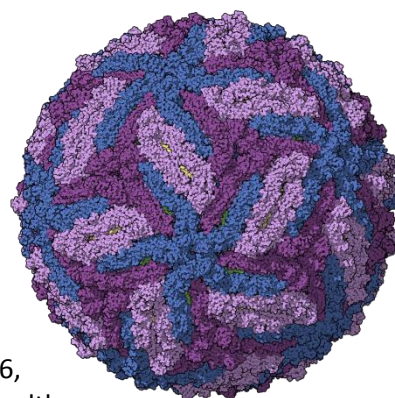


6 September 2016

ZIKA VIRUS

Zika virus was first discovered in 1947 and is named after the Zika Forest in Uganda. In 1952, the first human cases of Zika were detected and since then, outbreaks of Zika have been reported in tropical Africa, Southeast Asia, and the Pacific Islands. In February 2016, World Health Organization (WHO) declared the outbreak as a Public Health Emergency of International Concern as evidence grew that Zika can cause birth defects as well as neurological problems.



As of 25 August 2016, 70 countries and territories have reported evidence of mosquito-borne Zika virus transmission since 2007. 53 of these countries and territories have reported evidence of mosquito-borne Zika virus transmission since 2015. Brazil has reported the largest number of cases.

Sporadic cases of local Zika virus infection have also been detected in several countries in Southeast Asia, including Cambodia, Indonesia, Philippines, Malaysia (Sabah), Vietnam, Lao People's Democratic Republic and Thailand previously. As of June 2016, active transmission has been reported in Beung Kan and Phetchabun provinces of Thailand. Please see Table 1 for list of affected countries.

WHAT IS THE SITUATION IN SINGAPORE?



On 27 August 2016, Singapore reported its first case of Zika viral infection. Through active testing of potentially infected persons and greater awareness of the infection, the number of news cases tested positive climbed dramatically to more than 200 cases by the end of the first week. Most of the confirmed cases were found in the Aljunied Crescent, Sims Drive, Kallang Way and Paya Lebar Way area, but new cases had also emerged all over the island.

Besides the Aljunied area, two other clusters identified were in Bedok North Avenue 3 and Joo Seng Road. As of 6 Sept, there were 258 confirmed cases of locally transmitted Zika but 16 people who contracted Zika had no known links to other cases or clusters.

Preliminary analysis has found that the Zika virus belongs to the Asian lineage and likely evolved from the strain that was already circulating in Southeast Asia. With Zika cases to emerge in more areas given the presence of the Aedes mosquitoes here and with increasing number of sporadic cases not linked to known clusters of disease, the Ministry of Health announced on 6 Sept that it would be switching its focus from isolation of infected persons to vector control instead.



HOW IS THE ZIKA VIRUS TRANSMITTED?

1. Aedes Mosquito

The Zika virus is transmitted to humans by the bite of an infected *Aedes* mosquito (*Aedes aegypti* and *Aedes albopictus*). These are the same mosquitoes that spread dengue and chikungunya viruses. A mosquito is infected when it takes a blood meal from a Zika-infected person and later transmits the virus to other people it bites.



2. Pregnant mother to foetus

A pregnant woman already infected with Zika virus can pass the virus to her foetus during the pregnancy or around the time of birth.

Zika virus has been detected in breast milk but there is currently no clear evidence that the virus is transmitted to babies through breastfeeding

3. Sexual contact

Zika can be passed from a person who has Zika to his or her partners through sex. It can be passed from a person with Zika before their symptoms start, while they have symptoms, and after their symptoms end. Studies are underway to find out how long Zika stays in the semen and vaginal fluids of people who have Zika, and how long it can be passed to sex partners.

Fortunately, once an infected person has recovered, he or she is likely to be protected from future infections.

WHO IS AT HIGHER RISK OF CONTRACTING THE ZIKA VIRAL INFECTION?

- People who have travelled to countries with reported Zika infections are at higher risk of contracting the Zika virus.
- In Singapore, residents, pregnant women and people working or studying in the areas where Zika cases have been reported should seek medical attention if they are unwell.
- Pregnant women who had sexual intercourse with their male partner that are tested positive for Zika area are considered to have of possible exposure to the virus . They should consult their obstetrician to arrange for testing.



WHAT ARE THE SYMPTOMS OF ZIKA VIRUS INFECTION?

