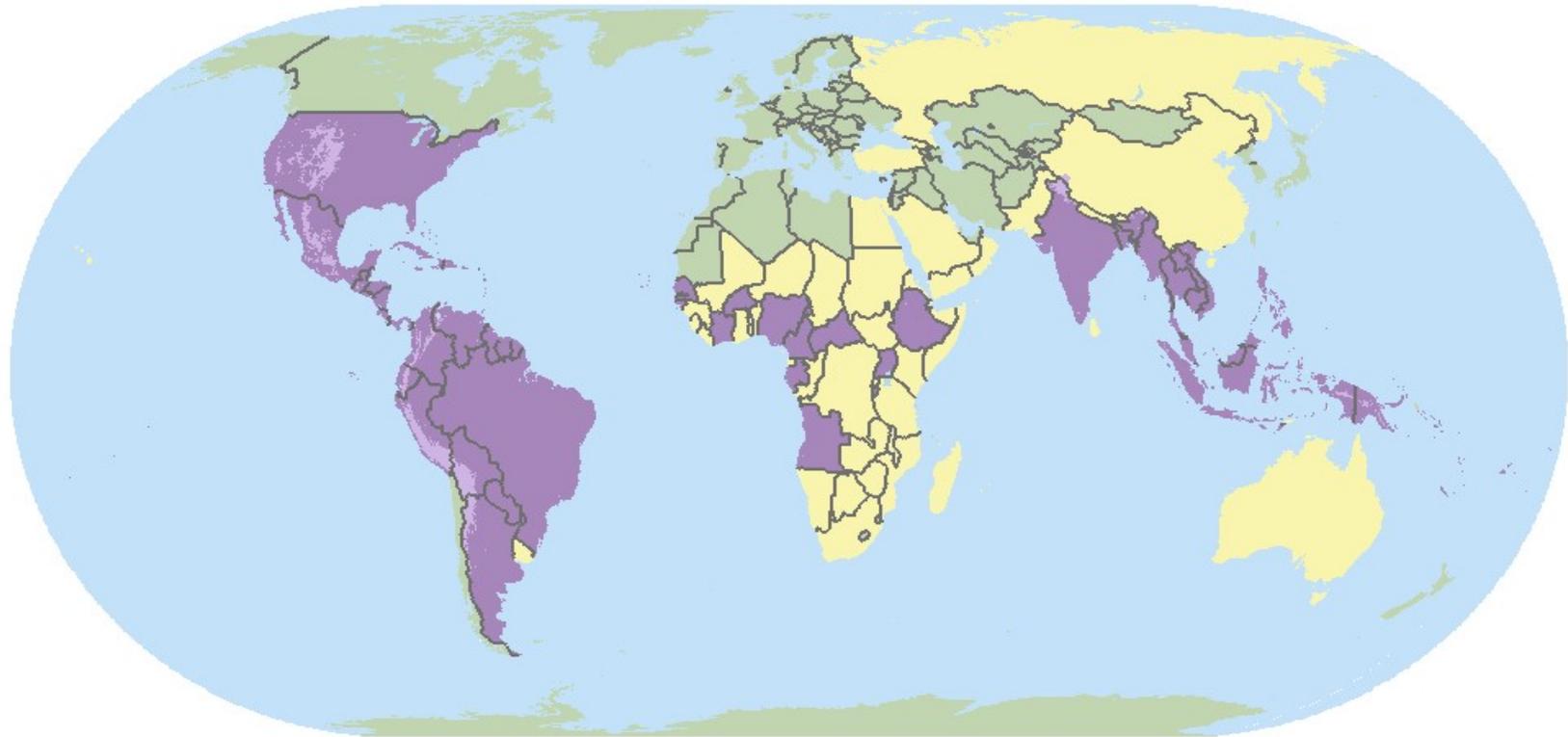
JULY 2019

- The peak incidence of ZIKV infection in the Americas was in 2016 and declined substantially throughout 2017 and 2018.
- **As of July 2019**, a total of 87 countries and territories have had evidence of autochthonous mosquito-borne transmission of Zika virus (ZIKV)
- Zika virus transmission has been found in all countries in the Region of the Americas except mainland **Chile, Uruguay and Canada**

Epidemiology Update...

