Summary of the 2017 winter influenza season in Hong Kong

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Hong Kong entered the winter influenza season in mid-February 2017. This year, the winter influenza season arrived later than the usual time between late December and January. The influenza activity had increased for a few weeks and then started to decrease since March. It returned to the baseline level in early April. In comparison with the winter influenza season in the previous two years, this influenza season is a mild season with a modest increase in influenza activity. The duration is about seven weeks which is shorter than that in the past two winter seasons (17 and 16 weeks in 2015 and 2016 respectively).

**Laboratory surveillance**

Among respiratory specimens received by the Public Health Laboratory Services Branch (PHLSB) of the Centre for Health Protection (CHP), the weekly percentage tested positive for seasonal influenza viruses ranged from 8.17% to 8.83% in the five weeks between January 8 and February 11, 2017. Afterwards, it gradually increased to the peak of 9.38% in the week ending March 4, and then decreased to 5.64% and 5.75% in the week ending April 1 and 8 respectively (Figure 1). Influenza A(H3N2) was the most common subtype detected during this season. From February 19 to April 8, 2017, influenza A(H3N2) constituted 79.4% of influenza detections. Of note, there has been slight increase in influenza B detections since early March. The percentage of respiratory specimens tested positive for influenza B in PHLSB has increased from 0.49% in the week ending March 4 to 1.07% and 0.88% in the week ending April 1 and 8 respectively.

**Influenza-like illness (ILI) outbreaks in schools and institutions**

The weekly number of institutional ILI outbreaks reported to CHP ranged from zero to seven between January 8 and February 11. Then, it had increased gradually to the peak level of 23 outbreaks in the week ending March 4, and has decreased to a range from five to 11 outbreaks during the period between March 5 and April 8 (Figure 2). From February 19 to April 8, the reported ILI outbreaks occurred in primary schools (45%), kindergartens/child care centres (20%), secondary schools (11%), residential care homes for the elderly (12%), residential care home for people with disabilities (6%) and others (6%). In comparison, 432 and 437 institutional ILI outbreaks were recorded during the winter season in 2015 and 2016 respectively.

**Influenza associated hospital admissions**

In public hospitals under the Hospital Authority (HA), the admission rates with principal diagnosis of influenza had increased in February till early March and then started to decrease (Figure 3). The increases among all age groups were modest. Among children aged below five years, the peak rate of 1.57 admitted cases per 10 000 population was recorded in the week ending February 25, as compared with the peak rate of 6.71 recorded in the 2016 winter season predominated by influenza A(H1N1)pdm09. Among elderly aged 65 years or above, the peak rate of 0.67 admitted cases per 10 000 population was recorded in the week ending March 4, as compared to the peak rate of 5.33 recorded in the 2015 winter season predominated by influenza A(H3N2).
Severe influenza cases

To monitor the severity of influenza infection, CHP has collaborated with HA and private hospitals to reactivate the enhanced surveillance for influenza-associated admissions to intensive care unit (ICU) or deaths among patients aged 18 or above since February 24, 2017. Besides, CHP continues its ongoing monitoring of severe paediatric influenza-associated complications or deaths among people aged below 18 years.

For adult patients aged 18 years or above, CHP recorded a total of 66 ICU admissions or deaths (including 41 deaths) with laboratory diagnosis of influenza between February 24 and April 12, 2017. Their ages ranged from 28 to 102 years (median: 81 years). Table 1 shows the age distribution of the cases. Majority (75.8%) of the severe cases were elderly aged 65 years or above. Among all the cases, 50 (75.8%) were influenza A(H3N2), seven (10.6%) were influenza A(H1N1)pdm09, one (1.5%) were influenza A without subtype determined and eight (12.1%) were influenza B. Among cases aged 65 years or above, 19 (38.0%) were known to have received the seasonal influenza vaccine (SIV) for the Northern Hemisphere 2016/17 season. Among cases aged between 18 and 64 years, only one patient (6.3%) was known to have received the SIV.

Separately, five paediatric cases of severe influenza-associated complication (including one fatal case) were reported to CHP among people aged below 18 years in the same period. Their ages ranged from 14 months to six years (median: two years), and all were female. The fatal case was an imported case from the Mainland who contracted influenza A(H1N1)pdm09 virus, while all local cases had influenza A(H3N2) virus infection. Except the imported case, all local cases did not receive the SIV for the current season. Among all the cases, one case had pre-existing medical and congenital conditions.

In total, 71 severe cases (including 42 deaths) with laboratory confirmation of influenza were recorded among all ages in the current season (Figure 4). The number of severe cases reported in this season was lower than those reported during winter seasons in the past years. Influenza A(H3N2) was the predominating virus. The severe cases and deaths mainly affected elderly aged 65 years or above, which was similar to previous seasons predominated by influenza A(H3N2).

