Communicable Diseases Watch

Communicable Diseases Watch (CDW) is an online bi-weekly on communicable diseases published by the Centre for Health Protection (CHP). The publication aims at providing healthcare professionals with up-to-date infectious disease news and knowledge relevant to Hong Kong. It is also an indication of CHP's commitment to responsive risk communication in addressing the growing community interest on infectious diseases.

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Please send enquiries to
cdssinfo@dh.gov.hk

Content Highlights

- Feature articles
- News
- Journal publication highlights

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Content

Author Index

Jan 1 - Jan 14, 2017 WEEKS 1 - 2 VOL 14 ISSUE Nº 1

Communicable Diseases WATCH

衛生防護中心 Centre for Health Protection 衛生署 Department of Health

FEATURE IN FOCUS

Update on situation of avian influenza A(H7N9)

Reported by Dr Albert AU, Senior Medical and Health Officer, and Dr Francis WONG, Medical and Health Officer, Respiratory Disease Office, Surveillance and Epidemiology Branch, CHP.

The activity of avian influenza A(H7N9) viruses has been increasing markedly since the end of 2016, indicating the start of a new wave of human infection this winter. There has been large increase in reports of human infections with avian influenza A(H7N9) in various parts of Mainland China recently. We reviewed the latest situation of H7N9 in this article.

Epidemiological situation

Human infections

The first two human H7N9 cases in the current wave reported by the National Health and Family Planning Commission (NHFPC) occurred in October 2016. The number of cases has been increasing markedly since November. The NHFPC has reported that six and 106 cases were detected in Mainland China in November and December 2016 respectively. This wave has been progressing much faster than that in the previous winter. In the fourth wave which occurred between late 2015 and mid-2016, only six cases were reported in the first three months since the first report in September 2015, as compared with 114 cases in the first three months in this wave.

Since October 2016, 143 human H7N9 cases have been reported by health authorities in 11 provinces/municipalities in the Mainland* (Figure 1), including 57 cases in Jiangsu (江蘇), 26 cases in Guangdong (廣東), 22 cases in Zhejiang (浙江), 14 cases in Anhui (安徽), 7 cases in Jiangxi (江西), 4 cases each in Hunan (湖南) and Shanghai (上海), 3 cases each in Fujian (福建) and Guizhou (貴州), 2 cases in Shandong (山東), and one case in Hubei (湖北). The reported cases in Guangdong occurred in various areas including Dongguan (東莞), Foshan (佛山), Guangzhou (廣州), Jiangmen (江門), Jieyang (揭陽), Meizhou (梅州), Qingyuan (清遠), Shenzhen (深圳), Zhaoqing (肇慶) and Zhongshan (中山). Among these 143 cases, their ages ranging from 23 to 91 (median=54). The male-to-female ratio was about 2:1. Most cases presented with severe conditions.

Figure 1 - Provinces/municipalities in Mainland China with human H7N9 cases reported since October 2016.

According to the information from the NHFPC, among the 114 cases detected from October to December 2016, at least 85 (75%) were known to have exposure to poultry or poultry markets before onset of symptoms while the sources of infection of most of the remaining cases were reported to be under investigation.

In Hong Kong, at time of writing four imported human H7N9 cases have been confirmed since December 2016. In comparison, 0, 10, three and three cases had been reported in the first, second, third and fourth wave respectively. All the four cases were imported from different areas in Guangdong. Three cases involved adult patients and the remaining case was a paediatric patient.

All the three adult cases had multiple pre-existing chronic diseases and presented with severe illnesses. Two of them passed away while the remaining case was in stable condition. The first case was a 75-year-old man who had history of chronic obstructive airway disease (COAD) and secondary polycythemia. He travelled to Dongguan before onset, and had visited a wet market and bought a slaughtered chicken there. He initially presented with chest discomfort, on and off cough with sputum, shortness of breath and runny nose on December 8. His condition deteriorated and he died on December 25.

The second case involved a 70-year-old man who had history of carcinoma of bladder, stroke and hyperlipidaemia. He had travelled to Zhongshan before onset. There were live poultry stalls and mobile stalls selling live poultry near his residence in Zhongshan. He developed fever, cough with sputum, shortness of breath, vomiting and diarrhoea before December 26 and was admitted to a public hospital on December 28 for management of pneumonia. His condition has been improving gradually after treatment.

*Some of the cases occurring in January 2017 have not been reported yet and hence not included.

The third case was 62-year-old male patient with history of hypertension, diabetes, hyperlipidemia, chronic heart failure, peptic ulcer and COAD. He travelled to Guangzhou before onset. It remained unknown whether he had history of contact with poultry while he was in Guangzhou. He developed fever, cough and shortness of breath on January 1 and returned to Hong Kong on January 3. He was admitted to a public hospital for treatment of pneumonia and heart failure on January 4. His condition deteriorated and he passed away on January 6.

The fourth case affected a 10-year-old boy who presented with mild influenza-like illness. He travelled to Foshan before onset and had visited a residence of his relatives in Foshan where there were live chickens. His condition remained stable all along and he had recovered. So far, tracing of the contacts and travel collaterals of the four imported cases did not identify any secondary cases.

Apart from Mainland China and Hong Kong, two human H7N9 cases have been detected in Macau since December 2016. The first case was reported on December 14, 2016, which was the first time human H7N9 case was detected in Macau. The case involved a 58-year-old poultry wholesaler who had contact with silky fowls with samples tested positive for avian influenza A(H7N9). He was asymptomatic but his respiratory specimen was tested positive for influenza A(H7N9) by PCR. The second case in Macau was an imported case from Zhongshan.

Since the emergence of human H7N9 infections in Mainland China in March 2013, at least 947 human H7N9 cases have cumulatively been reported globally. In the previous four waves, the majority of cases occurred between December and April (Figure 2). Apart from an asymptomatic case with exposure to infected poultry in Macau, all the remaining cases occurred in Mainland China with 28 cases exported to other areas outside Mainland China. The case fatality rate was about 40%. In Mainland China, the provinces with the greatest number of reported cases included Zhejiang (25%), Guangdong (23%) and Jiangsu (17%). In Hong Kong, since the detection of the first imported case in December 2013, 20 human H7N9 cases (including seven deaths) have been confirmed so far. Among them, 19 were imported from Guangdong and one was imported from Jiangsu.

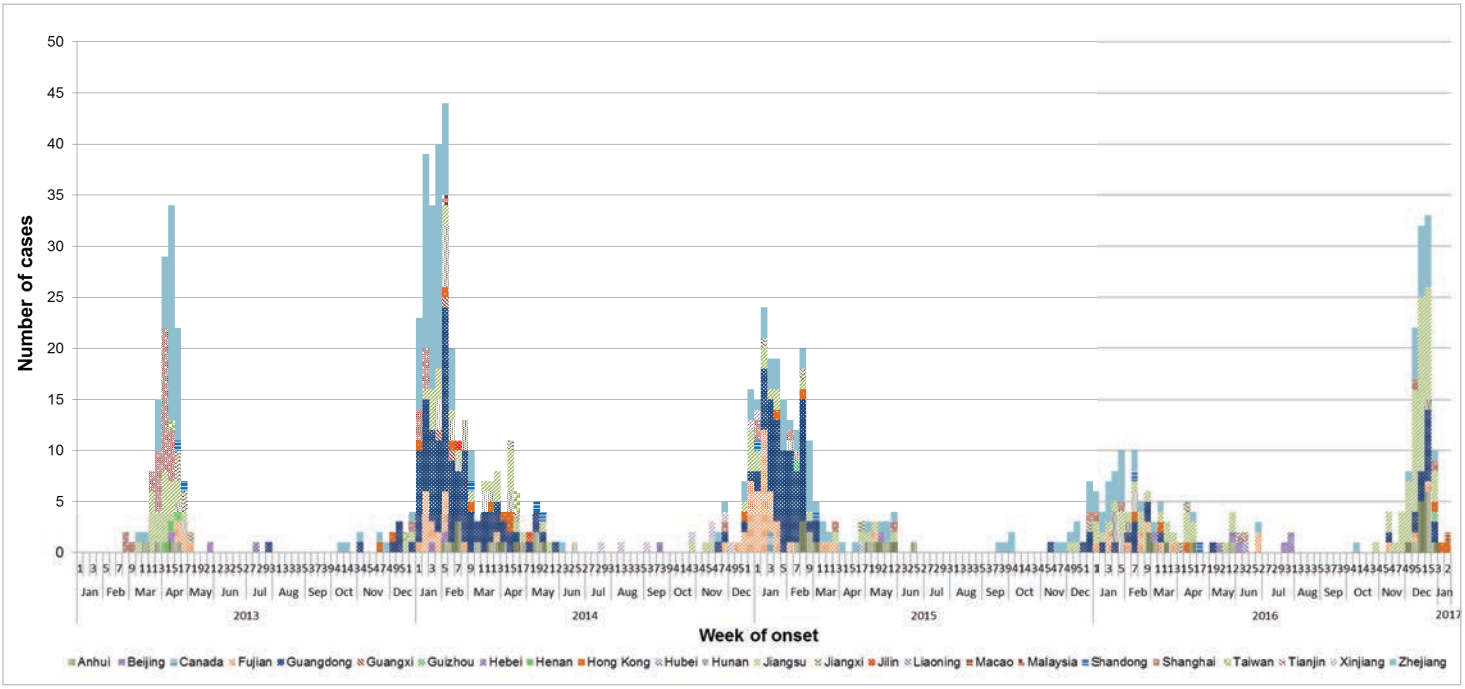

Figure 2 - Weekly number of human H7N9 cases by onset date, 2013-2017.

Poultry and environment

H7N9 has already become enzootic in poultry in Mainland China. Since 2015, under the national animal avian influenza H7N9 monitoring program of the Ministry of Agriculture, poultry and environmental samples taken from markets in Anhui, Fujian, Guangdong, Hubei, Hunan, Jiangsu, Jiangxi, Jilin (吉林), Shanghai and Zhejiang were tested positive for H7N9 virus by virological tests[1]. Of note, samples taken in Anhui, Guangdong and Zhejiang in December 2016 were tested positive for H7N9. The Health and Family Planning Commission of Guangdong Province reported that 60 out of 637 environmental samples collected from 21 live poultry markets in 15 cities in Guangdong in the first week of January 2017 were tested positive for H7 virus, with a positive rate of 9.4%[2]. In Jiangsu, the Provincial Health and Family Planning Commission reported that 15.8% of the environmental samples collected from live poultry markets in December 2016 were tested positive for H7[3].

According to reports received by the Food and Agriculture Organization on surveillance activities for H7N9 viruses in Mainland China, positive samples continue to be detected mainly from live bird markets, vendors and some commercial or breeding farms[4].

In Macau, samples taken from a consignment of silky fowls in a wholesale poultry market were tested positive for A(H7N9) on December 13, 2016. The affected silky fowls were imported from Mainland China.

Public health risk assessment

According to the World Health Organization, most human cases were exposed to avian influenza viruses through contact with infected poultry or contaminated environments, including live poultry markets. Since the viruses continue to be detected in animals and environments, further human cases are expected to occur from time to time. Locally, since the H7N9 virus continues to be

detected in poultry and environments in Mainland China especially Guangdong, further human cases are expected in affected and possibly neighbouring areas. In the past few years, most human H7N9 cases in the Hong Kong were detected in the first quarter of a year and were imported from Guangdong. In view of the heavy trade and travel between Mainland China and Hong Kong, further sporadic human cases and affected poultry imported to Hong Kong every now and then are expected, especially in the coming few months.

Even though small clusters of human H7N9 infections have been reported previously including those involving healthcare workers, current epidemiological and virological evidence suggests that H7N9 viruses have not acquired the ability of sustained transmission among humans, thus the likelihood of human-to-human transmission of avian influenza viruses is low. With oseltamivir prophylaxis and medical surveillance of the close contacts of any confirmed cases, the risk of secondary spread from cases imported into Hong Kong is considered to be low at the present moment provided that the avian influenza viruses still have not acquired the ability of efficient human-to-human transmission.

Important points to note

There is a likely risk that environments with live poultry in Mainland China are contaminated with avian influenza viruses. People travelling to the Mainland or other affected areas must avoid visiting wet markets, poultry markets or farms during travel. They should be alert to the presence of backyard poultry when visiting relatives and friends. They should also avoid purchase of live or freshly slaughtered poultry, avoid touching poultry/birds or their droppings. They should strictly observe personal and hand hygiene when visiting any places with the presence of live poultry. Adults and parents should look after children with extra care regarding personal, hand, food and environmental hygiene against infections during travel.

Travellers returning from affected areas should consult doctors promptly if symptoms develop, and actively inform the doctors of their travel history for prompt diagnosis and treatment. It is essential to tell the doctor if they have ever seen any live poultry during their travel, which may imply possible exposure to contaminated environments. This will enable doctors to assess the possibility of avian influenza infection and arrange necessary investigations and appropriate treatment in a timely manner.

Healthcare professionals are also reminded to seek travel and exposure history from returning travellers who present with fever, influenza-like illness or chest infection. If patients report seeing any live poultry during their travel in the Mainland, detailed information on possible exposure to environments contaminated by poultry should be solicited from them. Suspected cases fulfilling the reporting criteria should be reported to the Centre for Health Protection (CHP) for further investigation.

For updates on the latest situation of avian influenza, please refer to the designated website of the CHP (English: http://www.chp.gov.hk/en/view_content/24244.html; Chinese: http://www.chp.gov.hk/tc/view_content/24244.html).

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[2]Health and Family Planning Commission of Guangdong Province. http://www.gdwst.gov.cn/a/zwxw/20170111717051.html.
[3]Jiangsu Provincial Commission of Health and Family Planning. http://www.jswst.gov.cn/wsxx/nrgIIndex.action?catalogID=4028816b2ba99317012ba99950740003&type=2&messageID=ff80808159433fad015981a71c580427.
[4]Food and Agriculture Organization of the United Nations. http://www.fao.org/ag/againfo/programmes/en/empres/H7N9/situation_update.html.

Review of Legionnaires' Disease (LD) in 2016

Reported by Dr Francis WONG, Medical and Health Officer, Respiratory Disease Office, Surveillance and Epidemiology Branch, CHP.

Legionnaires' Disease (LD) is a type of bacterial pneumonia caused by legionella, most commonly *Legionella pneumophila* serogroup 1 (Lp1). Legionellae are ubiquitous in aqueous environments including fresh water environment as well as man-made water systems such as potable water supplies systems.

Since 2016, the Centre for Health Protection (CHP) of the Department of Health has adopted a revised risk-based strategy for environmental investigation and sampling for LD cases according to recommendations by CHP's Scientific Committee on Emerging and Zoonotic Diseases after reviewing the local epidemiology as well as prevention and control practices overseas. This article gave a review of the LD cases reported to CHP in the first year of implementation of the revised strategy.

Epidemiology of LD cases in 2016

CHP recorded a total of 75 LD cases in 2016 with an incidence rate of 1.02 per 100 000 population (Figure 1). There were 66 and 41 LD cases reported to CHP in 2015 and 2014 respectively. In comparison, the incidence rates of LD or legionellosis in 2014/2015 ranged from 0.57 to 1.89 per 100 000 population in overseas or neighbouring countries/areas including Australia, Canada, Europe, Japan, Taiwan, the United Kingdom and the United States.

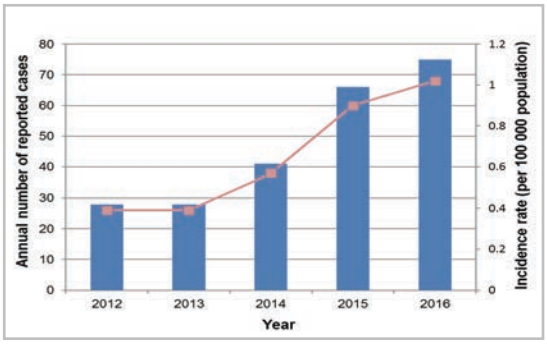

Figure 1 - Annual number and incidence rate of reported LD cases in Hong Kong, 2012-2016.

Among the 75 LD cases recorded in 2016, 74 were Chinese and one was an Indian man. Their ages ranged between 44 and 87 years (median=66 years). Males were predominately affected with a male-to-female ratio of 5.8:1.

The main presenting symptoms included fever (89.3%), cough (81.3%), shortness of breath (46.7%), chills/rigors (21.3%) and malaise (21.3%). All cases developed pneumonia requiring hospitalisation. Twenty-eight cases (37.3%)

required intensive care. Seven cases died within the same admission for LD (three cases were due to LD and the other four due to other concomitant diseases).

Regarding the positive test leading to the initial diagnosis of LD, 51 (68%) and 21 (28%) cases were initially diagnosed by urinary antigen test (UAT) and polymerase chain reaction (PCR) of respiratory specimens respectively, while only three cases (4%) were initially diagnosed by paired serology.

Sixty-five cases (86.7%) and six cases (8.0%) were classified as locally acquired and imported infections respectively, while the place of infection of the remaining four cases (5.3%) could not be determined because the patients had stayed both inside and outside Hong Kong during their incubation periods. The 65 locally acquired cases resided in various districts in Hong Kong (Figure 2). All the 75 cases were sporadic cases and epidemiological investigations did not reveal any outbreaks so far. Of note, two local cases were definite nosocomial cases while the remaining cases were community-acquired cases.

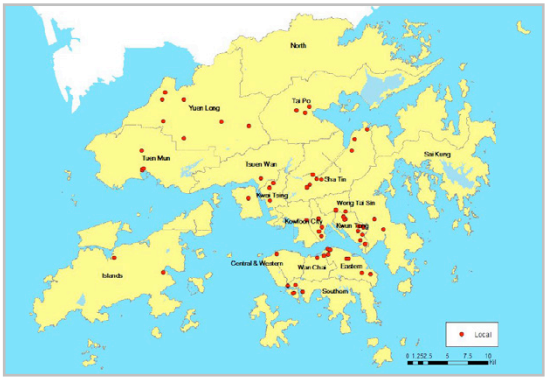

Figure 2 - Geographic distribution of the residential places of the 65 locally-acquired LD cases. (Source: Communicable Disease Information System.)

LD cases with environmental investigations undertaken and environmental samples collected

According to CHP's updated investigation strategy, environmental investigations were undertaken and environmental samples were collected for two nosocomial case and seven community-acquired cases. The details of the nine cases are as follows:

Two nosocomial cases

The first nosocomial case involved a patient with underlying medical conditions who was hospitalised in a private hospital during the whole incubation period. In the initial investigation, a total of eight water samples and two environmental swabs were collected from the ward where the patient had stayed before onset. Three water samples were tested positive for *Legionella* species ranging from 0.5-39.5 colony forming units per millilitre (cfu/ml) and one environmental swab was also cultured positive for non-pneumophila *Legionella*. Disinfection of the relevant water systems by superheat and flush was performed by the concerned hospital. Post-disinfection water samples were below the action level (i.e. 1 cfu/ml). Sequence-based typing found that *Legionella* bacteria from a tracheal aspirate specimen of the patient was closely related to those isolated from the three water samples.

The second nosocomial case involved a patient with underlying medical conditions who was hospitalised a public hospital during the whole incubation period. In the initial investigation, a total of 11 water samples and five environmental swabs were collected from the ward where the patient had stayed. Ten water samples were tested positive for *Legionella* species ranging from 3.0–72.4 cfu/ml and all the five environmental swabs were also cultured positive for *Legionella pneumophila*. Chemical disinfection of the relevant water tanks and water pipe systems was performed and all post-disinfection water samples were below the action level (i.e. 1 cfu/ml). No positive respiratory specimen was available from the patient for matching and the source of infection could not be established.

Three cases with exposure to high risk sources

Two patients reported use of respiratory equipment for pre-existing medical conditions during the incubation period. Water samples and swabs were collected from the concerned continuous positive airway pressure machine in one case, and swabs were collected from the concerned bi-level positive airway pressure machine in the other case. All specimens were tested negative for *Legionella* species.

One patient reported receiving dental treatment in a private dental clinic during the incubation period. Water samples were collected from the cup filler of the dental unit waterline and the probes of a scaler machine in the concerned dental clinic. The samples collected from the cup filler and one of the probes were both tested positive for *Legionella pneumophila* serogroup 2-14 at 0.3 cfu/ml while Lp1 DNA was detected in the patient's sputum. Disinfection of the dental unit waterline was carried out and post-disinfection water samples were below the action level (i.e. 0.1 cfu/ml). As *Legionella pneumophila* detected from the environmental samples and that from the patient's sputum were of different serogroups, the source of infection was unlikely to be related to the dental equipment.

Four cases with onset within six months and common exposure to the same potential sources during the incubation period

Two patients lived in the same housing estate in Sha Tin but in different blocks. The first patient had onset in February 2016 while the second patient had onset in May 2016. Epidemiological investigations revealed that there were fresh water cooling towers (FWCTs) in the estate. Water samples were taken from 10 FWCTs identified. Water samples from four of the FWCTs had Lp1 detected at levels ≥10 cfu/ml (range: 10–2 800 cfu/ml). Nuisance notice and advisory notice were issued by the Electrical and Mechanical Services Department to the owners of the concerned premises for decontamination and disinfection. Molecular studies showed that the isolate from the respiratory specimen of one patient and the isolates from the water samples were of different types and hence the source of infection of this patient was not related to the FWCTs. No positive respiratory specimen was available from the other case for matching and the source of infection could not be established.

Another two patients lived in the same building of a housing estate in Kwun Tong. The first patient had onset in November 2016 while the second patient had onset in December 2016. A water sample was taken from the water tank of the building where the two cases resided and was tested negative for *Legionella* species.

In summary, the number of LD cases recorded in 2016 was higher than that in 2015. The characteristics of the cases were similar to those recorded in previous years. Epidemiological investigations did not reveal any outbreaks. Environmental investigations

possibly related to increasing use of more sensitive laboratory diagnostic tests such as UAT and PCR in hospitals for detection of LD cases. The number of UAT and PCR performed by laboratories under the Hospital Authority had increased steadily from about 2 000 in 2010 to about 6 800 in 2015, and from about 140 in 2010 to about 1 700 in 2015 respectively. The increasing trend of LD or legionellois has also been observed in overseas countries in the past decade.

Persons with weakened immunity are at higher risk of having LD. It is very important for them to strictly observe the following health advice to prevent LD:

- Use sterile or boiled water for drinking, tooth brushing and mouth rinsing;
- Avoid using humidifiers, or other mist- or aerosol-generating devices. A shower may also generate small aerosols; and
- If using humidifiers, or other mist- or aerosol-generating devices, fill the water tank with only sterile or cooled freshly boiled water, and not water directly from the tap. In addition, clean and maintain humidifiers/devices regularly according to manufacturers' instructions. Never leave stagnant water in a humidifier/device. Empty the water tank, wipe all surfaces dry, and change the water daily.

NEWS IN BRIEF

Ad Hoc Clinical Infection & Public Health Forum: Avian Influenza A(H7N9) Infection: An Update

With the increased activity of avian influenza in the neighboring areas since the end of 2016, increasing numbers of human H7N9 cases have been reported in various areas in Mainland China including Guangdong. As of January 11, 2017, four imported cases have been confirmed in Hong Kong since December 2016. In view of rapid increase of cases this winter, a "Ad Hoc Clinical Infection & Public Health Forum: Avian Influenza A(H7N9) Infection: An Update" was conducted on January 11, 2017. A total of 179 participants had been enlightened on the presentation of epidemiological findings and clinical courses of the recent cases. There were also fruitful sharing of experience by doctors of different streams from public health officers to clinical physicians. Early identification of the cases via alertness on travel history and relevant exposure history during travel and early isolation are the mainstay of preventing transmission. All the information has been uploaded onto the training portal of Infectious Disease Control Training Centre (IDCTC) at http://icidportal.ha.org.hk/sites/en/Lists/Training Calendar/DispForm.aspx?ID=121.

Photo - Fruitful sharing of experiences between different streams of healthcare professionals.

CA-MRSA cases in December 2016

In December 2016, the Centre for Health Protection (CHP) recorded a total of 71 cases of community-associated methicillin resistant *Staphylococcus aureus* (CA-MRSA) infection, affecting 43 males and 28 females with ages ranging from eight months to 90 years (median=38 years). Among them, there were 49 Chinese, 9 Filipinos, 7 Caucasian, 3 Nepalese, 1 Indonesian, 1 mixed, and 1 Pakistani. Isolates of all the 71 cases exhibited the Panton-Valentine Leukocidin gene and were tested positive for either Staphylococcal Cassette Chromosome *mec* (SCC*mec*) type IV (44) or V (27).

Sixty-nine cases presented with uncomplicated skin and soft tissue infections while the remaining two cases had invasive CA-MRSA infections. The first case was a 65-year-old man who presented with cough with sputum and shortness of breath since November 22, 2016. He developed dizziness and loss of consciousness on November 23 and was admitted to intensive care unit of a public hospital. His chest x-ray showed right upper zone consolidation. His tracheal aspirate collected on November 23 was cultured positive for CA-MRSA. He was diagnosed to have pneumonia and treated with antibiotics. He required extracorporeal membrane oxygen therapy and weaned off subsequently. His current condition remained serious. The second case was a recurrent case affecting a 35-year-old man. He had history of CA-MRSA infection with right nostril abscess in August 2016. This time, he presented with fever, boils over chin and upper lip swelling since December 8, 2016. He was admitted to a public hospital on December 12 and was diagnosed to have facial abscess and sepsis. His blood samples collected on December 12 and 14 were cultured positive for CA-MRSA. He was treated with antibiotics and discharged on December 22. The close contacts of both cases were asymptomatic, and screening and decolonisation would be provided to them.

Besides, three household clusters, with each affecting two to three persons, were identified. Screening and decolonisation would be carried out for their close contacts. No cases involving healthcare worker were reported in December.

Scarlet fever update (December 1, 2016 – December 31, 2016)

Scarlet fever activity in December increased as compared with that in November. CHP recorded 224 cases of scarlet fever in December as compared with 182 cases in November. It included 118 males and 106 females aged between 21 months and 40 years (median=six years). There were five institutional clusters involving three kindergartens and two primary schools, affecting a total of 11 children. No fatal cases were reported during this reporting period.

A total of 1 468 cases have been recorded in 2016 (as of December 31, 2016), as compared with 1 210 cases in 2015.

Jan 15 - Jan 28, 2017 WEEKS 3 - 4 VOL 14 ISSUE N⁰ 2

Communicable Diseases WATCH

衞生防護中心 Centre for Health Protection 衞生署 Department of Health

FEATURE IN FOCUS

A review of hand, foot and mouth disease (HFMD) in Hong Kong

Reported by Dr KONG Wai-chi, Scientific Officer, Enteric and Vector-borne Disease Office, Surveillance and Epidemiology Branch, CHP.

Hand, foot and mouth disease (HFMD) occurs throughout the year but the disease activity usually peaks from May to July in Hong Kong. From 2012 to 2014, a smaller peak also occurred from October to December. In 2015, the summer peak season of HFMD lasted longer than usual. The HFMD activity remained at high level since the summer peak in 2015, only started to decline in January 2016 and returned to baseline in March 2016. This article described the epidemiology of HFMD in 2016 and 2017.

In the 2016 summer peak, the HFMD activity started to increase since May, peaked in July and declined to a stable level in early September. However, the HFMD activity increased again in late September and remained at high level in 2016. The HFMD activity started to decrease in early January 2017 and has returned to baseline level in late January (Figures 1 to 3).

The Centre for Health Protection of the Department of Health recorded a total of 691 and 874 HFMD/herpangina institutional outbreaks in 2015 and 2016 respectively. In 2016, an average of 73 HFMD/herpangina institutional outbreaks per month was recorded (range: 11 to 192). Among the 874 outbreaks, 528 (60.4%) occurred in child care centres/ kindergartens, 203 (23.2%) in primary schools and 111 (12.7%) in secondary schools. The remaining 32 (3.7%) outbreaks occurred in other institutions such as special schools, other residential institution/hostel, post-secondary institutions and university halls etc. The size of outbreaks ranged from two to 34 persons (median: four persons). One hundred and thirty one (15.0%) institutional outbreaks had positive causative agents identified. The confirmed outbreaks were associated with Coxsackievirus A6 (30.5%), followed by Coxsackievirus A4 (7.6%), Enterovirus 71 infection (EV71) (3.1%), Coxsackievirus A10 (2.3%), Coxsackievirus A16 (2.3%), Coxsackievirus A (unspecified) (2.3%), mixed agents (0.8%) and untyped enteroviruses (51.1%). As of January 31, a total of 15 HFMD/herpangina institutional outbreaks were recorded in 2017.

A total of 38 EV71 infections, affecting 22 (57.9%) males and 16 (42.1%) females, were recorded in 2016. The number was fewer than that in 2015 (56 cases). The patients' ages ranged from nine days to 34 years (median: 2.3 years). Thirty-one EV71 cases required hospitalisation with a median length of stay of three days (range: one to 18 days). Two cases developed severe complications (e.g. encephalitis and acute flaccid paralysis). As of January 31, 2017, a total of six EV71 cases were recorded in 2017 affecting three males (50%) and three females (50%). Their ages ranged from three to 12 years (median: 6.5 years). No fatal cases were recorded in 2016 and 2017 so far.

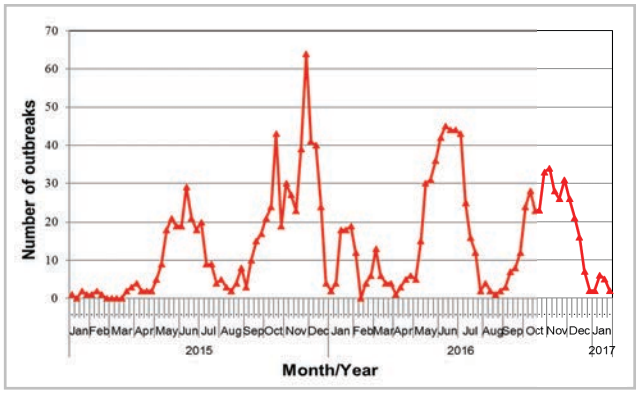

Figure 1 - Number of institutional HFMD/herpangina outbreaks recorded by CHP, 2015 to 2017 (as of January 31, 2017).

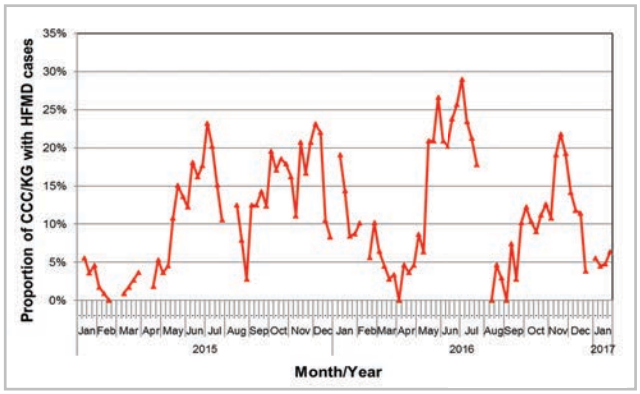

Figure 2 - Occurrence of HFMD in sentinel child care centres/ kindergartens (CCC/KG), under Sentinel Surveillance of Infectious Diseases, 2015 to 2017 (as of January 31, 2017). (Note: Broken line in the chart represented suspension of reports due to school holidays).

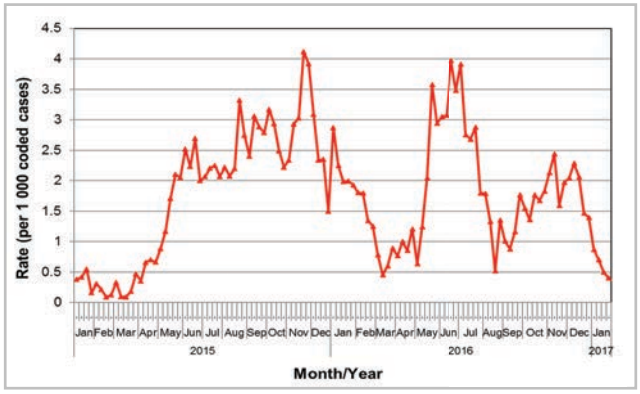

Figure 3 - Accident & Emergency Departments surveillance of HFMD syndrome, 2015 to 2017 (as of January 31, 2017).

There were eleven cases of severe paediatric enterovirus infections (SE) other than EV71 and poliovirus, affecting four males (36.4%) and seven (63.6%) females, in 2016. The number was greater than that recorded in 2015 (8 cases). The patients' ages ranged from eight days to 10 years (median: three months). All were inpatients with a median length of stay of eight days (range: four to 51 days). The complications of the SE cases were meningitis (6 cases), meningitis and myocarditis (2 cases), encephalitis (1 case), enterovirus infection of central nervous system and cerebellar ataxia (1 case) and meningoencephalitis (1 case). The laboratory results revealed that three cases were associated with coxsackieviruses with subtype of B1, B3 and A10 respectively while the laboratory results of the rest of the eight cases were enteroviruses other than EV71. No fatal cases were recorded in 2016 so far. As of January 31, no SE cases were recorded in 2017.

Currently, the HFMD activity has returned to baseline level, members of the public are reminded to continue to stay vigilant and observe good personal and environmental hygiene to prevent the disease.

Prevention of HFMD

Good hygiene practices are the mainstay of prevention:

- ☑ Maintain good personal hygiene;
- ☑ Wash hands with liquid soap and water especially:
  - before touching nose and mouth;
  - before eating or handling food;
  - after touching blister;
  - after using the toilet;
  - when hands are contaminated by respiratory secretions e.g. after coughing or sneezing; and
  - after changing diapers or handling soiled articles;
- ☑ Cover both the nose and mouth with a handkerchief or tissue paper when coughing or sneezing and discard the tissue paper into garbage bins with lids;
- ☑ Do not share towels and other personal items;
- ☑ Frequently clean and disinfect touched surface such as furniture, toys and commonly shared items with 1:99 diluted household bleach (mixing one part of 5.25% bleach with 99 parts of water), leave for 15 to 30 minutes, and then rinse with water and keep dry;
- ☑ Use absorbent disposable towels to wipe away obvious contaminants such as respiratory secretions, vomitus or excreta, and then disinfect the surface and neighbouring areas with 1:49 diluted household bleach (mixing one part of 5.25% bleach with 49 parts of water), leave for 15 to 30 minutes and then rinse with water and keep dry;
- ☑ Avoid group activities when HFMD outbreak occurs in the school or institution. Besides, minimise staff movement and arrange the same group of staff to take care of the same group of children as far as possible; and
- ☑ Avoid close contact (such as kissing, hugging) with infected persons.

Review of necrotising fasciitis associated with *vibrio vulnificus* infection

Reported by Dr KONG Wai-chi, Scientific Officer, Enteric and Vector-borne Disease Office, Surveillance and Epidemiology Branch, CHP.

Vibrio vulnificus (*V. vulnificus*) is a bacterium that normally lives in warm seawater. It may cause infection in those who have open wounds exposed to seawater or in those who eat seafood contaminated with the bacteria. Besides, consuming contaminated food with *V. vulnificus* may occasionally cause diarrhoea, vomiting and abdominal pain. *V. vulnificus* can also cause necrotising fasciitis which is a serious bacterial infection of the soft tissue and fascia. In this article, we reviewed the epidemiology of necrotising fasciitis associated with *V. vulnificus* infection (NFVV) recorded by the Centre for Health Protection (CHP) of the Department of Health (DH) from 2012 to 2016.

From 2012 to 2016, a total of 73 cases of NFVV were recorded. The annual number of cases ranged from eight to 18 (Figure 1). Over half of the NFVV cases (65.8%) were recorded in the summer months between June and September (Figure 2). As of January 31, no cases were recorded in 2017.

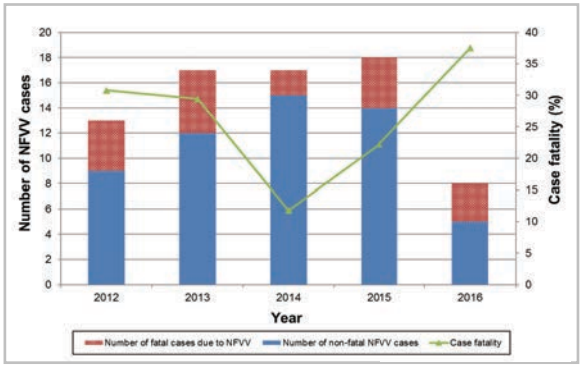

Figure 1 - Number of non-fatal NFVV cases, fatal cases due to NFVV and case fatality rates recorded by CHP, 2012 to 2016.

All 73 cases were adults with ages ranging from 37 to 102 years (median: 74 years). Forty-five (61.6%) males and 28 (38.4%) females were affected. Over half of the cases (68.5%) were 65 years of age or above. Sixty-two patients (84.9%) had pre-existing medical illnesses such as hypertension, diabetes mellitus, heart disease and chronic liver disease.

The patients commonly presented with swelling (84.9%), followed by pain (80.8%) and fever (64.4%). Lower limbs (63.0%) were more likely to be affected than upper limbs (35.6%). One case had both upper and lower limbs involved. All patients required hospitalisation. Fifty-eight cases (79.5%) required intensive care unit admission. Thirty-two patients (43.8%) required amputation. Fifty-two cases were discharged from hospitals with median length of stay of 40 days (range: 10 to 112 days). A total of 18 cases died from NFVV in the reporting period. The annual case fatality rate ranged from 11.8% to 37.5% (median: 29.4%) (Figure 1).

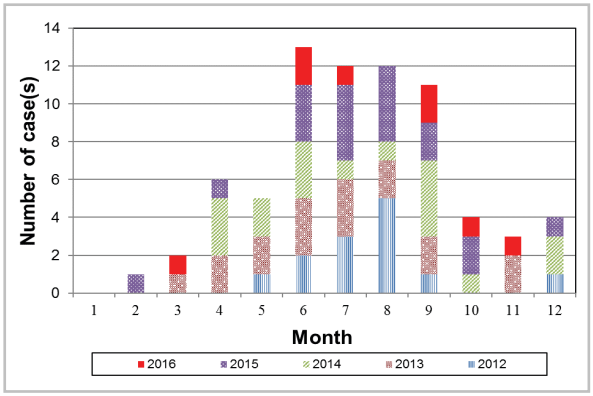

Figure 2 - Number of NFVV cases by month, 2012 to 2016.

Epidemiological investigation revealed that 38 cases (52.1%) recalled history of trauma before onset of symptoms. Among the 38 cases, 23 cases (60.5%) were injured by raw seafood. The most common seafood involved was fish (82.6%), followed by crab (8.7%) and prawn (8.7%).