- Thailand demonstrated seasonal patterns of ZIKV transmission that coincided with those of dengue virus, which share common mosquito vectors
- India reported a ZIKV outbreak in Rajasthan State in 2018
- All areas with prior reports of ZIKV transmission have the potential for re-emergence or re-introduction.

World Map of Areas with Risk of Zika



Map Legend

-  Country or territory with current Zika outbreak¹
-  Country or territory that has ever reported Zika cases² (past or current)
-  Areas with low likelihood of Zika infection because of high elevation (above 6,500 feet/2,000 meters)
-  Country or territory with mosquito³ but no reported Zika cases²
-  Country or territory with no mosquitoes that spread Zika

¹ No areas are currently reporting Zika outbreaks

² Locally acquired, mosquito-borne Zika cases

³ *Aedes aegypti*

How Zika is transmitted

- Through day-time active **mosquito bites**
- From a **pregnant women** to her fetus
- Through **sex**
- Through **blood transfusion** (very likely but not confirmed)

ZIKA VIRUS

For anyone who plans to travel to **Zika-affected areas**, avoiding mosquito bites is the best way to avoid exposure to the virus.

Zika virus is primarily spread through the **BITE OF INFECTED MOSQUITOS.**

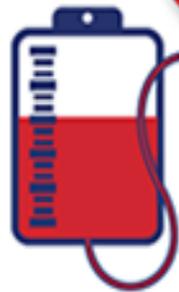
MOTHER-TO-BABY & SEXUAL ACTIVITY

If a pregnant woman is bitten by an infected mosquito, the infection can cross the placenta, infecting the fetus.

The virus can also be transmitted sexually.

TRANSFUSION

The virus can also be transmitted through blood transfusion or laboratory exposure.



HOW ZIKA CAN BE DIAGNOSED

Zika diagnosis...

Diagnosis of Zika is based on a person's-

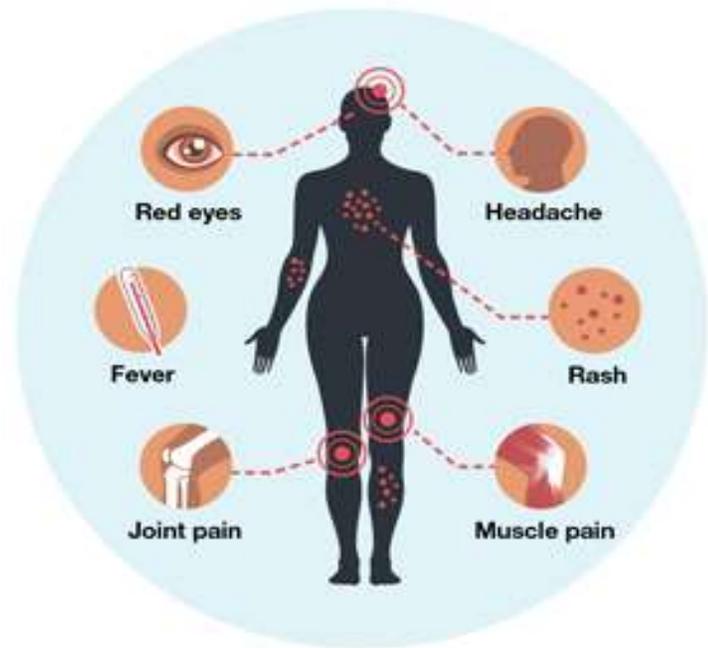
- Recent travel history,
- Symptoms, and
- Test results.

Clinical features

May be asymptomatic (60-80%)
or only have mild symptoms.

The most common symptoms
are-

- Fever
- Rash
- Headache
- Joint pain
- Red eyes
- Muscle pain



Incubation period: 3-12 days

Clinical features...

- Short-lasting , self-limiting febrile illness of 4-7 days duration without severe complications
- Symptoms of Zika are similar to other illnesses spread through mosquito bites, like dengue and chikungunya.
- Infected persons are likely to be protected from future infections.