Generally, the Zika virus causes 'mild' infections, with only **one in five** infected persons developing symptoms. The incubation period is 3 to 12 days after the infected mosquito bite. These symptoms which last between 4 to 7 days are often mild. They include:

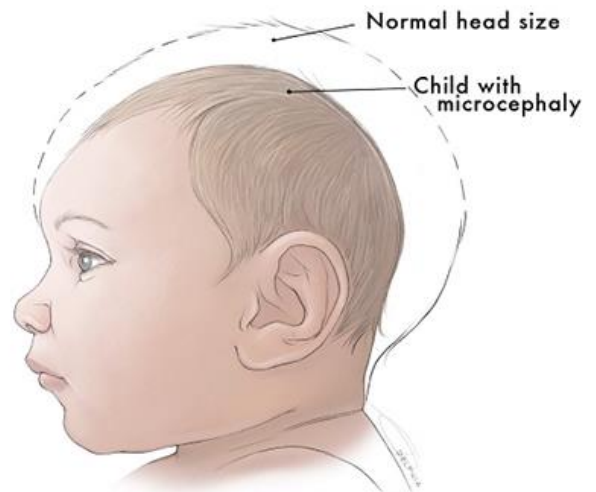
- Low grade fever
- Rashes
- Joint pains, muscle pain, headache
- Conjunctivitis (red eyes)

Travel history is important, and all returning travellers from areas with ongoing Zika virus transmission should inform their doctor about their travel history as imported cases can still occur.

ARE THERE ANY SERIOUS CONSEQUENCES OF ZIKA VIRAL INFECTION?

a. Microcephaly in Foetus

There is increasing evidence that Zika virus infection in pregnant women can cause microcephaly in the foetus. A recent study published in the *New England Journal of Medicine* found that the risk of an infected mother giving birth to a child with microcephaly is between one and 13 percent. Microcephaly is a birth defect where a baby's head is smaller than expected when compared to babies of the same sex and age. It can be an isolated condition, meaning that it can occur with no other major birth defects, or it can occur in combination with other birth defects. Microcephaly has been associated with developmental delay, fits, eye defects, hearing loss, and impaired growth, learning disabilities and other disabilities in the affected infant.



A pregnant patient with confirmed Zika infection will be advised to undergo serial ultrasounds for assessment of foetal (head) growth. Amniotic fluid testing for Zika may be offered to the pregnant woman after 15 weeks of pregnancy. However as there is currently not enough research to ascertain the effectiveness of testing for Zika in amniotic fluid, a positive Zika test in amniotic fluid does not always mean that the foetus will have birth defects. Amniotic fluid testing may be considered only after the potential risks and limitations in interpretation of results have been discussed with the obstetrician.

Zika virus infection does not pose a risk of birth defects for future pregnancies. The virus will not cause infections in a baby that is conceived after the virus is cleared from the blood.

b. Guillain-Barré syndrome

Guillain-Barré syndrome (GBS) is an uncommon sickness of the nervous system in which a person's own immune system damages the nerve cells, leading to weakness of the arms and legs and, in severe cases, the muscles that control breathing.

Several countries that have experienced Zika outbreaks recently have reported increases in people who have Guillain-Barré syndrome (GBS). Research suggests that GBS is strongly associated with Zika, although only a small proportion of people with recent Zika virus infection get GBS.

WHAT ARE THE TESTS AVAILABLE TO DIAGNOSE ZIKA VIRAL INFECTION?

Currently, the only reliable test available for Zika is the reverse transcriptase-polymerase chain reaction (RT-PCR) test which looks for genetic material of the virus in clinical specimens such as urine and blood. However, RT-PCR test is only able to detect Zika infection within 7-14 days of symptom onset. A negative test outside this period does not definitely mean that one was not infected.

At present, there is no reliable serological test (which looks for antibodies in the blood) for Zika.

WHAT TREATMENT IS AVAILABLE FOR ZIKA INFECTION?

There is no vaccine or specific treatment to fight the Zika virus. Like dengue infection, treatment is directed at alleviating symptoms.

WHAT IS THE CURRENT MANAGEMENT OF PATIENTS INFECTED WITH ZIKA INFECTION IN SINGAPORE?