V. vulnificus infection is not a notifiable infectious disease in Hong Kong. Nevertheless, doctors are encouraged to report these cases to CHP since November 2006. NFVV can cause serious illness associated with intensive care admission, amputation and high fatality. Doctors and members of the public are advised to maintain vigilance against the disease especially during summer months. Patients should promptly seek medical advice if relevant symptoms and signs of infection such as increasing redness, pain, swelling and pus develop.

Wound infection with *Vibrio vulnificus* (*V. vulnificus*) may result in necrotising fasciitis (commonly known as 'flesh-eating disease'). Necrotising fasciitis associated with *V. vulnificus* infection (NFVV) is a serious bacterial infection of the soft tissue and fascia (a sheath of tissue covering the muscle). It can lead to tissue destruction and can be fatal. Most cases of infection were reported during summer months. Clinical features of necrotising fasciitis may include intense pain, redness, swelling and rapidly developing tissue destruction. The skin changes can start at the site of injury as trivial as a small cut or bruise, while in other cases there is no obvious source of infection. The level of pain is out of proportion to the visible skin changes.

To prevent *V. vulnificus* infection, members of the public, particularly people with impaired immune response or underlying medical illnesses, are advised to adopt the following measures:

- Avoid having a wound coming in contact with seawater or raw seafood;
- Cleanse the wound thoroughly and cover it with waterproof dressing;
- Avoid skin contact with dirty water when visiting a wet market;
- Be careful with sharp parts of seafood, such as fish fins, shrimp heads and crabs to prevent cuts;
- Use appropriate protective devices (e.g. gloves) when handling raw seafood;
- Avoid eating raw oysters or shellfish;
- Cook seafood thoroughly; for shellfish (e.g. oysters, clams, mussels), cook until the shells open; and
- Avoid mixing ready-to-eat food and raw seafood.

NEWS IN BRIEF

A probable case of sporadic Creutzfeldt-Jakob disease

The Centre for Health Protection recorded a probable case of sporadic Creutzfeldt-Jakob disease (CJD) on January 18, 2017, affecting a 57 year-old man with good past health. He presented with progressive memory loss since June 2016. He was noted to have abnormal behaviour and suicidal ideation since early December and was admitted to a public hospital on December 10, 2016. Upon admission, he was found to have progressive dementia, muscle rigidity, myoclonus and visual hallucination. Findings of magnetic resonance imaging of the brain and electroencephalography were compatible with CJD. His condition was stable. No risk factors for either iatrogenic or variant CJD were identified. He was classified as a probable case of sporadic CJD.

Jan 29 - Feb 11, 2017 WEEKS 5 - 6 VOL 14 ISSUE N⁰ 3

Communicable Diseases WATCH

衞生防護中心 Centre for Health Protection 衞生署 Department of Health

FEATURE IN FOCUS

2016 Year in Review

Reported by Surveillance Section, Communicable Disease Division, Surveillance and Epidemiology Branch, CHP.

In this issue, we reviewed communicable diseases and issues of public health concern in 2016...

Avian influenza

In 2016, the Centre for Health Protection (CHP) of the Department of Health (DH) has recorded five human cases of avian influenza A(H7N9) and all were imported from Mainland China (four from Guangdong province (廣東省) and one from Jiangsu province (江蘇省)). They included four males and one female with ages ranging from 60 to 81 years (median: 75 years). The first three cases had onset of illness between January and April and the remaining two cases had onset of illness in December. The cases occurred at periods when the activity of avian influenza A(H7N9) in Mainland was high. All of them had pneumonia. Four cases had recovered while a 75-year–old man who had pre-existing chronic obstructive airway disease died. Epidemiological investigation revealed that all cases had visited wet markets or exposure to environments with poultry during the incubation period. Extensive contact tracing did not identify any secondary cases.

Apart from human infections, a sample of faecal droppings of live poultry taken from a poultry stall in Yan Oi Market in Tuen Mun was tested positive for H7N9 on June 4. Contact tracing of the persons with unprotected exposure to the poultry did not identify any human cases. Besides, there were four reports of detection of avian influenza A(H5N6) locally in Hong Kong in 2016. The first two reports involved chicken carcasses collected in Tuen Mun and Tai O respectively in February. The remaining two reports involved faecal droppings collected at Mai Po Nature Reserve in November.

Dengue fever

CHP recorded 124 dengue fever cases in 2016, which was higher than the annual number of 30 to 114 cases in the past 10 years (Figure 1). Among these 124 cases, there were 67 males and 57 females, with ages ranging from six to 79 years (median: 37.5 years). Among them, fever was the most common symptom (118, 95.2%), followed by headache (78, 62.9%), myalgia (62, 50%), and rash (61, 49.2%). Other symptoms included arthralgia (26, 21.0%) and eye pain (23, 18.5%). Eighty seven patients (70.2%) required hospitalisation and no case of severe dengue was recorded. All patients recovered and no fatal case was recorded.

One hundred and twenty cases were imported infections among which the patients had travelled to countries and areas including Indonesia (36), Thailand (19), the Philippines (18), India (10), Malaysia (10), Cambodia (4), the Maldives (4), Vietnam (4), Bangladesh (2), Singapore (2), Sri Lanka (2), Laos (1) and the Solomon Islands (1). Seven patients had travelled to multiple countries during the incubation period.

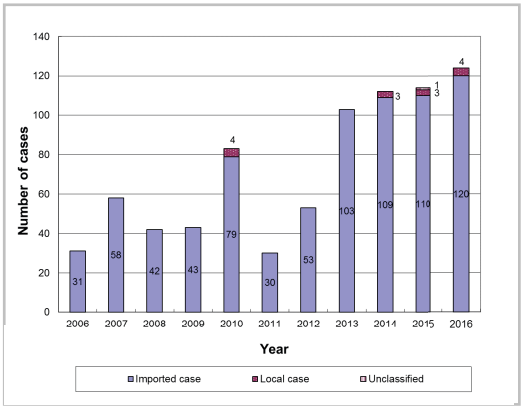

Figure 1 - Annual number of dengue fever cases from 2006 to 2016.

Four local cases were recorded with two cases in August and two cases in September, 2016 respectively. 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.

Hepatitis A

In 2016, a total of 98 cases of hepatitis A were recorded, affecting 68 men and 30 women aged from three to 86 years (median: 32 years). Sixty three cases (64.3%) acquired the infection locally. Seven cases (7.1%) were imported from Pakistan (3), Malaysia (2), India (1) and South Korea (1) respectively, while the imported statuses of the remaining 28 cases (28.6%) were unknown/ undetermined. Eighty four patients (85.7%) required hospitalisation.

Nine cases recorded in 2016 were men who have sex with men (MSM) who were known positive for human immunodeficiency virus, compared to generally zero to two per year from 2006 to 2015. For further details of this unusual increase in cases among MSM, please refer to the article "Unusual increase in number of hepatitis A infection among MSM in Hong Kong".

Hepatitis C

In 2016, a total of 37 cases of acute hepatitis C were recorded. The number had significantly increased comparing to previous years, ranging from three to 14 cases from 2012 to 2015 (Figure 2).

Of the 37 cases in 2016, 30 were male and seven were females (Figure 3). Their ages ranged from 23 to 94 years (median: 38 years). Over half of the cases (68%) were symptomatic. No fatalities were recorded due to acute hepatitis C.

Among the 37 recorded cases, 22 cases reported having unprotected sex, 21 cases were known MSM, two cases had tattoo procedure and one case was an intravenous drug user. All cases were sporadic cases without epidemiological linkage identified.

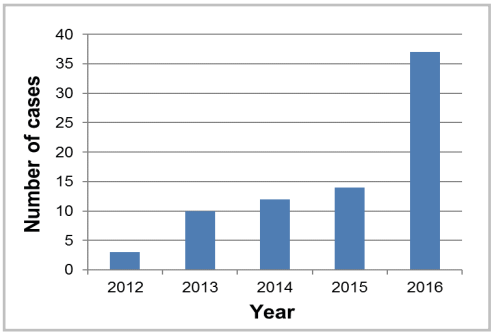

Figure 2 - Number of acute hepatitis C cases by year from 2012 to 2016.

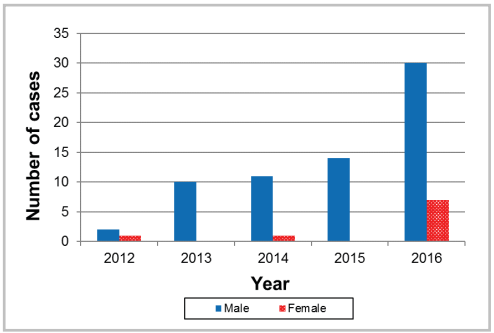

Figure 3 - Number of the acute hepatitis C cases by gender from 2012 to 2016.

Invasive Pneumococcal Disease

There were 189 cases of invasive pneumococcal diseases (IPD) notified to CHP in 2016, corresponding to an annual incidence of 2.6 cases per 100 000 population. This was comparable to the IPD incidence in recent years (2007 to 2015: 1.7 to 2.9 per 100 000 population) (Figure 4). Young children aged under five (16%) and elderly aged 65 years or above (39%) accounted for over half of the cases. Overall, incidence of IPD caused by the seven serotypes covered in PCV7/10/13[1] was highest from 2007 to 2009 but started to decrease afterwards. Incidence of IPD caused by the six serotypes that are covered by PCV13 but not by PCV7 and those not covered by PCV13 have increased since 2010.

Leptospirosis

In 2016, CHP recorded a total of seven cases of leptospirosis, affecting five males and two females, with 21 to 72 years of age. Among these cases, four were classified as imported infection and three acquired the infection locally. The four imported cases reported to have engaged in water sports (including swimming, rafting and hiking) in Malaysia (2), Thailand (1) and in both Laos and Thailand (1) respectively. For the three locally acquired infections, one had hiking and swimming in Tai Tam, while the other one worked mainly outdoors and reported to have an abrasion wound over his left foot during the incubation period. The third local case could not recall any high risk exposure such as water sports, hiking etc. during the incubation period. No fatalities were recorded in 2016.

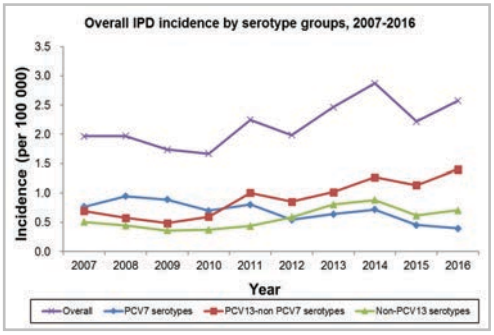

Figure 4 - IPD incidence in Hong Kong by serotype groups, 2007 to 2016.
Note: 2007 to 2014: Public Health Laboratory Services Branch laboratory surveillance (bacterial culture only); 2015 to 2016: IPD notification to CHP (bacterial culture + PCR).

Scarlet fever

In 2016, CHP recorded 1 467 cases of Scarlet fever (SF), as compared to a range of 1 100 and 1 526 cases recorded per year between 2011 and 2015. More cases were recorded during May to June and November to December while fewer cases were recorded during August (Figure 5). The epidemiological characteristics of cases in 2016 were similar to those reported in previous years. Their ages ranged from seven months to 55 years (median: 5 years) with the majority (96%) of the cases affecting children aged 10 years or below. The male-to-female ratio was 1.4:1. Five hundred and thirty nine cases (37%) required hospitalisation. Three cases aged between four and 10 years developed severe complications, including two cases of septic shock and one case of toxic shock syndrome. No fatal cases were recorded in 2016. Most cases (91%) were sporadic infection while the remaining 133 cases were involved in a total of 51 clusters. These included 37 school / institutional clusters (25 kindergartens/child care centres, 10 primary schools, one residential child care centre and one special school) and 14 home clusters. The number of persons affected in each cluster ranged from two to six persons (median: two).

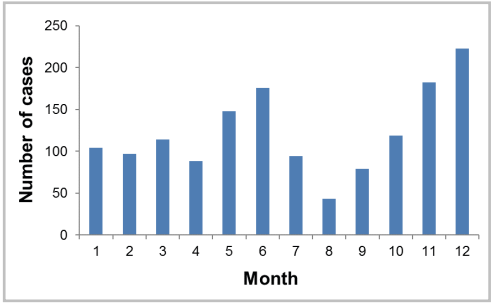

Figure 5 - Monthly number of scarlet fever cases recorded in 2016.

Seasonal influenza

In 2016, Hong Kong experienced two influenza seasons. The winter influenza season started in late January and ended in mid-May, spanning for about 16 weeks. Comparing with previous seasons, this winter season arrived and ended later than the usual time, which was also observed in other Northern Hemisphere countries and areas. Influenza A(H1N1)pdm09 and influenza B viruses co-circulated in this season. In contrast to the previous winter season predominated by influenza A(H3N2) where elders were mostly affected, children were particularly affected in this season as reflected by high hospital admission rates and large number of influenza-like illness (ILI) outbreaks in schools.

During the enhanced surveillance period of severe cases between January 29 and May 20, 2016, CHP recorded a total of 409 laboratory confirmed influenza cases (including 211 deaths) who required admission to intensive care unit or died among adults aged 18 years or above. Patients aged 18 to 49, 50 to 64 years and 65 years or above constituted 14%, 33% and 53% of the reported cases respectively, as compared to 3%, 10% and 88% in the previous winter season predominated by influenza A(H3N2). Most of the severe cases (77%) were known to have underlying chronic illnesses. Separately, 27 paediatric cases of severe influenza-associated

[1]There are more than 90 serotypes of pneumococci and existing pneumococcal vaccines covered different serotypes.

complication/death (including three deaths) were reported to CHP among people aged below 18 years in the same period. Forty one percent of them had pre-existing chronic medical conditions or congenital conditions.

The influenza activity in Hong Kong remained at a low level between May and August 2016. It increased again in September and October. This delayed summer season was mild in intensity and only lasted for about five weeks. Unlike the winter season in early 2016, the vast majority of the influenza viruses detected were influenza A(H3N2). CHP recorded a total of 56 adult severe influenza cases (including 39 deaths) between September 23 and October 27, 2016. No paediatric severe cases were recorded in the same period.

Varicella

In 2016, 8 880 cases of varicella (also known as chickenpox) were notified to CHP. Previously, the annual incidence of varicella exhibited cyclical changes with peaks observed every four to five years (Figure 6). The incidence was highest among preschool children aged one to five, followed by those aged six to 11 (Figure 7). In July 2014, varicella vaccine was incorporated into the Hong Kong Childhood Immunisation Programme (HKCIP). From 2014 to 2016, varicella incidence has been decreasing among those aged one to five while the incidence in other age groups has increased. In addition, six to 11-year-old became the group with highest incidence (Figure 7). The decrease in incidence among those aged one to five is likely a result of increased vaccination uptake in very young children.

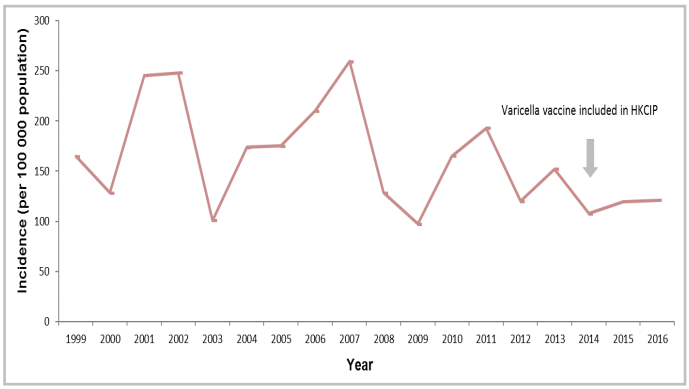

Figure 6 - Annual incidence of varicella in Hong Kong, 1999 to 2016.

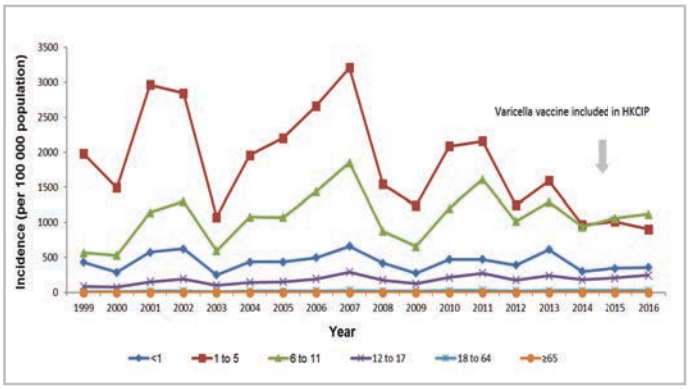

Figure 7 - Annual incidence of varicella in Hong Kong by age group, 1999 to 2016.

Varicella vaccine is effective in preventing varicella infection and its complications. Eligible children should follow the schedule recommended in the HKCIP for vaccination.

Zika Virus Infection

Zika Virus Infection has become a notifiable infectious disease in Hong Kong since February 5, 2016. CHP recorded two imported cases, involving one 38-year-old female and one 56-year-old male, on August 25 and November 15, 2016 respectively. The first patient had travelled to Saint Barthelemy in the Caribbean and presented with joint pain and red eyes while the second patient had travelled to multiple countries including Antigua and Barbuda, St Maarten and Anguilla and developed fever, rash and diarrhoea. Their blood and urine specimens were tested positive for Zika virus and they were admitted to hospitals for isolation and management. The conditions of the two patients were all along stable and they were later discharged with negative blood tests for Zika virus.

Unusual increase in number of hepatitis A infection among MSM in Hong Kong

Reported by Dr Billy HO, Senior Medical and Health Officer, Communicable Disease Division, Surveillance and Epidemiology Branch, Dr Bonnie WONG, Senior Medical and Health Officer, and Dr Kenny CHAN, Consultant, Special Preventive Programme, Public Health Services Branch, CHP.

An unusual upsurge of acute hepatitis A (HAV) infection affecting human immunodeficiency virus (HIV) positive men who have sex with men (MSM) was detected among the attendees of Integrated Treatment Centre (ITC), Special Preventive Programme of the Centre for Health Protection (CHP), Department of Health (DH) since August 2016. While the annual number of HAV cases was normally zero to two per year from 2006 to 2015, there was zero to three cases recorded per month since August 2016.

To assess the extent of possible outbreak, CHP has conducted retrospective investigations into previously reported cases of HAV. From September 2015 to February 10, 2017, CHP identified a total of 28 known MSM cases aged from 22 to 51 years (median: 33 years) who presented with acute hepatitis symptoms and were diagnosed to have HAV infection (Figure 1 and 2). Twenty-two were known to be HIV positive, who were patients attending one of the three designated public HIV clinics (ITC, the AIDS Clinical Service of Queen Elizabeth Hospital and the Infectious Disease Special Medical Clinic of Princess Margaret Hospital). All recorded cases were tested positive for anti-HAV IgM. All have recovered upon supportive treatment. Twenty-three have been discharged after hospitalisation and the remaining five required no admission. All patients recovered with supportive treatment and no fatality was recorded. One patient received first dose of HAV vaccination two weeks prior to his symptom onset, while another had completed combined hepatitis A and B vaccination series one year ago. The rest did not report history of HAV vaccination.

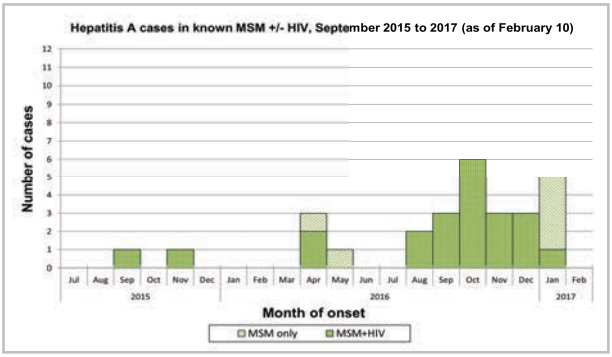

Figure 1 - Hepatitis A cases in known MSM +/- HIV, September 2015 to 2017 (as of February 10).

Ten of the 28 cases reported travel history within the incubation period, and the most common regions they had visited were Mainland China(3), Japan (2) and Thailand (2). Apart from one who reported acute HAV infection in his sexual partner two weeks following his own diagnosis, no other clustering of cases was identified. Seven cases were also known to have sexually transmitted infections (STI) (including syphilis, gonorrhea, chlamydia infection, and one case of HIV seroconversion) during or within one month of the HAV diagnosis.

Retrospective analysis of laboratory data revealed that available virus from 22 cases were identical to either one of two genetically distinguishable groups found within genotype 1A.

Epidemiological investigations conducted thus far did not suggest a common food nor water source among these cases. With reference to overseas experience, our epidemiological and laboratory investigations coupled with the clinical presentations suggested that male person-to-person sexual transmission might have accounted for this hepatitis A outbreak. Apart from spreading among HIV-positive MSM, the virus may have spread among other MSM in the community by sexual transmission.

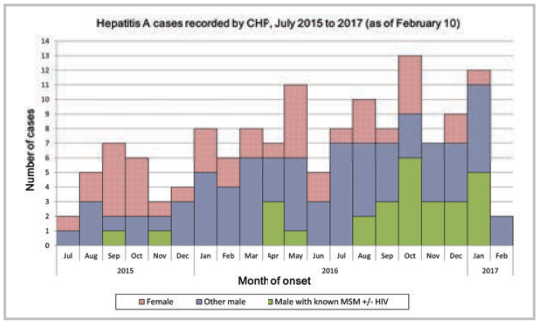

Figure 2 - Hepatitis A cases recorded by CHP, July 2015 to 2017 (as of February 10).

Vaccination for high-risk male attendees to control hepatitis A outbreak

In order to ward off infection and prevent community transmission, CHP has started a one-off HAV vaccination programme targeting MSM groups since February 3, 2017. HIV positive MSM followed up at the three public HIV clinics and current MSM attendees of two DH's male Social Hygiene Clinics with negative or unknown HAV immune status are to be offered two doses of hepatitis A vaccines for free.

In addition, education materials have been distributed to attendees of the three public HIV clinics and DH's Social Hygiene Clinics. Health promotion and counseling have been reinforced (Figure 3). In parallel, CHP has stepped up health education and publicity to raise the awareness towards hepatitis A infection among the MSM community via close liaison with non-governmental organisations (NGOs). The education materials have been distributed to NGOs working with people living with HIV and the MSM community and posted on websites and social media platform.

As timely risk communication, CHP has issued press releases on February 2 and 9. CHP has also sent letters to doctors and hospitals to alert frontline healthcare providers of the situation.

Figure 3 - Poster: Hepatitis A and You.

The Scientific Committee on AIDS and STI and the Scientific Committee on Vaccine Preventable Diseases will meet in April 2017 to review and update the current prevention and control strategies.

Periodic HAV outbreaks among MSM have been reported since early 90s in Europe, North America and Australia. Recent HAV outbreaks affecting MSM were also observed in Taiwan and a few European countries[1,2]. In Taiwan, over 1 000 cases of hepatitis A were notified to its Centers for Disease Control in 2016 and over half of the patients had HIV or other STIs such as syphilis or gonorrhea[1]. In some of these outbreak settings, it has been postulated that the existence of an endemic population among MSM infected with HAV sustains continuous circulation of particular strains and facilitates cyclical outbreaks. While hepatitis A infection does not appear to be worse in HIV-positive patients when compared to HIV-negative persons, studies have shown that HIV infection was associated with prolonged HAV viraemia, which might cause a long-lasting outbreak of HAV infection in HIV positive MSM[3]. Vaccinating susceptible individuals, together with safer sex practice and strict personal hygiene to avoid direct and indirect faecal-oral contact are keys to preventing hepatitis A via sexual transmission.

Facts on viral hepatitis A

HAV is usually transmitted by faecal-oral route either through contaminated drinks or food such as shellfish, or directly from close personal contact with an infected household member or sex partner. The patterns of endemicity have been found closely related to socioeconomic development. In developed areas with good sanitary and hygienic condition like Hong Kong, infection rates are low and person-to-person spread is a more common method of transmission. Disease may occur among adolescents and adults in high-risk groups, such as injecting-drug users, MSM, and people traveling to areas of high endemicity[4].

Hepatitis A Vaccination

The HAV vaccine contains whole inactivated virus and is a safe and highly effective vaccine in healthy, as well as in HIV positive individuals. Injection site reactions are the most frequent side effect. It is indicated for persons at risk of exposure and contraindicated in those who have signs of hypersensitivity after previous hepatitis A vaccine administration. In adults, it is given intramuscularly at the deltoid region. The standard vaccine course comprises two doses given at least six months, and up to 18 months, apart. In HIV infected individuals, the immune response to HAV vaccination improve with increasing CD4 cell counts and viral load suppression on antiretroviral treatment, and the two-dose series confers protection in up to 70 to 80% of the vaccinees; while in healthy persons, immunisation with the two-dose series is believed to confer protection close to 100% of the vaccinees for at least 10 years and possibly for life.

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NEWS IN BRIEF

A domestic cluster of pertussis

The Centre for Health Protection (CHP) recorded a domestic cluster of pertussis in early February 2017, affecting a 65-year-old woman and her 48-year-old son-in-law. The woman with underlying illness was admitted to a private hospital on January 31 for cough since January 11. Her nasopharyngeal swab (NPS) was tested positive for *Bordetella pertussis* on February 1. Her condition was stable and she was discharged on February 7.

Contact tracing identified one symptomatic household contact, the son in-law, who had symptom onset on January 29. He presented with cough and CHP referred him to a public hospital for management on February 2. His condition was stable and hospitalisation was not required. His NPS was tested positive for *Bordetella pertussis* on February 3.

The woman did not travel outside Hong Kong during the incubation period, while the man had frequent travel to Guangdong. Both of them were unsure about their vaccination status of pertussis. Other household contacts remained asymptomatic and they were given chemoprophylaxis. Investigation is on-going.

A sporadic case of necrotising fasciitis due to *vibrio vulnificus* infection

On February 7, 2017, CHP recorded a sporadic case of necrotising fasciitis due to *Vibrio vulnificus* infection affecting a 75-year-old male with underlying illnesses. He presented with fever and right forearm swelling since January 29. He attended the Accident and Emergency Department of a public hospital on January 30 and was admitted on same day. The clinical diagnosis was necrotising fasciitis. Excisional debridement of right forearm was performed on January 30 and February 3. His wound swab culture taken on January 30 grew *Vibrio vulnificus*. His current condition was stable. Epidemiological investigation revealed that the patient lived with his wife and son who remained asymptomatic. He did not have recent travel history. He did not report any wound or injury. The patient recalled history of buying seafood in a wet market during incubation period. Investigation is on-going.

CA-MRSA cases in January 2017

In January 2017, CHP recorded a total of 92 cases of community-associated methicillin resistant *Staphylococcus aureus* (CA-MRSA) infection, affecting 56 males and 36 females with ages ranging from 11 months to 85 years (median: 36 years). Among them, there were 68 Chinese, 7 Filipinos, 4 Pakistani, 3 Caucasian, 2 Indian, 1 Indonesian, 1 Japanese, 1 Nepalese, and 5 of unknown ethnicity.

Ninety one cases presented with uncomplicated skin and soft tissue infections while the remaining case had invasive CA-MRSA infection. This case affected a 30-year-old man who presented with fever and left hip pain since January 16. He was admitted to a public hospital on January 20. His blood specimen collected on January 20 and ulcer swabs of left hip collected on January 20 and 21 were cultured positive for CA-MRSA. The diagnoses were left hip pyomyositis and sepsis. He was treated with antibiotics. CT-guided drainage of the left hip lesion was performed on January 27. His current condition remained stable. His close contacts were asymptomatic, and screening and decolonisation would be provided to them.

Among the 92 cases, three cases involved healthcare workers were recorded, including two nurses working in different hospitals and a dental therapist. Investigation did not reveal any cases epidemiologically linked to these three patients. Besides, two household clusters, with each affecting two persons, were identified. Screening and decolonisation would be carried out for their close contacts.

Scarlet fever update (January 1, 2017 – January 31, 2017)

Scarlet fever activity in January 2017 decreased as compared with that in December 2016. CHP recorded 179 cases of scarlet fever in January 2017 as compared with 222 cases in December 2016. Among those 179 cases, there were 109 males and 70 females aged between two months and 13 years (median: five years). There were three institutional clusters involving one kindergarten and two primary schools, with each affecting two children. No fatal cases were reported during this reporting period.

Communicable Diseases WATCH

衛生防護中心 Centre for Health Protection 衛生署 Department of Health

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FEATURE IN FOCUS

Review of brucellosis cases in 2016

Reported by Ms Sheree CHONG, Scientific Officer, CD Surveillance and Intelligence Office, Surveillance and Epidemiology Branch, CHP.

Brucellosis is an infectious disease caused by the bacteria of the genus *Brucella* which primarily affect animals, such as cattle, dogs, pigs, sheep and goats. Humans can be infected via direct contact with infected animals, by consuming contaminated animal products or by inhaling contaminated aerosols.

In 2016, the Centre for Health Protection (CHP) of the Department of Health (DH) recorded a total of eight confirmed cases of brucellosis in Hong Kong, including five women and three men with ages ranged between 48 and 88 years (median=59 years).

Table 1 - Summarises their demographic, clinical and epidemiological features. No evidence of epidemiological linkage was found among these eight cases in 2016.

	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8
Sex/Age	F/51	F/66	M/73	F/48	F/78	M/52	M/51	F/88
Occupation	Security guard	Retired	Retired	Restaurant cleaner	Housewife	Fish seller	Unemployed	Retired
Past health	Gynaecological conditions	Good	Good	Good	Hypertension	Good	Neurological conditions	Neurological conditions
Date of onset	April 2016	January 2016	June 2016	June 2016	August 2016	July 2016	August 2016	October 2016
Clinical presentation	Fever, abdominal pain	Fever, weight loss, left leg swelling, flu-like symptoms	Fever, headache, neck stiffness	Fever, chills, rigor, right knee swelling	Fever, productive cough, anorexia, sustained a fall	Fever, chills, malaise, cough, runny nose, decreased appetite, weight loss, lower back pain, left leg pain, left sided chest wall pain	Fever, headache, sweating, fatigue, weight loss, arthralgia, generalised aching	Fever, chills, rigor, runny nose, fatigue
Microbiology findings	Blood culture positive for *Brucella melitensis*	Blood culture positive for *Brucella melitensis*	Paired sera showed more than 4-fold increase in antibody titres against *Brucella abortus*	Blood culture positive for *Brucella melitensis*	Blood culture positive for *Brucella melitensis*	Blood culture positive for *Brucella melitensis*	Paired sera showed 4-fold and more than 4-fold increase in antibody titres against *Brucella abortus* and *Brucella melitensis*, respectively	Paired sera showed more than 4-fold increase in antibody titres against *Brucella abortus*
Outcome	Recovered	Recovered	Recovered	Recovered	Recovered	Recovered	Recovered	Recovered
Exposure history	Handled and consumed the soup with lamb placenta and lamb meat in Mainland China one month before onset	No definite exposure history to animals or animal products	Handled and consumed pig hearts for several times since three months before onset	Handled and consumed mutton for several times since two months before onset	No definite exposure history to animals or animal products	Consumed cooked pig liver and intestines in Mainland China twice per month and keep a dog at home	No definite exposure history to animals or animal products	No definite exposure history to animals or animal products
Importation status	Imported	Unclassified	Local	Local	Local	Unclassified	Local	Local

Table 1 - Characteristics of eight brucellosis cases in Hong Kong in 2016.

The most commonly occurred symptoms among these eight patients were fever (8, 100%), musculoskeletal pain/swelling (5, 62.5%), weight loss (4, 50%), chills (3, 37.5%) and malaise/fatigue (3, 37.5%). None of these eight cases developed any disease-specific complications, such as sacroiliitis and orchitis. The diagnoses of majority of cases (5, 62.5%) were confirmed by isolation of *Brucella melitensis* from blood culture. The remaining three cases were confirmed by serological testing with paired sera showing four-fold or greater rise in antibody titre against *Brucella abortus* (2, 25%), and both *Brucella melitensis* and *Brucella abortus* (1, 12.5%). All eight patients required hospitalisation and had recovered uneventfully after treatment.

Among the eight cases recorded in 2016, five were classified as locally acquired infections, one was imported infection from Mainland China, and the remaining two cases had unclassified importation status as they stayed both in and outside Hong Kong during the incubation period and recalled no definite exposure history.

None of the eight cases belonged to at-risk occupations, such as animal handlers and veterinarians. Regarding the potential sources of infection, three cases had history of handling and consuming high-risk food items; one case had history of preparing and drinking the soup with lamb placenta and lamb meat during the visit to Mainland China but the patient denied consumption of the lamb placenta; and two cases had respectively handled and consumed pig hearts and mutton for several times since three months and two months before the symptom onset. There was another case that had consumed cooked pig liver and intestines in Mainland China but denied consumption of any other high-risk food both in and outside Hong Kong during the incubation period. The remaining four reported cases had no reported contact with internal organs or carcasses of animals, nor consumption of unpasteurised dairy products, raw or undercooked animal products.

Doctors are encouraged to report any suspected or confirmed brucellosis cases to the CHP for surveillance, control and prevention of the disease in the community. Moreover, brucellosis is a notifiable occupational disease.

Vaccine is available for animals only. To prevent brucellosis, members of the general public are urged to observe good personal and food hygiene:

- Do not consume unpasteurised dairy products, raw or undercooked meat and internal organs;
- Wash hands with liquid soap and water after having contacts with animals or their secretions;
- Cover wounds properly; and
- Wear appropriate protective gears, e.g. gloves when handling animal tissues or internal organs especially for those who are exposed occupationally.

Facts on brucellosis

Brucellosis is a bacterial infection caused by various species of *Brucella* bacteria. These bacteria primarily infect animals, such as cattle, dogs, pigs, sheep and goats.

Humans may acquire the infection in one of three ways: (1) ingestion of unpasteurised dairy products, raw or undercooked meat or internal organs from infected animals; (2) direct contact through breaks in the skin or mucous membrane with infected animal tissues, blood, urine, vaginal discharges, aborted fetuses and placentas; and (3) inhalation of contaminated aerosols.

Workers, such as slaughterhouse workers, meat-packing workers, and veterinarians, who have close contact with animals or their excretions, and laboratory workers, who work with *Brucella* cultures, are occupationally at a greater risk for contracting the disease. However, direct person-to-person transmission is extremely rare.

The incubation period of brucellosis is usually five to 60 days, but can be as long as several months. The symptoms of the disease are non-specific and may include fever, sweats, headache, pain in muscles, joint, and/or back, fatigue, loss of appetite, and physical weakness. Severe form of the disease may affect the brain, heart, skin, other organs or body systems.

The disease may progress to a chronic one and persist for years, if not adequately treated. Brucellosis can be treated by antibiotics and treatment will last for several weeks.

Update on Middle East Respiratory Syndrome

Reported by Dr Shirley TSANG, Scientific Officer, Respiratory Disease Office, Surveillance and Epidemiology Branch, CHP.

Introduction

Middle East Respiratory Syndrome (MERS) is a viral infection caused by the novel coronavirus MERS-coronavirus (MERS-CoV). MERS-CoV first emerged to cause human infections in the Middle East in early 2012. MERS-CoV is a zoonotic virus that has repeated entered the human population via contact with infected dromedary camels in the Arabian Peninsula. The virus also spreads among humans through close contacts. Since early 2012, the spread of MERS-CoV within the Middle East has been on-going with occasional exportation of cases to countries outside the Middle East. The largest outbreak outside the Middle East occurring in Korea in mid-2015 was triggered by a case exported to Korea from the Middle East. In this article, we reviewed the current situation of MERS.

Global Situation

Globally, since 2012, a total of 1 905 laboratory-confirmed cases of MERS have been reported to the World Health Organization (WHO) (as of February 24, 2017). Figure 1 shows the weekly number of laboratory-confirmed MERS cases by onset week. The number of reported cases reached 768 and 682 in 2014 and 2015 respectively and decreased to 252 in 2016. In 2017, 26 cases have been announced by the WHO via Disease Outbreak News so far.

The majority (1 689, 88.7%) of the cases were reported by countries/areas in the Middle East, including the Kingdom of Saudi Arabia (KSA) (1 545, 81.1%), the United Arab Emirates (UAE) (79, 4.1%), Jordan (28, 1.5%), Qatar (16, 0.8%), Oman (8, 0.4%), Iran (6, 0.3%), Kuwait (4, 0.2%), Bahrain (1, 0.1%), Lebanon (1, 0.1%), and Yemen (1, 0.1%) (Figure 2). Another 186 cases (9.7%) were related to the outbreak in Korea in mid-2015, including 185 cases in Korea and one case exported to Mainland China. The remaining 30 cases (1.6%) were detected in 17 countries outside the Middle East. They acquired the infection either during their travel to the Middle East (imported cases) or through exposure to a MERS patient who acquired the infection in the Middle East (import-related cases).

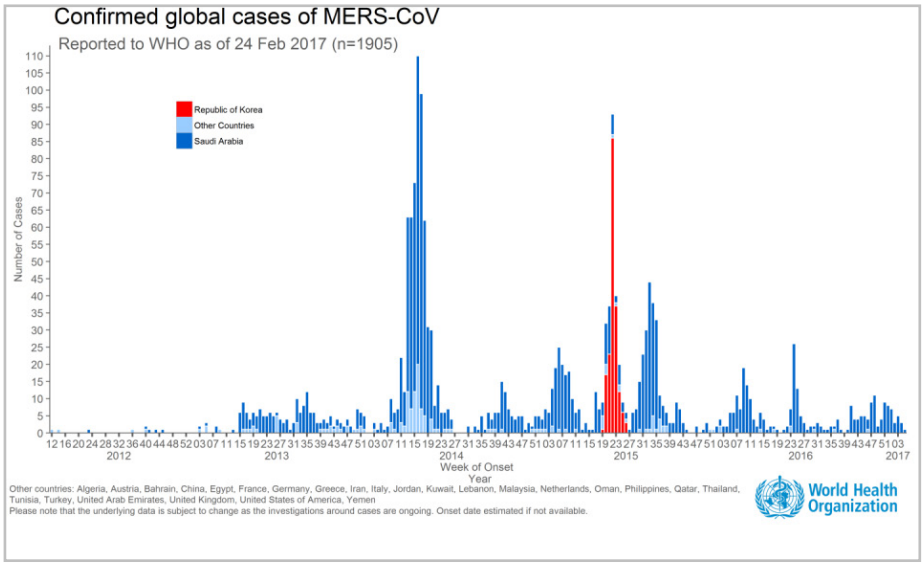

Figure 1 – Weekly number of MERS cases reported to the WHO by onset week (N = 1 905) (As of February 24, 2017). (Source:WHO (http://www.who.int/emergencies/mers-cov/maps-february-2017/en/))

From January 1, 2016 to February 24, 2017, a total of 278 MERS cases were reported to the WHO. Most of them (266/278, 95.7%) occurred in the KSA. The remaining cases in the Middle East were reported by Qatar (3), UAE (3), Oman (2) and Bahrain (1). Three cases were exported to countries outside the Middle East, including two cases in Thailand (imported from Oman and Kuwait in January and July 2016 respectively) and one case in Austria (imported from the KSA in September 2016). Hospital outbreaks in the Middle East occurred more frequently in 2016. While most of these outbreaks were small in size and affected several hospitals, two large hospital outbreaks occurred in Buraidah and Riyadh of the KSA in March and June 2016, respectively, resulting in large numbers of secondary cases among health care workers (HCWs) and patients. The number of cases started to decline after June 2016. However, MERS cases continued to appear sporadically in the KSA.