Differences among the diseases caused by *Aedes aegypti*

SYMPTOMS	DENGUE FEVER	CHIKUNGUNYA	ZIKA
FEVER	HIGH FEVER (>38°C) Lasts 4 to 7 days	HIGH FEVER (>38°C) Lasts 2 to 3 days - immediate start	ABSENT OR LOW Lasts 1 to 2 days
PAIN IN THE JOINTS	MILD PAIN May be present	INTENSE PAIN In almost 90% of cases	MODERATE PAINS Almost always present
RED SPOTS ON THE SKIN	DOES NOT APPEAR IMMEDIATELY May be present	AFTER 48 HOURS May be present	ALMOST ALWAYS PRESENT In the first 24 hours
ITCHINESS	LIGHT May be present	LIGHT May be present	MODERATE / INTENSE 50% ~ 80% of cases
REDNESS IN THE EYES	LIGHT May be present	MAY BE PRESENT	PRESENT IN MORE THAN 50% OF CASES
MUSCLE PAIN	ALMOST ALL CASES	30% OF CASES	65% OF CASES
BLEEDING	MODERATE	LIGHT	ABSENT

Investigations

- Zika virus can be identified by RT-PCR in acutely ill patients.

WHO recommends-

- First 1 to 3 days: RT-PCR from serum
- 3 to 5 days : RT-PCR from serum saliva or urine
- After 5 days : specific IgM and IgG antibodies
- IgM can be detectable within 3 days of the onset of illness
- Serological cross-reactions can occur with closely related flaviviruses such as dengue virus.
- Commercial assays for Zika diagnosis are not yet available

Complications

Complications

- Risk of Guillain-Barré Syndrome and Other neurologic manifestations.
- Adverse pregnancy outcomes

Complications...

Adverse pregnancy outcomes including –

- Increased risk of preterm birth,
- Foetal death and stillbirth, and
- Congenital malformations collectively characterized as

congenital Zika syndrome (CZS), including-

- microcephaly,
- abnormal brain development,
- limb contractures,
- eye abnormalities,
- brain calcifications.

Pregnancy and Zika

- The effect of Zika virus infection on mother and developing baby during pregnancy is a burning issue.
- Proportion with Birth Defects is 5-10% .
- About 2 in 20 (10%) babies of women with confirmed Zika virus infection during pregnancy in US states and about 1 in 20 (5%) in US territories had Zika associated birth defect.

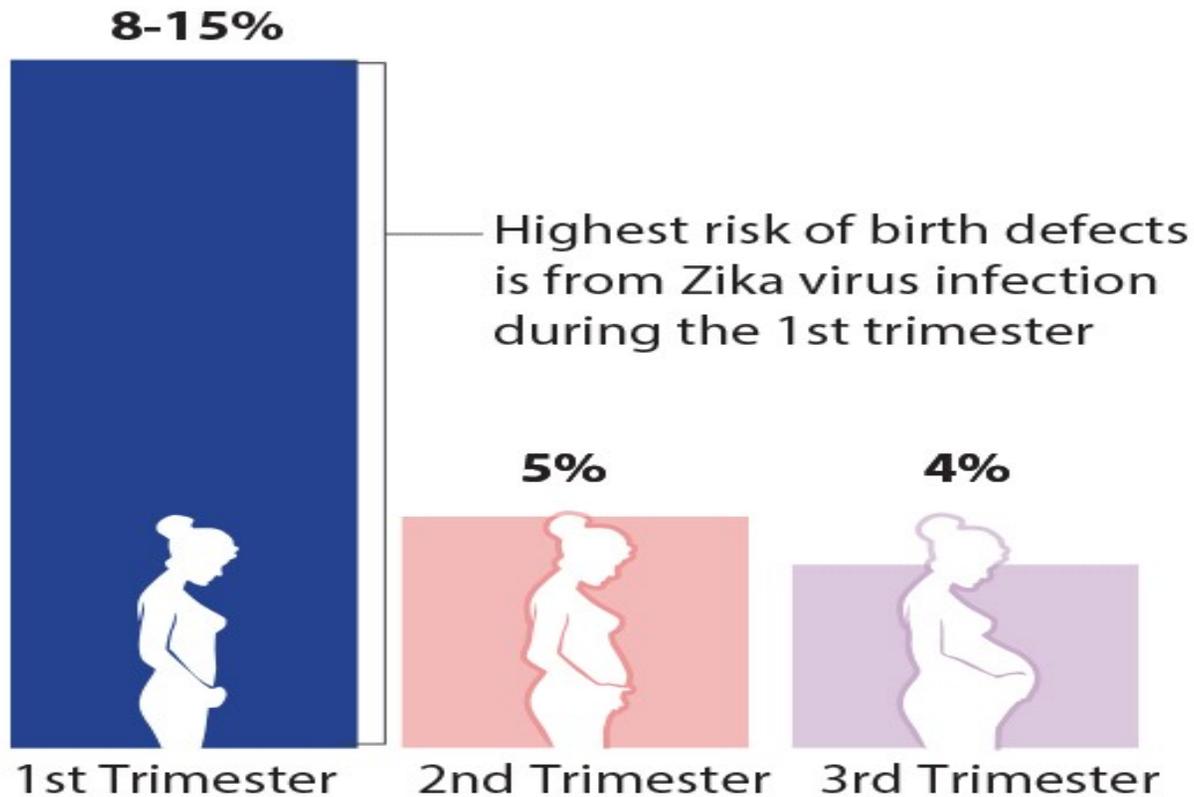
Pregnancy and Zika...