Zika virus infection is now classified as a notifiable infectious disease by the Ministry of Health. However, noting that patients are often asymptomatic or have only mild symptoms, and coupled with increasing number of sporadic cases with Zika Virus infections not linked to known clusters of disease, hospitalising patients for purpose of isolation from mosquitoes would be now less effective in controlling the spread of the infection. Hence, with effect from 6 Sept, patients with Zika infection who are relatively well may be managed in outpatient setting. Similar to the advice given to patients with dengue or chikungunya infection, they should also protect themselves and their household members from mosquito bites, and prevent sexual transmission of the infection.





WHAT CAN YOU DO TO PROTECT YOURSELF IF YOU ARE PREGNANT?

- a) You should reconsider your travel plans to areas with local transmission of Zika virus. If you need to travel to affected countries, you should undertake strict precautions against mosquito bites.
- b) Take steps to prevent mosquito bites by wearing long, covered clothing, applying insect-repellent (DEET) , and sleeping under mosquito nets or in rooms with wire-mesh screens or air-conditioned rooms to keep out mosquitoes.
- c) Consult a doctor if you develop a fever, rash, joint pain, or red eyes during the trip or within 2 weeks after traveling to an area where Zika has been reported. You should tell the doctor where you have travelled or the location of your residence.
- d) Although Zika virus infection remains a predominantly vector-borne disease, a small number of cases of sexual transmission have been documented. Until more is known about the risk of sexual transmission, men returning from areas with ongoing transmission of Zika who are sexual partners of pregnant women should practise safer sex, e.g. consistent and correct use of condoms during sex, or abstain from sex throughout the women's pregnancy.



WHAT DO OTHER TRAVELLERS NEED TO TAKE NOTE OF IF THEY HAVE BEEN TO A ZIKA-AFFECTED AREA?

1. Travellers who have returned to Singapore from countries listed above should monitor their health for the next 14 days and seek medical consultation with a doctor if they develop the following symptoms:
 - a. Fever,
 - b. Skin rashes,
 - c. Joint and muscle pains,
 - d. Headaches and
 - e. Red eyes



2. While Zika is predominantly transmitted by mosquitoes, sexual transmission can occur. Male travellers returning from areas with ongoing outbreaks of Zika should adopt safer sexual practices, e.g. consistent and correct use of condoms during sex, or consider abstinence for at least four weeks after their return.

If they are sexual partners of pregnant women, they should adopt these precautions throughout the women's pregnancy. This is consistent with the advice given by WHO.

IS THERE ANY ADVICE FOR COUPLES PLANNING FOR A PREGNANCY IF EITHER ONE LIVES, OR WORKS OR STUDIES IN AN AFFECTED AREA?

If both the man and woman are well:

- They should take strict precautions against mosquito bites, and if they have further questions, consult their doctor.

If a woman is symptomatic (with fever and rash and other symptoms such as red eyes or joint pain):

- She should seek medical attention promptly, and if confirmed positive for Zika, she should practise safe sexual practices or abstain from sexual intercourse for at least 8 weeks after recovery, before trying to conceive.

If the man is symptomatic (with fever and rash and other symptoms such as red eyes or joint pain):

- He should seek medical attention promptly, and if confirmed positive for Zika, he should practise safe sex through the correct and consistent use of condoms or abstain from sexual intercourse for at least 6 months after recovery.



WHAT CAN I DO TO HELP LIMIT THE SPREAD OF THE ZIKA VIRUS?

Given that the majority of Zika cases are asymptomatic or mildly symptomatic, and mosquitoes in the affected areas may already have been infected, isolation of positive cases may have limited effect to managing the spread. We **should** focus our efforts on **vector** control.

Do the 10-minute 5-step Mozzie Wipeout as recommended by National Environment Agency.

The 5 steps are:

- Change water in vases and bowls on alternate days,
- Remove water from flower pot plates on alternate days,
- Turn over all water storage containers,
- Cover bamboo pole holders when not in use, and
- Clear blockages and put BTI insecticide in roof gutters monthly.
-



When at home or outdoors you may prevent mosquito bites by:

- Using insect repellent
- Wearing clothing that covers your body, arms and legs
- Sleeping under mosquito net