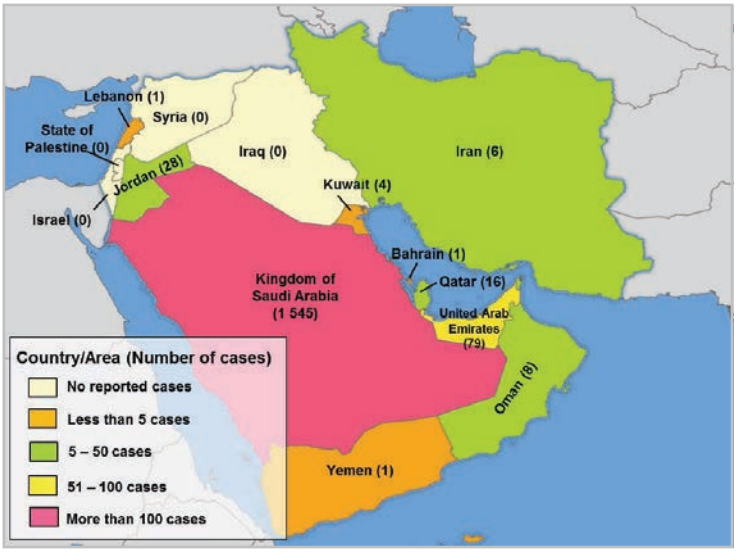

Figure 2 – Cumulative number of MERS cases in the Middle East since 2012 (N=1 689) (as of February 24, 2017).

The epidemiological characteristics of the reported cases remained similar since the emergence of the disease in 2012. Among all the cases, their ages ranged from nine months to 109 years (median=52 years). Males were predominantly affected with a male-to-female ratio of 1.9:1. About half of the cases were known to have pre-existing medical conditions such as diabetes, chronic lung disease, chronic renal disease and immunodeficiency. At least 677 deaths were recorded with a case fatality rate of about 36%. Among the 1 841 cases reported to the WHO up to December 2, 2016, 20.6% had no or mild symptoms while 19.9% had moderate symptoms and 47.5% had severe disease or died at the time of reporting. About 20% of the cases affected HCWs.

Local Situation

In Hong Kong, MERS was listed as a notifiable disease on September 28, 2012. As of February 28, 2017, a total of 713 suspected cases were reported to the Centre for Health Protection (CHP) of the Department of Health and all of them were tested negative for MERS-CoV. Besides, the CHP has also collaborated with public and private hospitals to enhance surveillance for MERS since February 23, 2013. Routine testing for MERS-CoV would be carried out for cases of pneumonia with unknown cause, pneumonia cases requiring intensive care, clusters of pneumonia, or HCWs with pneumonia, irrespective of their travel history. So far, no MERS cases have been detected in Hong Kong.

Risk Assessment

In 2016, the epidemiology and transmission patterns of MERS-CoV remained unchanged. According to the WHO, most of the reported cases were either nosocomial cases associated with transmission in health care settings or community-acquired cases with contact with dromedary camels and consumption of their raw milk. Limited human-to-human transmission has occurred between close contacts of confirmed cases in household settings. More efficient human-to-human transmission occurs in hospital settings. The continued occurrence of nosocomial outbreaks is a concern. Secondary cases have reported varying levels of contact with confirmed patients, ranging from direct contact (e.g. HCWs providing direct care to MERS patients before diagnosis with MERS) to no clear contact (e.g. patients sharing wards with MERS patients, but without sharing HCWs or rooms). Currently, there is no vaccine or specific anti-viral treatment for MERS.

The WHO expects that additional MERS cases will be reported from the Middle East, and that cases will continue to be exported to other countries by individuals who might acquire infection after exposure to an animal (for example, while visiting farms or markets or consuming raw camel products) or human source.

Special Points to Note

The symptoms of MERS may be non-specific at initial presentation. If healthcare professionals encounter any patients presenting with respiratory symptoms after visiting the Middle East, it is very important to ask for history of visiting any health care facility there and direct or indirect contact with dromedary camels. Medical practitioners are reminded to notify the CHP of any suspected cases of MERS fulfilling the reporting criteria (available from https://cdis.chp.gov.hk/CDIS_CENO_ONLINE/ceno.html) for prompt investigation. Besides, infection control measures are critical to prevent the possible spread of MERS-CoV in healthcare facilities. Please refer to the infection control guidelines on MERS issued by the CHP (http://www.chp.gov.hk/en/view_content/26535.html).

Prevention and Control Measures

To prevent MERS, members of the public are reminded to take heed of personal, food and environmental hygiene when travelling to the Middle East to prevent MERS:

- ☑ Avoid going to farms, barns or markets with camels during travel;
- ☑ Avoid close contact with sick people, especially with those suffering from acute respiratory infections, and avoid visits to healthcare settings with MERS patients;
- ☑ Adhere to food safety and hygiene rules such as avoiding consuming raw or uncooked animal products, including milk and meat, or foods which may be contaminated by animal secretions, excretions (such as urine) or products, unless they have been properly cooked, washed or peeled; and
- ☑ If feeling unwell, put on a surgical mask and seek medical attention immediately and,
  - Before departure: postpone travel until recovery;
  - While at overseas: inform hotel staff or tour leader; and
  - After returning home: inform doctor of recent travel history during medical consultation.

Further information and guidance on MERS-CoV are available on the CHP website: http://www.chp.gov.hk/en/view_content/26511.html.

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NEWS IN BRIEF

Two overseas cases of variant influenza A(H1N1) infection

Two laboratory confirmed human cases of infection with swine influenza A(H1N1) variant viruses in Italy and Switzerland were reported by the World Health Organization (WHO) recently.

The case in Italy affected a male in his 40's with underlying obesity (body mass index > 30 kg/m^2). He presented with rhinitis, cough, fever and dyspnoea in October 2016. His clinical condition subsequently deteriorated with development of bilateral pneumonia and severe acute distress respiratory syndrome requiring mechanical ventilation and extracorporeal membrane oxygenation. He was treated with oseltamivir. After a month of hospitalisation, he was discharged in good health. Phylogenetic analysis of the virus isolated from the patient indicated that it was closely related to the European avian-like swine influenza A(H1N1) viruses circulating in swine populations in Italy in recent years. According to information provided by Italian health authorities, he had contact with pigs on a pig farm and nasal swabs collected from weaning pigs in the farm were tested positive for influenza A.

The second case affected a 23-year-old male who worked in a farm with swine in Switzerland. He presented with mild acute respiratory symptoms in late December 2016. The virus isolated from him was found to be closely related to the European avian-like swine influenza A(H1N1) viruses circulating in swine in Europe. Samples from the swine at the farm were also tested positive for influenza A(H1N1) viruses.

According to the WHO, swine influenza A(H1N1) viruses are endemic in pig populations and circulate among swine in many regions of the world. Most human infections with influenza A(H1N1) variant viruses were exposed to the swine influenza viruses through contact with infected swine or contaminated environments. Current evidence suggests that these viruses have not acquired the ability of sustained transmission among humans. (Source of information: WHO)

Workshop for Preparedness of Bioterrorism on February 16 and 17, 2017

Being an international city, Hong Kong is facing the threat of potential bioterrorism. A 1.5-day "Workshop for Preparedness of Bioterrorism" was conducted on February 16 and 17, 2017 to get our healthcare workers prepared for such a threat. A total of 114 participants had attended the workshop and received information from local and overseas speakers. Sessions ranged from information on emerging infectious diseases and potential agents of bioterrorism, to recognition and management of such agents. Specific topics on anthrax and smallpox vaccines, together with the local preparedness against bioterrorism were also delivered. All the information has been uploaded onto the training portal of Infectious Disease Control Training Centre (IDCTC) at http://icidportal.ha.org.hk/sites/en/Lists/Training_Calendar/DispForm.aspx?ID=122&Source=http%3A%2F%2Ficidportal%2Eha%2Eorg%2Ehk%2Fsites%2Fen%2Fdefault%2Easpx.

Photo 1 - Group photo for guests and Dr TY WONG, Head (ICB) on February 16, 2017.

Photo 2 - Sharing in Round Table Meeting on February 17, 2017.

A sporadic case of *Streptococcus suis* infection

On February 17, 2017, the Centre for Health Protection (CHP) recorded a case of *Streptococcus suis* infection affecting a 74-year-old woman with underlying illnesses. She presented with bilateral knee pain on February 11 and was admitted to a public hospital on February 14. Her blood sample collected on February 15 grew *Streptococcus suis*. Her clinical diagnosis was sepsis and she was treated with antibiotics. She remained in stable condition. She had handled raw pork at home but denied any previous skin wound or contact with pigs. Her home contacts remained asymptomatic.

A probable sporadic case of Creutzfeldt-Jakob disease

On February 22, 2017, CHP recorded a probable case of sporadic Creutzfeldt-Jakob disease (CJD) affecting a 67-year-old woman with underlying illnesses. She initially presented to a medical practitioner for rapidly progressive cognitive impairment since April 2016. Subsequently, she was admitted to a public hospital in January 2017 and was found to have dysphagia, dysphasia, akinetic mutism and myoclonus. Electroencephalography and imaging findings were compatible with CJD. Her condition was stable in hospital. She had no known family history of CJD and there were no reported risk factors for iatrogenic or variant CJD. She was classified as a probable case of sporadic CJD.

A sporadic case of psittacosis

On February 23, 2017, CHP recorded one sporadic case of psittacosis affecting an 80-year-old male with underlying illnesses. He presented with fever and cough with sputum on February 11 and was admitted to a public hospital on February 16. His clinical diagnosis was severe pneumonia with pleural effusion and he required intensive care. He was treated with antibiotics and he required pleural drainage, invasive mechanical ventilation and haemofiltration. His nasopharyngeal aspirate (NPA) collected on February 17 was tested positive for *Chlamydophila psittaci* DNA by PCR. His condition deteriorated and he passed away on February 19. According to his next of kin, he had no contact history of birds or bird droppings during incubation period. He had travelled to Guangdong alone during late January and early February. His home contact was asymptomatic.

A sporadic case of human myiasis

On February 24 2017, CHP recorded a sporadic case of human myiasis affecting an 88-year-old male with pre-existing medical conditions. He resided in a residential care home for the elderly (RCHE) and required assistance in daily activities. He was brought to the Accident and Emergency Department of a public hospital for oral bleeding on February 21 and was admitted on the same day. Maggots collected over the wound were identified as *Chrysomya bezziana* larvae. His clinical condition remained stable. He had no recent travel history. His contacts in the RCHE were asymptomatic. Health advice on personal care and environmental hygiene was given to the institution.

Feb 26 - Mar 11, 2017 WEEKS 9 - 10 VOL 14 ISSUE N^{0} 5

Communicable Diseases WATCH

衛生防護中心 Centre for Health Protection 衛生署 Department of Health

FEATURE IN FOCUS

Drug-resistant Tuberculosis

Reported by Dr KC CHANG, Senior Medical Officer, and Dr CK CHAN, Ag Consultant Chest Physician, Tuberculosis and Chest Service, Public Health Services Branch, CHP.

Global picture

Despite the availability of standard tuberculosis (TB) treatment and the advent of rapid diagnostic tools and novel drugs, the global epidemic of tuberculosis (TB) continues alongside the crisis of multidrug-resistant (MDR) TB. In 2015, there were an estimated 10.4 million new TB cases worldwide,[1] including an estimated 480 000 cases of MDR-TB and an additional 100 000 cases of rifampicin-resistant TB (RR-TB). Only 132 120 (23%) RR/MDR-TB cases were notified to the World Health Organization (WHO). India, China and the Russian Federation accounted for 45% of RR/MDR-TB. An estimated 3.9% of new cases and 21% of previously treated cases had MDR/RR-TB. Among MDR-TB cases, an estimated 9.5% had extensively drug-resistant TB (XDR-TB), which was MDR-TB with additional bacillary resistance to any fluoroquinolone and at least one of the second-line injectable agents.

Local drug resistance scene

In Hong Kong, the notification rate of TB decreased from a peak of 697 per 100 000 population in 1952 to 60.1 per 100 000 population in 2016 (provisional figure) (Figure 1).[2] MDR-TB and XDR-TB rates were around 1% (Figure 2) and 0.1% respectively.[2] There is no room for complacency, however, given the substantial drug resistance rates in neighbouring areas and the increasingly frequent population movements. When left untreated, MDR-TB and XDR-TB transmit in the community.[3]

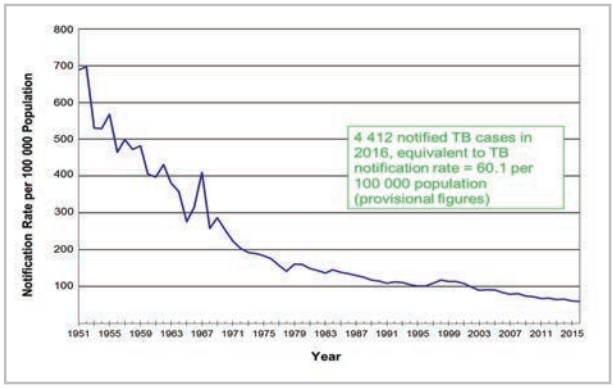

Figure 1 - TB notification rate (all forms) in Hong Kong from 1952 to 2016.

Detection of drug-resistant tuberculosis

Controlling the infection at source remains the cornerstone in TB control. The crisis of MDR-TB highlights the importance of rapid diagnosis that enables timely initiation of effective TB treatment. The past decade witnessed the advent of molecular/genotypic tests that rapidly detect TB and drug resistance. WHO has recommended use of Xpert MTB/RIF (a fully automated, real-time DNA-based polymerase chain reaction assay) for rapid detection of TB and rifampicin resistance,[4] and use of Genotype MTBDRsl (a line probe assay) as the initial test for rapidly detecting resistance to fluoroquinolones and the second-line injectables among patients with RR-TB or MDR-TB.[5] In Hong Kong, genotypic drug susceptibility tests for rifampicin, isoniazid, fluoroquinolone and second-line injectables are increasingly utilised to better inform the initial choice of drugs, pending complementary information from culture-based drug susceptibility testing methods.

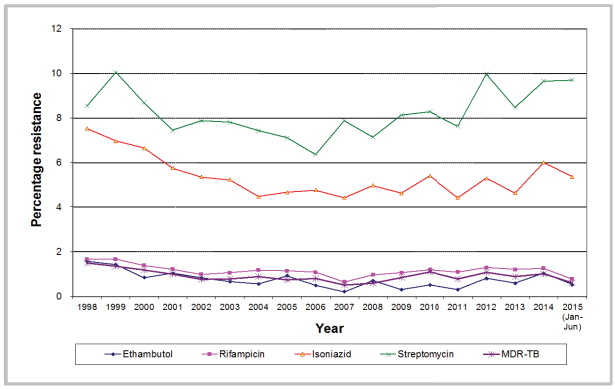

Figure 2 - Trend of anti-TB drug resistance in Hong Kong from 1998 to 2015.

Treatment of drug-resistant tuberculosis

WHO has recently updated treatment guidelines for drug-resistant TB with introduction of a shorter MDR-TB treatment regimen and a new classification for TB drugs (Table 1) that recognises two repurposed agents (linezolid and clofazimine) as core agents and includes two novel drugs (delamanid and bedaquiline) as add-on agents.[6] When bacillary resistance to fluoroquinolones and second-line injectable agents is excluded, or considered highly unlikely, a shorter MDR-TB regimen may be used.[6] The shorter MDR-TB regimen, which comprises four core drugs (moxifloxacin, clofazimine, ethambutol and pyrazinamide) given for nine to 12 months supplemented by three companion drugs (kanamycin, high-dose isoniazid, and ethionamide or prothionamide) in the initial four to six months, is predominantly used among second-line treatment-naïve RR/

MDR-TB patients in settings with a low prevalence of fluoroquinolone-resistant MDR-TB or XDR-TB. When it is inappropriate to give the shorter MDR-TB regimen, WHO recommends a conventional regimen that comprises pyrazinamide and at least four likely effective TB drugs (one chosen from Group A, one from Group B, and at least two from Group C).[6] If the minimum number of effective TB medicines cannot be composed as given above, an agent from Group D2 and other agents from Groups D3 and D1 may be added. Linezolid has become virtually essential in the treatment of fluoroquinolone-resistant MDR-TB and XDR-TB. Prolonged use of linezolid is required for establishing stable cure, but prolonged use was previously hampered by bone marrow suppression and peripheral neuropathy,[7-9] which have substantially reduced with use of better dosing schedules. When there are insufficient companion drugs in the regimen to protect linezolid, delamanid or bedaquiline is added. WHO has published guidelines for use of delamanid and bedaquiline, both of which are potentially cardiotoxic (clinically manifested as prolonged QT).[10-13] By the end of 2015, at least 70 countries have started using bedaquiline and 39 countries have used delamanid. In Hong Kong, a handful of patients have received delamanid with promising results. Bedaquiline will soon be locally available.

Group	Description	Drugs
A	Fluoroquinolones	Lfx, Mfx, Gfx
B	Second-line injectable agents	Km, Amk, Cm
C	Other core agents	Eto or Pto, Cs or Trd, Lzd, Cfz
D1	Add-on agents: first-line drugs	Z, E, H^h
D2	Add-on agents: novel drugs	Bdq, Dlm
D3	Add-on agents: others	PAS, Ipm-Clv, Mpm-Clv, Amx-Clv, Thz

Table 1 - The latest WHO classification of TB drugs for the treatment of RR-TB and MDR-TB. (Abbreviations: Amk, amikacin; Amx-Clv, amoxicillin with clavulanate; Bdq, bedaquiline; Cfz, clofazimine; Cm, capreomycin; Cs, cycloserine; Dlm, delamanid; E, ethambutol; Eto, ethionamide; Gfx, gatifloxacin; H^h, high-dose isoniazid; Ipm-Clv, imipenem-cilastatin with clavulanate; Km, kanamycin; Lfx, levofloxacin; Lzd, linezolid; Mfx, moxifloxacin; Mpm-Clv, meropenem with clavulanate; PAS, para-aminosalicylic acid; Pto, prothionamide; Thz, thiocetazone; Trd, terizidone; Z, pyrazinamide)

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Update on HIV epidemiology of men who have sex with men in Hong Kong

Reported by Dr Alfred YW SIT, Medical and Health Officer, Dr BY SHU, Senior Medical and Health Officer, and Dr Kenny CHAN, Consultant, Special Preventive Programme, Public Health Services Branch, CHP.

The Department of Health (DH) has implemented a voluntary anonymous case-based HIV and AIDS reporting system with input from both clinicians and laboratories since 1984. The cumulative number of HIV and AIDS reports in Hong Kong reached 8 410 and 1 766 cases as of end 2016.

The annual number of reported HIV infection has continued to increase in the past few years. It reached a record high of 725 cases in 2015, and then showed a mild drop of 4.6% to 692 cases in 2016.

Similar to previous few years, the HIV situation in Hong Kong was still dominated by men who have sex with men (MSM) infections (homosexual and bisexual contact). In 2016, MSM accounted for 61% of all newly reported HIV cases, and 73.7% if excluding cases with undetermined route of transmission due to inadequate information. MSM also accounted for a continually expanding

proportion in the overall male infected cases, from 41.4% in 2006 to 71.1% in 2016 (Figure 1).

The majority of the MSM reported cases in 2016 were Chinese (91%). The median age has been decreasing, from 37 in 2010 to 32 in 2016, which suggested that more younger MSM population was affected. In 2016, the age group of 20 to 29 accounted for the highest proportion among the MSM cases (38.0%), followed by the age group of 30 to 39 (30.7%) (Figure 2).

In 2016, the majority (75.2%) of the reported MSM cases were assessed to have contracted the virus locally, 9.0% in Mainland and 9.9% in other places respectively.

The annual community-based HIV/AIDS Response Indicator Survey (HARiS) continued to be conducted in 2016. Results showed that condom use rates in the last anal sex with emotional relationship partners, regular sex partners and non-regular sex partners were 59.9%, 70.5% and 79.9% respectively. The HIV testing rate within past one year was 58.5%, with another 24.2% never get tested.

Up till now, condom use remains one of the most effective ways to prevent HIV infection. All sexually-active people are advised to practise safer sex by proper and consistent use of condom. As current HIV treatment (highly active antiretroviral therapy (HAART) can effectively control HIV replication, reduce risk of onward HIV transmission, reduce disease progression and improve patients' health, all MSM should test for HIV at least once a year irrespective of their sexual practice. They are also advised to repeat the HIV test after the three-month window period since the last date of unprotected sex. Expanded regular testing of the MSM community would improve early diagnosis, treatment and care for both personal and public health good.

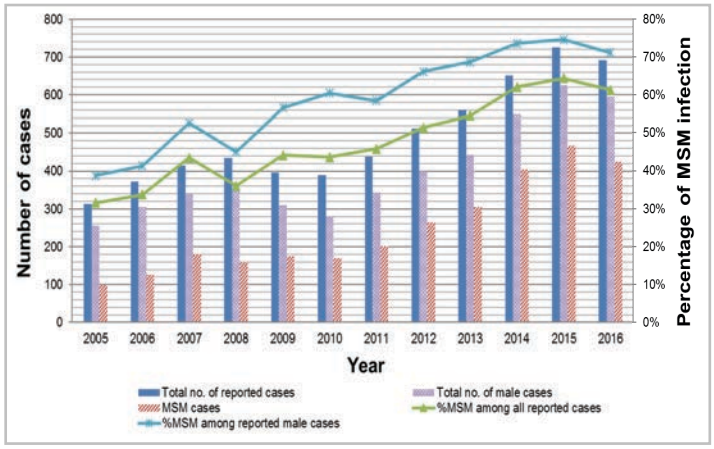
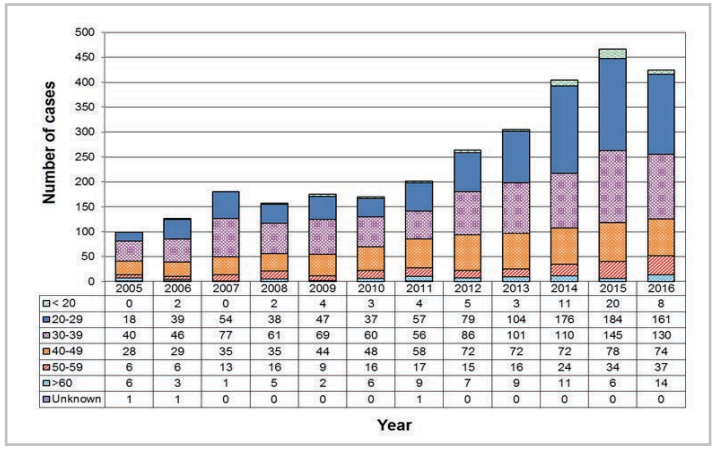


Figure 1 - Proportion of MSM infection among all cases and male cases (2005-2016).



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
< 20	0	2	0	2	4	3	4	5	3	11	20	8
20-29	18	39	54	38	47	37	57	79	104	176	184	161
30-39	40	46	77	61	69	60	56	86	101	110	145	130
40-49	28	29	35	35	44	48	58	72	72	72	78	74
50-59	6	6	13	16	9	16	17	15	16	24	34	37
>60	6	3	1	5	2	6	9	7	9	11	6	14
Unknown	1	1	0	0	0	0	1	0	0	0	0	0

Figure 2 - Age breakdown of HIV-infected MSM cases (2005-2016).

HIV testing services in Hong Kong

People can call DH's AIDS Hotline (2780 2211), Gay Men HIV Testing Hotline (2117 1069) or contact various AIDS non-governmental organisations for free and anonymous HIV testing and counselling services. They may also attend Social Hygiene Clinics (free for eligible person), or consult their family doctors for HIV testing. More information on HIV testing can be found on www.27802211.com and www.21171069.com.

Table 1 - A list of HIV testing services or AIDS Non-governmental Organisations (Services provided may not be limited to MSM).

Department of Health	Website
AIDS Counselling and Testing Service	http://www.info.gov.hk/aids/chinese/hotline/main.htm
Social Hygiene Service	http://www.dh.gov.hk/english/clinictimetable/shc.htm

AIDS Non-governmental Organisations	Phone
A-Backup	3116 7204
AIDS Concern	2394 6677
Project Touch of The Boys' and Girls' Clubs Association	6387 6984
CHOICE	3188 9024
Hong Kong AIDS Foundation	2513 0513
Midnight Blue	2493 4555
Rainbow of Hong Kong	8108 1069
Rainbow Action	6998 1069
The Society of Rehabilitation and Crime Prevention, HK	2323 3983 8206 9922

NEWS IN BRIEF

Workshop on Sterilization and Infection Control related to Operating Theatre on March 1 and 2, 2017

A two-day "Workshop on Sterilization and Infection Control related to Operating Theatre" was conducted on March 1 and 2, 2017, which consisted of a half day visit to the Sterile Supply Department and Endoscopic Reprocessing Unit of Tuen Mun Hospital, together with a 1.5-day didactic lectures. Sessions were ranged from sharing the current practices on equipment validation and packaging requirement, to the future development of sterilisation service. Local and overseas experience on theatre ventilation in preventing infection were also shared. In particular, there was interesting sharing of the new operation theatre design for the upcoming new hospitals in Hong Kong. There were fruitful experiences sharing and exchange, especially on the monitoring, by overseas and local experts through the panel discussion sessions. Audiences were enlightened on the importance of proper sterilisation process and ventilation setup in the operating theatre. All the information has been uploaded onto the Hong Kong Training Portal on Infection Control and Infectious Diseases (http://icidportal.ha.org.hk/).

Photo 1 – Group photo of overseas speakers and workshop organising committee on March 1, 2017.

Photo 2 – Brief introduction on the hospital sterilisation service before hospital visit on March 1, 2017.

Revised classification scheme of countries and areas affected by Zika Virus Infection

A new classification scheme of countries and areas affected by Zika Virus Infection (ZVI) was adopted in the latest Zika virus situation report published by the World Health Organization (WHO) on March 10, 2017. According to the situation report, WHO, the United States Centers for Disease Control and Prevention (CDC) and the European Centre for Disease Prevention and Control have developed a new classification scheme which serves to categorise countries and areas according to the presence of and potential for vector-borne Zika virus transmission. The new scheme classifies countries and areas into four categories instead of three categories adopted in the previous classification. Based on the defined criteria and expert review, some countries and areas were reclassified and some were classified for the first time, bringing the total number of affected countries and areas under the new scheme to 148 (Table 1). The whole situation report can be accessed via the following link: http://www.who.int/emergencies/zika-virus/situation-report/10-march-2017/en/.

Moreover, CDC has recently updated its Zika travel guidance and now recommends that pregnant women should not travel to any area where there is a risk of ZVI, including areas where the virus has been newly introduced or reintroduced and local mosquito-borne transmission is ongoing; areas where the virus was present before 2015 (endemic) and there is no evidence transmission has stopped; and areas where the virus is likely to be circulating but has not been documented. Their recommendation can be found at https://www.cdc.gov/media/releases/2017/s0310-zika-travel-guidance.html.

	WHO Regional Office	Country / territory / subnational area	Total
Category 1: Area with new introduction or re-introduction with ongoing transmission	AFRO	Angola; Cape Verde; Guinea-Bissau	3
	AMRO/PAHO	Anguilla; Antigua and Barbuda; Argentina; Aruba; Bahamas; Barbados; Belize; Bolivia; Bonaire, St Eustatius and Saba; Brazil; British Virgin Islands; Cayman Islands; Colombia; Costa Rica; Cuba; Curacao; Dominica; Dominican Republic; Ecuador; El Salvador; French Guiana; Grenada; Guadeloupe; Guatemala; Guyana; Honduras; Jamaica; Martinique; Mexico; Montserrat; Nicaragua; Panama; Paraguay; Peru; Puerto Rico; Saint Barthelemy; Saint Kitts and Nevis; Saint Lucia; Saint-Martin; St Maarten; St Vincent and the Grenadines; Suriname; Trinidad and Tobago; Turks and Caicos Islands; the United States; the US Virgin Islands; Venezuela	47
	SEARO	Maldives	1
	WPRO	American Samoa; Fiji; Marshall Islands; Micronesia; Palau; Papua New Guinea; Samoa; Singapore; Solomon Islands; Tonga	10
Subtotal			61
Category 2: Area either with evidence of virus circulation before 2015 or area with ongoing transmission that is no longer in the new or re-introduction phase, but where there is no evidence of interruption	AFRO	Burkina Faso; Burundi; Cameroon; Central African Republic; Cote d'Ivoire; Gabon; Nigeria; Senegal; Uganda	9
	AMRO/PAHO	Haiti	1
	SEARO	Indonesia; Thailand; Bangladesh	3
	WPRO	Cambodia; Laos; Malaysia; Philippines; Vietnam	5
Subtotal			18
Category 3: Area with interrupted transmission and with potential for future transmission	AMRO/PAHO	Easter Island (Chile)	1
	WPRO	Cook Islands; French Polynesia; New Caledonia; Vanuatu	4
Subtotal			5
Category 4: Area with established competent vector but no known documented past or current transmission	AFRO	Benin; Botswana; Chad; Comoros; Congo; Democratic Republic of the Congo; Equatorial Guinea; Eritrea; Ethiopia; Gambia; Ghana; Guinea; Kenya; Liberia; Madagascar; Malawi; Mali; Mauritius; Mayotte; Mozambique; Namibia; Niger; Reunion; Rwanda; Sao Tome and Principe; Seychelles; Sierra Leone; South Africa; South Sudan; Togo; Tanzania; Zambia; Zimbabwe	33
	AMRO/PAHO	Uruguay	1
	EMRO	Djibouti; Egypt; Oman; Pakistan; Saudi Arabia; Somalia; Sudan; Yemen	8
	EURO	Georgia; Região Autónoma de Madeira (Portugal); Russia; Turkey	4
	SEARO	Bhutan; India; Myanmar; Nepal; Sri Lanka; Timor-Leste	6
	WPRO	Australia; Brunei Darussalam; China; Christmas Island; Guam; Kiribati; Nauru; Niue; Northern Mariana Islands; Tokelau; Tuvalu; Wallis and Futuna	12
Subtotal			64
Total			148

Table 1 - Classification of countries and areas affected by Zika Virus Infection, published on March 10, 2017.

Locally, the Centre for Health Protection (CHP) of the Department of Health recorded two imported cases of ZVI so far. Our risk assessment and recommendations on the prevention and control of ZVI remained the same. Countries and areas classified under Categories 1 and 2 in WHO's new classification scheme are regarded as those with ongoing Zika virus transmission (affected areas). Pregnant women and women preparing for pregnancy should not travel to affected areas. Moreover, members of the public are reminded to adopt strict anti-mosquito measures and safe sex during travel. Further details of the affected areas can be found at the CHP website (http://www.chp.gov.hk/en/view_content/43209.html).

Mar 12 - Mar 25, 2017 WEEKS 11 - 12 VOL 14 ISSUE Nº 6

Communicable Diseases WATCH

衞生防護中心 Centre for Health Protection 衞生署 Department of Health

FEATURE IN FOCUS

Immunisation Coverage for Children Aged Two to Five: Findings of the 2015 Immunisation Survey

Reported by Mr Desmond CHAN, Scientific Officer, Vaccine Preventable Disease Office, Surveillance and Epidemiology Branch, CHP.

Background

Immunisation is one of the most effective public health measures in the prevention and control of infectious diseases. Immunisation coverage is an important indicator for the planning and evaluation of immunisation programmes. Under the Hong Kong Childhood Immunisation Programme (HKCIP), the Government provides a number of vaccines free-of-charge to eligible children in Hong Kong[1]. These vaccines are given at birth in hospitals, during pre-school period by the Department of Health (DH)'s Maternal and Child Health Centres (MCHC), and in primary schools by DH's outreaching School Immunisation Teams (SIT). The Student Health Service (SHS) under the DH also provide catch-up vaccination to secondary school students. Alternatively, parents may opt to have their children vaccinated in private medical sector at their own expenses.

DH conducted territory-wide immunisation surveys to estimate the immunisation coverage among children aged two to five attending pre-primary institutions including kindergartens (KG), childcare centres (CCC) and kindergartens-cum-childcare centres (KG-cum-CCC). Five rounds of immunisation surveys had been conducted in 2001[2], 2003[3], 2006[4], 2009[5] and 2012[6], covering birth cohorts of 1995 to 2009. The surveys' results showed that the overall immunisation coverage for vaccines included in the CIP was consistently high for these children (above 95%). However, it was noted that in the children born or resided outside Hong Kong before two years of age had relatively lower immunisation coverage. A new round of immunisation coverage survey was conducted in 2015, targeting children born between 2009 and 2012.

Methods

We conducted a cross-sectional study. The study population was children aged two to five (defined as children born between 2009 and 2012) attending pre-primary institutions in Hong Kong. Pre-primary institutions included KG, CCC and KG-cum-CCC. We obtained a list of pre-primary institutions from the Education Bureau (EDB) and the Social Welfare Department (SWD) as the sampling frame. We selected 5% of the pre-primary institutions in this list by stratified cluster sampling. We invited all children attending the selected institutions as secondary sampling units. Participation was on a voluntary basis. We obtained written consent from parents. We collected demographic information by asking parents to complete a self-administered questionnaire. The demographic information of children included date of birth, gender, place of birth, place of residence before two years of age and current place. Parents submitted copies of all relevant immunisation records to us through the pre-primary institutions. Trained field workers from the SIT collected the questionnaires and extracted information from the immunisation records to a standardised data recording form. The information included type, date and place of vaccination. In addition to hardcopies of the immunisation records, we also obtained children's immunisation record in DH's MCHCs under the Immunisation Record System. When the immunisation record was incomplete, we asked parents to provide other immunisation documents, if any.

We included only children born within the target birth cohorts i.e. between 2009 and 2012 in our analysis. We defined local children as those who were born in Hong Kong, resided in Hong Kong before two years of age and lived in Hong Kong at the time of survey. All other children were defined as non-local children. We calculated coverage as the proportion of children vaccinated using the total number in each group as a denominator. We calculated the proportion of vaccines received by place of vaccination. We computed the risk ratios of coverage and their 95% confidence intervals (95% CI) among local and non-local children for different vaccines. We compared immunisation coverage of various vaccines in this survey with earlier surveys. We computed the time of vaccination as the duration between date of vaccination and date of birth to study the timeliness of vaccination.

Results

A total of 51 KG, CCC and KG-cum-CCC were successfully recruited. Among 10 727 children enrolled in these 51 institutions, 8 723 participated in the survey. The overall response rate was 81.3%. Immunisation records of 8 522 children (98%) were available and reviewed and analysed as valid respondents of the survey. Children born outside the target birth cohorts of 2009 to 2012 (n=201) were excluded from the analysis. Of these respondents, 65%, 32% and 3% were attendants of KG, KG-cum-CCC and CCC

respectively. Eighty-two percent of valid respondents who were born in Hong Kong, resided in Hong Kong before two years of age and lived in Hong Kong at the time of survey were considered as local children. The remaining 18% were classified as non-local children (Table 1).

In the 2009 to 2012 birth cohorts, the overall routine immunisation coverage reached 95%, except for pneumococcal conjugate vaccines (PCV) (Table 2). Excluding PCV, 96% of surveyed children completed their routine vaccination under HKCIP. Local children had higher coverage (98%) for all HKCIP vaccines when compared to non-local children (87%) and the difference was greatest for PCV. PCV coverage exceeded 95% among local children, except for PCV booster of those born in 2009. Local children were also more likely to complete all HKCIP vaccines than non-local children (risk ratio=2.04, 95% CI: 1.80-2.31) (Table 2).

Regarding the place of vaccination for CIP vaccines, 85% of local children received their vaccines in MCHC and 14% received them in the private health sector (Figure 1). In contrast, 58% of non-local children received their vaccines in MCHC whilst 36% received them in Mainland China.

Both local and non-local children received vaccines included in the HKCIP in a timely manner and the median time of vaccination was comparable to the recommended age of vaccination (Table 3).

Discussion

High coverage for routine childhood vaccines was maintained in Hong Kong. The immunisation coverage of CIP vaccines had been consistently around 95% for most cohorts studied in our surveys[2-6]. As PCV was introduced in September 2009 and only children born after July 1, 2009 were eligible for the standard three-plus-one regimen, it is not unexpected that the PCV coverage for local children of the 2009 cohort was lower than that of the 2010 to 2012 cohorts. High PCV coverage was achieved for local children. The introduction of PCV into the CIP in 2009 was well accepted.

Table 1 - Descriptive characteristics of the survey participants (8 522), Hong Kong Immunisation Coverage Survey 2015.