Confirmed Zika virus
infection during pregnancy =

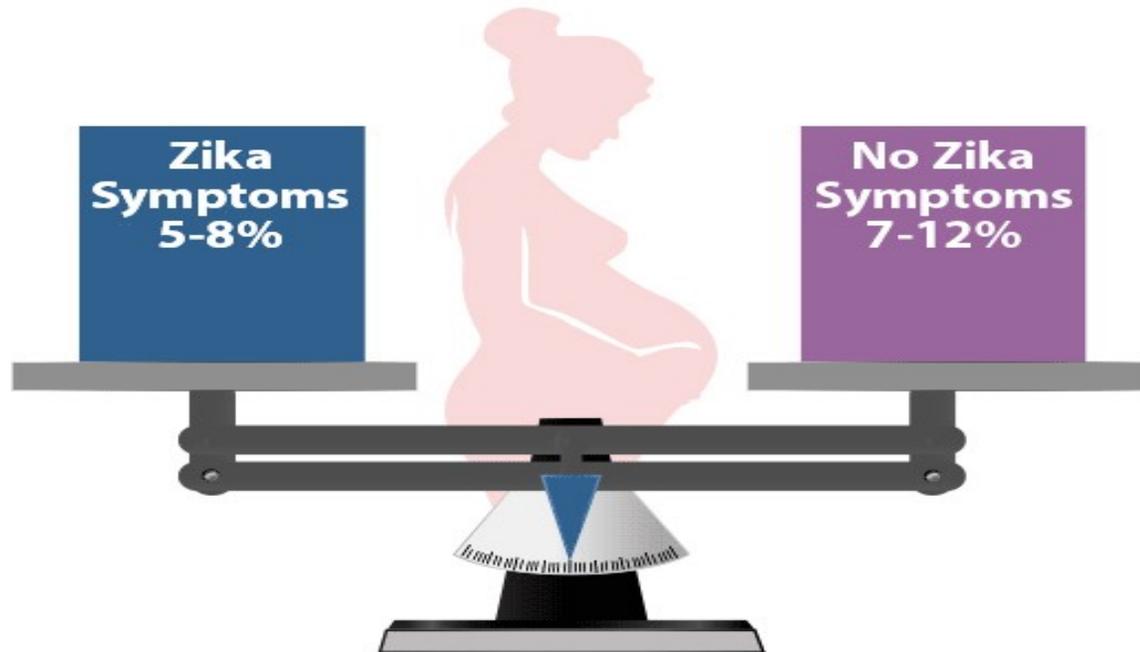
5-10%

with Zika-associated
Birth Defects

Pregnancy and Zika...



Pregnancy and Zika...



Pregnancy and Zika...

Of the 1,450 babies at least one year old born to mothers with Zika during pregnancy in the US territories who had some follow-up reported

6%

had Zika-associated birth defects, such as small head size, brain damage, or eye damage.

9%

had nervous system problems possibly caused by Zika, such as seizures, problems with swallowing and moving, or developmental delays.