In summary, CHP has recorded a mild winter influenza season with a modest increase in influenza activity, as reflected by the relatively small increases in various surveillance parameters including positive percentage of influenza viruses in PHLSB, number of reported ILI outbreaks, hospital admission rates and number of severe cases when compared with those observed in winter seasons in the past years. Influenza A(H3N2) was the predominating virus. The severe cases and deaths mainly affected elderly aged 65 years or above, which was similar to previous seasons predominated by influenza A(H3N2).

Further information on the latest situation of influenza and the prevention measures can be obtained from the CHP’s influenza page (www.chp.gov.hk/en/view_content/14843.html).

Be vigilant against mosquito-borne diseases

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Hong Kong may soon enter rainy season which is normally between April and September. Moreover, Hong Kong Observatory expects normal to above-normal temperatures and rainfall this spring; thus the activity of mosquito-borne diseases may increase. It is therefore important for the public to stay vigilant and protect against mosquito-borne diseases in the coming months. Key mosquito-borne diseases of concern for Hong Kong include dengue fever (DF), chikungunya fever (CF), Zika Virus Infection (ZVI), malaria and Japanese encephalitis (JE).
Dengue fever

DF is an acute mosquito-borne infection caused by the dengue viruses. The dengue viruses encompass four different serotypes. The symptoms of first infection are usually mild but subsequent infections with other serotypes of dengue virus are more likely to result in severe dengue, a severe and potentially fatal complication. DF is transmitted to humans through the bites of female Aedes mosquitoes. DF is endemic in more than 100 countries worldwide and the Americas, South-East Asia and Western Pacific regions are the most seriously affected.

In Hong Kong, DF is a notifiable infectious disease. While its principal vector Aedes aegypti is not found locally, the prevailing species Aedes albopictus can also spread the disease. The Centre for Health Protection (CHP) of the Department of Health (DH) recorded a total of 762 cases from 2007 to 2016, with the annual number of cases ranging from 30 to 124. Most of the cases were imported from other countries/areas. The five most common countries/areas that cases were imported from in the last decade were Indonesia (176 cases), Thailand (140 cases), the Philippines (119 cases), India (50 cases) and Malaysia (49 cases).

Local cases have been recorded in 2010 (4 cases), 2014 (3 cases), 2015 (3 cases) and 2016 (4 cases). Seasonality of onset of local cases was observed with a peak in September (Figure 1). The four local cases in 2016 were recorded in August (2 cases) and September (2 cases). The first three cases lived in Central/Mid-Levels, while the fourth case lived in Wong Tai Sin. Laboratory investigation showed that the first three cases were caused by dengue virus serotype 3. Genetic characterisation of the virus from the three cases supported their epidemiological relationship. The fourth case was caused by dengue virus serotype 1. In 2017, as of April 12, 18 cases have been confirmed, all of which were imported (Figure 2).

Chikungunya fever

CF is caused by the chikungunya virus being transmitted to humans through Aedes mosquito bites. The disease is characterised by fever frequently accompanied by joint pain. Other common signs and symptoms include muscle pain, headache, nausea, fatigue and rash. The joint pain is often very debilitating which usually lasts for a few days but may be prolonged for weeks. Most patients recover fully, but in some cases joint pain may persist for several months, or even years. CF occurs in Africa, Asia and the Indian subcontinent. In recent decades mosquito vectors of chikungunya have spread to Europe and the Americas.

CF was made notifiable in Hong Kong since March 6, 2009. From 2009 to 2016, there were 19 CF cases recorded by CHP and the annual number of cases ranged between zero and eight, all of which were imported cases. Cases were imported from India (8 cases), Indonesia (6 cases), the Philippines (2 cases), multiple countries (2 cases) and Singapore (1 case). In 2017, as of April 12, no CF cases have been recorded (Figure 3).

Zika Virus Infection

ZVI and its association with adverse pregnancy outcome (microcephaly) and neurological and autoimmune complications such as Guillain-Barré syndrome remain a significant enduring public health challenge requiring intense action. Globally, Zika virus continues to spread geographically to areas where competent vectors are present. The World Health Organization revised its classification scheme of countries and areas affected by ZVI on March 10, 2017. Under the new classification scheme, a total of 148 countries and areas were involved and classified according to the presence of and potential for vector-borne Zika virus transmission.