Characteristics		Number	Percentage
Year of birth	2009	2 276	26.7
	2010	2 488	29.2
	2011	2 831	33.2
	2012	927	10.9
Gender	Male	4 480	52.6
	Female	4 042	47.4
Birth & residential status	Local	6 970	81.8
	Non-local	1 552	18.2
Place of birth	Hong Kong	8 105	95.1
	Mainland China	321	3.8
	Others	96	1.1
Usual place of residence before two years of age	Hong Kong	7 101	83.3
	Mainland China	1 334	15.7
	Others	70	0.8
	Unknown	17	0.2
Current place of residence	Hong Kong	7 983	93.7
	Mainland China	517	6.1
	Hong Kong & Mainland China	1	0.0
	Unknown	21	0.2
Setting	Kindergarten	5 515	64.7
	Child care centres (CCC)	262	3.1
	Kindergarten-cum-CCC	2 745	32.2
Total		8 522	100

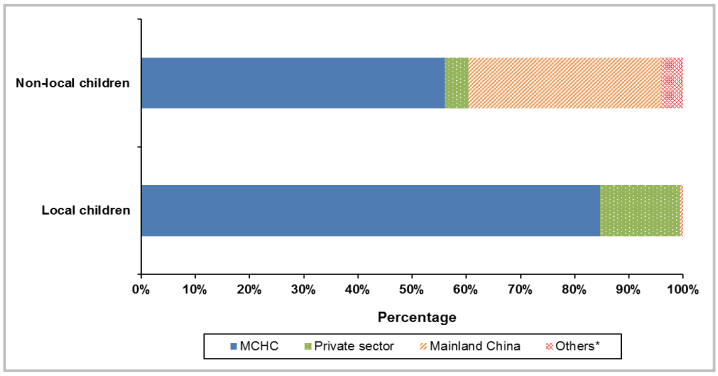


Figure 1 - Proportion of Childhood Immunisation Programme vaccines received in different settings by place of birth/residence, birth cohorts 2009-2012, Hong Kong Immunisation Coverage Survey 2015.
*(Notes: *Others include those vaccinated at facilities under the Hospital Authority, Macau, other overseas places and unknown.)*

Table 2 - Immunisation coverage for vaccines included in HKCIP, of children from birth cohorts 2009-2012, Hong Kong Immunisation Coverage Survey 2015.

Type of vaccine	2009			2010			2011			2012			2009-2012			Risk ratio (95%CI)
	Local (n=1 729)	Non-local (n=547)	Total (n=2 276)	Local (n=2 010)	Non-local (n=478)	Total (n=2 488)	Local (n=2 345)	Non-local (n=486)	Total (n=2 831)	Local (n=886)	Non-local (n=41)	Total (n=927)	Local (n=6 970)	Non-local (n=1 552)	Total (n=8 522)	Local vs Non-local
BCG	100.0	98.8	99.7	99.8	98.8	99.6	99.7	98.4	99.5	99.7	97.6	99.6	99.8	98.7	99.6	1.93 (1.30-2.88)
Hep B 3rd dose	99.7	97.7	99.2	99.4	98.2	99.2	99.5	97.6	99.2	99.4	94.8	99.2	99.5	97.8	99.2	1.67 (1.30-2.13)
Polio Booster	99.0	86.8	96.0	98.8	89.2	96.9	98.4	89.5	96.9	97.7	92.8	97.4	98.6	88.6	96.7	2.30 (1.97-2.69)
DTP Booster	99.1	96.4	98.5	98.9	97.4	98.6	98.5	96.1	98.1	97.7	92.8	97.4	98.7	96.5	98.3	1.29 (1.14-1.46)
Measles*	99.5	97.6	99.1	99.5	98.9	99.3	99.1	98.8	99.0	99.6	100.0	99.6	99.4	98.4	99.2	1.28 (1.07-1.53)
Mumps*	99.5	95.6	98.6	99.4	98.3	99.2	99.1	97.5	98.8	99.6	100.0	99.6	99.4	97.2	99.0	1.64 (1.33-2.02)
Rubella*	99.5	95.6	98.6	99.4	98.5	99.2	99.1	98.4	99.0	99.6	100.0	99.6	99.4	97.5	99.0	1.55 (1.26-1.90)
PCV 1st dose	99.5	75.5	93.8	99.4	82.7	96.2	99.6	88.1	97.7	99.9	95.1	99.7	99.6	82.2	96.4	8.62 (6.13-12.10)
PCV 2nd dose	98.4	64.8	90.3	99.3	73.4	94.3	99.5	78.5	95.9	99.8	82.9	99.0	99.2	72.2	94.3	7.37 (5.77-9.40)
PCV 3rd dose	96.3	58.0	87.1	99.1	68.2	93.1	99.3	75.2	95.2	99.6	82.9	98.8	98.5	67.2	92.8	5.20 (4.36-6.21)
PCV Booster	87.1	47.7	77.7	98.2	61.5	91.1	98.9	69.9	93.9	99.1	75.7	98.0	95.8	59.7	89.2	2.75 (2.50-3.02)
Complete immunisation#	98.3	84.0	94.8	98.2	87.5	96.2	97.8	88.0	96.1	96.7	90.4	96.4	97.9	86.5	95.8	2.04 (1.80-2.31)

*Notes: *In Hong Kong, children received MMR according to HKCIP; #Excluding PCV*

Table 3 - Timeliness of Childhood Immunisation Programme vaccines received by local and non-local children, birth cohorts 2009-2012[1], Hong Kong Immunisation Coverage Survey 2015.

Recommended Age	Vaccines included in HKCIP	Local children		Non-local children	
		Number of children studied	Time of vaccination Median (interquartile range) (months)[2]	Number of children studied	Time of vaccination Median (interquartile range) (months)[2]
Newborn	B.C.G. Vaccine	6 956	1 (1-2) (days)	1532	1 (1-2) (days)
	Hepatitis B Vaccine – 1st dose	6 956	0 (0-0) (days)	1539	0 (0-0) (days)
1 month	Hepatitis B Vaccine – 2nd dose	6 954	1.1 (1.1-1.3)	1536	1.1 (1.1-1.3)
2 months	DTP Vaccine[3] – 1st Dose	6 956	2.1 (2.1-2.3)	1540	2.4 (2.1-3.3)
	Polio Vaccine[3] – 1st Dose	6 956	2.1 (2.1-2.2)	1538	2.2 (2.1-2.4)
	Pneumococcal Conjugate Vaccine[1] – 1st dose	6 155	2.1 (2.1-2.3)	1104	2.3 (2.1-4.5)
4 months	DTP Vaccine[3] - Second Dose	6 956	4.2 (4.1-4.4)	1538	4.3 (4.2-4.7)
	Polio Vaccine[3] – Second Dose	6 956	4.2 (4.1-4.4)	1537	4.2 (3.6-4.4)
	Pneumococcal Conjugate Vaccine[1] – 2nd dose	6 146	4.2 (4.1-4.4)	978	4.4 (4.2-5.2)
6 months	DTP Vaccine[3] – 3rd Dose	6 952	6.3 (6.2-6.6)	1535	6.3 (6.0-6.6)
	Polio Vaccine[3] – 3rd Dose	6 952	6.3 (6.2-6.6)	1531	6.2 (5.0-6.6)
	Pneumococcal Conjugate Vaccine[1] – 3rd Dose	6 133	6.3 (6.2-6.6)	915	6.4 (6.2-7.1)
	Hepatitis B Vaccine – 3rd Dose	6 936	6.3 (6.2-6.6)	1518	6.4 (6.2-6.9)
12 months	Measles vaccine - 1st Dose[4]	6 926	12.3 (12.2-12.6)	1528	12.3 (9.8-12.7)
	Mumps vaccine - 1st Dose[4]	6 925	12.3 (12.2-12.6)	1508	12.7 (12.3-18.6)
	Rubella vaccine - 1st Dose[4]	6 925	12.3 (12.2-12.6)	1513	12.4 (12.2-13.7)
	Pneumococcal Conjugate Vaccine[1] - Booster	6 088	12.3 (12.2-12.6)	832	12.4 (12.2-12.8)
18 months	DTP Vaccine[3] - Booster	6 872	18.4 (18.3-18.8)	1498	18.7 (18.4-19.9)
	Polio Vaccine[3] – Booster	6 865	18.4 (18.3-18.8)	1375	18.5 (18.3-20.2)

Notes:
1. *Children born before July 1, 2009 were excluded from the analysis since they were not eligible for the standard PCV programme.*
2. *Except for BCG and first dose of Hep B vaccine which is presented in day, time of vaccination for other vaccines are presented as months.*
3. *Combined Diphtheria, Tetanus, acellular Pertussis & Inactivated Poliovirus Vaccine is recommended in HKCIP but children receiving any forms of diphtheria, tetanus, pertussis and poliovirus containing vaccines were included in the analysis.*
4. *Combined Measles, Mumps and Rubella (MMR) vaccine is recommended in Hong Kong but children receiving any forms of measles, mumps and rubella containing vaccines were included in the analysis.*

Local children had higher routine immunisation coverage when compared to non-local children and the difference was most prominent for PCV. The coverage of the third dose of Hepatitis B, booster doses of DTP and polio among non-local children fell below 95% is also of concern. When compared to local children, more non-local children received vaccines in Mainland China (35.7% among non-local children vs 0.4% among local children). These children were more mobile and less likely to adhere to the HKCIP compared to local children. As MCHC provided routine PCV catch-up vaccination to children up to two years of age, non-local children who resided in Mainland China before two years of age were less likely to complete their PCV immunisation and hence the coverage was lower.

In addition to high immunisation coverage, preschool children in Hong Kong also adhered well to the recommended age of vaccination. There was only slight delay in receiving CIP vaccines which could be due to appointment issues, sickness of the child and availability of parents and caregivers. Both the health care providers and the parents followed closely the recommended schedule, despite that these children received their vaccines in different sectors.

Limitations

There are limitations to our study. First, Mainland China and the private health sector in Hong Kong recorded vaccinations using systems that differed from the Hong Kong public sector. Some parents in our study might not have submitted all the immunisation records. Despite efforts such as phone calls and letters to remind parents of non-local children to ensure complete sets of immunisation records were collected, our survey may not have captured all the records. Moreover, we could not distinguish between lack of vaccination and lack of documentation of vaccination. Therefore, we may have underestimated the contribution of Mainland China and the private health sector to the immunisation coverage. Second, we selected only children attending pre-primary institutions. In Hong Kong, early childhood education in pre-primary institutions is not mandatory. According to the EDB and SWD, the proportion of children aged two years attending pre-primary institution in Hong Kong was about 50%, compared to 86% for children aged three to five years in the 2014/15 school year. So the findings from this study may not be generalisable to those children who were not attending pre-primary institution.

Conclusion

Our study led to three main conclusions. First, routine immunisation coverage remained high, including the newly launched PCV programme. Second, preschool children in Hong Kong received HKCIP vaccines in a timely manner. Third, non-local children had lower documented coverage of routine vaccination, which is of concern. To protect the public from vaccine preventable diseases, clinicians are advised to take note of the findings of this survey and help to provide childhood immunisation to individual young children, especially those who are not born or residing locally to ensure the overall high coverage in the community.

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Review of Shiga toxin-producing *Escherichia coli* infection in Hong Kong from 2007 to 2016

Reported by Dr YU Wing-man, Medical and Health Officer, Enteric and Vector-borne Disease Office, Surveillance and Epidemiology Branch, CHP.

Escherichia coli (*E. coli*) are Gram-negative bacteria commonly found in the intestinal tract of healthy humans and warm-blooded animals. While most strains are harmless, some can cause severe foodborne disease. In particular, Shiga toxin-producing *E. coli* (STEC) is an important group of *E. coli* that can cause severe diarrhoea and accounts for many foodborne outbreaks worldwide.[1,2] This article reviews the local epidemiology of STEC over the past decade.

From 2007 to 2016, the Centre for Health Protection (CHP) of the Department of Health recorded 32* cases of STEC infection including two cases reported on a voluntary basis prior to July 2008. The annual number of cases ranged from zero to eight (Figure 1). As of March 17, 2017, CHP did not record any case in 2017 so far.

Females comprised 53% of the 32 cases. The ages of the cases ranged between six months to 80 years (median: two years). Sixty-nine percent (22 cases) were children under six years old and two of them had underlying illness before onset of symptoms. On the other hand, four cases were elderly aged 65 or above and all had underlying medical illnesses.

Except two children who were cousins living in the same flat, all cases recorded were sporadic. Four were imported cases, of which three had been to Mainland China and one to Thailand. The other 28 patients acquired the infection locally. Half of the affected persons had symptom onset in the warmer months from May to August (Figure 2).

Most of them (29 cases, 91%) presented with diarrhoea with 10 (34%) of them presented with bloody diarrhoea. More than half (19 cases, 59%) of the patients presented with fever. Other symptoms included vomiting (16 cases, 50%) and abdominal pain (10 cases, 31%). Twenty-seven patients (84%) required in-hospital management for the infection. The length of stay ranged from one to 30 days with a median of three days. None of them developed haemolytic uraemic syndrome and no fatal cases were recorded.

Epidemiological investigations revealed that two patients recalled consumption of high risk foods, namely, undercooked beef. Two children had visited local farms where one of them had contacted sheep, goats and rabbits while the other had fed rabbits. High risk exposure could not be recalled in the rest of the cases.

Facts on STEC

STEC is transmitted to humans primarily through consumption of contaminated foods, such as raw or undercooked ground meat products, contaminated fruits and vegetables, unpasteurised dairy products, contaminated water, and direct contact with animals or their environment. Direct person-to-person transmission through the oral-faecal route can also occur. Moreover, exposure to recreational water sources like swimming in contaminated water is a route of infection.

Symptoms of STEC infection usually start three to four days after consumption of contaminated food. Symptoms include abdominal cramps and diarrhoea that may in some cases progress to bloody diarrhoea. Fever and vomiting may also occur. In serious cases, the infection may lead to a life-threatening complication named haemolytic uraemic syndrome which is a type of kidney failure. People of any age can become infected. Very young children and the elderly are more likely to develop severe illness, but even healthy older children and young adults can become seriously ill. Clinical management for STEC infection is usually supportive while fluid and electrolyte replacement is important when there is severe diarrhoea.

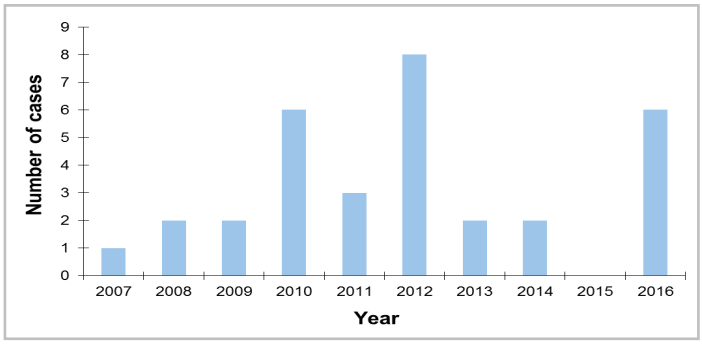

Figure 1 - Annual number of confirmed cases of STEC infection from 2007 to 2016.

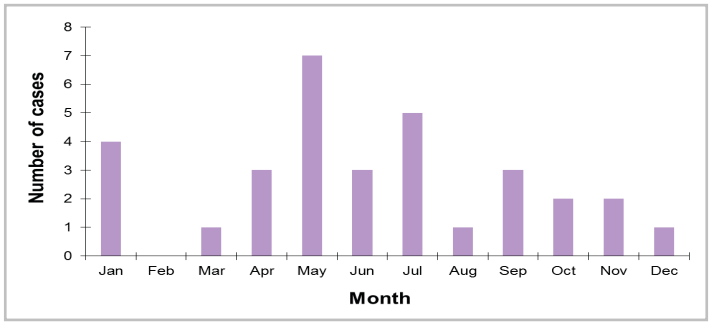

Figure 2 - Number of cases of STEC infection by month of symptom onset from 2007 to 2016.

*In Hong Kong, *E. coli* O157:H7 infection became a notifiable infectious disease in July 2008 and before that, cases were reported on a voluntary basis to the CHP. In view of the occurrence of large-scale non-O157 STEC outbreaks in Europe in mid-2011, the CHP has refined the notification to include all STEC infections to the list of notifiable infectious diseases since June 10, 2011.

Maintaining good food, personal and environmental hygiene is the mainstay of preventing STEC infection. Members of the public are advised to avoid eating or drinking undercooked food and unpasteurised milk. Moreover, the public should cook food and boil water thoroughly before consumption. Hand hygiene is of particular importance for patients with STEC infection, their close contacts and caregivers and for those who visit animal farms or petting zoos. More health information is available in the CHP website: http://www.chp.gov.hk/en/content/9/24/23315.html.

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NEWS IN BRIEF

A local sporadic case of leptospirosis

On March 13, 2017, the Centre for Health Protection (CHP) recorded a local case of leptospirosis affecting a 63-year-old housewife with underlying illnesses. She presented with fever, right loin pain and vomiting on February 19 and was admitted to a public hospital on February 20. She developed respiratory failure, acute kidney injury and septic shock and was admitted to the intensive care unit for further management including mechanical ventilation, renal dialysis and inotropic support. She was treated with antibiotics and her condition improved. She was transferred back to general ward on March 2. Paired sera on February 20 and March 3 showed more than four-fold rise in antibody titre against *Leptospira* by microscopic agglutination test. The patient had no travel history during the incubation period. She denied any water recreation activities, skin wound, or contact with rodents or animals. Investigations are on-going.

A probable case of sporadic Creutzfeldt-Jakob disease

CHP recorded a probable case of sporadic Creutzfeldt-Jakob disease (CJD) on March 16, 2017, affecting an 85 year-old man with underlying illnesses. He presented with sudden onset of left-sided weakness on January 19, 2017. He attended a public hospital on January 22 and was admitted on the same day. Subsequently, he developed rapidly progressive dementia, myoclonus, akinetic mutism, generalised rigidity, dysarthria and dysphagia. Finding of electroencephalography was compatible with CJD. His condition was stable. No risk factors for either iatrogenic or variant CJD were identified. He was classified as a probable case of sporadic CJD.

A local sporadic case of hantavirus infection

On March 22, 2017, CHP recorded a sporadic case of hantavirus infection affecting a 22-year-old man with good past health. He presented with on and off fever, runny nose, abdominal pain and vomiting since March 5. He attended the Accident and Emergency Department of a public hospital on March 11 and was admitted on the same day. He subsequently developed acute renal failure, impaired liver function and reduction in platelet count. His blood collected on March 15 was tested positive for Hantavirus IgM and Hantavirus polyvalent antibody titre was raised to 2 560. He was given antibiotics and his clinical condition was stable all along. Epidemiological investigation revealed that the patient was a student. He lived with his parents and elder brother in Yuen Long who remained asymptomatic. He did not keep pets at home and had no travel history during incubation period. He denied any previous skin wounds and any contacts with rodents or their excreta. He did not report any rodent bites. The Food and Environmental Hygiene Department was informed and investigations are on-going.

CA-MRSA cases in February 2017

In February 2017, CHP recorded a total of 82 cases of community-associated methicillin resistant *Staphylococcus aureus* (CA-MRSA) infection, affecting 44 males and 38 females with ages ranging from 15 months to 88 years (median: 37.5 years). Among them, there were 59 Chinese, 8 Filipinos, 3 Caucasian, 3 Indian, 3 Pakistani, 2 Nepalese, 1 Korean, 1 Singaporean and 2 of unknown ethnicity.

Eighty-one cases presented with uncomplicated skin and soft tissue infections while the remaining case had severe CA-MRSA infection. This case affected a 33-year-old woman who presented with fever, right periorbital pain and swelling since January 19. She was admitted to a public hospital on January 21. Her blood specimen collected on January 21 was cultured positive for CA-MRSA. She was diagnosed to have herpes zoster with ophthalmic involvement, orbital cellulitis and sepsis. She was treated with antibiotics and antivirals and was discharged on February 7. She did not have any close contacts. Separately, among the 82 cases, the isolate of one case affecting a 52-year-old woman was found to be resistant to mupirocin. She presented with finger abscess and recovered after antibiotic treatment.

Among the cases, one was a nurse working in an outpatient clinic. Investigation revealed that this patient was a household contact of a previous confirmed case reported in January 2017. Apart from the above cluster, two other cases were involved in two household clusters epidemiologically linked to one and two previous reported cases respectively. Decolonisation would be provided for their close contacts.

Scarlet fever update (February 1, 2017 - February 28, 2017)

Scarlet fever activity in February was similar to that in January. CHP recorded 168 cases of scarlet fever in February as compared with 176 cases in January. The cases recorded in February included 98 males and 70 females aged between seven months and 31 years (median: six years). There were eight institutional clusters occurring in six kindergartens and two primary schools, affecting a total of 18 children. No fatal cases were reported in February. Of note, there has been an unusual increase in the activity of scarlet fever in March, which was higher than that in the same period in previous years. In view of the increase in scarlet fever activity in the recent few weeks, parents should take extra care of their children in maintaining strict personal, hand and environmental hygiene. People suspected to have scarlet fever should consult a doctor promptly.

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Communicable Diseases WATCH

衛生防護中心 Centre for Health Protection 衛生署 Department of Health

FEATURE IN FOCUS

Summary of the 2017 winter influenza season in Hong Kong

Reported by Ms Vera CHOW, Scientific Officer, Respiratory Disease Office, Surveillance and Epidemiology Branch, CHP.

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.

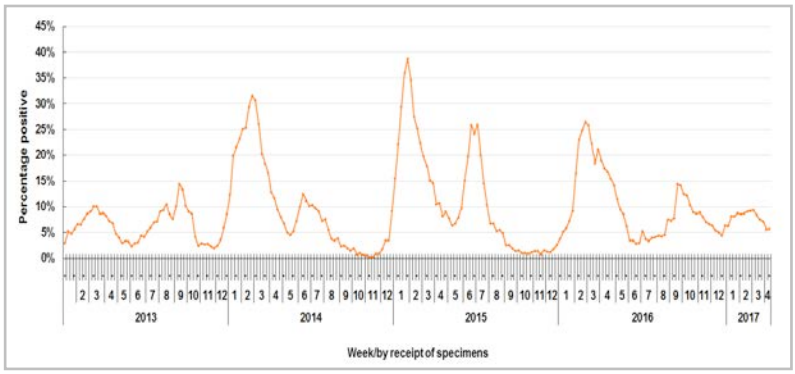

Figure 1 - Weekly percentage of respiratory tract specimens tested positive for influenza viruses by PHLSB, 2013-2017 (as of April 8, 2017).

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.

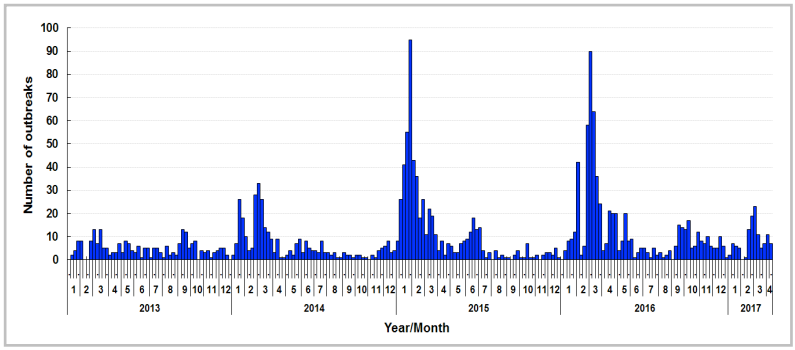

Figure 2 - Weekly number of institutional ILI outbreaks reported to CHP, 2013-2017 (as of April 8, 2017).

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 two years. The number of severe cases reported in 2015 and 2016 was 665 (502 deaths) and 436 (214 deaths) respectively.

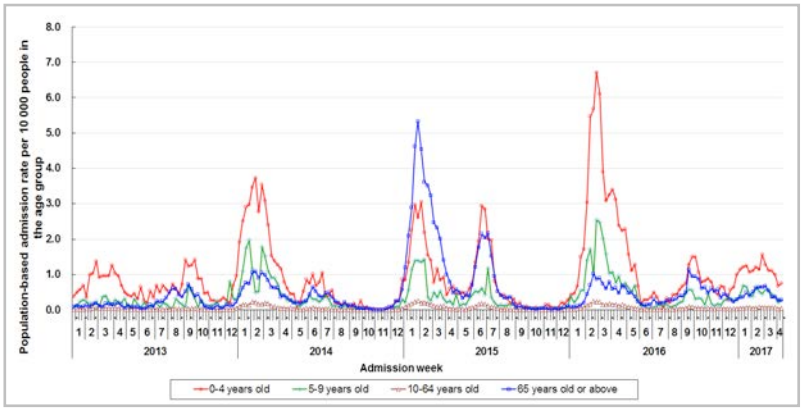

Figure 3 - Weekly admission rates with principal diagnosis of influenza in public hospitals by age groups, 2013-2017 (as of April 8, 2017).

Table 1 - Age distribution of the severe influenza cases among adults recorded from February 24 – April 12 and their history of receiving the SIV for 2016/17 season.

Age group	Total number		Known to have received SIV (%)
	Cases including deaths (%)	Deaths (%)	
18 – 49	3 (4.5%)	0 (0%)	1/3 (33.3%)
50 – 64	13 (19.7%)	2 (4.9%)	0/13 (0%)
≥ 65	50 (75.8%)	39 (95.1%)	19/50 (38.0%)
Total	66	41	20/66 (30.3%)

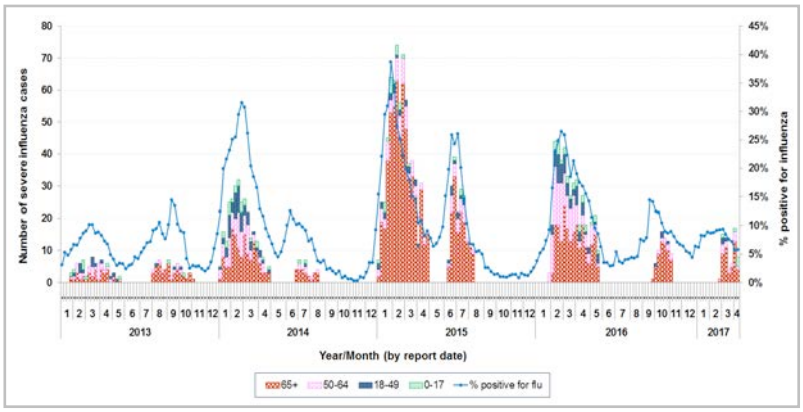

Figure 4 - Weekly number of severe influenza cases reported during influenza seasons and percentage positive for influenza among respiratory specimens tested by PHLSB, 2013-2017 (as of April 8, 2017).
(Remark: The enhanced surveillance system for severe cases among patients aged 18 years or above was only activated intermittently during influenza seasons.)

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

Reported by Dr Terence LAM, Scientific Officer, Dr Zenith WU, Medical and Health Officer, and Dr YU Wing-man, Medical and Health Officer, Enteric and Vector-borne Disease Office, Surveillance and Epidemiology Branch, CHP.

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[1].

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).

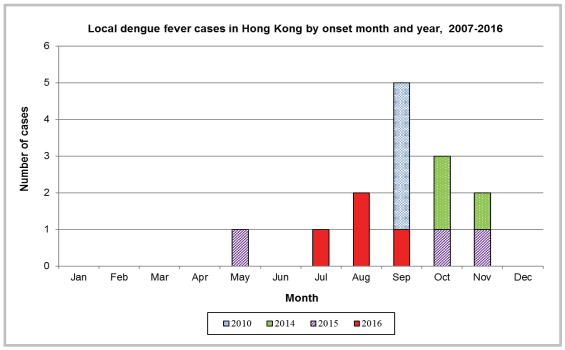

Figure 1 - Number of local DF cases in Hong Kong by onset month and year from 2007 to 2016.

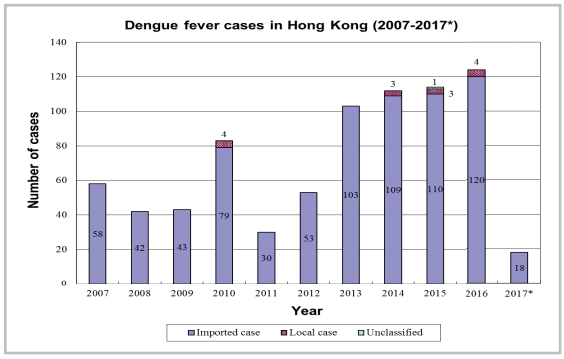

*Figure 2 - Number of DF cases in Hong Kong from 2007 to 2017 (*Provisional figures as of April 12, 2017).*

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[2]. CF occurs in Africa, Asia and the Indian subcontinent. In recent decades mosquito vectors of chikungunya have spread to Europe and the Americas[2].

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).

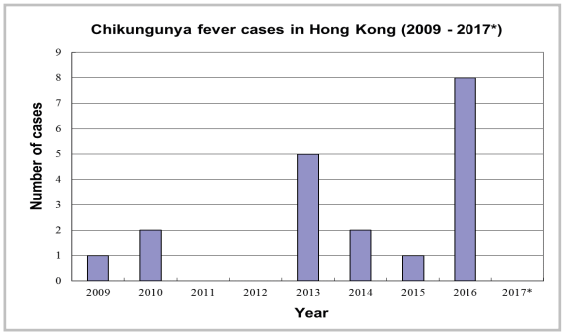

*Figure 3 - Number of CF cases in Hong Kong from 2009 to 2017 (*Provisional figures as of April 12, 2017).*

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[3]. 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[4].

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 ranged 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).

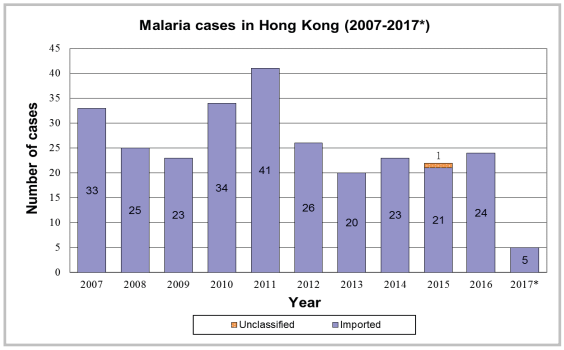

*Figure 4 - Number of malaria cases in Hong Kong from 2007 to 2017 (*Provisional figures as of April 12, 2017).*

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 ranged 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).

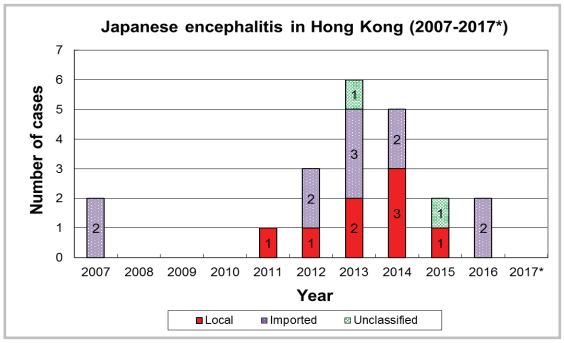

*Figure 5 - Number of JE cases in Hong Kong from 2007 to 2017 (*Provisional figures as of April 12, 2017).*

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).

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NEWS IN BRIEF

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 on March 19. She was admitted to a public hospital on March 24 and chest X-ray showed bilateral lower zone hazziness. 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 *Chlamydophila 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 hazziness. 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 *Chlamydophila 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 *Chlamydophila 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 5. 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.

Communicable Diseases WATCH

衛生防護中心 Centre for Health Protection 衛生署 Department of Health

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FEATURE IN FOCUS

Celebrating World Immunisation Week 2017 (April 24 - 30)

Reported by Dr CHAN Hong-lam, Medical and Health Officer, Vaccine Preventable Disease Office, Surveillance and Epidemiology Branch, CHP.

Designated by the World Health Organization (WHO), the World Immunisation Week (WIW) takes place annually during the last week of April as a global initiative to promote the use of vaccines for protecting people of all ages against diseases. The theme for this year is "#VaccinesWork".

Immunisation is considered one of the most successful and cost-effective public health interventions. Routine immunisation provides a point of contact for health care at the beginning of life and offers every child the chance at a healthy life from the start. As with many developed countries, the introduction of universal childhood immunisation in Hong Kong since the 1950s has been remarkably successful at eradicating or reducing the prevalence of many serious diseases such as smallpox and poliomyelitis. Likewise, many other vaccine preventable diseases such as diphtheria and tetanus have reached historic or near record lows over the last two decades. In 2011, Hong Kong was verified by Western Pacific Regional Office (WPRO) of WHO as having achieved the goal of hepatitis B control. On September 21, 2016, WHO Regional Verification Commission for Measles Elimination in the Western Pacific confirmed that Hong Kong had achieved the interruption of endemic measles virus transmission.

Nevertheless, maintaining high vaccination coverage is of utmost importance in vaccine preventable diseases. In January 2017, over 500 measles cases were reported in the WHO European Region. Four hundreds and seventy-four of those were reported in seven endemic countries including France, Germany, Italy, Poland, Romania, Switzerland and Ukraine. Estimated national immunisation coverage with the second dose of measles-containing vaccine in those countries is less than the 95% threshold. Measles is highly contagious and is still endemic in most parts of the world. The virus can spread to any country, including those that have eliminated the disease. Every un- or under-immunised person regardless of age is therefore at risk of contracting the disease. Large outbreaks can occur in countries where immunisation rate is persistently low. Continuous effort from both the healthcare sector and the community on maintaining high vaccination coverage is essential in prevention and control of local measles transmission.

Successful immunisation requires proper storage and handling of vaccines. The system used for storing vaccines in good condition is called the cold chain. Some vaccines are sensitive to freezing, some to heat and others to light. Vaccines must be maintained at condition recommended by manufacturers at every link in the cold chain. Breaching of cold chain can lead to reduction in vaccine potency and protective effect. In each primary care practice providing vaccination, written plans on routine and emergency storage and handling of vaccines should be available. Purpose-built vaccine refrigerators (PBVR) are the preferred means of storage for vaccines and bar fridge should not be used. A thermometer, recording minimum and maximum temperature and a temperature recording chart is needed. It is a good practice to check and record temperatures at least twice daily. Health care providers should strictly follow the manufacturers' recommendation on storage temperatures of individual

vaccines and keep proper usage and maintenance of refrigerator. If any incident happened or abnormalities found, appropriate actions should be taken.

Control of vaccine preventable diseases relies greatly on immunisation. Successful immunisation requires maintaining quality of vaccines from the time of manufacture until the point of administration. This involves cooperation from multiple health care levels. Health care providers should familiarise with the handling of vaccines and management of cold chain breach.

For more information on the WHO's WIW, please visit the website: http://www.who.int/campaigns/immunization-week/2017/en.

When cold chain breach occurs...

- Vaccines exposed to temperature outside the recommended ranges should remain properly stored, but segregated from unexposed vaccines. Mark "Do NOT Use" for the exposed vaccines;
- Record the date, range and duration of temperature breach;
- Contact the manufacturer or drug company to determine whether the vaccines are still usable. If in doubt, it is better not to vaccinate; and
- Take active steps to correct and prevent the problem from recurring.

Reference: Hong Kong Reference Framework for Preventive Care for Children in Primary Care Settings Module on Immunisation Revised Edition 2015.

Hand Hygiene Awareness Day 2017 – Fight antibiotic resistance – it's in your hands

Reported by Dr John KC SHUM, Medical and Health Officer, Ms YT CHEUNG, Nursing Officer, Dr Queenie KM AU, Senior Medical and Health Officer, and Dr TY WONG, Head, Infection Control Branch, CHP.

Proper hand hygiene is the key element to infection control in both healthcare settings and the community. Since 2005, Hong Kong has pledged support to the World Health Organization (WHO)'s first Global Patient Safety Challenge: Clean Care is Safer Care, and has committed to promote good hand hygiene so as to control the spread of infectious diseases. From 2010 onwards, Hand Hygiene Awareness Day has been marked annually on May 5 in Hong Kong to raise the awareness. This year, WHO's newly launched theme on hand hygiene is:

Fight antibiotic resistance – it's in your hands

Antimicrobial resistance (AMR) continues to pose a threat to global public health. WHO urges healthcare workers to focus on the fight against antibiotic resistance in the context of hand hygiene and infection prevention and control programmes. WHO regards hand hygiene to be at the core of effective infection prevention and control to combat antibiotic resistance. One of the objectives in WHO's Global Action Plan on AMR issued in 2015 is to "Reduce the incidence of infection through effective sanitation, hygiene and infection prevention measures". For this purpose, WHO issues a call to healthcare workers' action: "Clean your hands at the right times and stop the spread of antibiotic resistance".

To echo WHO's call to action, the Centre for Health Protection (CHP) of the Department of Health would further heighten awareness of healthcare workers and general public on the importance of good hand hygiene as cornerstone to combat AMR. A series of promotional materials were produced to enhance and sustain hand hygiene practice among healthcare workers. These

include DVDs containing educational video clips on hand hygiene and antimicrobial resistance and brand-new designed banners and posters as reminder, which will be delivered to out-patient clinics in both public and private hospital sectors.

Thanks to our Hand Hygiene Campaign partners, the hospitals from both public and private sectors, for their unfailing support in promoting proper hand hygiene all along. In addition to on-going hand hygiene compliance audit, various activities have been organised territory-wide both in public and private hospitals with satisfactory response. CHP would continue to fully support these meaningful hand hygiene activities.

Photos of Hand Hygiene (HH) campaign organised by private and public sectors in 2016:


Hand Hygiene Promotion activity in St. Teresa's Hospital (left and right).


Hand Hygiene Promotion activity in Grantham Hospital.




Hand Hygiene Promotion activity in Princess Margaret Hospital (left 1st) and United Christian Hospital (left 2nd, 3rd and 4th).

On the community side, an Announcement on Public Interests (API) "Clean Your Hands Frequently To Keep The Germs Away" will be re-launched on television media. Public could access the latest information on Hand Hygiene Day 2017 through CHP's website and Facebook fanpage of the Central Health Education Unit. In view of positive feedback last year, CHP will continue distributing hand hygiene booklets to kindergartens to reinforce hand hygiene awareness building since young age. Besides, CHP will provide support and training for students of healthcare professionals, which will in turn educate the general public on hand hygiene. We aim to disseminate this core health messages to general public in an interactive way through multiple platforms.

QR code for the CHP Facebook page: http://www.facebook.com/CentreforHealthProtection

Like our Facebook page!

NEWS IN BRIEF

A domestic cluster of pertussis

The Centre for Health Protection (CHP) recorded a domestic cluster of pertussis in April 2017, affecting a baby and her two household contacts. The baby was a two-month-old girl presented with cough and runny nose since March 26. She was admitted to a public hospital on April 5. Her condition was stable and she was discharged on April 6. Her pernasal swab taken on April 5 was tested positive for *Bordetella pertussis*.

Contact tracing identified four symptomatic household contacts. The baby's 25-year-old mother had cough since April 8 and her prenasal swab collected on April 10 was tested positive for *Bordetella pertussis*. The baby's 51-year-old grandmother had cough since March 5 and her prenasal swab collected on April 11 was tested positive for *Bordetella pertussis*. Two other household contacts (the baby's grandfather and aunt) also presented with upper respiratory symptoms and their prenasal swabs were tested negative for *Bordetella pertussis*. All symptomatic contacts were treated with a course of antibiotics and their condition were stable all along.