Without evaluation, some health problems may not be detected or treated.

Pregnancy and Zika...

Doctor's Visit Checklist:

For Pregnant Women Living in an Area with a Zika Outbreak (Red Areas on the Zika Map) or Other Areas with Risk of Zika (Purple Areas on the Zika Map)

Zika virus can pass from a pregnant woman to the fetus. Zika is linked to microcephaly, a severe birth defect that signals a problem with brain development. If you are pregnant and living in any area with risk of Zika, talk to your healthcare provider about Zika, even if you don't feel sick.

Use this checklist to make sure you and your healthcare provider talk about these important questions.



Here are some questions you may want to ask your healthcare provider:

- ✓ How can I prevent Zika infection during my pregnancy? How can I protect my family?
- ✓ How can I prevent sexual transmission of Zika?
- ✓ Should I be tested for Zika?
- ✓ Do I need an ultrasound?
- ✓ Do I need to be referred to a high-risk obstetrics specialist or a maternal-fetal medicine specialist?

Be sure to ask any other questions or mention concerns you may have about Zika and your pregnancy.

Pregnancy and Zika...

CDC's Response to **Zika**

For Pregnant Women: A Positive Zika Virus Test What does it mean for me?



CDC understands that pregnant women may be worried and have questions about Zika virus. A positive test result might cause concerns, but it doesn't mean your baby will have birth defects. Learn more about what you might expect for your pregnancy if you get a positive test result for Zika.



I tested positive. What happens next?

If you get a positive test result for Zika during pregnancy, it signals to your doctor or other healthcare provider to watch your pregnancy more carefully. CDC recommends steps your doctor can take to help care for you during your pregnancy. Your doctor or other healthcare provider might do more ultrasounds or other tests to check the growth and development of your fetus and to look for signs of Zika virus infection during your pregnancy.

What are ultrasounds?

Ultrasounds are a safe and routine way for doctors or other healthcare providers to see the fetus during pregnancy. An ultrasound is usually done between 18-20 weeks of pregnancy as part of normal care. Extra ultrasounds are sometimes done later in pregnancy when doctors need more information about the fetus.

Pregnancy and Zika...



Pregnant?

Warning: Zika can cause microcephaly and other severe brain defects
There is no vaccine to prevent Zika virus infection



Protect yourself from mosquito bites



Daytime is most dangerous
Mosquitoes that spread chikungunya, dengue, and Zika are aggressive daytime biters. They can also bite at night.



Use insect repellent
It works!
Look for the following active ingredients: DEET, picaridin, IR3535, oil of lemon eucalyptus or para-menthane-diol, or 2-undecanone



Wear protective clothes
Wear long-sleeved shirts and long pants and use insect repellent. For extra protection, treat clothing with permethrin.



Mosquito-proof your home
Use screens on windows and doors. Use air conditioning when available. Keep mosquitoes from laying eggs near standing water.

Pregnancy and Zika...

PREGNANT? READ THIS BEFORE YOU TRAVEL

What we know about Zika

- Zika can be passed from a pregnant woman to her fetus.
- Zika infection during pregnancy can cause certain birth defects.
- Zika is spread mostly by the bite of an infected *Aedes aegypti* or *Aedes albopictus* mosquito.
 - » These mosquitoes bite during the day and night.
- There is no vaccine to prevent or medicine to treat Zika.
- Zika can be passed through sex from a person who has Zika to his or her sex partners.

What we don't know about Zika

- If there's a safe time during your pregnancy to travel to an area with risk of Zika.
- If you do travel and are infected, how likely it is that the virus will infect your fetus and if your baby will have birth defects from the infection.



Travel Notice

CDC has issued a travel notice (Level 2-Practice Enhanced Precautions) for people traveling to areas with a Zika outbreak (red areas on the Zika map).

- For a current list of places with Zika outbreaks, see CDC's Travel Health website: <http://wwwnc.cdc.gov/travel/page/zika-travel-information>

Pregnancy and Zika...

CDC recommends special precautions for pregnant women and women trying to become pregnant

Pregnant?

Pregnant women should not travel to areas with a Zika outbreak (red areas on Zika map).