Locally, CHP recorded two imported cases of ZVI so far, in August and November, 2016. The first patient had travelled to Saint Barthelemy in the Caribbean while the second patient had travelled to multiple countries including Antigua and Barbuda, St Maarten and Anguilla. As long as there is international travel, there is always risk of importation of Zika virus to Hong Kong. Aedes albopictus, the vector that can transmit DF and CF, can also transmit Zika virus. As this vector is present locally and asymptomatic infection is very common, there is also risk of local spread in case ZVI is imported to Hong Kong.

Malaria

Malaria is caused by a group of Plasmodium parasites transmitted by infected Anopheles mosquitoes. It is commonly found in many parts of tropical and sub-tropical areas where the climate is warm, for example, Africa, Southeast Asia and South America. Symptoms of malaria include intermittent fever, chills, sweating, headache, tiredness, nausea, vomiting and muscle pain. If the disease is not treated promptly, it may lead to complications including anaemia, liver and kidney failure, seizures, mental confusion, coma, and even death.
In the past decade (2007-2016), CHP recorded a total of 271 cases, with the annual number of cases ranging between 20 and 41. All cases, except one unclassified case, were imported. The five most common countries/areas that cases were imported from in 2007 to 2016 were India (95 cases), Pakistan (28 cases), Nigeria (26 cases), Ghana (13 cases) and Indonesia (9 cases). In 2017, as of April 12, five imported cases have been recorded (Figure 4).

Japanese encephalitis
The JE virus is transmitted by Culex mosquitoes that lay eggs in large water bodies. Pigs and wading birds act as principal amplifying hosts and reservoir hosts respectively. Since humans seldom develop enough viremia to infect feeding mosquitoes, they are considered a dead-end host. Only one in approximately 250 infections results in severe disease characterised by rapid onset of high fever, headache, neck stiffness, disorientation, coma, seizures, spastic paralysis and death. Among clinical cases, the case-fatality rate is estimated to be around 20% to 30%. About 30% of survivors have serious residual neurologic, psychological, intellectual and/or physical disabilities. The disease occurs mainly in the rural and agricultural areas of Asia and the Western Pacific Region.

JE has been a notifiable disease since July 16, 2004. In the past decade (2007-2016), CHP recorded a total of 21 cases, with the annual number of cases ranging between zero and six. Eleven (52%) of these were imported cases, mainly from mainland China (8 cases). Eight (38%) cases were infected locally, and for two cases (10%) the place of origin of infection were unclassified. All of the above local cases had symptoms onset between June and July. In 2017, as of April 12, no cases have been recorded (Figure 5).

General measures on preventing mosquito-borne diseases
The most important measures in the prevention of mosquito-borne diseases are preventing mosquito proliferation and adopting measures to protect persons from mosquito bites. Members of the public should stay vigilant and take necessary preventive measures against mosquito-borne diseases, whether in Hong Kong or travelling abroad. Preventive measures include wearing loose, light-coloured long-sleeved tops and trousers, and using DEET-containing insect repellents on exposed parts of the body and clothing, especially when taking part in outdoor activities.

Chemoprophylaxis for malaria
Protection against mosquito bites and chemoprophylaxis remain the mainstay of prevention of malaria. Anti-malarial drugs may be needed if travelling to endemic area. The prescription of anti-malarial drugs depends on various factors including the itinerary, time of travel, types of activity and past medical history of the travellers. The drugs need to be started before the trip, and continued throughout the trip until one to four weeks after leaving the endemic area, according to the instruction of the doctor.

Vaccination against JE
JE vaccination is recommended for travellers who plan to stay one month or longer in endemic areas during the JE transmission season, and for short-term (less than one month) travellers if they plan to have significant extensive outdoor or night-time exposure in rural areas during the transmission season. JE vaccination is not recommended for the general public.

Travel health advice
Travellers planning to travel to high risk areas should arrange a travel health consultation with doctors at Travel Health Service or private clinics at least six weeks before the trip for advices including bite prevention measures, the need for any vaccinations and anti-malarial prophylaxis etc. Travellers who return from dengue fever affected areas should apply insect repellent for 14 days and those who return from Zika affected areas should apply insect repellent for at least 21 days upon arrival in Hong Kong. If feeling unwell such as having fever, travellers should seek medical advice promptly and provide travel details to their doctors.

Further details of mosquito-borne diseases and anti-mosquito measures can be found at the following websites:
- Tips for using insect repellents on the CHP website (http://www.chp.gov.hk/en/view_content/38927.html);
- The page on ZVI, DF, CF, malaria and JE on DH’s Travel Health Service (http://www.travelhealth.gov.hk).