Epidemiological investigation revealed that the baby's grandparents had travelled to India from February 21 to March 7, other household contacts had no recent travel history. The baby was born in Hong Kong and had received the first dose of combined diphtheria, tetanus, acellular pertussis and inactivated poliovirus (DTaP/IPV) vaccine according to the local Childhood Immunisation Programme, while her mother and grandmother could not recall their vaccination history. Chemoprophylaxis and screening were offered to other household contacts. Investigation is ongoing.

A local confirmed case of Brucellosis

On April 15, 2017, CHP recorded a sporadic case of brucellosis affecting a 2-year-old boy with good past health. He presented with fever, chills, malaise and arthralgia since April 4, 2017. He was admitted to a private hospital on April 5, 2017. His blood specimen collected on April 6, 2017 grew *Brucella* species. He was treated with a course of antibiotics. His condition was stable and was discharged on April 10, 2017. The family reported no recent travel history. The patient regularly visited a local leisure farm where he had fed a goat. The family kept dogs and cat as pets which were not recently pregnant. There was no exposure to internal organs or carcasses of animals, and no consumption of unpasteurised dairy products, raw or undercooked animal products. The other family members remained asymptomatic. Investigation is on-going.

CA-MRSA cases in March 2017

In March 2017, CHP recorded a total of 119 cases of community-associated methicillin resistant *Staphylococcus aureus* (CA-MRSA) infection, affecting 66 males and 53 females with ages ranging from six months to 100 years (median: 32 years). Among them, there were 86 Chinese, 11 Filipinos, 5 Indian, 4 Caucasian, 4 Pakistani, 3 Nepalese, 2 Vietnamese, 1 Bangladeshi, 1 Indonesian, and 2 of unknown ethnicity.

One hundred and fifteen cases presented with uncomplicated skin and soft tissue infections while the remaining four cases had severe CA-MRSA infections. The first severe case was a 43-year-old man with history of right forearm abscess in February 2017. He presented with fever, malaise, back pain, joint pain and chest pain on March 11. He attended the Accident and Emergency Department (AED) of a public hospital on March 13 and was admitted on the same day. Physical examination revealed splinter haemorrhage, Osler's node and Roth's spot. Transesophageal echocardiogram showed no vegetation. His blood specimen collected on March 15 was cultured positive for CA-MRSA. He was diagnosed to have sepsis and infective endocarditis. He developed shock and acute kidney injury requiring admission to intensive care unit (ICU). He was treated with antibiotics and was discharged on April 8.

The second severe case was a 36-year-old man who presented with pain, erythema and swelling of left thigh on February 22, and fever on February 24. He attended the AED of a public hospital on February 24 and was admitted for management. His blood and left thigh wound swab collected on February 24 were cultured positive for CA-MRSA. The diagnosis was left thigh abscess with sepsis. Incision and drainage of the left thigh abscess was done on February 24 and he was treated with antibiotics. His current condition remained stable.

The third severe case was a 50-year-old woman who had diabetes mellitus. She presented with decrease in appetite on February 23, and vomiting on February 25. She attended the AED of a public hospital on February 25 and was admitted for management. She was found to have high blood glucose level and metabolic acidosis. Her blood specimen and midstream urine collected on February 26 were cultured positive for CA-MRSA. The diagnoses were sepsis and diabetic ketoacidosis. She was treated with insulin, antibiotics and fluid replacement. Subsequently, she developed multi-organ failure requiring mechanical ventilation, inotropic support and haemodialysis. Her condition deteriorated and she succumbed on March 1.

The fourth severe case was a 25-year-old man with eczema. He worked as a physiotherapist in a private hospital. He initially presented with left perianal abscess, and skin abscesses at right lower back and right posterior thigh in early March. He was admitted to a public hospital from March 6 to 7 for incision and drainage of abscesses. A pus swab taken from the right lower back abscess was cultured positive for CA-MRSA. In late March, he developed fever, multiple skin abscesses involving right buttock, thigh and calf, and scalp folliculitis. He was readmitted to a public hospital on March 29 and April 6 for further management. Incision and drainage of the right thigh abscess was done on March 30. His blood specimen collected on March 29 was cultured positive for CA-MRSA. He was diagnosed to have sepsis and multiple skin abscesses. He completed a course of antibiotics and was discharged on April 14. Investigation did not reveal any epidemiological linkage to other cases. Screening and decolonisation would be offered to the close contacts of these severe cases.

Separately, six household clusters, with each affecting two persons, were identified. Decolonisation would be offered to their close contacts.

Scarlet fever update (March 1, 2017 – March 31, 2017)

Scarlet fever activity in March increased as compared with that in February. CHP recorded 249 cases of scarlet fever in March as compared with 168 cases in February. The cases recorded in March included 153 males and 96 females aged between six months and 17 years (median: five years). There were 13 institutional clusters occurring in ten kindergartens and three primary schools, affecting a total of 34 children. No fatal cases were reported in March. Of note, there has been an unusual increase in the activity of scarlet fever in March, which was higher than that in the same period in previous years. In view of the increase in scarlet fever activity in the recent few weeks, parents should take extra care of their children as it mostly affects children. People should maintain strict personal, hand and environmental hygiene. As scarlet fever can be treated by appropriate antibiotics effectively, people suspected to have scarlet fever should consult a doctor promptly. Children suffering from scarlet fever should refrain from attending school or child care setting until fever has subsided and they have been treated with antibiotics for at least 24 hours.

Apr 23 - May 6, 2017 WEEKS 17 - 18 VOL 14 ISSUE N⁰ 9

Communicable Diseases WATCH

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FEATURE IN FOCUS

Update on situation of scarlet fever

Reported by Dr Ashley FONG, Medical and Health Officer, Respiratory Disease Office, Surveillance and Epidemiology Branch, CHP.

Scarlet fever (SF) is a bacterial infection caused by Group A *Streptococcus* (GAS) and is a notifiable disease in Hong Kong. Before 2011, the annual number of SF cases reported to the Department of Health (DH) was below 250 cases. There has been a significant increase in the number of reported SF cases since the territory-wide outbreak of SF in the first half of 2011. The annual number of SF cases reported to the Centre for Health Protection (CHP) of DH ranged between 1 100 and 1 526 from 2011 to 2016 (Figure 1).

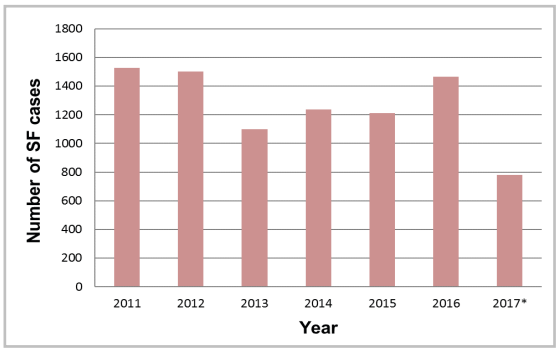

Figure 1 - Annual number of SF cases reported to CHP, 2011-2017 (as of April 30, 2017).*

While SF occurred throughout the year locally, there was a seasonal pattern for SF in Hong Kong with its activity higher from November to March and from May to June in the past few years (Figure 2).

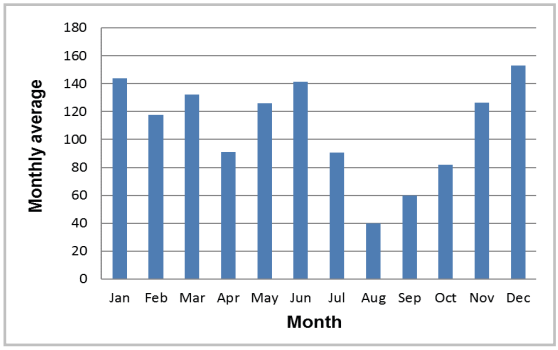

Figure 2 - Average monthly number of SF cases reported to CHP, 2012-2016.

In the past few months, the activity of SF remained at a high level. It followed the seasonal trend and started to increase since November 2016. The activity remained at a high level in December 2016 and January 2017, and slightly decreased in February. The monthly number of SF cases recorded from November 2016 to February 2017 was 182, 222, 176 and 168 respectively. However, the SF activity increased again in March with a total of 249 cases recorded. This was higher than the number recorded in the same period in previous years and was also the greatest monthly number of cases ever recorded by CHP. The number of SF cases has decreased to 187 in April.

The clinical and epidemiological features of the SF cases recorded during the first four months of 2017 were largely similar to those recorded from 2012 to 2016 (Table 1). Among the 780 cases reported in the first four months of 2017, the proportion of male cases was 57%. Their ages ranged from two months to 31 years (median: five years). The majority affected were children under ten years old (762 cases, 98.0%). Two hundred seventy-four patients (35.1%) required hospitalisation and among them, there was one severe case requiring admission to intensive care unit. This was a five-year-old girl with good past health. She presented with fever, vomiting and rash over chest and abdomen on March 23, and was admitted to a public hospital on March 26. She was diagnosed to have chickenpox and streptococcal pneumonia complicated with toxic shock syndrome. She was treated with antibiotics and discharged on April 3. No fatalities were recorded during this period.

Table 1 - Characteristics of SF cases, 2012-2017 (as of April 30, 2017).

	2012 - 2016	January - April, 2017
Number of reported cases	6 514	782
Sex ratio (M:F)	1.4:1	1.3:1
Age range (median)	1 months - 64 years (6 years)	2 months - 31 years (5 years)
Number requiring hospitalisation	2 720 (42%)	274 (35%)
Number of severe cases (%)	15 (0.23%)	1 (0.13%)
Number of deaths (case fatality rate)	1 (0.02%)	0
Number of clusters recorded	Institutions: 138 Households: 85	Institutions: 24 Households: 13
Number of persons involved in each cluster (median)	2 - 6 (2)	2 - 5 (2)
Percentage of cases involved in clusters (%)	7.7%	10.8%

In the first four months of 2017, there were 24 institutional clusters involving 17 kindergartens/child care centres and seven primary schools, and 13 household clusters. A total of 84 persons (10.8% of all the cases) were affected, with two to five patients (median: two patients) affected in each cluster.

In summary, the SF activity in Hong Kong had increased since November 2016 following the seasonal pattern, and it further increased to a higher than usual level in March before it started to decrease in April. There was no evidence of changes in the epidemiology of the SF cases recorded in the past few months. CHP will continue to closely monitor the SF situation.

As SF can be treated with appropriate antibiotics effectively, people who are suspected to have SF should consult their doctor promptly for effective treatment. Children suffering from scarlet fever should refrain from attending school or child care setting until fever has subsided and they have been treated with antibiotics for at least 24 hours. To prevent SF, members of the public should:

- Maintain good personal and environmental hygiene;
- Keep hands clean and wash hands properly;
- Wash hands when they are dirtied by respiratory secretions, for example, after sneezing;
- Cover nose and mouth while sneezing or coughing and dispose of nasal and mouth discharge properly; and
- Maintain good ventilation.

Facts on Scarlet Fever

SF usually starts with a sore throat, headache and fever and may be followed by a fine red, erythematous rash, which gives the skin a sand-paper-like texture. The rash may occur at any part of the body such as the upper trunk, armpit and neck, but spare the face, palms of the hands and sole of the feet. The tongue of the infected person may appear swollen, red and bumpy, and have a "strawberry"-like appearance with a whitish coating.

It usually runs a mild course, but complications may develop occasionally. Potential complications include otitis media, throat abscess, pneumonia, meningitis, acute rheumatic fever, acute glomerulonephritis, sepsis and toxic shock syndrome. SF can be effectively treated with antibiotics. Prompt treatment helps alleviate symptoms faster, prevents rare but serious complications, and minimises the risk of transmission.

Global and local updates on pertussis

Reported by Ms Fanny WS HO, Scientific Officer, Vaccine Preventable Disease Office, Surveillance and Epidemiology Branch, CHP.

Pertussis, commonly known as whooping cough, is an acute, highly contagious respiratory infection caused by the bacterium *Bordetella pertussis*. It is spread by droplets when an infected person coughs or sneezes, or via direct contact with respiratory secretions. The illness affects people of all ages, especially infants who are too young to be vaccinated. In adolescents and adults, the disease may have a mild and nonspecific course. However, in unprotected young children and particularly infants, morbidity is more often substantial and the disease may be fatal.

Since the last decade, pertussis has been a cause of concern in several developed countries, where resurgence of the disease was noted despite high vaccination coverage. Epidemics have been observed in Australia, Canada, the United Kingdom and the United States, leading to significant morbidity and mortality among young infants and children. In Australia, an increase in pertussis cases was reported in preschool-aged children from 2008 which might have been attributable to the removal of the 18-month booster dose of diphtheria, tetanus and acellular pertussis (DTaP) vaccine in the country in 2003[1]. In 2012, increases in incidence were observed in Canada across all age groups nationally, with the highest incidence rates in those less than one year and those 10 to 14 years of age[2]. At the same time, England and Wales also experienced a nationwide pertussis outbreak with over 9 300 cases and 14 infant deaths[3]. Large multi-state outbreaks were reported in the United States resulting in more than 48 000 cases in the most recent peak year of 2012, predominantly among school-aged children (seven to 10 years)[4,5].

Similarly in Asia, increased pertussis activity was seen in Mainland China with a substantial rise from 1 743 cases in 2013 to 6 744 cases in 2015[6]. In Japan, pertussis incidence rates have been rising among adolescents and adults since the early 2000s, and a large epidemic occurred with 17 349 cases reported between 2008 and 2010[7].

In an effort to provide indirect protection to vulnerable young infants, different vaccination strategies targeting adolescents and adults, in addition to children, were recommended in these countries, including additional booster for adolescents, vaccination of pregnant women and household contacts of infants (cocoon strategy). Further in 2014, in the light of recent pertussis resurgence in some countries, the World Health Organization (WHO) Strategic Advisory Group of Experts on Immunization (SAGE) Working Group on Pertussis Vaccines reviewed the epidemiological situation in selected countries and the impact of different vaccination strategies in reducing infant mortality[8]. Relevant recommendations were made and incorporated into the updated WHO position paper on pertussis vaccines published in August 2015[9].

While the reasons for the increase in cases of pertussis are not fully understood, some studies suggest that the apparent resurgence was largely driven by waning of immunity and renewed susceptibility to infection within the birth cohorts of children vaccinated with acellular vaccines[10]. There are also some other explanations for this increasing trend, such as increased disease awareness, improved diagnostics using polymerase chain reaction (PCR) testing, lower vaccine effectiveness of acellular pertussis vaccine compared with whole cell pertussis vaccine, and possible genetic changes in circulating strains of *Bordetella pertussis*[11,12].

In Hong Kong, pertussis occurs in cyclical peaks every three to five years. The number of annual notifications increased from 20 cases in 2012 to a high of 50 cases in 2015. Although the number dropped to 31 cases in 2016, the activity increased again this year, with 26 cases reported in the first four months of 2017 (Figure 1).

Between 2012 and the first four months of 2017, a total of 177 pertussis cases were reported to the Centre for Health Protection (CHP) of the Department of Health. Cases were almost evenly distributed between the two sexes (88 females and 89 males), with ages ranging from 19 days to 92 years (median: three months). One hundred forty-nine (84%) cases were locally acquired infection while 24 of them were imported from Mainland China (22), India (1) and Russia (1). Two cases were unclassified due to trans-border movement during the incubation period, while two other patients could not be reached for further investigation and thus the source of infection remained unknown.

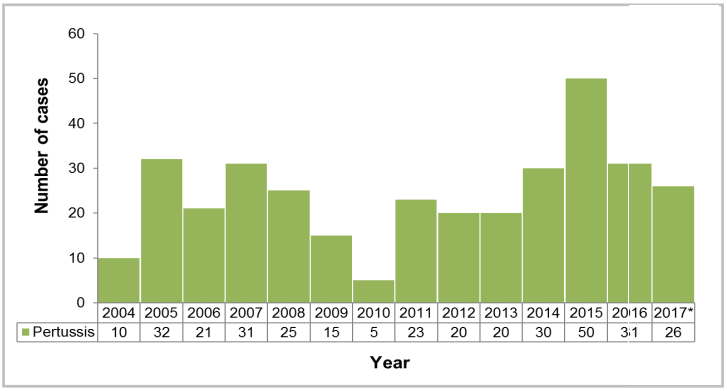

Figure 1 - Annual notifications of pertussis in Hong Kong, 2004-2017 (as of April 30).*

All the reported cases were laboratory confirmed by either culture (7%) or PCR (93%). Positive specimen types included pernasal swabs (48%), nasopharyngeal swabs (34%), nasopharyngeal aspirates (11%), sputum (4%), bronchoalveolar lavage (2%) and tracheal/endotracheal aspirate (1%). *Bordetella pertussis* was also detected in the nasopharyngeal/pernasal swabs from ten asymptomatic household contacts of the cases during active case finding and contact tracing.

Clinically, the most common presenting symptom was persistent cough (100%), followed by post-tussive vomiting (49 cases, 28%), runny nose (48 cases, 27%), shortness of breath (30 cases, 17%) and fever (23 cases, 13%). One hundred fifty (80%) cases required hospitalisation, among which nine of them required treatment at the intensive care unit. No pertussis-related fatalities were recorded over the period of review.

Infants aged less than one year, who are at greatest risk for severe disease and death, accounted for two-third of overall cases (104 cases, 60%). Infection was most prevalent among infants under six months of age (100 cases, 56%) for whom the primary series of DTaP vaccination was not completed. Among these cases, 48 (27%) of them were aged less than two months and had not reached the recommended age for the first dose of DTaP vaccine under the Hong Kong Childhood Immunisation Programme (HKCIP). Except one four-year-old Russian boy who was unsure of his vaccination status, 14 children aged one to 12 years reported to have received the primary series and subsequent boosters at appropriate age. For the 58 adult cases (16 to 92 years), most of them (53 cases, 91%) were either unvaccinated or had unknown vaccination status.

Locally, large pertussis outbreaks were uncommon. From 2012 to April 2017, 16 outbreaks were identified. These outbreaks were generally small in size (ranging from two to seven persons), mostly affecting young infants, their parents, siblings, other household members and caregivers. Among these 42 epidemiologically linked cases, 14 (33%) were infants aged less than six months who were not fully vaccinated, seven (17%) of which were younger than two months old and not yet due for vaccination.

Since 1956, pertussis vaccination has been included in the childhood immunisation programme in Hong Kong. The coverage rates with three doses in children aged two to five years have exceeded 95% for many years. The current pertussis vaccine provided in the Maternal and Child Health Centres for infants and young children and by the School Immunisation Teams for primary school children is in the form of combined diphtheria, tetanus, acellular pertussis and inactivated poliovirus 4-in-1 vaccine. The

three doses of primary series are administered to infants at two, four and six months of age, whilst the three boosters are given to children at 18 months of age, Primary One and Primary Six respectively. Completion of the primary series with acellular pertussis vaccine is expected to confer 85% protective efficacy, and up to 90% following booster vaccination[13].

In view of the current pertussis resurgence, the Scientific Committee on Vaccine Preventable Disease under CHP will keep abreast of the latest epidemiological trends and revisit local vaccination strategies from time to time.

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NEWS IN BRIEF

A sporadic confirmed case of brucellosis

On April 22, 2017, the Centre for Health Protection (CHP) recorded a confirmed case of brucellosis affecting a 74-year-old woman with underlying illnesses. She presented with fever, headache and fatigue on March 25, 2017. Her fever subsided after a few days but other symptoms persisted. On April 15, she developed dizziness and syncope and was admitted to a public hospital on the same day. She was discharged on April 17 with a diagnosis of syncope. Her blood specimen collected on April 16 grew *Brucella melitensis*. She was called back for re-admission to the same public hospital on April 20. She was treated with antibiotics and her condition was stable. The patient recalled history of injury to her left palm while preparing raw pork at home in mid-February and she also had history of handling raw mutton at home during the incubation period. She had no travel history outside Hong Kong except for a day trip to Macau in January. Her home contacts were asymptomatic. Investigations are on-going.

May 7 - May 20 2017 WEEKS 19 - 20 VOL 14 ISSUE Nº 10

Communicable Diseases WATCH

衞生防護中心 Centre for Health Protection 衞生署 Department of Health

FEATURE IN FOCUS

Aircraft Disinsection Programme

Reported by Dr Benjamin WF FUNG, Acting Senior Port Health Officer, Mr Edward WK CHAN, Senior Port Health Inspector, and Dr Raymond LM HO, Chief Port Health Officer, Port Health Office, Emergency Response and Information Branch, CHP.

To prevent the importation of diseases through infected mosquitoes, the Port Health Office (PHO) of the Centre for Health Protection (CHP) of the Department of Health requires all inbound aircraft from the affected areas of Zika Virus Infection to conduct aircraft disinsection starting from noon on April 26, 2017.

Background

The Ad-hoc Advisory Group[1] on aircraft disinsection for controlling the international spread of vector-borne diseases of the World Health Organization (WHO) earlier recommended Member States to consider conducting aircraft disinsection based on risk assessment as one of the effective measures against Zika. With reference to overseas experience, PHO introduces this new requirement which aims at reducing the risk of importation of *Aedes aegypti*, the Zika vector currently not found in Hong Kong, via air traffic, as a prudent measure to better protect public health. So far, three imported cases of Zika Virus Infection have been recorded in Hong Kong.

New requirement

According to the new requirement, for flights coming from Zika-affected areas, i.e. countries/areas in Category 1 or 2 classified by WHO[2] that are considered to have ongoing Zika virus transmission, airlines/aircraft operators are required to provide PHO with a declaration of aircraft disinsection as well as flight details and information on disinsection practice. PHO will request operators practising regular disinsection to provide documentary proof and/or empty insecticide cans (Photo 1).

Photo 1 - A Port Health Inspector is verifying the documentary proof of disinsection.

As for aircraft without proof of disinsection, PHO requires the airlines/aircraft operators concerned to carry out on-arrival disinsection. WHO's classification table of Zika-affected areas has been uploaded to the CHP's website (http://www.chp.gov.hk/en/view_content/43209.html) for easy reference.

Any airline/aircraft operator which fails to submit the declaration of aircraft disinsection may contravene section 49(1) of the Prevention and Control of Disease Regulation (Cap. 599A) and is liable on conviction to a fine of $10 000 and imprisonment for six months. Pursuant to section 49(2), the person who signs or countersigns the declaration shall also ensure that the information contained in the declaration is not false in a material particular, and a person who knowingly contravenes this is liable on conviction to a fine of $10 000 and imprisonment for six months.

Support for aviation sector

To familiarise all stakeholders with the new requirement, PHO with support from the Pest Control Advisory Section of the Food and Environmental Hygiene Department has issued a set of technical and administrative guidelines, and conducted briefings for the Hong Kong Business Aviation Centre, passenger/cargo airlines and aircraft operators. A press release has also been issued and uploaded with the set of guidelines to the following website: http://www.dh.gov.hk/english/main/main_ph/main_ph.html.

Monitoring

To monitor the compliance of airlines/aircraft operators with the new requirement, PHO has set up a designated box in airport for collecting documentary proof and empty insecticide cans. Port Health Inspectors have also been inspecting aircraft arriving from Zika-affected areas since the launching of the aircraft disinsection programme. From April 26 to May 9, 2017, a total of 35 aircraft were inspected and no irregularity was detected.

Photo 2 - Port Health Inspectors are supervising on-arrival disinsection.

In addition, one operator could not manage to conduct disinsection for its aircraft before arrival. Immediately after landing, the concerned aircraft was disinsected under the supervision of Port Health Inspectors (Photo 2).

PHO will continue to maintain liaison with the Airport Authority Hong Kong and the aviation sector, and keep a close watch on the progress of the aircraft disinsection programme.

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Review of ciguatera fish poisoning in Hong Kong

Reported by Dr Zenith WU, Medical and Health Officer, Enteric and Vector-borne Disease Office, Surveillance and Epidemiology Branch, CHP.

Ciguatera fish poisoning (CFP) is a foodborne disease caused by the consumption of marine fish which have accumulated ciguatoxins, which are naturally occurring toxins, through their diet[1]. In this article we reviewed the CFP outbreaks recorded by the Centre for Health Protection (CHP) of the Department of Health in the past ten years.

Ciguatoxins are a group of heat-stable and lipid-soluble toxins that are unaffected by gastric acid or cooking. They originate from certain microalgae that are a source of nutrition for small herbivorous fish, which in turn were preyed by bigger carnivorous fish that are consumed by human, leading to CFP. The main toxic microalga leading to CFP is *Gambierdicus toxicus* which is found primarily in coral reef waters[2]. Fish containing ciguatoxin are not distinguishable as the odour, colour and taste of the fish are not affected by the presence of toxin.

Symptoms of CFP usually develop within 30 minutes and up to 24 hours, to occasionally 48 hours, after consuming contaminated fish. The first symptoms can either be gastrointestinal or neurological in nature[3]. Gastrointestinal symptoms include nausea, vomiting, diarrhoea and abdominal pain. Neurological symptoms include tingling sensation and numbness in the mouth and extremities, muscle cramping, sensation of temperature reversal (a sensory inversion whereby hot or warm objects feel cold and cold objects may feel warm), skin itchiness and blurred vision. Rarely, cardiovascular collapse may result. The disease is generally non-fatal and of short duration. However, in a few severe cases, symptoms can persist for months or even years[1]. Currently, there is no specific treatment for CFP, and management is largely supportive.

Worldwide, as many as 50 000 cases of CFP were reported every year and it is endemic in tropical and subtropical regions of the Pacific basin, Indian Ocean, and Caribbean[2]. In the Indian Ocean, endemic areas are known to be around the Reunion Island, parts of Madagascar and Indonesia[1]. In the coastal region of East and Southeast Asia, extensive tropical and subtropical coral reefs were found along the coasts and in the neighbouring seas with ciguatoxic fishes. The incidence of CFP was higher in the coastal cities of southern China than in Japan[4].

In Hong Kong, CFP is a notifiable infectious disease under food poisoning in the Prevention and Control of Disease Ordinance (Cap 599). From 2008 to 2017 (as of May 17), a total of 93 CFP cases affecting 234 persons were recorded by CHP. Number of person(s) affected per case ranged from one to 20 (median: two persons). Overall, there was a general decreasing trend in both the numbers of cases and persons affected from 2008 to 2015, followed by a small increase from 2015 till now (Figure 1). Seasonal trend was observed with a peak in the number of cases reported during the months from April to June (Figure 2). Females accounted for 55.6% of the persons affected. The age of those affected ranged from two to 81 years with the majority of them being adults. Majority of the CFP (90, 96.8%) were local cases, while the rest were imported from Mainland China (2, 2.2%) and Fiji (1, 1.1%).

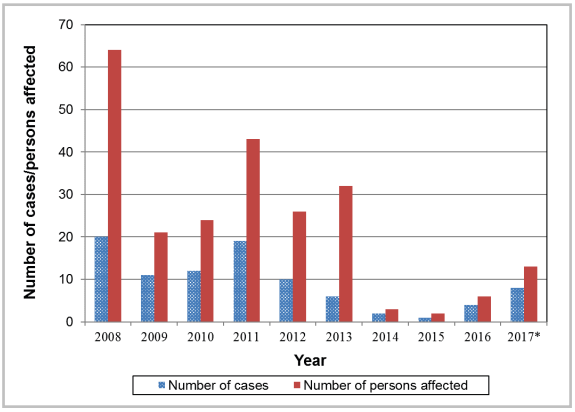

Figure 1 - Annual number of CFP cases and persons affected recorded by CHP, 2008-2017 (as of May 17).*

The five most common symptoms experienced by the person affected were numbness (201, 85.9%), diarrhoea (114, 48.7%), focal paralysis or weakness (103, 44.0%), abdominal pain (87, 37.2%) and nausea (64, 27.4%). The patients developed symptoms from immediately after consumption to 44.5 hours after consumption of the incriminated food. Fifty-one affected persons (21.8%) required hospital admission, including one admission into coronary care unit. No deaths due to CFP were recorded. The incriminated fish were prepared at home in the majority (60, 64.5%) of the cases, followed by food premises (32, 34.4%) and workplace (1, 1.1%).

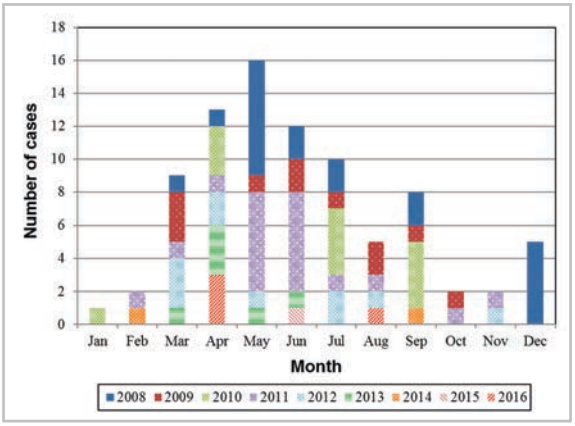

Figure 2 - Number of CFP cases recorded by CHP by month and year, 2008-2016.

Upon notification of cases of suspected CFP, CHP will initiate prompt epidemiological investigation, particularly the suspected source of the incriminated food, in order to stop its further distribution to and consumption by other persons. Food and Environmental Hygiene Department (FEHD) will also be notified. Upon receipt of notification of ciguatera fish poisoning case, FEHD will take immediate actions to trace the source of fish and instruct the fish traders concerned to stop selling the affected coral reef fish, if available. Where appropriate, samples of fish will be taken for laboratory analysis and surveillance will be stepped up.

To prevent CFP, members of the public should observe the following measures:

- Eat less coral reef fish;
- Eat small amounts of coral reef fish at any one meal and avoid having a whole fish feast in which all the dishes come from the same big coral reef fish;
- Avoid eating the head, skin, intestines and roe of coral reef fish, which usually have a higher concentration of toxins;
- When eating coral reef fish, avoid consuming alcohol, peanuts or beans as they may aggravate CFP;
- Seek medical treatment immediately should symptoms of ciguatoxin fish poisoning appear; and
- Coral reef fish should be purchased from reputable and licensed seafood shops. Do not buy the fish when the source is doubtful.

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NEWS IN BRIEF

A domestic cluster of pertussis

In May 2017, the Centre for Health Protection (CHP) recorded a domestic cluster of pertussis affecting a one-month-old girl, her 27-year-old mother and her 25-year-old aunt. The baby girl presented with productive cough on May 3 and was admitted to a public hospital on May 10. Her pernasal swab was tested positive for *Bordetella pertussis*. She was treated with antibiotics and was discharged on May 17. Upon contact tracing, her mother and aunt were found to have cough since April 21 and 22 respectively. They were referred to the Accident and Emergency Department of public hospitals on May 17 and 18. Both did not require hospital admission. They were given antibiotics and remained in stable condition. Their pernasal swabs were also tested positive for *Bordetella pertussis*.

Epidemiological investigation revealed that all of them did not have travel history during the incubation period. The girl was not yet due for the first dose of diphtheria, tetanus, acellular pertussis and inactivated poliovirus vaccine; her mother could not recall her own vaccination history while her aunt did not receive any pertussis-containing vaccine before. All the other close contacts of the girl and her aunt had recent upper respiratory tract infection symptoms but their pernasal swabs were all tested negative for *Bordetella pertussis*. They were given chemoprophylaxis. Investigations are on-going.

A sporadic case of leptospirosis

On May 5, 2017, CHP recorded a sporadic case of leptospirosis affecting a 56-year-old woman with unremarkable past health. She presented with fever, diarrhoea, nausea and low back pain since March 31, 2017. She was admitted to a public hospital on April 3. Her blood specimens collected on April 6 and April 25 for *Leptospira* Microscopic Agglutination Test (MAT) detected more than four-fold rise in titres for *Leptospira Australis*. She was treated with a course of antibiotics. Her condition improved gradually and she was discharged on April 16. Epidemiological investigation revealed that the patient had travelled to Xinhui, Guangdong from March 16 to 20 where she sustained left thumb abrasion while cooking. The patient reported no exposure to rodents or stray dogs, and she denied other high risk activities such as water activities or visits to farms. Her home contacts were asymptomatic. Investigation is on-going.

CA-MRSA cases in April 2017

In April 2017, CHP recorded a total of 101 cases of community-associated methicillin resistant *Staphylococcus aureus* (CA-MRSA) infection, affecting 66 males and 35 females with ages ranging from 4 months to 83 years (median: 35 years). Among them, there were 76 Chinese, 9 Filipinos, 4 Pakistani, 3 Caucasian, 3 Nepalese, 1 African, 1 Indian, 1 Vietnamese and 3 of unknown ethnicity. All cases presented with uncomplicated skin and soft tissue infections.

Five household clusters, with each affecting two persons, were identified. No cases involving healthcare worker were reported during this reporting period.

Scarlet fever update (April 1, 2017 – April 30, 2017)

Scarlet fever activity in April decreased as compared with that in March. CHP recorded 187 cases of scarlet fever in April as compared with 249 cases in March. The cases recorded in April included 86 males and 101 females aged between nine months and 31 years (median: five years). There was one institutional cluster occurring in a kindergarten, affecting two children. No fatal cases were reported in April.

Field Epidemiology Training Programme (FETP) training course 2017

The Hong Kong FETP of CHP organised a five-day training course for public health professionals on "Outbreak control and investigation" during May 8 to 12, 2017. The objective of the course was to equip participants with knowledge and skills on the methodological and organisational steps of outbreak investigations. The training course included presentations by the facilitators and participants, practical exercises and case studies. A total of 12 participants attended the training courses and the course was well-received.

May 21 - Jun 3 2017 WEEKS 21 - 22 VOL 14 ISSUE N^{0} 11

Communicable Diseases WATCH

衛生防護中心 Centre for Health Protection 衛生署 Department of Health

FEATURE IN FOCUS

Health authorities from Guangdong and Macau visited Hong Kong on the collaboration in the prevention and control of avian influenza

Reported by Dr Philip WONG, Senior Medical and Health Officer, Communicable Disease Surveillance and Intelligence Office, Surveillance and Epidemiology Branch, CHP.

In order to strengthen the mutual communication and co-operation in combating avian influenza in the tripartite region, health authorities from Guangdong and Macau visited Hong Kong on May 18 and 19, 2017 to discuss the collaboration in the prevention and control of avian influenza.

In the current fifth wave of human infection with avian influenza A(H7N9) since October 2016, over 700 human cases in 25 provinces/municipalities/autonomous regions in Mainland China have been reported. Among these cases, over 60 cases were reported in Guangdong Province. In Hong Kong, five cases were recorded in this wave, all were imported including four from Guangdong Province. Apart from Hong Kong, human H7N9 cases imported from Guangdong Province have been detected in Macau and Taiwan in this wave.

Photo 1 - Group photo with delegations from Guangdong, Macau and representatives from AFCD, FEHD and HA.

The Centre for Health Protection (CHP) of the Department of Health met the delegations from the Guangdong Provincial Center for Disease Control and Prevention, the Health and Family Planning Commission of Guangdong Province and the Center for Disease Control of Macau Special Administrative Region. Other representatives from Hong Kong included Agriculture, Fisheries and Conservation Department (AFCD); Food and Environmental Hygiene Department (FEHD) and the Hospital Authority (HA) (Photo 1 and 2).

During the meeting on May 18, public health experts of the three places reviewed the latest situation of avian influenza A(H7N9) in the tripartite region. The participants had in-depth discussions and experience-sharing on the collaboration in the prevention and control of avian influenza and related notification system.

Photo 2 - Hong Kong representatives had the meeting with the delegation at the Centre for Health Protection (CHP) Building.

Public health actions in combating avian influenza were discussed during the meeting, including disease surveillance, laboratory surveillance, diagnosis and clinical management, travel health advice and public education, port health measures, preparedness plan and risk communication, poultry import and control, laboratory surveillance on poultry, measures implemented in wholesale poultry market and retail markets.

In that afternoon, the participants visited Cheung Sha Wan Temporary Wholesale Poultry Market to have a better understanding on the operation of wholesale market in Hong Kong. Briefing on the market operation, biosecurity measures and segregation measures in the wholesale market was conducted by AFCD colleagues (Photo 3 and 4).

Photo 3 & 4 - The delegations visited Cheung Sha Wan Temporary Wholesale Poultry Market.

The participants then visited the poultry commodity in the Tai Kok Tsui Market and were briefed by colleagues of FEHD on the avian influenza control measures, stringent hygiene requirements for retail outlets including daily cleansing and disinfection, and prohibition of the keeping of live poultry overnight at retail level (Photo 5 and 6).

On May 19, the participants visited the Tai Lung Veterinary Laboratory in Lin Tong Mei, Sheung Shui and were briefed on the surveillance and veterinary laboratory testing services on avian influenza by AFCD colleagues (Photo 7 and 8).

In summary, Guangdong, Macau and Hong Kong's health authorities all agreed that in order to minimise the public health risk of avian influenza in the three places, the current communication and co-operation should be continued and strengthened.

Photo 5 & 6 - The delegations visited the poultry commodity in the Tai Kok Tsui Market.

Photo 7 & 8 - The delegations visited the Tai Lung Veterinary Laboratory in Lin Tong Mei, Sheung Shui.

JOURNAL PUBLICATION HIGHLIGHTS

Effect of diabetes mellitus on the clinical presentation and treatment response in tuberculosis

Chi C Leung[1] , Wing W Yew[2], Thomas YW Mok[3], Kam S Lau[4], Chi F Wong[5], Chi H Chau[5], Chi K Chan[1], Kwok C Chang[1], Greta Tam[2] and Cheuk M Tam[1]
[1]Tuberculosis and Chest Service, Centre for Health Protection, Department of Health, Hong Kong SAR, China
[2]Stanley Ho Centre for Emerging Infectious Diseases, The Chinese University of Hong Kong, Hong Kong SAR, China
[3]Respiratory Medical Department, Kowloon Hospital, Hong Kong SAR, China
[4]Respiratory Medical Unit, Ruttonjee Hospital, Hong Kong SAR, China
[5]Tuberculosis and Chest Unit, Grantham Hospital, Hong Kong SAR, China

Diabetes mellitus (DM) is associated with more severe disease and it adversely affects the treatment response of tuberculosis (TB). This study aimed to explore the effects of DM on the presentation of TB and its response to treatment in Hong Kong.

