

立法會 *Legislative Council*

LC Paper No. CB(2)607/18-19(05)

Ref : CB2/PL/HS

Panel on Health Services

Background brief prepared by the Legislative Council Secretariat for the meeting on 21 January 2019

Prevention and control of various mosquito borne diseases

Purpose

This paper provides background information on mosquito borne diseases and summarizes the concerns of the members of the Panel on Health Services ("the Panel") on the prevention and control of dengue fever and Zika virus infection.

Background

2. Mosquito borne diseases are those spread by the bite of an infected mosquito which is a vector.¹ Dengue fever, Japanese encephalitis, malaria and Zika virus infection are common mosquito borne diseases in Hong Kong. Other mosquito borne diseases include Chikungunya fever, West Nile virus infection and Yellow fever. All these diseases are statutorily notifiable infection diseases under the Prevention and Control of Diseases Ordinance (Cap. 599).

Dengue fever

3. The *Aedes* mosquito² is the primary vector of dengue fever which is an acute mosquito-borne infection caused by the dengue viruses and is an endemic

¹ Vector is living organism that can transmit infectious diseases between humans or from animals to humans. Many vectors are bloodsucking insects, which ingest disease-producing microorganisms during a blood meal from an infected host (human or animal) and later inject it into a new host during their subsequent blood meal.

² In Hong Kong, the principle vector *Aedes aegypti* is not found, but *Aedes albopictus*, which can also spread the disease, is a mosquito commonly found in Hong Kong.

illness in many countries in Southeast Asia. The dengue viruses encompass four distinct serotypes (i.e. DEN-1 to -4), each of which can lead to dengue fever and severe dengue (also known as dengue haemorrhagic fever).³ There is no specific antiviral treatment for the disease. Once recovered, lifelong immunity against that particular serotype of dengue virus will develop. However, cross-immunity to the other serotypes after recovery is only partial and temporary. Subsequent infections with other serotypes of dengue virus are more likely to result in life-threatening severe dengue.

Japanese encephalitis

4. Japanese encephalitis, which occurs mainly in the rural and agricultural areas of Asia and the Western Pacific region, is an acute mosquito-borne infection caused by the Japanese encephalitis virus that is transmitted by the bite of infected *Culex* mosquitoes.⁴ Vaccination for Japanese encephalitis is available but is generally not recommended except for those travellers who plan to stay one month or longer in endemic areas. There is no specific antiviral treatment for Japanese encephalitis. The case-fatality rate can be as high as 30% among those with symptoms.⁵ Of those who survive, 20% to 30% suffer permanent intellectual, behavioural or neurological problems.

Malaria

5. Malaria is a serious and sometimes fatal disease caused by parasites. It is transmitted in most cases through the bites of infected female *Anopheline* mosquitoes, as well as through contaminated blood or blood product transfusion, organ transplant, or from a mother to her foetus or newborn baby before or during delivery.⁶ Currently, anti-malaria drugs with other supportive measures

³ Dengue fever is clinically characterized by sudden onset of high fever, severe headache, pain behind the eyes, muscle and joint pain, loss of appetite, nausea and rash. Some infected people may not develop apparent symptoms, and some may only have mild symptoms like fever. The incubation period ranges from three to 14 days, commonly four to seven days.

⁴ The mosquitoes breed where there is abundant water such as rice paddies and become infected by feeding on pigs and wild birds infected with the Japanese encephalitis virus.

⁵ Most infections of Japanese encephalitis occur without apparent symptoms or with mild symptoms such as fever and headache. More severe infection is characterized by rapid onset of headache, high fever, neck stiffness, impaired mental state, coma, tremors, convulsions (especially in children) and paralysis. The incubation period ranges from four to 14 days.

⁶ Symptoms of malaria include fever, chills, headache, muscle pain and weakness, cough, vomiting, diarrhoea and abdominal pain. Complications include anaemia, generalized convulsion, circulatory collapse, organ failure such as kidney failure, coma and death if the disease is not treated promptly. The incubation period usually ranges from seven to 30 days, but may be up to months or even longer.

against malaria are available but early diagnosis and prompt treatment are crucial. Patients under treatment should complete the whole course of medication to ensure clearance of the malaria parasites.

Zika virus infection

6. Zika virus infection is a mosquito borne diseases caused by Zika virus that is mainly transmitted through the bites of an infected *Aedes* mosquito⁷ as well as through blood.⁸ Cases of possible person-to-person transmission through blood transfusion, sexual contact and perinatal transmission have been reported. Zika virus infection during pregnancy is a cause of congenital brain abnormalities, including microcephaly. It is also a trigger of Guillain-Barré Syndrome. The above apart, acute disseminated encephalomyelitis which is a disease of the central nervous system is found to be one of the neurologic manifestations possibly resulted from Zika virus infection. No specific antiviral treatment is currently available for the disease.

Deliberations of the Panel

7. The Panel discussed the measures for the prevention and control of dengue fever and Zika virus infection in November 2014 and February 2016 respectively. The deliberations and concerns of members are summarized in the following paragraphs.

Investigation of cases of mosquito-borne diseases

8. Members noted that on and off, there were local cases of dengue fever. Question was raised about the number of local cases of dengue fever which would warrant an area to be considered endemic of dengue infection.