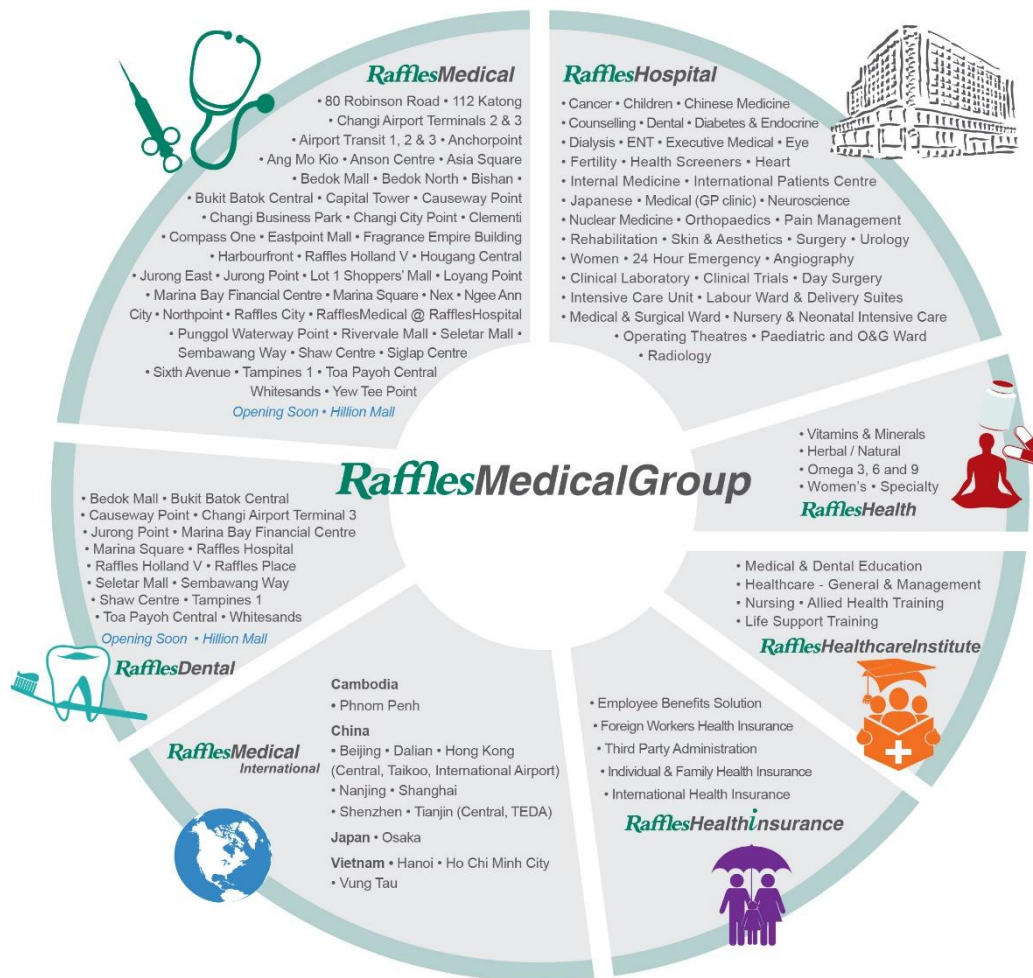
Table 1

Ongoing outbreaks		Ongoing local transmission/ exported cases
<p><u>Latin America and the Caribbean</u></p> <p>Tucumán province, Argentina Aruba Barbados Belize Bolivia Bonaire Brazil Colombia Dominica Costa Rica Curaçao Dominican Republic El Salvador Ecuador French Guiana Guadeloupe Guatemala Haiti Honduras Jamaica Martinique Mexico Nicaragua Panama Paraguay Peru Puerto Rico Saint Bethelmy Saint Lucia Saint Martin Saint Vincent and the Grenadines Sint Maarten Suriname Trinidad and Tobago Venezuela US Virgin Islands</p>	<p><u>Oceania</u></p> <p>American Samoa Federated States of Micronesia Fiji Tonga Samoa</p> <p><u>Africa</u></p> <p>Cape Verde</p> <p><u>Asia</u></p> <p>Beung Kan province, Thailand Phetchabun province, Thailand</p> <p><u>United States</u></p> <p>Florida</p>	<p><u>Latin America and the Caribbean</u></p> <p>Anguilla Antigua and Barbuda Bahamas Cayman Islands Cuba Grenada Saba Sint Eustatius Turks and Caicos</p> <p><u>Asia</u></p> <p>Indonesia Thailand Vietnam</p> <p><u>Africa</u></p> <p>Guinea-Bissau</p>



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