Consecutive TB patients with DM, receiving a nine-month extended treatment in a territory-wide treatment programme from 2006 to 2010, were examined in this study. These patients were followed up prospectively to assess their treatment response. Successful treatment completers were tracked through the TB registry and death registry for relapse and death data till December 31, 2014. A total of 21 414 consecutive patients received treatment in the Tuberculosis and Chest Service of the Department of Health from January 1, 2006 to December 31, 2010 were included in this study. It was found that DM was independently associated with more chest symptoms (adjusted odds ratio (AOR): 1.13, p=0.006) and systemic symptoms (AOR: 1.30, p<0.001) but less with other site-specific symptoms (AOR: 0.58, p<0.001) at TB presentation. There was more frequent pulmonary involvement (AOR: 1.69, p<0.001), with more extensive lung lesion (AOR: 1.25, p<0.001), lung cavity (AOR: 2.00, p<0.001) and positive sputum smear (AOR: 1.83, p<0.001) and culture (AOR: 1.38, p<0.001), but no difference in the proportion of retreatment cases or isoniazid and/or rifampicin resistance. After initiation of treatment, there was higher overall incidence (AOR: 1.38, p<0.001) of adverse effects (mainly gastrointestinal symptoms, renal impairment and peripheral neuropathy), more smear non-conversion (AOR: 1.59, p<0.001) and culture non-conversion (AOR: 1.40, p<0.001) at two months, and lower combined cure/treatment completion rate at 12 months (AOR: 0.79, p=0.003), but no difference in the relapse rate after having successfully completed treatment.

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From SARS to Avian Influenza Preparedness in Hong Kong

Andrew TY Wong[1], Hong Chen[1], Shao-haei Liu[2], Enoch K Hsu[1], Kristine S Luk[3], Christopher KC Lai[4], Regina FY Chan[5], Owen TY Tsang[6], KW Choi[7], YW Kwan[8], Anna YH Tong[9], Vincent CC Cheng[10], and Dominic NC Tsang[11]
[1]Infectious Disease Control Training Centre, Hospital Authority Head Office, Hong Kong SAR, China
[2]Infection, Emergency and Contingency, Quality and Safety Division, Hospital Authority Head Office, Hong Kong SAR, China
[3]Department of Pathology, Princess Margaret Hospital, Hong Kong SAR, China
[4]Department of Pathology, Queen Elizabeth Hospital, Hong Kong SAR, China
[5]Infection Control Team, United Christian Hospital, Hong Kong SAR, China
[6]Hospital Authority Infectious Disease Centre, Princess Margaret Hospital, Hong Kong SAR, China
[7]Department of Medicine, Alice Ho Miu Ling Nethersole Hospital, Hong Kong SAR, China
[8]Department of Paediatrics and Adolescent Medicine, Princess Margaret Hospital, Hong Kong SAR, China
[9]Information Technology and Health Informatics Division, Hospital Authority Head Office, Hong Kong SAR, China
[10]Department of Microbiology, Queen Mary Hospital, Hong Kong SAR, China
[11]Chief Infection Control Officer Office, Hospital Authority Head Office, Hong Kong SAR, China

The first human infection with avian influenza A(H5N1) was reported in Hong Kong in 1997. It continues to be a major threat to global public health as it is a likely candidate for the next influenza pandemic. Since the human outbreak of avian influenza A(H5N1) in Hong Kong, effective preparedness and response plan in case of an influenza pandemic was first formulated in 2005 and modified and strengthened in the following years. This paper describes in detail about avian influenza preparedness in public hospitals in Hong Kong to illustrate policies and practices associated with control of emerging infectious diseases (EIDs). In brief, the Hong Kong Special

Administrative Region (HKSAR) government developed strategy for the prevention and control of influenza pandemic after emergence of the first case of severe acute respiratory syndrome (SARS) in Hong Kong in 2003. The HKSAR government's risk-based preparedness plan for influenza pandemics includes three response levels: Alert, Serious, and Emergency. The different response levels provide the command, control, and coordination frameworks for territory-wide response. This enables early detection based on epidemiological exposure followed by initiation of a care bundle and there are corresponding actions to be taken by public hospitals during different response levels. The Hospital Authority's response to avian influenza generally follows the HKSAR government preparedness plans, so this greatly facilitates communication with the public. Key components of the pandemic response measures taken by the public hospital system in Hong Kong include strengthening disease surveillance systems, enhancing infection control practices, and building up surge capacity. Information technology, laboratory preparedness, clinical and public health management, and infection control preparedness provide a comprehensive and generalisable preparedness plan for EIDs. The Preparedness Plan for Influenza Pandemic has been used as a model to develop preparedness and response plans for other EIDs including Middle East respiratory syndrome, Ebola virus disease and Zika virus infection.

Clinical Infectious Diseases. 2017 May 15;64(suppl2):S98-S104.
https://academic.oup.com/cid/article-lookup/doi/10.1093/cid/cix123

Review of first 36 cases of New Delhi metallo-β-lactamase-producing *Enterobacteriaceae* in Hong Kong

David C Lung[1], Owen TY Tsang[2], KW Choi[3], Ivan FN Hung[4], KM Chan[5], Alan KL Wu[6], Eugene YK Tso[7], TC Wu[8], TS Lam[9], Ada WY Wong[10], Ken HL Ng[11], Steffi SY Lui[10], Enoch K Hsu[10], Andrew T.Y. Wong[10]
[1]Department of Clinical Pathology, Tuen Mun Hospital, Hong Kong SAR, China
[2]Department of Medicine and Geriatrics, Princess Margaret Hospital, Hong Kong SAR, China
[3]Department of Medicine, Alice Ho Miu Ling Nethersole Hospital, Hong Kong SAR, China
[4]Department of Medicine, University of Hong Kong, Queen Mary Hospital, Hong Kong SAR, China
[5]Department of Clinical Pathology, Tuen Mun Hospital, Hong Kong SAR, China
[6]Department of Clinical Microbiology, Pamela Youde Nethersole Eastern Hospital, Hong Kong SAR, China
[7]Department of Medicine and Geriatrics, United Christian Hospital, Hong Kong SAR, China
[8]Department of Medicine, Queen Elizabeth Hospital, Hong Kong SAR, China
[9]Surveillance and Epidemiology Branch, Centre for Health Protection, Department of Health, Hong Kong SAR, China
[10]Infection Control Branch, Centre for Health Protection, Hong Kong SAR, China

New Delhi metallo-β-lactamases (NDMs) are enzymes with broad-spectrum inactivating activity against carbapenems and other β-lactams. Bacteria harbouring a *bla*$_{NDM}$ gene are resistant to multiple antimicrobials, limiting therapeutic options and rendering severe infections difficult to treat. In this study, authors reviewed the first 36 cases of NDM-producing Enterobacteriaceae identified in Hong Kong from 2009 to 2013.

Thirty-six cases with NDM-producing Enterobacteriaceae were isolated from the local registry of the Public Health Laboratory Service Branch, Centre for Health Protection of the Department of Health. Most of the patients (n=28) were adult and eight were children with age ranged from four months to 95 years (median=59 years). More male were affected with male-to-female ratio of 2.6:1. Majority were identified through the admission screening programme (n=28) and seven cases were identified from clinical specimens and one through contact tracing. All of them had at least one risk factor for NDM acquisition such as having travel history (n=35) and in contact with healthcare facilities outside Hong Kong (n=33, 28 patients had history of hospitalisation). Currently, all carbapenem-resistant Enterobacteriaceae (CRE) positive patients would be identified ('tag') in Hospital Authority's Clinical Management System. If the patients were re-admitted, an alert message would be shown in the system for implementing appropriate infection control measures. The authors indicated that it was necessary to de-tag these patients for operation needs. As shown in this study, NDM-producing Enterobacteriaceae might present in the gut for more than two years, it is necessary to take this finding into account to define the de-tagging period in the electronic system.

Journal of Global Antimicrobial Resistance. 2017 March;8:199-201.
http://www.sciencedirect.com/science/article/pii/S2213716517300152

NEWS IN BRIEF

A domestic cluster of pertussis

In May 2017, the Centre for Health Protection (CHP) recorded a domestic cluster of pertussis affecting a two-month-old girl and her 23-year-old father. The baby girl had presented with cough and runny nose since May 7, 2017 and was admitted to a public hospital on May 17. Her pernasal swab was tested positive for *Bordetella pertussis*. She was treated with antibiotic and was discharged on May 24. Upon contact tracing, her father had been found to have cough since April 30. He was referred to the Accident and Emergency Department of the public hospital on May 24. He did not require hospital admission. He was given antibiotic and remained in stable condition. His pernasal swab was also tested positive for *Bordetella pertussis*.

Epidemiological investigation revealed that both of them travelled to Guangdong from April 15 to 27. The girl was not yet due for her first dose of diphtheria, tetanus, acellular pertussis and inactivated poliovirus vaccine while her father could not recall his own vaccination history. The great grandmother and grandfather of the girl also had cough but their pernasal swabs were both tested negative for *Bordetella pertussis*. They were given chemoprophylaxis. Chemoprophylaxis were also offered to other asymptomatic close contacts.

A probable sporadic case of Creutzfeldt-Jakob disease

On May 26, 2017, CHP recorded a probable case of sporadic Creutzfeldt-Jakob disease (CJD) affecting a 55-year-old man with underlying illnesses. He had presented with left side rigidity since April 4, 2017, followed by myoclonus. He was admitted to a public hospital on April 24, 2017 due to increase in left upper limb involuntary movement. He was later found to have rapidly progressive dementia, dysphasia, dysphagia and akinetic mutism. Electroencephalography and imaging findings were compatible with CJD. His condition was stable in hospital. He had no known family history of CJD and there were no reported risk factors for iatrogenic or variant CJD. He was classified as a probable case of sporadic CJD.

A local sporadic case of listeriosis

On June 2, 2017, CHP recorded a case of listeriosis affecting an 81-year-old man with underlying illnesses. He presented with fever, shortness of breath and confusion on May 26 and was admitted to a public hospital on May 27. His blood culture yielded *Listeria monocytogenes*. He was treated with antibiotics and his condition was stable. He had no recent travel history. He had no history of consumption of high risk food item during the incubation period. His home contact was asymptomatic. Investigations are on-going.

Jun 4 - Jun 17 2017 WEEKS 23 - 24 VOL 14 ISSUE Nº 12

Communicable Diseases WATCH

衛生防護中心 Centre for Health Protection 衛生署 Department of Health

FEATURE IN FOCUS

Update on the upsurge of hepatitis A infection among MSM in Hong Kong and Updated recommendations on hepatitis A vaccination

Reported by Dr Bonnie WONG, Senior Medical and Health Officer, Dr Kenny CHAN, Consultant, Special Preventive Programme, Public Health Services Branch, and Dr Billy HO, Senior Medical and Health Officer, Communicable Disease Division, Surveillance and Epidemiology Branch, CHP.

Since the publication of the article in CD Watch reporting an unusual increase in number of reported hepatitis A (HAV) infection among men who have sex with men (MSM) in Hong Kong (Volume 14, Number 3; Jan 29 – Feb 11, 2017 at http://www.chp.gov.hk/files/pdf/cdw_v14_3.pdf), as at June 9, 2017, the Centre for Health Protection (CHP) of the Department of Health (DH) has identified 15 more MSM cases with confirmed hepatitis A infection via retrospective investigations and prospective reporting (Figure 1 and 2).

A confirmed case was defined as a laboratory-confirmed HAV infection with clinical symptoms in an individual identified as MSM. As of June 9, 2017, CHP identified a total of 43 cases aged 20 to 51 years (median: 33 years), with symptom onset from September 2015 to May 2017. Thirty-six (83.7%) required hospitalisation and no fatalities were recorded. Thirty-three cases (76.7%) were known to be HIV positive attending one of the three designated public HIV clinics.

Apart from two who had received hepatitis A vaccine two weeks and one year prior to symptom onset respectively, the rest did not report history of HAV vaccination. Fourteen of the 43 cases reported travel history within the incubation period, and the most common regions they had visited were Mainland China (5), Japan (3) and Taiwan (3).

At least eleven cases were also diagnosed to have sexually transmitted infections (STIs) (including syphilis, gonorrhea, chlamydia infection, and one case of HIV seroconversion) during or within one month of their HAV diagnosis. Ten cases admitted to have oral-anal sex with their sexual partners during the incubation period. Apart from one cluster affecting two patients who were sex partners residing together, no other epidemiological linkage among these cases could be found.

CHP also performed microbiological investigations to characterise and assess the extent of outbreak. Thirty-six cases had specimen available for laboratory analysis, all of which belonged to genotype IA, while 23 (63.8%) had identical nucleotide sequences within the genotyping window, but no epidemiological linkage among the cases could be found. No common food or water source was identified among these cases. Epidemiological investigations suggested that transmission was by way of sexual contact between men, a high proportion of whom were HIV-infected.

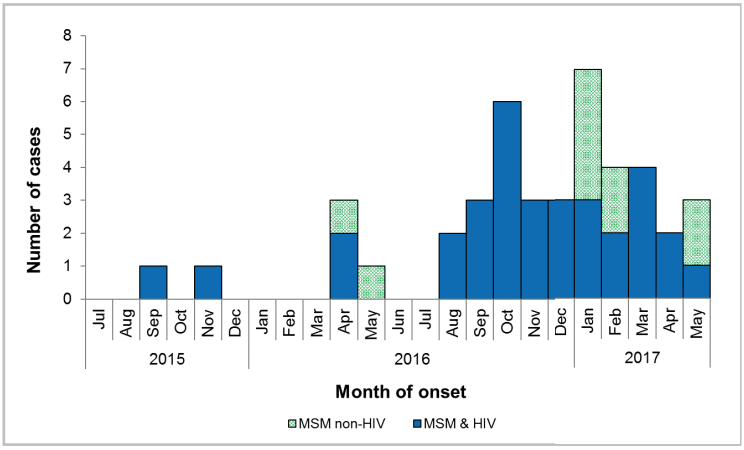

Figure 1 - Hepatitis A cases among known MSM, by HIV status, July 2015-June 9, 2017.

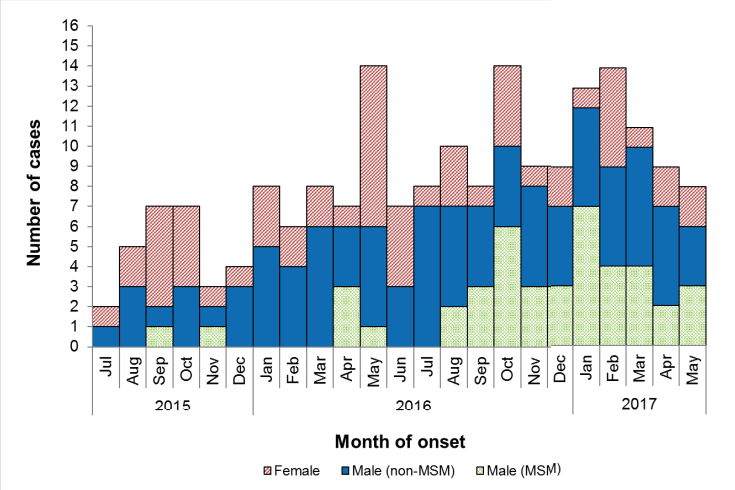

Figure 2 - Hepatitis A cases recorded by CHP, July 2015-June 9, 2017.

Since February 3, 2017, CHP has launched a HAV vaccination programme targeting the MSM community in an attempt to prevent a large-scale outbreak. HIV-positive MSM followed up at the three public HIV clinics and current MSM attendees of two DH's male Social Hygiene Clinics with negative or unknown HAV immune status were offered two doses of hepatitis A vaccines for free. As of June 9, 2017, a total of 1 432 doses were given at the three HIV clinics while 121 clients received the vaccination from the private sector, giving a vaccination coverage of 81% among eligible HIV-infected MSM. One hundred and ten doses were given to MSM attendees of the two DH's Social Hygiene Clinics.

Updated recommendations on hepatitis A vaccination

In June 2017, the Scientific Committee on AIDS and STI (SCAS) and the Scientific Committee on Vaccine Preventable Diseases (SCVPD) issued a statement extending the recommendation for hepatitis A vaccine to MSM in order to reduce the risk of infection in this vulnerable community, in addition to persons with chronic liver disease, persons with clotting factor disorders receiving plasma-derived replacement clotting factors, and travellers to endemic areas as laid out in the previous recommendations. Details of the statement can be found at: http://www.chp.gov.hk/files/pdf/statement_on_hav_and_msm_201706.pdf.

CHP has also issued letters to doctors and hospitals to alert the health profession to the situation and remind them to offer comprehensive assessment to patients presented with suspected or confirmed hepatitis A. Health education and promotion in collaboration with non-governmental organisations has been ongoing to raise the awareness towards HAV infection among the MSM community who are advised to practice good personal hygiene and food safety, to practice safer sex measures including avoidance of oral-anal contact and to receive HAV vaccination as indicated. CHP will continue to monitor the situation closely and keep in view the effectiveness of the current measures in controlling this outbreak.

Global situation update on hepatitis A outbreaks mostly affecting MSM[1]

Between June 2016 and mid-May 2017, an unusual increase in cases of hepatitis A affecting mainly MSM has been reported by low endemicity countries in the European Region (involving 15 countries), and in the Americas (involving Chile and the USA).

In Europe, 1 173 cases related to the three distinct multi-country HAV outbreaks were reported as of May 16, 2017. In Chile, 706 HAV cases were reported at national level as of May 5, 2017. In the United States, the New York City Health Department has noted an increase in HAV cases among MSM who did not report international travel.

WHO recommends hepatitis A vaccination for risk groups, including MSM, in low endemicity settings. The current global situation is of particular concern from a public health perspective because of the limited availability of hepatitis A vaccine in many countries. In addition, several national and international lesbian, gay, bisexual, and transgender (LGBT) pride festivals will take place between June and September 2017, including the World Pride Festival in Madrid, Spain between June 23 and July 2, 2017, where up to two million international guests are expected to attend.

Specific recommendations for people attending the LGBT World Pride festival are as follow:

- Before the event: Those attending the event should seek advice from healthcare providers on hepatitis A vaccination, HIV, and other STI prevention measures prior to departure.
- During the event: Preventive measures should be reinforced to reduce the risk of sexual and/or food and water borne infections.
- After the event: Attendants should contact a healthcare provider if experiencing symptoms suggestive of hepatitis A or STI infection.

Reference:

[1]World Health Organization. Disease outbreak news. Hepatitis A outbreaks mostly affecting men who have sex with men - European Region and the Americas. Accessed on June 18, 2017, at http://www.who.int/csr/don/07-june-2017-hepatitis-a/en/.

Update of Ebola Virus Disease

Reported by Dr Eric LAM, Medical and Health Officer, Communicable Disease Surveillance and Intelligence Office, Surveillance and Epidemiology Branch, CHP.

A new Ebola Virus Disease (EVD) outbreak was notified to the World Health Organization (WHO) by the Ministry of Health (MOH) of the Democratic Republic of Congo (DRC) on May 11, 2017. Since its onset, so far this outbreak has been confined to a geographically remote and isolated area located in a northern province of the country that borders with the Central African

Republic (Figure 1). The majority of cases presented with fever, vomiting, bloody diarrhoea and other bleeding symptoms and signs. No healthcare workers were confirmed to be infected. As of June 15, 2017, there were a total of eight cases, five were serologically confirmed. Among all these cases, four fatalities were recorded[1].

EVD is caused by Ebola virus that belongs to the virus family *Filoviridae*. While there are five species within the genus *Ebolavirus*, among them, three have been associated with large outbreaks in Africa, namely: *Bundibugyo ebolavirus*, *Sudan ebolavirus* and *Zaire ebolavirus*[2]. The 2014-2016 outbreak in West Africa was the largest Ebola outbreak since the discovery of the disease in 1976. It was caused by the *Zaire ebolavirus* with more than 28 000 cases and more than 11 000 deaths.

The current EVD outbreak in DRC was also caused by the *Zaire ebolavirus*. It was the eighth EVD outbreak in this central African country, since the deadly disease was first reported in humans in the African continent. Among the previous seven outbreaks of Ebola in DRC over the past 40 years, six were caused by the Zaire subtype and one was caused by the Bundibugyo subtype[3]. The number of cases reported in each of these previous outbreaks in DRC ranged from one to 318[4].

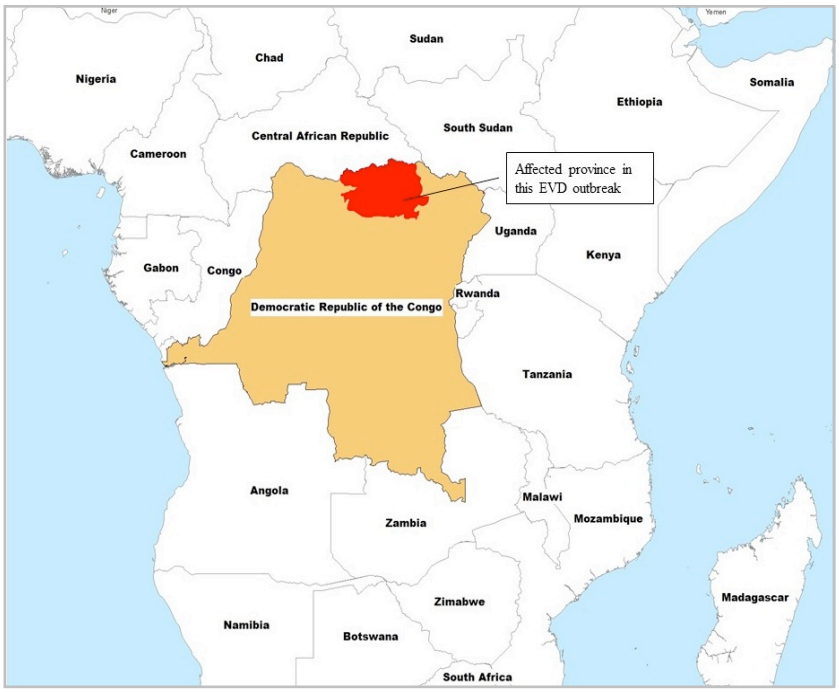

Figure 1 - Recent EVD outbreak in the Democratic Republic of Congo. (Source: CDIS.)

Taking lessons from the largest EVD outbreak in human history that originated from West Africa in 2014-2016[5], WHO, together with other international non-government organisations including the United Nations Children's Fund (UNICEF) and Médecins Sans Frontières (MSF) etc., has offered rapid and direct technical and operational support to DRC in its response to the most recent EVD outbreak. The country's MOH has taken a strategic approach in the prevention, detection and control of the disease. These strategies, including enhanced surveillance of suspected cases and contacts, laboratory confirmation, proper case management by trained healthcare workers, infection control measures, safe burials, social mobilisation and timely risk communication, have proven effective in the containment of this disease outbreak.

According to the latest assessment by WHO, the overall risk at the global level, in light of this EVD outbreak in DRC, is considered low. Currently, WHO has also advised against application of any travel or trade restrictions on the country[5].

In Hong Kong, EVD is a notifiable disease under the disease group of "viral haemorrhagic fever" since 2008. All registered medical practitioners are required to notify the Centre for Health Protection (CHP) of the Department of Health of all suspected or confirmed cases of EVD. As of June 11, 2017, there have been no confirmed cases of EVD recorded locally.

Despite the current local situation and the risk assessment by WHO, the Hong Kong Government continues to maintain vigilance and keep abreast of the latest developments concerning EVD. Risk assessment is carried out on an ongoing basis, with regular review on the effectiveness of the relevant response plans and reinforcement of public health measures as and when necessary.

There is no specific treatment and development of licensed vaccine for EVD is still underway. In a major trial led by WHO in Guinea in 2015, an Ebola vaccine called rVSV-ZEBOV was shown to be highly protective against the deadly virus in the contacts of confirmed EVD cases[6]. While this offers additional evidence to the possibility of preventing the deadly disease through vaccination, further study on the vaccine's effects on humans, in particular on the vaccine's safety and the durability of protection offered, is warranted. To prevent the infection of ebolavirus, it is important for members of the public to observe the following:

- Observe good personal and environmental hygiene;
- Wash the hands with liquid soap or clean with alcohol-based handrub;
- Avoid close contact with feverish or ill persons, and avoid contact with blood or bodily fluids of patients, including items which may have come in contact with an infected person's blood or bodily fluids;
- Cook food thoroughly before consumption; and
- Avoid contact with animals.

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NEWS IN BRIEF

A sporadic case of necrotising fasciitis due to *Vibrio vulnificus* infection

On June 8, 2017, CHP recorded a sporadic case of necrotising fasciitis due to *Vibrio vulnificus* infection affecting a 49-year-old male with underlying illnesses. He presented with bilateral feet and ankles pain and malaise since June 5. He attended the Accident and Emergency Department of a public hospital on June 6 and was admitted on the same day. The clinical diagnosis was necrotising fasciitis. Excisional debridement of left foot was performed. Specimens of blood and left foot fluid collected on June 6 grew *Vibrio vulnificus*. His current condition was stable. Epidemiological investigation revealed that the patient did not have recent travel history. There was no history of wound or injury. He lived with his wife and mother-in-law who remained asymptomatic. Investigation is ongoing.

CA-MRSA cases in May 2017

In May 2017, CHP recorded a total of 112 cases of community-associated methicillin resistant *Staphylococcus aureus* (CA-MRSA) infection, affecting 65 males and 47 females with ages ranging from nine months to 82 years (median: 36 years). Among them, there were 82 Chinese, 10 Filipinos, 6 Indian, 4 Caucasian, 3 Nepalese, 2 Indonesian, 1 Pakistani, and 4 of unknown ethnicity.

One hundred and eleven cases presented with uncomplicated skin and soft tissue infections while the remaining case had severe CA-MRSA infection. The severe case affected a 43-year-old man with underlying illness. He presented with left clavicular painful mass on April 18, 2017. He attended the Accident and Emergency Department of a public hospital on April 21 and was admitted for management. He was found to have multiple abscesses in lung, right kidney and head of left clavicle. He developed pericardial effusion with cardiac tamponade and renal failure requiring admission to intensive care unit. Drainage of the renal abscess and pericardial effusion were performed. His blood specimen collected on April 21 was cultured positive for CA-MRSA. His right renal abscess aspirate collected on April 22 and pericardial fluid collected on April 25 were cultured positive for MRSA. He was treated with antibiotics. His condition improved and he was transferred to general ward on April 28.

Separately, the isolate of one case affecting an eight-year-old girl was found to be resistant to mupirocin. The patient presented with axilla abscess and recovered after antibiotic treatment.

Among the 112 cases, two sporadic cases involved healthcare workers. One case was a physiotherapist working in a private healthcare centre while the other one was a nurse working in a public hospital. Investigation did not reveal any epidemiologically linked cases. Besides, three household clusters, with each affecting two persons, were identified.

Scarlet fever update (May 1, 2017 – May 31, 2017)

Scarlet fever activity in May increased as compared with that in April. CHP recorded 210 cases of scarlet fever in May as compared with 187 cases in April. The cases recorded in May included 122 males and 88 females aged between four months and 43 years (median: six years). There were two institutional clusters occurring in a kindergarten and a primary school, affecting a total of five children. No fatal cases were reported in May.

Jun 18 - Jul 1 2017 WEEKS 25 - 26 VOL 14 ISSUE N⁰ 13

Communicable Diseases WATCH

衛生防護中心 Centre for Health Protection 衛生署 Department of Health

FEATURE IN FOCUS

Management of institutional outbreaks of infectious diseases in Hong Kong

Reported by Dr Carol YAU, Senior Medical and Health Officer, Communicable Disease Division, Surveillance and Epidemiology Branch, CHP.

Infectious disease outbreaks are more common in institutional settings such as schools, child care centres (CCC), nursing homes and residential care homes for people with special needs. Institutional settings may facilitate the transmission of some infectious diseases. Susceptible groups such as elderly and young children are at higher risk for complications of infectious diseases. Early detection of infectious disease and prompt implementation of control measures are therefore important to prevent and limit secondary transmission in institutions.

To prevent communicable disease outbreaks in institutional setting, the Centre for Health Protection (CHP) of the Department of Health has published a set of guidelines on "Prevention of Communicable Diseases in Residential Care Homes for Elderly (RCHE)/ Residential Care Homes for Persons with Disabilities (RCHD)/Schools/Kindergartens (KG)/CCC" for reference by institutions, which are available at: http://www.chp.gov.hk/en/guideline/478/35.html. CHP also provides regular infection control trainings for staff of RCHE and RCHD. For KG and CCC, the pre-primary institutions inspection team of CHP monitors and strengthens the implementation of infection control and preventive measures among the institutions. The team also conducts visits to these institutions to observe the compliance of infection control procedures and to give appropriate advice on any necessary improvement measures.

CHP has established a comprehensive disease surveillance system through collaborations with different health care sectors and institutions on sentinel surveillance, laboratory surveillance and hospital admission data monitoring. Information gathered from different systems provides early warning of activities of common infectious diseases, such as influenza, hand, foot and mouth disease (HFMD) and acute gastroenteritis (AGE). Results of different surveillance systems are uploaded regularly to the CHP website (http://www.chp.gov.hk/en/dns_submenu/10/26/44.html) for public information. Prior to the usual peak season of these infectious diseases, with the help of other government departments such as the Education Bureau and the Social Welfare Department, CHP will issue letters to alert management of institutions and health care providers to be vigilant and adopt preventive measures to prevent outbreak occurring in their institutions.

If an outbreak does occur in an institution, CHP has a reporting system in place to centralise all infectious disease notifications from health care sectors and community institutions. CHP encourages institutions to report suspected institutional outbreaks of infectious diseases to CHP for public health management. In 2016, CHP recorded more than 2 500 institutional outbreaks; outbreaks of HFMD (including herpangina), influenza-like illness (ILI), upper respiratory tract infection (URI), AGE and scabies accounted for more than three-quarters of all reported institutional outbreaks. HFMD and AGE outbreaks predominately occurred in pre-primary institutions (KG/CCC); while outbreaks of scabies mainly occurred in RCHE (Table 1).

After receiving suspected outbreak notification, CHP will contact the institution concerned to obtain more information to verify the existence of an outbreak. Once the outbreak has been confirmed, CHP will conduct epidemiological investigation and field visit as appropriate. Relevant health advice will be provided to the institution and the condition of the affected persons will be monitored through communication with the institution, relevant health care providers, the affected persons and their relatives as appropriate. The institution will be advised to carry out infection control measures, which may be specific for different types of institutions and possible causative agents. General infection control measures should include regular hand-washing, cleaning and disinfection of the environment, excluding and isolation and/or cohorting of sick persons. Specific measures are available in the management of selected infectious disease outbreaks, such as facility-wide oseltamivir chemoprophylaxis for the control of influenza outbreak in high-risk settings.

Table 1 - Common institutional outbreaks in Hong Kong, 2016.*

Institution/ Types of outbreaks	HFMD Number (percentage of total)	ILI Number (percentage of total)	URI Number (percentage of total)	AGE Number (percentage of total)	Scabies Number (percentage of total)
KG/CCC	529 (60.5)	155 (23.7)	38 (27.5)	76 (47.5)	0 (0)
School	314 (35.9)	353 (53.9)	24 (17.4)	33 (20.6)	0 (0)
RCHE/ nursing home	1 (0.1)	93 (14.2)	37 (26.8)	17 (10.6)	59 (93.7)
RCHD	1 (0.1)	29 (4.4)	15 (10.9)	11 (6.9)	0 (0)
Others	29 (3.3)	25 (3.8)	24 (17.4)	23 (14.4)	4 (6.3)
All	874 (100)	655 (100)	138 (100)	160 (100)	63 (100)

**Excluding outbreaks of statutorily notifiable communicable diseases*

Risk communication is one of the major components in outbreak management. The institution concerned will be advised to inform parents/guardians, staff, residents and their relatives of the outbreak and to provide relevant health advice. For major outbreaks, such as those involving a large number of persons, CHP will usually issue press release to alert the general public of the situation and provide health advice to prevent similar outbreaks. The institution will be put under medical surveillance to monitor the progress of the outbreak and to evaluate the effectiveness of control measures. CHP will also inform and liaise with other relevant government departments for outbreak control when necessary.

With all the above communication and collaboration with various institutions and relevant stakeholders, it is envisaged that everyone involved could be better prepared, and outbreaks in institutions in Hong Kong could be prevented or detected early and managed appropriately to protect the public health in Hong Kong.

Any suspected institutional outbreaks of communicable diseases can be reported to the Central Notification Office of CHP for prompt epidemiological investigations and outbreaks controls (http://www.chp.gov.hk/en/notification/478/632.html). For the latest information on communicable diseases, please visit CHP's website at http://www.chp.gov.hk.

Update of hepatitis E infection in Hong Kong

Reported by Ms Doris CHOI, Scientific Officer, Enteric and Vector-borne Disease Office, Surveillance and Epidemiology Branch, CHP.

Hepatitis E is liver disease caused by infection of the hepatitis E virus (HEV). According to the World Health Organization, a global burden of disease study estimated that HEV genotypes 1 and 2 account for approximately 20.1 million HEV infections, 3.4 million symptomatic cases and 70 000 deaths every year[3].

In Hong Kong, acute hepatitis E is a notifiable infectious disease under viral hepatitis in the Prevention and Control of Disease Ordinance (Cap 599). From 2008 to 2017, as of May 31, a total of 954 hepatitis E cases were recorded by the Centre for Health Protection (CHP) of the Department of Health (DH). The number of hepatitis E cases recorded showed an increasing trend from 2008 to 2012 and peaked at 150 cases in 2012. The number of hepatitis E cases then decreased from 2012 to 2013 and remained stable between 84 and 96 cases annually from 2013 to 2016 (Figure 1).

The following section reviews the acute hepatitis E cases recorded by CHP from 2012 to 2017 (as of May 31). A total of 554 cases were recorded from 2012 to May 31, 2017 with age of the patients ranging from 15 to 96 years (median: 55 years). The majority of patients were Chinese (511, 92.2%). More males were affected (349, 63.0%) than females (205, 37.0%), and among the latter, none of them was pregnant. More cases were recorded in February and March (Figure 2). Most of the cases acquired the infection locally (464, 83.8%) while 38 cases (6.9%) contracted the disease during their travel to Mainland China (30 cases), India (2 cases), Korea (1 case), Nepal (1 case), Pakistan (1 case), Thailand (1 case), the United Kingdom (1 case) and multiple countries (1 case), respectively. The place of contracting the disease could not be determined in 52 cases (9.4 %) as the patients stayed both in and outside Hong Kong during the incubation period.

The most common clinical presentation included tea-coloured urine (480, 86.6%), followed by jaundice (438, 79.1%), anorexia (368, 66.4%), nausea (314, 56.7%) and abdominal pain (310, 56.0%). Four hundred and seventy-six (85.9%) patients required hospitalisation with a median length of stay of six days. Nine fatal cases were recorded, giving a case fatality rate of 1.6%. The age of the deceased patients ranged from 59 to 79 years (median: 74 years). Most of them (7, 77.8%) had underlying illnesses while two enjoyed good past health.

Hepatitis E is a liver disease caused by infection of the hepatitis E virus (HEV). HEV is a single-stranded RNA virus which belongs to the Hepeviridae family. HEV has only one serotype but can be distinguished into four human pathogenic genotypes, namely, genotypes 1 to 4.

HEV is mainly transmitted through the faecal–oral route. In developed countries, HEV infection is usually acquired by ingestion of raw or uncooked shellfish or undercooked meat or offal derived from infected animals; whereas in developed countries it is usually acquired by drinking feacal-contaminated water. Other routes of transmission such as transfusion of infected blood products and vertical transmission have also been reported. The incubation period ranges from two to ten weeks, with an average of five to six weeks[1]. HEV-infected persons exhibit a wide clinical spectrum, ranging from asymptomatic infection through acute icteric hepatitis to fulminant hepatitis. The clinical features include fever, malaise, anorexia and vomiting, followed by jaundice, tea-coloured urine and hepatomegaly. The overall case fatality rate during HEV outbreaks is about one percent but can be up to 20% to 25% for pregnant women who are infected with HEV in their third trimester of pregnancy[2]. Chronic infection is uncommon but has been reported in organ transplant recipients on immunosuppressive drugs.

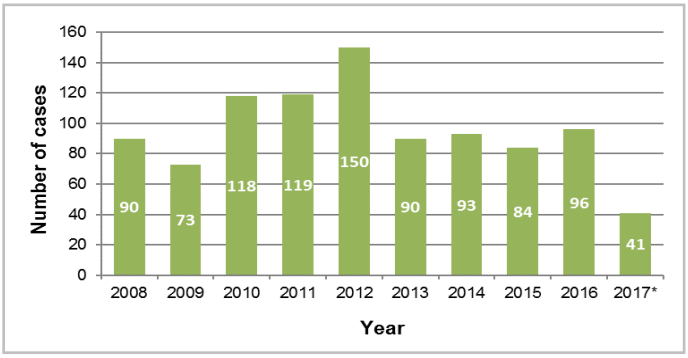

*Figure 1 - Annual number of acute hepatitis E infection in Hong Kong, 2008-2017 (*provisional figure as of May 31, 2017) (n=954).*

During the incubation period, 163 patients (29.4%) consumed shellfish and more than half of them ingested oyster (99, 60.7%). Among them, 17 (17.1%) indicated consumption of raw oyster. Besides, 208 patients (37.5%) consumed pig offal, mainly pig liver (172, 82.7%). Eight of them indicated that they ingested pig liver with congee (4.7%) and 31 (18.0%) reported that they consumed the pig liver with hotpot. The majority of cases (552, 99.6%) were sporadic but one cluster affecting two persons were recorded in 2012. The cluster involved a 36-year-old man with good past health who presented with tea-coloured urine and anorexia in mid-May 2012. Four days later, his 62-year-old father also developed jaundice, tea-coloured urine, abdominal pain and fever. They were both

hospitalised and recovered uneventfully. As both of them shared meals frequently during the long incubation period, the incriminating food could not be identified.

There is no specific treatment that can alter the course of acute hepatitis E. Prevention is the most effective approach against the disease. Currently, effective vaccine for hepatitis E is not available in Hong Kong. The mainstay of prevention of hepatitis E is maintaining good personal hygiene, especially hand hygiene, and adherence to food and water safety.