Before travel to other areas with risk of Zika (purple areas on the Zika map), pregnant women should talk with their doctors and carefully consider risks and possible consequences of travel.

Pregnant women and their sex partners should strictly follow steps to prevent mosquito bites.

If you have a sex partner who lives in or travels to an area with Zika, you should use condoms from start to finish every time you have sex, or do not have sex during the pregnancy.

If you develop the symptoms of Zika, see a healthcare provider right away for testing.

Trying to become pregnant?

Before travel to areas with a Zika outbreak (red areas on the Zika map) or other areas with risk of Zika (purple areas on the Zika map), couples trying to become pregnant should talk with their doctors and carefully consider risks and possible consequences of travel.

Strictly follow steps to prevent mosquito bites and sexual transmission during your trip.

Talk to your healthcare provider about plans to become pregnant.



Pregnancy and Zika...

Your Best Protection: Prevent Mosquito Bites

Clothing

- Wear long-sleeved shirts and long pants.
- Treat clothing and gear with permethrin or purchase permethrin-treated items.
 - » Treated clothing remains protective after multiple washings. See product information to learn how long the protection will last.
 - » If treating items yourself, follow the product instructions carefully.
- Do NOT use permethrin products directly on skin. They are intended to treat clothing.



Indoor Protection

- Stay in places with air conditioning or that use window and door screens to keep mosquitoes outside.
- Sleep under a mosquito bed net if air conditioned or screened rooms are not available or if sleeping outdoors.



Repellent

Use Environmental Protection Agency (EPA)-registered insect repellents. When used as directed, these insect repellents are safe and effective for pregnant and breastfeeding women.

- Always follow the product label instructions.
- Reapply as directed.
- Do not spray repellent on the skin under clothing.
- If you are also using sunscreen, apply sunscreen before applying insect repellent.
- Use a repellent with one of the following active ingredients: DEET, picaridin, IR3535, oil of lemon eucalyptus or para-menthane-diol, or 2-undecanone.



Pregnancy and Zika...

CDC's Response to **Zika**

PREGNANT AND IN AN AREA WITH RISK OF ZIKA?*
WARNING: ZIKA IS LINKED TO BIRTH DEFECTS



Protect Your Pregnancy

From getting Zika from mosquito bites



Protect Yourself from Bites Day and Night
Mosquitoes that spread Zika virus bite during the day and night.

Use Insect Repellent
It's safe and it works! Read the label and follow the directions.



Cover Your Skin
Wear long-sleeved shirts and long pants.

Mosquito-Proof Your Home
Use screens on windows and doors. Use air conditioning when available. Eliminate standing water.



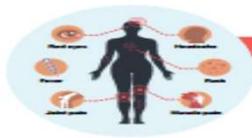
From getting Zika from sex



Don't have Sex
Don't have sex during your pregnancy.

OR

Use a Condom
Use a condom the right way every time you have vaginal, anal, oral sex, or share sex toys during your pregnancy.



Talk to your Healthcare Provider

If you think you or your partner may have or had Zika, tell your healthcare provider.



There is No Vaccine to Prevent Zika Virus Infection

For more information: www.cdc.gov/chikungunya | www.cdc.gov/dengue | www.cdc.gov/zika

*Visit www.cdc.gov/zika/geo/index.html for more information on areas with risk of Zika.



U.S. Department of
Health and Human Services
Centers for Disease
Control and Prevention

PREVENTION OF ZIKA

How to prevent Zika

There is no vaccine to prevent Zika.



The best way to prevent diseases spread by mosquitoes is to protect yourself and your family from mosquito bites.

Zika prevention...

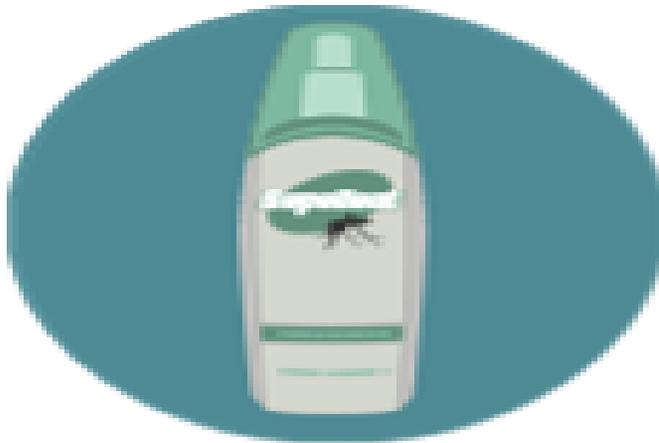
Clothing:



Wear long-sleeved shirts and long pants

Zika prevention...