9. The Administration advised that whether an area would be considered as endemic of dengue infection would depend on whether there was a continuous circulation of the virus resulting in the prevalence of local cases. To eliminate the sources of infection and prevent an outbreak of local cases of dengue fever, the Food and Environmental Hygiene Department ("FEHD") would strengthen mosquito prevention and control at the community concerned. For all notified

⁷ *Aedes aegypti*, which is currently not found in Hong Kong, is considered the most important vector for Zika transmission to humans. Other *Aedes* mosquito species such as *Aedes albopictus* widely present locally are also considered as potential vectors.

⁸ Most Zika virus infection is asymptomatic. Patients with symptoms commonly present with skin rash, fever, conjunctive, muscle or joint pain and general malaise. These symptoms are usually mild and last for a few days. The incubation period ranges from three to 14 days.

cases, arrangement of patient isolation would be made to prevent secondary spread in case the patient was febrile.

10. Members noted that as recommended by the Hong Kong College of Obstetricians and Gynaecologists and the Hospital Authority, pregnant women with a history of travel to areas with Zika virus transmission should perform maternal blood or urine tests if they developed symptoms during, or within two weeks after the trip. There was a concern about the safety and reliability of maternal blood tests and the circumstances under which a pregnant woman with positive test result had to terminate her pregnancy.

11. The Administration advised that the accuracy maternal blood tests to detect Zika virus infection would depend on many factors such as the timing of maternal infection relative to the timing of testing. Maternal Zika virus infection did not necessarily indicate fetal infection. Prenatal ultrasound and, where necessary, amniotic fluid testing would be performed for detecting fetal infection or abnormalities. Individualized clinical management and treatment option would be formulated according to the clinical conditions of pregnant women who tested positive for Zika virus infection.

Port health measures

12. As most people infected with Zika virus were asymptomatic, concern was raised about the port health measures put in place by the Administration to guard against the virus. There was a view that the public health materials displayed or broadcasted at some boundary control points should also cover Zika virus infection. The Administration advised that the Department of Health ("DH") had implemented a series of enhanced port health measures, such as stepping up the environmental hygiene and mosquito control measures, and distributing leaflets and displaying posters on anti-mosquito measures at boundary control points. Relevant travel health advice had also been uploaded to the website of the Centre for Health Protection ("CHP") and DH's dedicated website on travel health service.

Travel alert

13. Question was raised about the issuance of Outbound Travel Alert for areas where mosquito-borne diseases was endemic and there were frequent travel for people between Hong Kong and the areas concerned. Members were advised that according to the World Health Organization, there should be no restrictions on travel or trade with countries and areas with mosquito-borne diseases. Travellers going to areas affected by mosquito-borne diseases should adopt extra preventive measures to avoid mosquito bites.

Publicity and public education

14. Members called on the Administration to step up its publicity efforts and public health education to enhance public awareness of the threat posed by mosquito-borne diseases, in particular the need to take preventive measures of dengue fever when travelling to areas with reported cases of dengue fever; and the risks of Zika virus infection which included, among others, its infection during pregnancy was a cause of microcephaly in infants. There was a suggestion that the Food and Health Bureau ("FHB") should collaborate with the Education Bureau to roll out publicity programmes at schools to promote the importance of mosquito prevention and control to parents.

15. The Administration advised that it had promulgated the health advice of prevention of mosquito bites and mosquito proliferation through distribution of health education materials, broadcasting Announcement in the Public Interests, as well as making available relevant guidelines on CHP's website.

Prevention of mosquito proliferation

16. Members noted that eliminating breeding sites for mosquitoes was one of the best preventive measures to prevent mosquito-borne diseases. There was a concern that ovitraps were not placed in populated areas under FEHD's dengue vector surveillance programme to monitor the situation of mosquito breeding. Some members called on the Administration to step up inspections of construction sites and enforcement actions against mosquito breeding. To eliminate potential mosquito breeding sites in the New Territories, there were also suggestions of introducing mandatory requirement of covering vent pipes of septic tanks for small village houses and providing village residents, in particular singleton elderly, with mosquito screens and assistance.

17. According to the Administration, FEHD had stepped up its mosquito control work through increasing the number of surveillance areas with ovitraps for *Aedes albopictus* which might carry dengue fever and Zika viruses. FEHD would inspect construction sites regularly and housing estates when required; brief the relevant parties like works departments and their contractors on the importance of mosquito prevention; as well as provide anti-mosquito advice to estate management offices. Enforcement action would be taken against the parties concerned if breeding of mosquito larvae or accumulation of water which might lead to mosquito breeding was found during inspection. On members' enquiry about the monitoring of the performance of the out-sourced pest control roving teams, the Administration advised that FEHD would monitor their performance through site inspection, feedback by the District Councils concerned and the complaints received.

Relevant papers

18. A list of the relevant papers on the Legislative Council website is in the **Appendix**.

Council Business Division 2
Legislative Council Secretariat
18 January 2019

**Relevant papers on the prevention and control of
various mosquito borne diseases**

Committee	Date of meeting	Paper
Panel on Health Services	17.11.2014 (Item III)	Agenda Minutes
	15.2.2016 (Item III)	Agenda Minutes CB(2)1453/15-16(01)

Council Business Division 2
Legislative Council Secretariat
18 January 2019