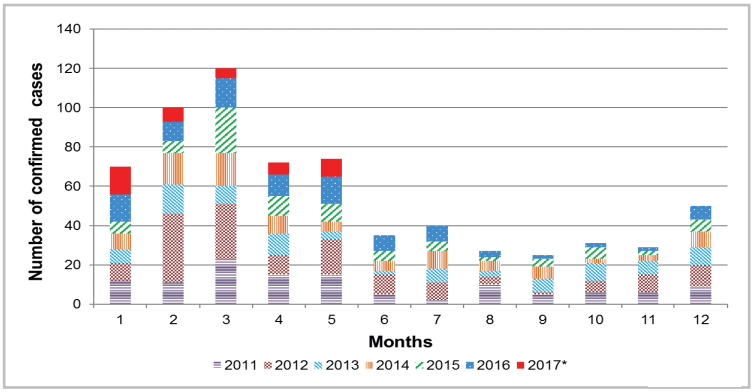

*Figure 2 - Seasonality of hepatitis E infection in Hong Kong, 2012-2017 (*provisional figure as of May 31, 2017) (n=554).*

Tips on food hygiene for preventing hepatitis E infection

The risk of hepatitis E infection can be reduced by adopting the five Keys to Food Safety in handling food, i.e. Choose (Choose safe raw materials); Clean (Keep hands and utensils clean); Separate (Separate raw and cooked food); Cook (Cook thoroughly); and Safe Temperature (Keep food at safe temperature) to prevent foodborne diseases:

- Maintain hygienic practices such as hand washing with safe water, particularly before handling food or eating, and after using the toilet or handling vomitus or faecal matter;
- Obtain drinking water from the mains and boil it before consumption;
- Avoid consumption of water and ice of unknown purity;
- Purchase fresh food from reliable sources. Do not patronise illegal hawkers;
- Clean and wash food thoroughly;
- Cook food, especially seafood (e.g. shellfish), pork and pig offal, thoroughly before consumption. Avoid raw food or undercooked food; and
- Use separate chopsticks for handling raw food and cooked food when having hotpot.

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NEWS IN BRIEF

Three sporadic cases of listeriosis

From June 20 to 28, 2017, the Centre for Health Protection (CHP) recorded three sporadic cases of listeriosis. The first case was a 46-year-old woman with underlying illness. She presented with fever and diarrhoea on June 13 and was admitted to a public hospital on June 17. Her blood culture collected on June 17 yielded *Listeria monocytogenes*. She was treated with antibiotics and her condition was stable. She lived alone.

The second case was a 69-year-old man with underlying illness. He presented with fever on June 23 and was admitted to a public hospital the next day. His blood culture collected on June 24 yielded *Listeria monocytogenes*. He was treated with antibiotics and his condition remained stable. His home contact was asymptomatic.

The third case was a 61-year-old man with underlying illnesses. He was admitted to a public hospital for management of his underlying illness on June 22. He developed fever, chills, myalgia and abdominal pain on June 24. His blood culture collected on June 25 yielded *Listeria monocytogenes*. He was treated with antibiotics and his condition was stable. His home contacts were asymptomatic.

The three cases had no recent travel history and had no history of consumption of high risk food item during the incubation period. So far, no epidemiological linkage was identified among the cases. Investigations are on-going.

A possible sporadic case of Creutzfeldt-Jakob disease

On June 30, 2017, CHP recorded a possible case of sporadic Creutzfeldt-Jakob disease (CJD) affecting a 76-year-old woman with underlying illnesses. She had presented with right side weakness and ataxia since April 2017 and was later admitted to a public hospital on May 5, 2017. She subsequently developed rapidly progressive dementia, myoclonus, extrapyramidal signs, rigidity, gait disturbance, dysarthria and dysphagia which required tube feeding. Her condition was stable. She had no known family history of CJD and there were no reported risk factors for iatrogenic or variant CJD. She was classified as a possible case of sporadic CJD.

Jul 2 - Jul 15 2017 WEEKS 27 - 28 VOL 14 ISSUE N⁰ 14

Communicable Diseases WATCH

衛生防護中心 Centre for Health Protection 衛生署 Department of Health

FEATURE IN FOCUS

Diphtheria: Review of a long forgotten disease

Reported by Ms Fanny WS HO, Scientific Officer, Vaccine Preventable Disease Office, Surveillance and Epidemiology Branch, CHP.

Diphtheria is an acute infectious disease caused by the bacterium *Corynebacterium diphtheria*, which primarily affects the upper respiratory tract and occasionally the skin. Transmission usually occurs from person-to-person through respiratory droplets or less commonly, through contact with discharge from skin lesions. The disease is characterised by a mild fever, sore throat and an adherent membrane (pseudomembrane) on the tonsils and nasopharynx. Most complications of diphtheria are attributable to the effects of the diphtheria toxin and its subsequent dissemination to other organs and tissues distant from the site of infection. The most frequent complications of diphtheria are myocarditis and neuritis. Death occurs in 5 to 10% of the cases, with higher mortality rates (up to 20%) among persons younger than five and older than 40 years of age.

Diphtheria is a significant cause of childhood mortality in developing nations. In spite of the widespread use of diphtheria vaccines since the 1920s which led to a dramatic decline in morbidity and mortality worldwide, the disease remains endemic in countries with low vaccination coverage and substandard living conditions. During the 1990s, a large epidemic was reported in the former Soviet Union resulting in over 157 000 cases and 5 000 deaths due to an increasing proportion of susceptible adults, decreased childhood immunisation, suboptimal socioeconomic conditions and high population movement in the country[1]. Globally, the World Health Organization recorded 4 530 diphtheria cases in 2015[2], and still the disease continues to occur in parts of South-East Asia, South America, Africa and India where immunisation is insufficient. A small resurgence was also seen in Malaysia and the Philippines in 2016 with 31 and 42 diphtheria cases recorded respectively, compared with four and nine cases in the previous year[3].

In Hong Kong, during the pre-vaccine era from 1928 to 1940, an average of 250 cases of diphtheria with 104 deaths was recorded annually[4]. After the end of the Second World War, there had been a steady increase in the number of cases rising from 122 cases in 1947 to a peak of 2 087 cases in the late 1950s (Figure 1). The total registered deaths over the same period also increased from 49 to 157. The majority of infections occurred in children under ten years of age, particularly those under five. Following the introduction of mass immunisation in 1956, cases of diphtheria began to decline gradually. In mid-1959, the then Medical and Health Department further intensified the immunisation campaign against diphtheria and these efforts were reinforced annually before the arrival of each winter season (Figure 2). As a result of these continuing efforts, case count fell drastically since the 1960s from 1 450 cases to no more than two cases in the late 1970s. No diphtheria cases were recorded since the last fatal case occurred in 1982.

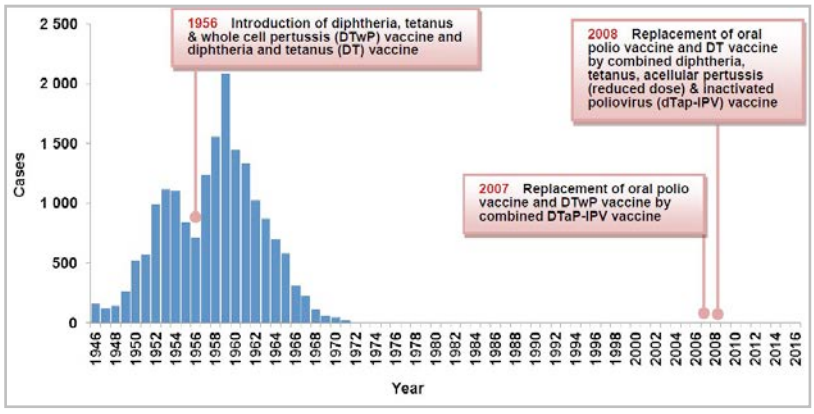

Figure 1 - Diphtheria cases in Hong Kong by year, 1946-2016.

Figure 2 - Diphtheria immunisation posters encouraging parents to vaccinate their children during 1958-1959 (Source: Government Records Service).

Diphtheria is highly preventable through routine vaccination. Completion of the 3-dose primary series with booster vaccination at appropriate intervals is essential to reduce the risk of diphtheria in all age groups. Under the Hong Kong Childhood Immunisation Programme, diphtheria toxoid vaccine is provided free to eligible children in combination with tetanus, acellular pertussis and inactivated poliovirus (DTaP-IPV) vaccines at two, four and six months of age, followed by booster doses at 18 months, Primary one and Primary six

(reduced dose). A complete primary series according to the immunisation schedule is expected to confer 97% protective efficacy[5]. In Hong Kong, the vaccination coverage for the 3-dose primary series among children two to five years of age has been above 95%[6], which is sufficient to maintain herd immunity and mitigate the spread of the disease in the community.

In addition to active immunisation, maintaining personal and environmental hygiene is important in preventing infection and spread of diphtheria. Travellers to endemic areas are advised to keep their vaccinations up-to-date and, if necessary, consult their family doctor for primary or booster vaccination before departure. Physicians are also reminded to stay vigilant in the disease diagnosis and notification of any suspected diphtheria cases. For more information on diphtheria, please visit the CHP website: http://www.chp.gov.hk/en/content/9/24/20.html.

Prevention Tips

Maintain good personal hygiene

- ☑ Wash hands frequently with liquid soap and water, especially before touching the mouth, nose or eyes, or after touching public installations such as handrails or door knobs;
- ☑ Cover nose and mouth with tissue paper when coughing or sneezing, and wash hands thoroughly afterwards. Dispose of soiled tissue paper in a lidded rubbish bin;
- ☑ Put on a surgical mask when having respiratory symptoms. Refrain from work or school and seek medical advice promptly;
- ☑ Clean broken skin immediately and cover properly with waterproof adhesive dressings. Wash hands before and after touching wounds. Consult doctor promptly if symptoms of infection develop; and
- ☑ Maintain good environmental hygiene.

Maintain good indoor ventilation

- ☑ Frequently clean and disinfect touched surface such as furniture, toys and commonly shared items with 1:99 diluted household bleach (mixing 1 part of 5.25% bleach with 99 parts of water), leave for 15 to 30 minutes, and then rinse with water and keep dry. For metallic surface, disinfect with 70% alcohol; and
- ☑ Use absorbent disposable towels to wipe away obvious respiratory secretions, and then disinfect the surface and neighbouring areas with 1:49 diluted household bleach (mixing 1 part of 5.25% bleach with 49 parts of water), leave for 15 to 30 minutes and then rinse with water and keep dry. For metallic surface, disinfect with 70% alcohol.

Vaccination

- ☑ Active immunisation with diphtheria toxoid can provide long-lasting protection in the majority of immunised children.

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Update on yellow fever

Reported by Dr KONG Wai-chi, Scientific Officer, Enteric and Vector-borne Disease Office, Surveillance and Epidemiology Branch, CHP.

Yellow fever is an acute infection caused by the yellow fever virus which is transmitted via the bite of infected mosquitoes belonging to the *Aedes, Haemagogus* and *Sabethes* species. The majority of persons infected with yellow fever virus have no illness or only mild illness. Some people may develop sudden onset of fever, chills, headache, back pain, generalised muscle pain, weakness, fatigue, nausea and vomiting. The condition of most patients improves and their symptoms disappear after three to four days. Those who recover from yellow fever usually have lasting immunity against subsequent infection. However, a small percentage of the symptomatic cases will progress to a more severe form of the disease. The severe form is characterised by high fever, jaundice, bleeding, and eventually shock and failure of multiple organs; in some, infection may be complicated by secondary bacterial infection. Fatality rate among severe cases is about 20 to 50%.

There is no specific drug treatment for yellow fever. Management is mainly for symptomatic relief. Yellow fever is prevented by vaccination and avoiding mosquito bites.

Yellow fever is endemic in tropical and subtropical areas in Africa and South Americas (Figure 1 and 2)[1,2]. This article provides an update on the latest situation of the recent outbreaks of yellow fever in affected African countries, Brazil, as well as those affected countries and areas.

Angola[3,4]

A yellow fever outbreak started in Luanda, Angola in December 2015 and spread quickly to the rest of the country. A total of 4 306 cases and 376 deaths, of which 884 cases and 121 deaths were laboratory confirmed, were reported in Angola. The last case was detected in June 2016 and Angola declared the end of the yellow fever outbreak in December 2016. Cases of yellow fever in Angola had been exported to countries including Democratic Republic of the Congo (DRC), Kenya and Mainland China.

The national task force of Angola carried out emergency vaccination campaigns included mop up and preventative campaigns. As of mid-June 2016, Angola had received over 11 million vaccines from International Coordinating Group (ICG) for Vaccine Provision and almost half of the country had been vaccinated.

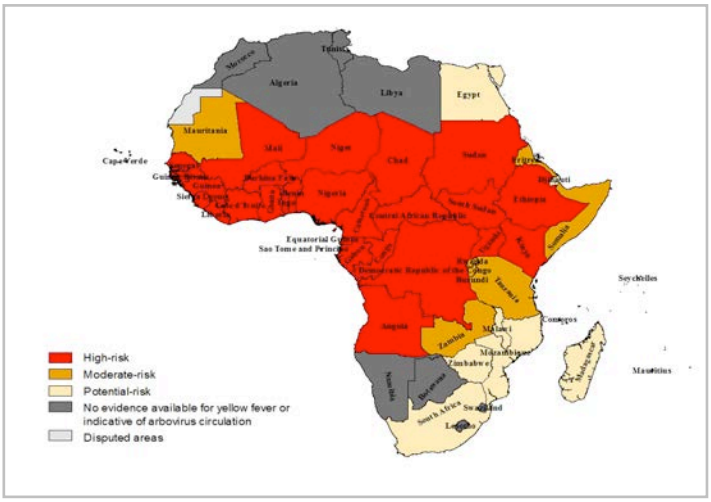

Figure 1 - Yellow fever risk classification in Africa.

Democratic Republic of the Congo (DRC)[3,5,6]

In March 2016, the National International Health Regulations (IHR) Focal Point of the DRC notified the World Health Organization (WHO) of cases of yellow fever in connection with the outbreak occurring in Angola. As of mid-February 2017, a total of 2 987 cases of yellow fever were reported from all 26 provinces of DRC during the outbreak, of which 81 cases had been laboratory confirmed, with 16 deaths. Most of the confirmed cases acquired the infection in Angola. The last case was detected in July 2016 and DRC declared the end of the yellow fever outbreak in February 2017.

In response to this outbreak in DRC, ICG on Vaccine Provision had released 2.2 million doses of vaccines and operational fund for the vaccination campaign. In addition, WHO also supported the Ministry of Health in DRC to vaccinate 10.7 million people in the city of Kinshasa using a dose-sparing strategy* as a short-term measure.

Figure 2 - Yellow fever risk in South America.

Brazil[7]

In December 2016, cases of yellow fever were reported in Minas Gerais and the outbreak extended to areas located in proximity of Minas Gerais. The outbreak is ongoing. According to the latest update in July 2017, a total of 792 confirmed cases and 274 deaths were reported from December 2016 to May 31, 2017.

With the support from WHO, The Brazilian Government stepped up yellow fever vaccination campaigns in several states. Moreover, strengthening surveillance and case management throughout the country were also enhanced since January 2017.

Situation in Asia[8,9,10]

Although the vector, *Aedes* spp. mosquitoes, are present in the Asia, no autochthonous yellow fever cases are reported so far.

Mainland China, which had never had a yellow fever outbreak before, reported 11 imported cases who had returned from Angola in March and April 2016. The 11 affected persons include eight males and three females, aged from 18 to 53 years. The majority of them were from the province of Fujian (7 cases), two were from Jiangsu, and one each was from Sichuan and Zhejiang respectively. At least five of them did not receive vaccination against yellow fever before going to Angola. One case did receive yellow fever vaccine in Angola, but then developed symptoms within four days of receiving the vaccine so is likely to have acquired the infection before protection from the vaccination could develop.

Situation in Hong Kong

In Hong Kong, yellow fever is a notifiable infectious disease under the Prevention and Control of Disease Ordinance (Cap. 599). The last case of imported yellow fever was recorded in 1945. Despite that the vector *Aedes aegypti* is not found, the prevailing species *Aedes albopictus* had been demonstrated experimentally to be a possible vector of yellow fever, but it is not as competent and important as *Aedes aegypti.* Due to the large volume of international travel, there is risk of importation of yellow fever into Hong Kong. Although the risk for local transmission is low, members of the public should prevent yellow fever by vaccination and avoiding mosquito bites.

*Dose-sparing strategy (using one fifth of a regular dose of the yellow fever vaccine) would provide immunity against yellow fever for at least 12 months and likely longer. However, a yellow fever vaccine given at a fractional dose would not qualify for a yellow fever certificate under the IHR requirements.

Vaccination

WHO recommends immunisation against yellow fever for all travellers aged nine months and above, travelling to and from at-risk areas, unless they are contraindicated. In Hong Kong, yellow fever vaccination is available at the Travel Health Centres of Department of Health. When travellers are vaccinated against yellow fever, they will be provided with an International Certificate of Vaccination or Prophylaxis. The certificate will be effective 10 days after the date of vaccination. Following the amendment to the IHR (2005) on July 11, 2016, the certificate of vaccination against yellow fever is valid for the life of the person vaccinated, instead of 10 years.

Avoid mosquito bites*

1. Wear loose, light-coloured, long-sleeved tops and trousers, and use DEET-containing insect repellent on exposed parts of the body and clothing;
2. Take additional preventive measures when going outdoor activities:
   - ✦ Avoid using fragrant cosmetics or skin care products; and
   - ✦ Re-apply insect repellents according to instructions.

*For more information on prevention of yellow fever, please visit the Travel Health Service website: http://www.travelhealth.gov.hk/english/travel_related_diseases/yellow_fever.html

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NEWS IN BRIEF

Three sporadic cases of necrotising fasciitis due to *Vibrio vulnificus* infection

In early July, 2017, CHP recorded three sporadic cases of necrotising fasciitis due to *Vibrio vulnificus* infection. The first patient was a 67-year-old male with underlying illnesses. He presented with fever and painful left middle finger swelling spreading towards left upper limb since July 3. He attended the Accident and Emergency Department (AED) of a public hospital on July 4 and was admitted to intensive care unit on the same day. The clinical diagnosis was necrotising fasciitis. Left above-elbow amputation was performed. Specimen of left forearm fascia taken on July 4 grew *Vibrio vulnificus*. His condition deteriorated and he passed away on July 13. Epidemiological investigation revealed that the patient had been to a wet market to buy a fish on July 2 and had prepared it with bare hands. It was not known whether he had sustained any sting injury. He had no recent travel history. He lived with his wife and two sons who remained asymptomatic.

The second patient was a 61-year-old male with underlying illnesses. He presented with chills and rigors since July 2. He developed bilateral painful lower limb swelling since July 3 with increasing severity. He attended the AED of a public hospital on July 4. He subsequently developed septic shock and was admitted to intensive care unit on the same day. The clinical diagnosis was necrotising fasciitis. Emergency debridement on bilateral lower limbs was performed. The left leg tissue specimen collected on July 6 grew *Vibrio vulnificus*. He was still in critical condition. The patient did not have recent travel history. He denied any visits to wet markets or any history of injury. He lived with his wife and daughter who remained asymptomatic. Investigation is ongoing.

The third patient was an 83-year-old male with underlying illnesses. He presented with fever, right wrist pain and swelling on July 3 and was admitted to a public hospital through the AED on the same day. The clinical diagnosis was necrotising fasciitis. Excisional debridement was performed. Specimens of blood and tissue collected on July 3 and July 4 respectively grew *Vibrio vulnificus*. His current condition was serious. Epidemiological investigation revealed that the patient swam daily in seawater from June 27 to June 30. He had history of right wrist abrasion by a door frame on June 30. There was no recent travel history. He lived with a domestic helper who remained asymptomatic. Investigation is ongoing.

A probable sporadic case of Creutzfeldt-Jakob disease

On July 10, 2017, the Centre for Health Protection (CHP) recorded a probable case of sporadic Creutzfeldt-Jakob disease (CJD) affecting a 64-year-old woman with underlying illnesses. She had presented with dizziness, visual disturbance and unsteady gait since April 2017. She was admitted to a private hospital in May 2017 and subsequently referred to a public hospital for further investigation. She subsequently developed progressive dementia, dysphasia and dysphagia. Her condition was serious. She had no known family history of CJD and there were no reported risk factors for iatrogenic or variant CJD. She was classified as a probable case of sporadic CJD.

A domestic cluster of pertussis

CHP recorded a domestic cluster of pertussis in July 2017, affecting a baby and his two close contacts. The baby was a one-month-old boy who had presented with cough and post-tussive vomiting since June 22. He was admitted to a public hospital on June 27. His condition was stable and he was discharged on July 6. His pernasal swab taken on June 27 was tested positive for *Bordetella pertussis*.

Contact tracing identified four symptomatic close contacts. The baby's 33-year-old mother had cough since May 27 and her prenasal swab collected on June 30 was tested positive for *Bordetella pertussis*. The baby's 68-year-old grandfather had cough since May 25 and his pernasal swab collected on June 30 was also tested positive for *Bordetella pertussis*. Two other close contacts (the baby's grandfather and aunt) also presented with upper respiratory symptoms while their pernasal swabs were tested negative for *Bordetella pertussis*. All symptomatic contacts were treated with a course of antibiotics and their conditions were stable all along.

They had no recent travel history. The baby was born in Hong Kong and was not yet due for the first dose of combined diphtheria, tetanus, acellular pertussis and inactivated poliovirus (DTaP/IPV) vaccine, while his mother and grandfather could not recall their vaccination history. Chemoprophylaxis and screening were also offered to other household contacts. Investigation is ongoing.

CA-MRSA cases in June 2017

In June 2017, CHP recorded a total of 119 cases of community-associated methicillin resistant *Staphylococcus aureus* (CA-MRSA) infection, affecting 68 males and 51 females with ages ranging from eight months to 84 years (median: 35 years). Among them, there were 87 Chinese, 10 Filipinos, 5 Pakistani, 3 Caucasian, 3 Indian, 3 Nepalese, and 8 of unknown ethnicity.

One hundred and seventeen cases presented with uncomplicated skin and soft tissue infections while the remaining two cases had severe CA-MRSA infections. The first severe case affected a 31-month-old girl with underlying illnesses and past history of pneumonia caused by CA-MRSA. She presented with fever, cough with sputum, and vomiting on May 10. She attended the AED of a public hospital on May 18 and was admitted for management. Her chest X-ray showed right middle lobe consolidation. She was diagnosed with pneumonia. Her sputum collected on May 19 was cultured positive for CA-MRSA. She was treated with antibiotics. The patient remained stable and was transferred to another public hospital for rehabilitation on June 2. The second severe case affected a 55-year-old man with underlying illnesses. He presented with right thigh pain, fever, chills and rigors on June 7. He attended the AED of a public hospital on June 14 and was admitted for management. His blood specimen collected on June 14 was cultured positive for CA-MRSA. He was diagnosed to have right thigh abscess and sepsis. He was treated with antibiotics and incision and drainage of right thigh abscess with pus cultured positive for MRSA. He was discharged on June 30 in stable condition.

Among the 119 cases, two sporadic cases involved healthcare workers who were nurses working in two different public hospitals. Investigation did not reveal any epidemiologically linked cases. Besides, five clusters, with each affecting two persons, were identified. Four cases were household contacts and one case was a close contact of previously reported cases.

Scarlet fever update (June 1, 2017 – June 30, 2017)

Scarlet fever activity in June increased as compared with that in May. CHP recorded 227 cases of scarlet fever in June as compared with 207 cases in May. The cases recorded in June included 137 males and 90 females aged between nine months and 43 years (median: six years). There were nine institutional clusters occurring in seven kindergartens, a primary school and a special school, affecting a total of 21 children. No fatal cases were reported in June. Of note, a total of 1 213 SF cases had been reported to CHP in the first six months of 2017, representing a marked increase from the figures for the same period in 2016 (727 cases) and 2015 (674 cases). In view of the increase in scarlet fever activity in the recent few weeks, parents should take extra care of their children in maintaining strict personal, hand and environmental hygiene. People suspected to have scarlet fever should consult a doctor promptly. Children suffering from scarlet fever should refrain from attending school or child care setting until fever has subsided and they have been treated with antibiotics for at least 24 hours.

Communicable Diseases WATCH

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FEATURE IN FOCUS

Updated Situation of Seasonal Influenza in Hong Kong

Reported by Ms Vera CHOW, Scientific Officer, Respiratory Disease Office, Surveillance and Epidemiology Branch, CHP.

Overview

The seasonal influenza activity in Hong Kong this year was different from the typical epidemiological patterns in the past few years. After a mild increase in seasonal influenza activity during February and March 2017, the influenza activity returned to the baseline in April. However, it started to increase and exceeded the baseline in May, indicating the arrival of the summer influenza season. This season arrived earlier than the traditional summer influenza seasons that usually occurred between July and September in the past. The influenza activity continued to increase steadily in June and exceeded the peak level recorded during the winter season this year. It further increased sharply from late June to mid-July and reached a very high level with some of the surveillance parameters exceeding the highest levels recorded in recent years. However, the surveillance data in the past two weeks (July 16 to 29) showed signs of decrease in the activity. Based on past epidemiological patterns, the Centre for Health Protection (CHP) of the Department of Health anticipates that the influenza activity will remain high in the coming weeks.

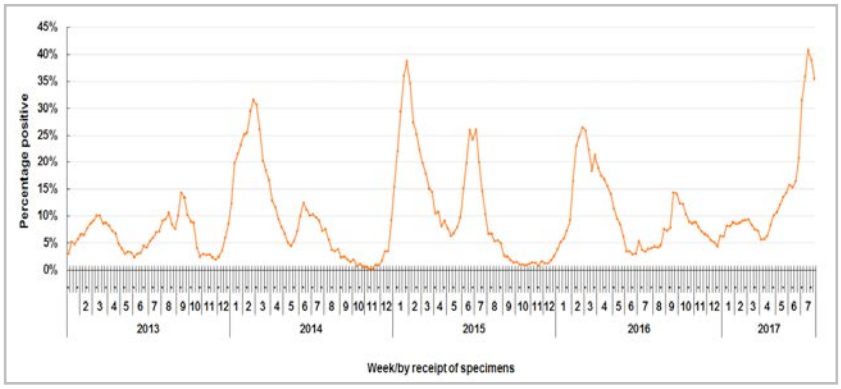

Figure 1 - Percentage of respiratory specimens tested positive for influenza viruses, 2013-2017.

Influenza A(H3N2) has predominated in this season, which is known to cause more severe diseases in the elderly as compared with other influenza types. The current summer season was similar to the situation of the winter season in early 2015 which was also predominated by influenza A(H3N2). In both seasons, large numbers of severe influenza cases affecting elderly patients were recorded.

Laboratory surveillance

The weekly percentage tested positive for seasonal influenza viruses among respiratory specimens received by the Public Health Laboratory Services Branch (PHLSB) of CHP steadily rose from 10.75% in the week ending May 6 to 20.76% in that ending June 24, and then sharply increased over the next three weeks to the peak of 40.86% in the week ending July 15 (Figure 1). This peak exceeded the previous maximum level recorded since 2014 (38.71% during the 2015 winter season). It then decreased to 39.00% and 35.49% in the past two weeks.

Influenza A(H3N2) virus, which predominated in the 2017 winter season and the 2016 summer season, continued to be the predominating virus in this season. From May 7 to July 29, the proportion of influenza A(H3N2) detected by PHLSB was 88.8%, whereas for influenza A(H1N1)pdm09, influenza B and influenza C viruses, the proportions were 6.8%, 3.5% and 0.9% respectively. The recently circulating influenza A(H3N2) viruses remained antigenically similar to the strain contained in the seasonal influenza vaccine recommended for the 2016/17 Northern Hemisphere season so far.

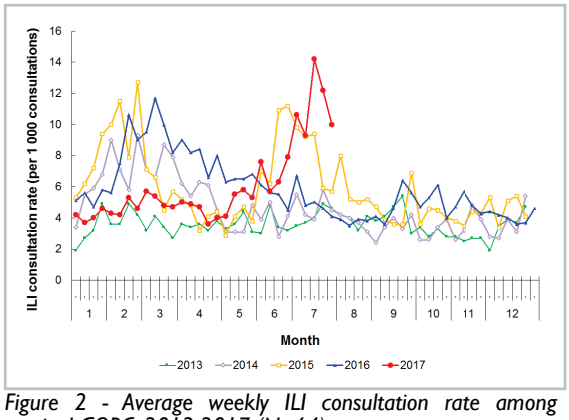

Figure 2 - Average weekly ILI consultation rate among sentinel GOPC, 2013-2017 (N=64).

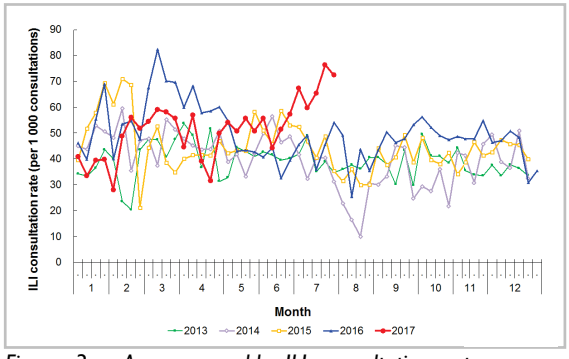

Figure 3 - Average weekly ILI consultation rate among sentinel private doctors, 2013-2017 (N=55).

Influenza-like illness (ILI) surveillance among sentinel general out-patient clinics (GOPC) and private doctors

The average weekly ILI consultation rate among sentinel GOPC reached the peak level of 14.2 (per 1 000 consultations) in the week ending July 15, which was the highest level recorded after the 2009 pandemic (higher than 12.7 and 11.7 recorded in the 2015 and 2016 winter seasons respectively) (Figure 2). The rate among sentinel private doctors reached the peak of 76.4 (per 1 000 consultations) in the week ending July 22, which was similar to the peak of 71.0 and 82.3 recorded in the 2015 and 2016 winter seasons respectively (Figure 3). In summary, the ILI consultation rates in out-patient settings have reached a very high level in this season.

ILI syndromic surveillance in Accident and Emergency Departments (AED) in public hospitals

According to the ILI syndromic surveillance in AED in public hospitals, the average weekly ILI attendance rate reached a high level ranging from 232.2 to 233.1 per 1 000 coded cases in the past three weeks (July 9 to 29) (Figure 4). Higher rates were recorded in winter seasons in previous years: 2008 (261.4), 2011 (339.5), 2014 (254.1), 2015 (259.0) and 2016 (295.0). In summary, the ILI attendance rate in AED reached a high level in this season but was lower than the peak levels recorded in previous years.

Outbreaks of ILI in schools/institutions

The weekly number of institutional ILI outbreaks reported to CHP reached a high level in July, ranging between 41 and 44 during the 4-week period from June 25 to July 22 (Figure 5). The number of ILI outbreaks slightly decreased to 39 last week. The peak level was lower than that recorded during the 2015 and 2016 winter seasons (95 and 90 outbreaks per week respectively). During the period between May 7 and July 29, a total of 364 ILI outbreaks were recorded as compared to 403 and 374 recorded in the same duration in the 2015 and 2016 winter seasons respectively. In this season, the majority of outbreaks occurred in residential care homes for the elderly (RCHE) (47.0%), followed by primary schools (PS) (20.1%), kindergartens/child care centres (KG/CCC) (15.9%), secondary schools (SS) (4.9%) and residential care homes for the disabled (RCHD) (4.9%). This was similar to the situation in the 2015 winter season predominated by influenza A(H3N2) where most outbreaks occurred in RCHE, but unlike the situation in the 2016 winter season predominated by influenza A(H1N1)pdm09 where most outbreaks occurred in schools (Figure 6).

Influenza-associated hospital admissions

In public hospitals, the weekly admission rates with principal diagnosis of influenza have reached very high levels in mid-July (Figure 7). In this season, the peak admission rate was highest among children aged below five years (10.02 admitted cases per 10 000 population in the week ending July 15), followed by elderly aged 65 years or above (6.59 in the week ending July 15) and children aged five to nine years (2.47 in the week ending July 1). The peak rates among children aged below five years and elderly aged 65 years or above exceeded the previous highest rates recorded after the 2009 pandemic (6.73 among children aged below five years in the 2016 winter season and 5.34 among elderly aged 65 years or above in the 2015 winter season).

Although the influenza-associated admission rates were high, so far there was no observed increase in the proportion of death among the hospitalised influenza cases. Among the cases admitted to public hospitals with laboratory

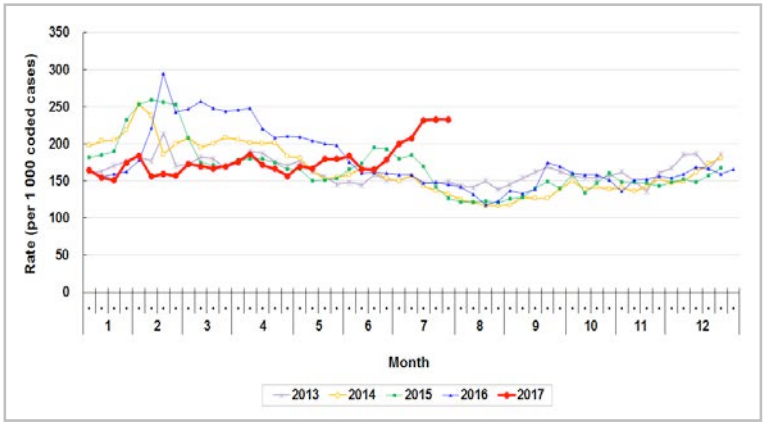

Figure 4 - Average ILI attendance rate at AED by week, 2013-2017 (N=18).

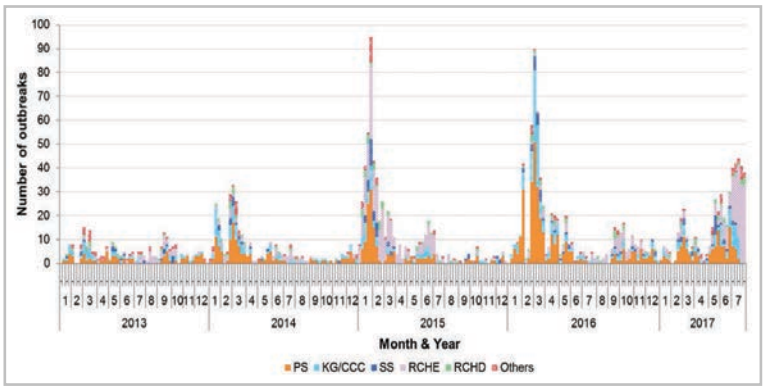

Figure 5 - Weekly number of ILI outbreaks in schools and institutions, 2013-2017.

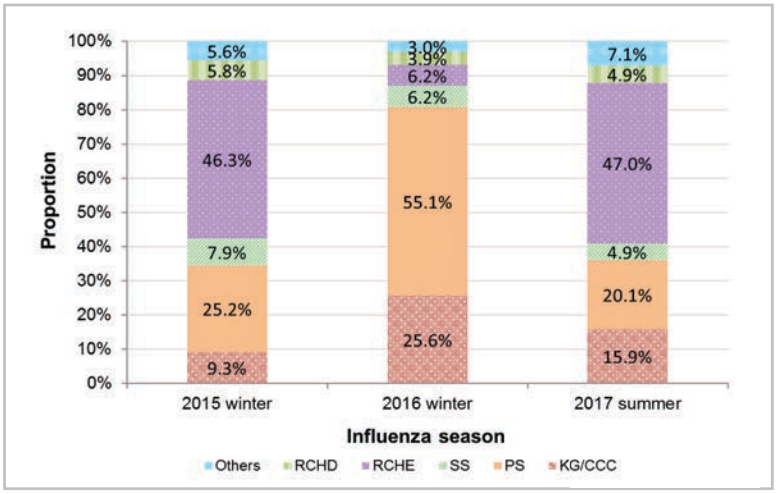

Figure 6 - Distribution of the institutional ILI outbreaks recorded during the 2015 winter season, 2016 winter season and the current season (as of July 29, 2017).

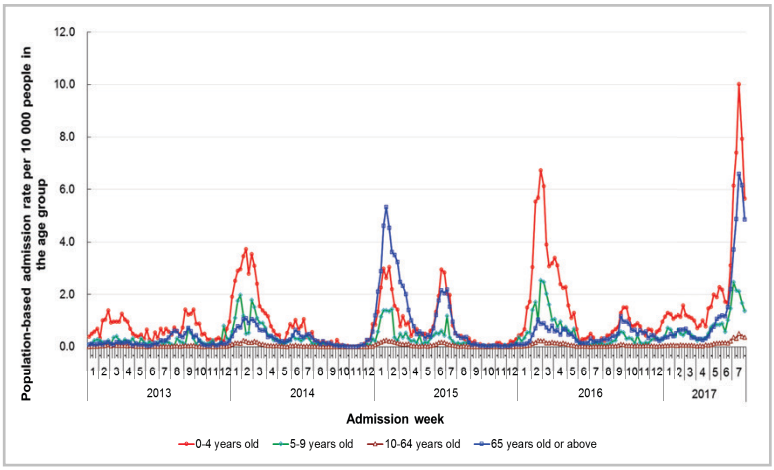

Figure 7 - Weekly admission rates with principal diagnosis of influenza in public hospitals by age groups, 2013-2017.

confirmation of influenza, the proportion of deaths was 2.1%, which was within the ranged observed in previous seasons (Table 1).

Severe influenza cases

CHP has collaborated with Hospital Authority 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 May 5. From May 5 to August 2, a total of 431 ICU admissions or deaths (including 304 deaths) with laboratory diagnosis of influenza have been recorded among adult patients. Their ages ranged from 18 to 105 years (median: 81 years). The majority (77.7%) of the severe cases were elderly aged 65 years or above (Table 2). The cumulative incidence and mortality rates were much higher among persons aged 65 years or above than persons under 65 years. About 80% of the severe cases were known to have pre-existing chronic diseases.

Separately, 19 paediatric cases of influenza-associated complication/death (including three fatal cases) were reported to CHP among people aged below 18 years from May 5 to August 2. Their ages ranged from six months to 15 years (median: two years). Six cases (31.6%) had pre-existing chronic diseases. Seventeen cases (89.5%) had not received the seasonal influenza vaccine for the 2016/17 season. In 2017, a total of 27 cases (including four deaths) have been recorded so far.

In this season, the number of severe cases reported reached the peak around mid-July and then started to decrease. An average of 11.3 severe cases among all ages per day was recorded during the 7-day period between July 12 and July 18, and the daily average slightly decreased to 10.1 cases in the recent 7-day period (July 27 to August 2).

The numbers of severe cases and deaths among adult patients recorded in this season so far were larger than those recorded in the same duration in the 2016 winter season but smaller than those recorded in the 2015 winter season (Table 3). On the other hand, the numbers of severe cases and deaths among paediatric patients recorded in this season were similar to the ranges recorded in the same duration in the previous two winter seasons.