Insect repellent:



Treat your clothing and gear with permethrin or
buy pre-treated items

Zika prevention...

- Use **Envirmental Protection Agency (EPA)**-registered insect repellents external icon with one of the following active ingredients:
DEET, picaridin, IR3535, oil of lemon eucalyptus or para-menthane-diol, or 2-undecanone.
- Always follow the product label instructions.
- When used as directed, these insect repellents are proven safe and effective even for pregnant and breastfeeding women.
- Do not use products containing oil of lemon eucalyptus or para-menthane-diol on children younger than 3 years old.

Zika prevention...

Sexual transmission:



Prevent sexual transmission of Zika by using condoms or not having sex

Zika prevention...

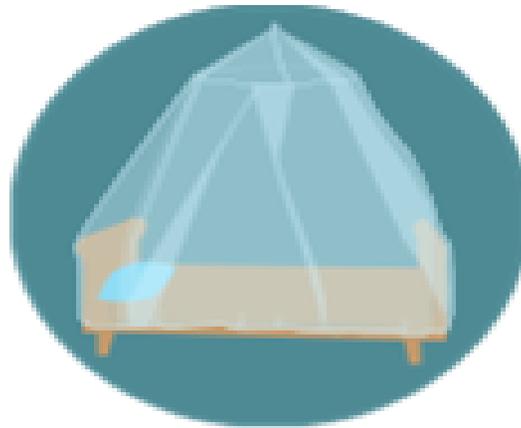
At Home:

- Stay in places with air conditioning and window and door screens to keep mosquitoes outside.
- Take steps to control mosquitoes inside and outside your home.

Zika prevention...

- Mosquito netting can be used to cover babies younger than 2 months old in carriers, strollers, or cribs.

At Home:



- Sleep under a mosquito bed net if air conditioned or screened rooms are not available or if sleeping outdoors.

What to do if you have Zika

There is no specific medicine or vaccine for Zika virus.



Treat the symptoms

What to do if you have Zika...

- Get adequate rest.
- Drink fluids to prevent dehydration.
- Take medicine such as acetaminophen to reduce fever and pain.
- Do not take aspirin or other non-steroidal anti-inflammatory drugs (NSAIDs).
- If you are taking medicine for another medical condition, talk to your healthcare provider before taking additional medication.



Bangladesh Perspective

Bangladesh Perspective

- Bangladesh confirmed in August 2014 its first case of the Zika virus from Chittagong (southern port city) in an old sample of blood from a 67-year old man who had not been overseas
- The first case of ZIKV-infection from Bangladesh detected using qRT-PCR among two hundred samples tested.
- Since the patient had no history of traveling outside the country we can infer that ZIKV is being circulating in Bangladesh even before 2014.

Bangladesh Perspective...



Though, introduction/extension of ZIKV in Bangladesh still remains a big question to answer, it seems logical to predict that the case we detected may remain as only the tip of the iceberg!

Bangladesh Perspective...

Factors should be discoursed which may contribute in masking the real scenario, like;

- i) Lacking in test facilities,
- ii) Lack of optimum awareness among the physicians,
- iii) Absence of acute febrile illness surveillance and
- iv) Manifestations of mild clinical signs/symptoms.

Take Home Message

- As there is no specific vaccine available against ZikV, so prevention must be taken in vulnerable situation
- Take special care specially during pregnancy and lactation.
- Ensure safe sex to prevent transmission
- Ensure adequate rest and plenty of fluid if affected.
- Notice surveillance team if suspected

Conclusion

Presence of ZIKV raises serious public health concerns in Bangladesh owing to its association with congenital anomalies/neurological-manifestations.

Therefore, every suspected viral fever patient, particularly pregnant women be screened for ZIKV infection to rule out yet another emerging infection in Bangladesh.

Thank you