References
Two linked local cases of spotted fever

The Centre for Health Protection (CHP) recorded two epidemiologically linked cases of spotted fever in the past month, affecting two persons from the same household. The first case was a 54-year-old man with good past health. He presented with fever, headache, rash and an ulcer on his left leg since February 24. He was admitted to a public hospital on March 5. The second case was a 54-year-old woman with good past health. She presented with fever and rash since March 10. She was admitted to a public hospital on March 17. Both patients were stable and were discharged after treatment.

Serology tests confirmed both patients had spotted fever. They had no recent travel history during the incubation period. Other home contacts were asymptomatic. The Food and Environmental Hygiene Department has conducted vector surveys on the areas visited by the cases during the incubation period and has carried out necessary control measures. Investigations are on-going.

A local confirmed case of tetanus

On March 30, 2017, CHP recorded a local confirmed case of tetanus affecting a 55-year-old lady with underlying illness. She presented with mild facial asymmetry since March 20 and developed trismus since March 22. She subsequently also developed dysphagia, neck stiffness and chest wall pain. She attended the Accident and Emergency Department of a public hospital and was admitted to medical ward on the same day. Upon admission, she also had spasticity over four limbs, autonomic disturbance and opisthotonus. On March 27, her condition deteriorated. She required intubation and she was transferred to the Intensive Care Unit. The clinical diagnosis was tetanus. The patient was given intravenous antibiotics, tetanus toxoid and immunoglobulin. Her condition was critical.

Epidemiological investigation revealed that the patient was a regular leisure farmer. She had bilateral nasal polyps with functional endoscopic sinus surgery performed on March 3. After the surgery, she continued to work in the farm nearly every day. Apart from the nasal surgery, she reported no other wounds. She had no travel history during incubation period. Vaccination history against tetanus was uncertain. Her household contact remained asymptomatic.

Three sporadic cases of psittacosis

In late March to early April 2017, CHP recorded three cases of psittacosis. The first case was a 60-year-old female with unremarkable past health. She presented with fever and productive cough since March 19 and was admitted to a public hospital on March 24 and chest X-ray showed bilateral lower zone haziness. The clinical diagnosis was pneumonia. Her condition deteriorated requiring management in the intensive care unit. Her condition improved upon treatment with antibiotics and she was transferred back to general ward on March 28. Her nasopharyngeal aspirate (NPA) collected on March 25 was tested positive for Chlamydia psittaci DNA. Her current condition was stable. She had no recent travel history. She did not report any contact history with birds or their excreta during the incubation period.

The second case was a 34-year-old female with unremarkable past health. She presented with persistent fever, chills and cough since March 22 and later developed headache, myalgia and shortness of breath. She was admitted to a public hospital on March 30 with chest X-ray showing right lower zone haziness. The clinical diagnosis was pneumonia. She was treated with antibiotics. She remained stable and was discharged home on April 3. Her sputum collected on March 31 was tested positive for Chlamydia psittaci DNA. She had travelled to Taipei with friends on March 12 to 15 and visited a bird street on March 13. She denied direct contact with birds or their excreta there and elsewhere in Hong Kong during the incubation period. Her travel collaterals remained asymptomatic.

The third case was a 66-year-old male with underlying illnesses. He presented with fever, cough and malaise since March 19 and was admitted to a public hospital on April 2. Chest X-ray showed right lower lobe consolidation and the clinical diagnosis was pneumonia. His NPA collected on April 3 was tested positive for Chlamydia psittaci DNA. He was treated with antibiotics and his condition remained stable. He had no recent travel history and did not report any contact history with birds or their excreta during the incubation period.

The three cases were not epidemiologically linked. Their home contacts were asymptomatic. Investigations are on-going.

A sporadic case of Listeriosis infection

On April 3, 2017, CHP recorded a case of listeriosis infection affecting a 59-year-old man who had underlying illness. He presented with fever and vomiting since March 29 and was admitted to a public hospital on March 30. His condition deteriorated and was transferred to intensive care unit for further management on the same day. His blood and cerebrospinal fluid specimens collected on March 30 grew Listeria monocytogenes. His clinical diagnosis was meningitis and sepsis; and he was treated with antibiotics. He had no recent history of travel and his food history was unknown. He lived with his family; they were asymptomatic.

A sporadic case of Streptococcus suis infection

On April 5, 2017, CHP recorded a case of Streptococcus suis infection affecting a 65-year-old woman who was immunocompromised with multiple medical morbidities. She presented with fever and right lower limb swelling since March 30 and was admitted to a public hospital on March 31. Her blood sample collected on March 31 grew Streptococcus suis. Her clinical diagnosis was sepsis and she was treated with antibiotic. She remained in stable condition and was discharged on April 8. She reported no wounds and she denied any history of handling raw pork or contact with pigs. She lived with her husband. He was asymptomatic.