Discussion

The local seasonal influenza activity has been atypical in 2017. The winter season was mild with low level of influenza circulation yet the influenza activity in the summer season was much higher than that recorded in the winter season in 2017. It was also higher than previous summer seasons. Similar to Hong Kong, sharp increases in influenza activity have also been recorded in June and July 2017 in Guangdong and Macau.

Several factors might account for the severity of this season. This season was predominated by influenza A(H3N2) virus, which is notoriously known to affect the elderly population. The aging population in Hong Kong has resulted in an increasing number of frail elderly who are more prone to influenza infection and its complications. There was a net increase of 183 300 persons aged 65 years or above between 2012 and 2016. The annual increase in population size of 65 years or above was more than 4% in the past five years in Hong Kong. Furthermore, the immunity induced by seasonal influenza vaccination in late 2016 has been waning in the elderly population, making them susceptible to influenza infection in the current summer season.

Table 1 - Admissions and deaths with laboratory confirmation of influenza in public hospitals.

Season (predominating virus; duration)	Cumulative number of influenza admissions	Cumulative number of influenza deaths	Percentage of deaths among admitted influenza cases
2017 summer (H3N2; May 5 - August 2)	14 713 (90 days so far)	306	2.1%
2016 summer (H3N2; September 23 - October 27)	1 597 (35 days)	40	2.5%
2016 winter (H1N1pdm09; January 29 - May 20)	11 159 (113 days)	212	1.9%
2015 summer (H3N2; June 12 - August 7)	4 129 (57 days)	135	3.3%

Table 2 - Age distribution and cumulative incidences of severe cases and deaths recorded from May 5 to August 2 among adult patients.

Age group	Cases [including ICU admissions and deaths]	Cumulative incidence (per 100 000 population)	Deaths	Cumulative mortality (per 100 000 population)
18 - 49	21 (4.9%)	0.62	6 (2.0%)	0.18
50 - 64	75 (17.4%)	4.26	25 (8.2%)	1.42
≥ 65	335 (77.7%)	28.80	273 (89.8%)	23.47
Total	431 (100%)	6.82	304 (100%)	4.81

Table 3 - Numbers of severe cases recorded in the first thirteen weeks of surveillance during the 2015 winter season, 2016 winter season and the current summer season.

Number of cases	2015 winter (predominated by H3N2)	2016 winter (predominated by H1N1pdm09)	2017 summer (predominated by H3N2)
Adult severe cases (including deaths)	576	352	395
Adult death cases	442	171	279
Paediatric cases of influenza-associated complication/death	18	23	19
Paediatric cases of influenza-associated death	1	3	3

The latest surveillance data suggested that the peak of this season has already passed though the influenza activity still remained at a high level. In the past three winter seasons (2014, 2015 and 2016) with high influenza activity recorded, the duration ranged from 16 to 17 weeks. It took 10 to 13 weeks for the influenza activity to decrease from the peak level back to the baseline. So far, about 13 weeks have passed in this season. It is foreseen that it will last for some time before the influenza activity returns to the baseline. CHP will closely monitor the situation.

Hong Kong Strategy and Action Plan on Antimicrobial Resistance

Reported by Dr Jonathan NGAI, Medical and Health Officer, and Dr Ken NG, Consultant, Infection Control Branch, CHP.

Antimicrobial resistance (AMR) occurs when microorganisms change in ways that render the medications used to cure the infections they cause ineffective. AMR is a global public health concern that results in reduced efficacy of antimicrobials, making the treatment of patients difficult, costly or even impossible.

The Government of the Hong Kong Special Administrative Region (the Administration) has all along recognised the growing problem of AMR. Different sectors have been implementing control measures with a common view to contain its spread. In recognition of the major threat posed by AMR, the Administration announced in the 2016 Policy Address the setting up of a High Level Steering Committee on Antimicrobial Resistance (HLSC) to formulate strategies in collaboration with the relevant sectors to tackle the threat.

The Government launched the Hong Kong Strategy and Action Plan on Antimicrobial Resistance (2017-2022) in July 2017 to outline key areas, objectives and actions to contain the growing threat of AMR in Hong Kong.

Endorsed by the HLSC chaired by the Secretary for Food and Health, the Action Plan adopts a "One Health" approach as recommended by international health agencies and focuses on resistance in bacteria that present an urgent and serious threat to public health. The rising threat of AMR should be addressed by a comprehensive framework taking a multi-sectoral and whole-of-society approach as resistant bacteria arising either in humans or animals may spread from one sector to another.

The Action Plan identifies six key areas to slow the emergence of AMR and prevent its spread. After consulting stakeholders across sectors, disciplines and organisations, and soliciting their support for implementation, a total of 19 objectives with detailed actions are recommended as follows:

1. Strengthen knowledge through surveillance and research

- Set up an AMR surveillance system under "One Health" for Hong Kong;
- Build laboratory capacity to support surveillance activities in both human and animal sectors; and
- Monitor antimicrobial use in humans and animals.

2. Optimise use of antimicrobials in humans and animals

- Strengthen regulation on over-the-counter purchase of prescription-only antimicrobials;
- Implement and enhance training in prescribing antimicrobials through Antibiotic Stewardship Programme in the human health sector;
- Monitor compliance with antibiotic prescription guidelines of human health practitioners; and
- Ensure proper use of antimicrobials in animals.

3. Reduce incidence of infection through effective sanitation, hygiene and preventive measures

- Strengthen infection prevention and control measures in healthcare settings;
- Strengthen infection control training for healthcare workers;
- Develop and strengthen infection prevention and control programmes in veterinary settings and along the food supply chain; and
- Enhance vaccination uptake.

4. Improve awareness and understanding of AMR through effective communication, education and training

- Raise awareness of AMR among the general public, students and the target population;
- Engage patients in adopting infection control measures and proper use of antibiotics; and
- Include AMR and related topics in school curricula and in the continuous training of human health and veterinary professionals.

5. Promote research on AMR

- Promote research on innovative technology and medical science;
- Promote research on behavioural science and psychology; and
- Promote research on health and economic burden.

6. Strengthen partnerships and foster engagement of relevant stakeholders

- Strengthen international partnerships and regional collaboration; and
- Inform public policy and facilitate stakeholder engagement.

The Action Plan provides guidance not only for public health, healthcare and veterinary partners, but also to co-ordinate efforts from all sectors of the community.

The full text of the Action Plan and health education materials on AMR have been uploaded to the thematic website on AMR of the Centre for Health Protection of the Department of Health (http://chp.gov.hk/en/view_content/47850.html)

Jul 30 - Aug 12 2017 WEEKS 31 - 32 VOL 14 ISSUE N⁰ 16

Communicable Diseases WATCH

衛生防護中心 Centre for Health Protection 衛生署 Department of Health

FEATURE IN FOCUS

Poliomyelitis and acute flaccid paralysis surveillance in Hong Kong

Reported by Ms Anna WONG, Scientific Officer, Vaccine Preventable Disease Office, Surveillance and Epidemiology Branch, CHP.

Poliomyelitis is a viral infection caused by poliovirus which is highly infectious. The faecal-oral route is the major route of transmission, affecting mainly children under five years of age. Most of the cases are asymptomatic. Less than 1% of infected persons will have weakness or paralysis of limbs which is usually asymmetric with legs being affected more than the arm. In severe cases, the paralysis can result in permanent disability or even death.

The disease was widespread globally before the introduction of the polio vaccine in the late 1950s and early 1960s. Since then, the number of polio cases had decreased from an estimate of around 350 000 to 37 reported cases in last year[1]. While most parts of the world are certified polio-free, global polio eradication remains a challenge. Today, endemic transmission of the virus is ongoing in three countries from three different regions of the world, namely Pakistan, Afghanistan and Nigeria. The threat of re-introduction of the virus to polio-free areas necessitates public health concern.

Locally, polio cases dropped significantly after the introduction of polio vaccination into the Hong Kong Childhood Immunisation Programme (HKCIP) in 1963. The last cases of poliomyelitis caused by wild poliovirus and vaccine-associated paralytic poliomyelitis were reported in 1983 and 1995 respectively. Acute flaccid paralysis (AFP) surveillance system was set up in 1997 initially to prepare for World Health Organization (WHO)'s poliomyelitis eradication. In October 2000, Hong Kong was certified polio-free together with other countries in the Western Pacific Region. Subsequent to the certification, the AFP surveillance system continues to monitor the progress in maintaining Hong Kong's polio-free status.

WHO has set up a list of standards to assess the quality of the system. Our AFP surveillance system has been functioning effectively to fulfil the performance indicators set by WHO. The sensitivity, timeliness and completeness of the system were all met with reference to the performance indicators during the period of 2012 to 2016 (Table 1). However, the WHO target of at least 80% of AFP cases with two adequate stool specimens is yet to be reached this year. In 2017, there were eight reported AFP cases as of July 31, among which only six cases provided two adequate stool specimens for investigation.

Before the global eradication of poliomyelitis is achieved, there is always a possibility of re-introduction of the poliovirus to places that have been declared disease free. The highly mobile population and heavy international travel in Hong Kong pose a constant risk of poliovirus importation. Hong Kong has been devoting its utmost effort to maintain polio-free and to support global polio eradication. In the recent immunisation survey conducted in 2015, we have maintained a high immunisation coverage rate for polio vaccine which is above 95%.

In this regard, to help maintain Hong Kong's high standard of AFP surveillance, we urged continuous support from all doctors to promptly report cases of

Table 1 - Performance of Acute Flaccid Paralysis Surveillance in Hong Kong, 2012-2017.

Performance Indicators	Target	Actual Performance					
		2012	2013	2014	2015	2016	2017#
Number of non-polio AFP cases per 100 000 population aged < 15	> 1	1.2	1.5	2.3	1.25	1.25	1
Percentage of surveillance site providing routine report (including "zero reports") on time	> 80%	83%	82%	92%	98%	97%	97%
Percentage of AFP cases investigated	> 80%	100%	100%	100%	100%	100%	100%
Percentage of AFP cases investigated < 48 hrs	> 80%	100%	100%	100%	100%	100%	100%
Percentage of AFP cases follow-up at 60 days	> 80%	100%	100%	100%	100%	100%	Pending
Percentage of AFP case with two adequate stool specimens	> 80%	86%	100%	89%	90%	90%	75%
Percentage of specimen results sent from national laboratory within 14 days of receipt of the specimen in the laboratory	> 80%	98%	97%	93%	94%	100%	100%

#*as of July 31, 2017*

[1]World Health Organization [Internet]. Poliomyelitis fact sheet number 114. Geneva: WHO; 2017. Available from: http://www.who.int/mediacentre/factsheets/fs114/en/index.html, accessed August 8, 2017.

children aged under 15 years presenting with features compatible with AFP to Central Notification Office (CENO) by fax (2477 2770) or via CENO on-line at https://cdis.chp.gov.hk/CDIS_CENO_ONLINE/ceno.html, and arrange two stool specimens, at least 24 hours apart within 14 days of onset of paralysis. We also take this opportunity to thank you for the continual support from key physicians and infection control teams in both private and public sectors to participate in the monthly zero reporting that ensures completeness of our AFP surveillance system.

Review of food poisoning in Hong Kong, 2012-2017 (as of April 30, 2017)

Reported by Dr Zenith WU, Medical and Health Officer, Enteric and Vector-borne Disease Office, Surveillance and Epidemiology Branch, CHP.

Food poisoning is a notifiable infectious disease in Hong Kong. It results from consumption of contaminated food or water containing bacteria, viruses or toxins of biochemical or chemical nature. The incubation period of food poisoning varies from hours to days depending on the nature of the causative agent. Common symptoms include vomiting, diarrhoea and abdominal pain, with or without fever. While the symptoms are self-limiting in most patients, serious complications such as dehydration and septicaemia leading to death may occur when appropriate treatment is delayed, but these are rare. In this article, we reviewed the local epidemiology of food poisoning from 2012 to 2017 (as of April 30), with a focus on food poisoning due to bacteria which was the commonest cause among confirmed food poisoning cases.

During 2012 to 2017 (as of April 30), the Centre for Health Protection (CHP) of the Department of Health recorded 1 449 food poisoning cases, affecting 6 235 persons. From 2012 to 2016, the annual number of cases ranged from 213 to 378, with the number of persons affected ranged from 1 076 to 1 529. There was a general decreasing trend in both the annual number of cases and number of people affected (Figure 1). A seasonal trend was observed with more cases recorded in January to February and July to August (Figure 2).

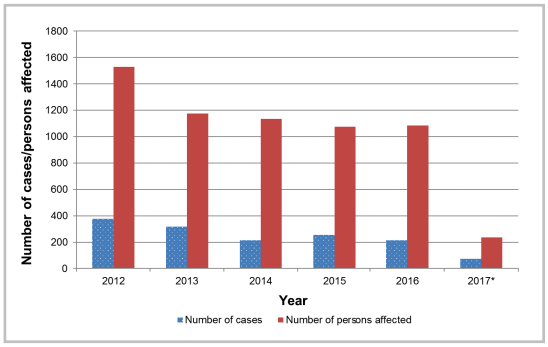

*Figure 1 - Number of food poisoning cases and persons affected, 2012–2017 (*up to April 30).*

Among these 1 449 cases, 399 (27.5%) were confirmed, affecting 1 886 persons. Bacteria were accountable for the majority (256 cases, 64.2%) of these confirmed cases, affecting 1 256 persons, followed by biochemical (71 cases, 17.8%), virus (63 cases, 15.8%) and chemical (9 cases, 2.3%).

Although a few clusters of epidemiologically linked food poisoning outbreak were recorded in recent years, most of the bacterial food poisoning cases were of small scale with the majority (84.8%) of them affecting five persons or below and only 2.3% of the cases affected more than 20 persons. The male-to-female ratio of the persons affected was 1:1.2 and the majority of them were adults aged 20 to 65 years (75%) with age groups of the two age extremes being less commonly affected. One hundred and sixty seven affected persons (13.3%) required hospitalisation. The commonest causative agents identified were non-typhoidal *Salmonella* (169 cases, 66%) and *Vibrio parahaemolyticus* (74 cases, 28.9%). More confirmed food poisoning cases due to both non-typhoidal *Salmonella* and *Vibrio parahaemolyticus* were recorded in the warmer months (Figure 3).

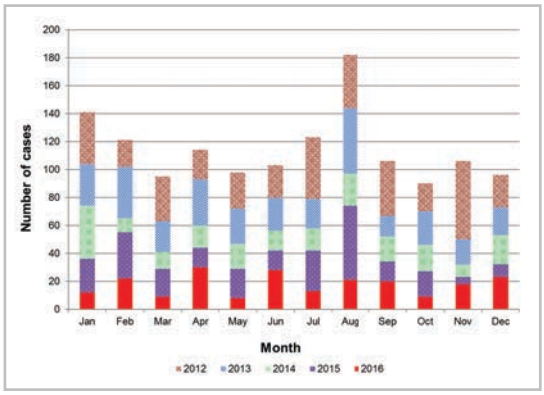

Figure 2 - Number of food poisoning cases by year and month, 2012–2016.

In food poisoning cases caused by non-typhoidal *Salmonella* with single incriminating food item and ingredient, the commonest incriminating food ingredients were egg (63.2%), meat such as beef and pork (excluding chicken) (26.3%) and chicken (6.1%). In contrast, seafood (58%) such as shrimp, crab, oyster and clam, was the commonest incriminating food ingredients in cases attributed to *Vibrio parahaemolyticus*, followed by chicken (25%).

In summary, the annual number of food poisoning cases and number of people affected decreased over the past five years. Although a few clusters of epidemiologically linked food poisoning outbreak were recorded in recent years, most of the bacterial food poisoning cases were of small scale. Members of the public are reminded to practice food safety to prevent food poisoning. The "5 Keys to Food Safety", advocated by the World Health Organization and adopted by the Centre for Food Safety of the Food and Environmental Hygiene Department, are five simple and effective keys for people to follow when handling food to prevent foodborne diseases[1]. The core messages of the 5 Keys to Food Safety are:

1. Choose (Choose safe raw materials);
2. Clean (Keep hands and utensils clean);
3. Separate (Separate raw and cooked food);
4. Cook (Cook thoroughly); and
5. Safe Temperature (Keep food at safe temperature).

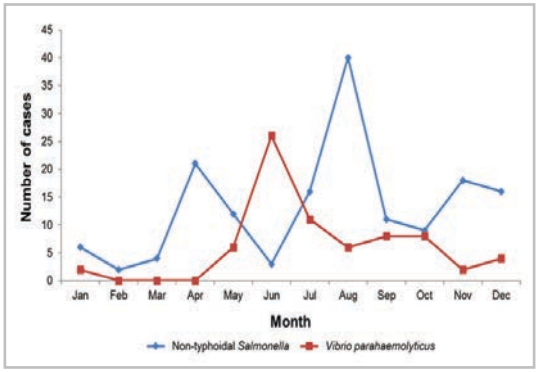

Figure 3 - Number of confirmed food poisoning cases due to non-typhoidal Salmonella and Vibrio parahaemolyticus by month, 2012-2016.

Reference

[1]Centre for Food Safety (2014) 5 Keys to Food Safety.
Available at http://www.cfs.gov.hk/english/consumer_zone/consumer_zone_5_Keys_to_Food_Safety.html.

NEWS IN BRIEF

Two sporadic cases of necrotising fasciitis due to *Vibrio vulnificus* infection

From July 31 to August 11, 2017, the Centre for Health Protection (CHP) recorded two sporadic cases of necrotising fasciitis due to *Vibrio vulnificus* infection. The first patient was an 81-year-old male with underlying illnesses. He presented with right knee and ankle swelling on July 27 and was admitted to a public hospital on July 29. The clinical diagnosis was necrotising fasciitis complicated with acute kidney injury. Excisional debridement of right lower leg was performed on July 30 and he required intensive care after the operation. His wound swab taken on July 30 grew *Vibrio vulnificus*. He passed away on July 31. He did not have recent travel history and his home contact remained asymptomatic. The patient recalled history of right knee and foot abrasion when walking along the seashore in Sha Tau Kok during incubation period.

The second patient was a 67-year-old male with underlying illnesses. He presented with left foot swelling and pain since August 5. He saw a private doctor on August 6. His condition worsened and the patient attended an Accident and Emergency Department (AED) of a public hospital on August 7. He was admitted on the same day. The clinical diagnosis was necrotising fasciitis. Excisional debridement of left foot was performed. Specimens of left foot tissue collected on August 10 grew *Vibrio vulnificus*. His current condition was stable. Epidemiological investigation revealed that he sustained an injury over his left sole while picking up clams at a beach near Siu Lam on August 4. He did not have any travel history during incubation period. He lived with his wife who remained asymptomatic. Investigation is ongoing.

A sporadic case of *Streptococcus suis* infection

On August 1, 2017, CHP recorded a sporadic case of *Streptococcus suis* infection affecting a 43-year-old man with good past health. He had presented with fever with chills and rigors, dizziness and headache on July 26. He attended a traditional Chinese medical practitioner for treatment but symptom persisted. He subsequently developed confusion and was brought to the AED of a public hospital on July 28 and was admitted on the same day. His blood culture yielded *Streptococcus suis*. The clinical diagnosis was sepsis and meningitis. He was given courses of antibiotics and his condition remained stable. Investigation revealed that the patient was a construction site worker. He lived with his wife in Yuen Long. He had an abrasion wound over right arm but denied history of handling raw pork during incubation period. He did not travel during the incubation period. His wife remained asymptomatic. Investigation is ongoing.

A sporadic confirmed case of brucellosis

On August 2, 2017, CHP recorded a confirmed case of brucellosis affecting a 76-year-old man with underlying illness. He presented with dizziness and sustained a fall on July 13. He was admitted to a public hospital on the same day. He developed fever on July 15 after admission and his fever persisted despite treatment with antibiotics. His paired serology collected on July 22 and 26 showed four-fold rise in antibody titre against *Brucella abortus* and *Brucella melitensis*. His condition was stable. He had no recent travel history. No risk factor was identified. His home contact was asymptomatic. Investigation is on-going.

Two sporadic cases of psittacosis

On August 3, 2017, CHP recorded two sporadic cases of psittacosis. The first case was a 54-year-old woman with good past health. She presented with fever, cough and shortness of breath on July 21. She was admitted to a public hospital on July 31 and her chest X-ray (CXR) showed bilateral pneumonia. Her illness was complicated with respiratory failure and septic shock requiring intensive care, mechanical ventilation, inotropic support and antibiotics treatment. Her endotracheal aspirate collected on July 31 was tested positive for *Chlamydophila psittaci* DNA by polymerase chain reaction (PCR). She was transferred back to the general medical ward on August 12 and her condition was stable. She travelled to Guangdong for a day trip during the incubation period. She denied any direct contact with birds during her travel to Guangdong or in Hong Kong, but recalled history of removing bird droppings from her balcony at home.

The second case was a 63 year-old male with underlying illnesses. He presented with fever and cough since July 22 and later developed shortness of breath. He was admitted to a public hospital on July 26 and was transferred to the intensive care unit on the same day. His CXR showed right lower zone consolidation. The clinical diagnosis was pneumonia. His sputum and nasopharyngeal aspirate taken on July 26 and tracheal aspirate taken on July 27 were all tested positive for *Chlamydophila psittaci* DNA by PCR. He was treated with antibiotics. He was transferred back to general medical ward on August 12 and his current condition was stable. He had travelled to Guangdong on July 15 to 16. He denied any direct contact with birds, bird droppings or bird carcasses during the incubation period.

Their travel collaterals and household contacts were asymptomatic. So far, no epidemiological linkage has been identified among the two cases. Investigations are on-going.

A sporadic case of listeriosis

On August 8, 2017, CHP recorded a case of listeriosis affecting an 89-year-old woman with pre-existing medical conditions. She presented with abdominal pain and decreased appetite on July 24, and was admitted to a public hospital on July 30. Her blood specimen collected on July 31 grew *Listeria monocytogenes*. The clinical diagnosis was sepsis and she was treated with antibiotics. Subsequently, she developed septic shock with multi-organ failure and she passed away on August 2. According to the patient's son, she lived alone and had no recent travel history. She did not consume high risk food during the incubation period. Investigation is on-going.

Aug 13 - Aug 26 2017 WEEKS 33 - 34 VOL 14 ISSUE Nº 17

Communicable Diseases WATCH

衛生防護中心 Centre for Health Protection 衛生署 Department of Health

FEATURE IN FOCUS

Update on rubella in Hong Kong

Reported by Fanny WS HO, Scientific Officer, Vaccine Preventable Disease Office, Surveillance and Epidemiology Branch, CHP.

Rubella was once endemic in Hong Kong with occasional peaks observed in the early years. Following the introduction of the anti-rubella vaccine (ARV) in 1978, annual number of hospital discharges due to rubella infection varied from 119 to 900 cases during 1979-1993. The disease was made notifiable in 1994, and since then annual notifications fluctuated from eight cases in 1994 to a high of 4 958 cases in 1997 (Figure 1).

Despite a spike in rubella cases in 2000, case count continued to decline and remained low in recent years. No rubella cases have been recorded so far in 2017. For the past five years from 2012 to 2016, a total of 98 rubella cases have been recorded, with annual notifications ranging from three to 44 cases (0.04-0.61 per 100 000 population) (Figure 2). While majority of the cases were locally acquired infection, nine had history of travel outside Hong Kong including Mainland China (4), India (2), Indonesia (1), Maldives (1), both Vietnam and Korea (1) during their incubation period. Rubella outbreak was uncommon with only a small cluster of two cases within the same household reported in 2012.

Over half (53%) of these rubella cases were laboratory-confirmed with positive serological test for rubella IgM antibody, isolation of rubella virus or positive reverse transcription-polymerase chain reaction (RT-PCR) for rubella virus in clinical specimens. More males (57%) than females were affected. The age of the cases ranged from six months to 63 years (median: 26 years). Sixty-one cases (62%) had never received or unknown history of rubella vaccination, while four other cases (4%) were less than one year old and had not reached the recommended age for vaccination.

Two rubella cases (2%) reported in 2012 were pregnant at gestation 18 and 25 weeks at the time of diagnosis. One of them (18 weeks gestation) with unknown vaccination status returned to Mainland China for delivery and the outcome was unknown, whilst the other pregnant case (25 weeks gestation), also with uncertain vaccination history, had a normal delivery in Hong Kong. The only three cases of

Rubella, commonly known as "German measles", is a highly communicable viral infection characterised by fever, rash, lymph node swelling and respiratory symptoms. Although rubella infection is often mild in young children, older children and adults are more likely complicated with arthritis, encephalitis and orchitis. Infection in early pregnancy, especially during the first trimester, may result in miscarriage, stillbirth or congenital rubella syndrome (CRS) with severe birth defects such as deafness, cataracts, congenital heart disease and mental retardation.

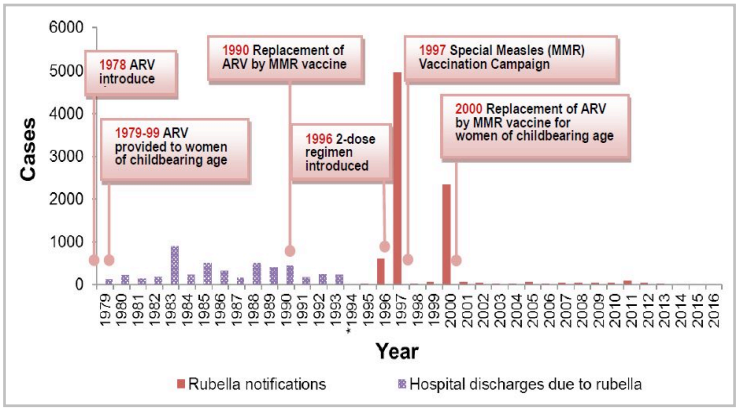

*Figure 1 - Hospital discharges due to rubella and rubella notifications in Hong Kong, 1979-2016. (*Note: Rubella became a notifiable disease in 1994.)*

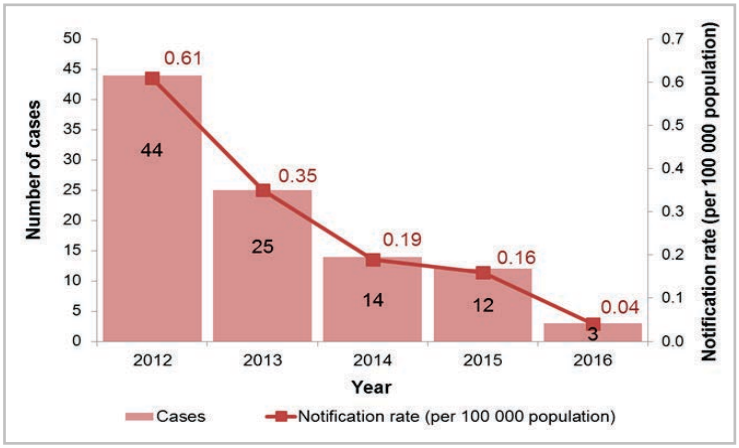

Figure 2 - Number of rubella cases and notification rates in Hong Kong, 2012-2016.

congenital rubella syndrome during the period were reported in 2012, all affecting babies whose mothers were born in Mainland China with either uncertain or no history of rubella vaccination[1].

In Hong Kong, rubella vaccination was incorporated into the Childhood Immunisation Programme (CIP) in 1978. An anti-rubella vaccine was administered in the early years, and later replaced by the measles, mumps & rubella (MMR) combined vaccine since 1990. Currently, two doses of MMR vaccine are given to children at age one and Primary One respectively. Rubella vaccination is also provided to women of childbearing age from 1979 onwards. Following the introduction of varicella vaccine in July 2014, the measles, mumps, rubella and varicella vaccine (MMRV) will replace the second dose of MMR vaccine when the cohort of children having received the first dose of varicella vaccine under the CIP reaches Primary One (school year of 2018/19 earliest). Uptake of rubella-containing vaccine (RCV) has remained high at over 95% for children aged two to five years as shown in the 2015 Immunisation Coverage Survey. Seroprevalence rates of rubella virus antibodies were at least 80% or above in both sexes and all age groups in 2014 and over 85% in antenatal serum specimens from all age groups of pregnant women in 2016.

Although rubella infection is usually uncomplicated, infection in nonimmune women during early pregnancy can lead to serious outcomes in developing foetus. Childbearing age women who are not immunised should check their immunity status before pregnancy and receive rubella vaccine accordingly. Apart from active immunisation, maintaining personal and environmental hygiene is important in preventing infection and spread of rubella. For more information on rubella and MMR vaccination, please visit the CHP website: http://www.chp.gov.hk/en/content/9/24/40.html.

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[1]The three babies, aged from six days to one month, presented with complications such as pneumonia, meningoencephalitis and congenital heart defects.

Update on amoebic dysentery in Hong Kong, 2007-2017

Reported by Ms Doris CHOI, Scientific Officer, Enteric and Vector-borne Disease Office, Surveillance and Epidemiology Branch, CHP.

Amoebic dysentery is an intestinal infection caused by the protozoan parasite *Entamoeba histolytica* (*E. histolytica*). It occurs worldwide but is more common in countries or areas with poor sanitation, particularly in the tropics[1]. It is also more common in travellers to and immigrants from tropical places with poor sanitary conditions, people who live in institutions with poor sanitary condition and men who have sex with men[2]. The disease is transmitted through faecal-oral route, either directly from person-to-person contact or indirectly by eating or drinking food or water contaminated with faecal matter. About 10% to 20% of people who are infected with *E. histolytica* are symptomatic[2]. The incubation period is usually two to four weeks but may range from a few days to several months[3]. While symptoms are often mild and include diarrhoea and frequent and small-volume of loose stool with blood, complications including fulminant colitis, peritonitis and extraintestinal infection may occur. The commonest extraintestinal infection is liver abscess which presents with fever and right upper quadrant pain. Treatment includes appropriate use of antibiotics.

In Hong Kong, amoebic dysentery is a notifiable infectious disease under the Prevention and Control of Disease Ordinance (Cap 599). From 2007 to 2017 (as of July 31), the Centre for Health Protection of the Department of Health recorded a total of 63 confirmed cases with the annual number of cases ranging from two to 11 (median: five cases). More cases were recorded in 2014 and 2017 with 11 and ten cases respectively (Figure 1). In this article, we summarise the epidemiological characteristics of the 63 cases.

Cases of amoebic dysentery were recorded all year round. Most of the cases acquired the infection locally (n=45, 71.4%) while one-fifth (n=13, 20.6%) were imported from Mainland China (2), Australia (1), Cambodia (1) , India (1), Indonesia (1), Japan (1), Malaysia (1), Nepal (1), the Philippines (1), the United States (1) and multiple countries (2) respectively. Five patients (7.9%) had stayed in Hong Kong and overseas during the incubation period, so the place of acquiring the infection could not be ascertained (Figure 1). All cases were sporadic. All patients affected were adults with age ranging from 20 to 76 years (median: 46 years) and the age groups between 35 and 54 years were predominantly affected. Similar to that reported in literature[4,5], the majority were males (n=55, 87.3%) (Figure 2)

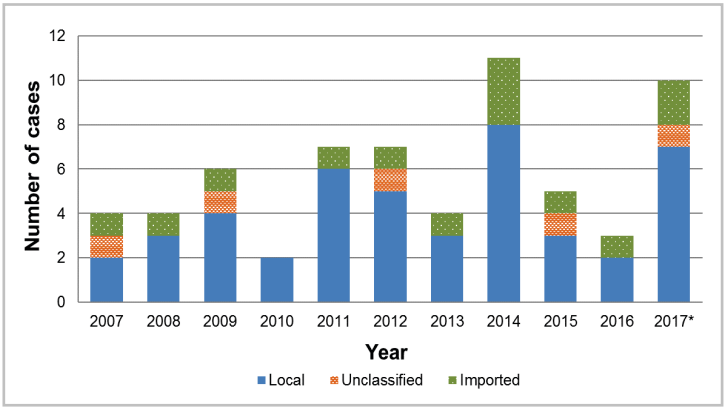

*Figure 1 - Annual number and importation status of amoebic dysentery, 2007 to 2017 (*as of July 31, 2017) (n=63).*

but the exact reason was not clear. Sixty-four percent of the patients (n=40) enjoyed good past health while 30.2% (n=19) had underlying medical illness and the past health of four patients was unknown (6.3%).

Among the 63 patients, bloody diarrhoea (n=43, 68.3%) was the most common clinical presentation, followed by non-bloody diarrhoea (n=40, 63.5%), abdominal pain (n=37, 58.7%) and mucus in stool (n=33, 53.0%). One patient developed liver abscess. Most of the patients received endoscopic examination (n=51, 81.1%) and intestinal ulcer was found in 40 (78.4%) of them. More than half of them (n=36, 57.1%) required hospitalisation with length of stay ranged from one to 99 days (median=3.5 days). Two patients required intensive care; one was due to complication of colonoscopy with bowel perforation and the other was due to gangrenous colitis followed by multiple organ failure and shock. No fatal cases were recorded.

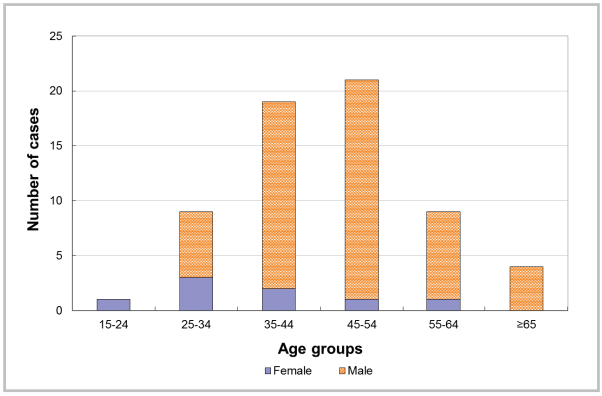

Figure 2 - Number of cases of amoebic dysentery by gender and age groups of patients, 2007-2017 (*as of July 31, 2017) (n=63).*

Although the sources of infection could not be ascertained for most cases, a number of known risk factors reported in literature were identified from some cases, such as drinking well/stream water or unboiled tap water (n=4), consuming raw vegetables in India (n=1), residents of a residential care home for the disabled (n=2) or had oral-anal sex (n=1).

To prevent amoebic dysentery, members of the public are advised to adopt the following measures:

- ☑ Maintain good personal, food and environmental hygiene. Adopt the 5 Keys to Food Safety in handling food to prevent foodborne diseases:
  1. Choose (Choose safe raw materials)
  2. Clean (Keep hands and utensils clean)
  3. Separate (Separate raw and cooked food)
  4. Cook (Cook thoroughly)
  5. Safe Temperature (Keep food at safe temperature);
- ☑ Wash hands thoroughly with liquid soap and water before handling food or eating, and after using toilet or handling faecal matter;
- ☑ Drink only boiled water from the mains or bottled drinks from reliable sources;
- ☑ Avoid drinks with ice of unknown origin;
- ☑ Purchase fresh food from hygienic and reliable sources. Do not patronise illegal hawkers;
- ☑ Eat only thoroughly cooked food;
- ☑ Wash and peel fruit by yourself and avoid eating raw vegetables;
- ☑ Exclude infected persons and asymptomatic carriers from handling food and from providing care to children, elderly and immunocompromised people; and
- ☑ Refrain from work or school, and seek medical advice if suffering from gastrointestinal symptoms such as diarrhoea.

For more information on food safety, please visit the website of Centre for Food Safety: http://www.cfs.gov.hk/eindex.html.

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NEWS IN BRIEF

Two sporadic cases of necrotising fasciitis caused by *Vibrio vulnificus*

In mid-August 2017, the Centre for Health Protection (CHP) recorded two sporadic cases of necrotising fasciitis caused by *Vibrio vulnificus*.

The first case was a 55-year-old male with underlying illnesses. He presented with erythema and swelling over left index finger and both ankles on August 9, followed by fever on August 10. He attended the Accident and Emergency Department of a public hospital on August 10 and was admitted on the same day. Excisional debridement of wounds was performed on August 11. The operative diagnosis was necrotising fasciitis. Tissue specimens collected from his left hand, left knee and right ankle, pus swab of his left arm and blood taken on August 11 all grew *Vibrio vulnificus*. He was put under intensive care after operation. His condition deteriorated and he succumbed on August 12. According to his family member, he had sustained left index finger injury while preparing meal on August 9, otherwise no history of injury to other parts of body could be recalled. There was no known exposure to sea water or seafood during incubation period.

The second case was a 65-year-old female with underlying illnesses. She presented with fever and painful swelling of right middle finger on August 15 and was admitted to a public hospital the next day. Incision and drainage with wound exploration was performed on August 16 and amputation of right middle finger was performed on August 17. The operative diagnosis was necrotising fasciitis. Her right middle finger tissue collected on August 16 grew *Vibrio vulnificus*. She was treated with antibiotics and her condition was stable. She had visited wet market and had handled raw fish at home on August 13 but she reported no history of wound or injury.

Both cases had no recent travel history outside Hong Kong. Their home contacts remained asymptomatic.

A local sporadic case of leptospirosis

On August 22, 2017, CHP recorded a local sporadic case of leptospirosis affecting a 68-year-old female with pre-existing medical conditions. She presented with fever and nausea on July 15, 2017 and was admitted to a public hospital on July 19. Blood tests showed derangement of liver function. She was transferred to intensive care unit on July 28. She was treated with antibiotics and her condition improved. She was discharged on August 1. Paired sera on July 19 and August 14 showed more than four-fold increase in antibody titre against *Leptospira* by microscopic agglutination test. Epidemiological investigation revealed that the patient kept a dog and farmed in her backyard during the incubation period. She occasionally saw rodents around her living area in Wun Yiu, Tai Po. She had no recent travel history. She denied any skin wounds. Her family members remained asymptomatic.

A sporadic confirmed case of brucellosis

On August 22, 2017, CHP recorded a confirmed case of brucellosis affecting an 85-year-old man with good past health. He presented with fever, cough, runny nose, dizziness and vomiting on July 19 and was admitted to a public hospital on the same day. He had persistent fever despite treatment with multiple antibiotics. His paired sera collected on August 10 and 16 showed four-fold rise in antibody titre against *Brucella abortus* and *Brucella melitensis*. His condition subsequently deteriorated and he died on August 18. He had no recent travel history. No risk factor was identified. His home contacts were asymptomatic.

CA-MRSA cases in July 2017

In July 2017, CHP recorded a total of 114 cases of community-associated methicillin resistant *Staphylococcus aureus* (CA-MRSA) infection, affecting 73 males and 41 females with ages ranging from 15 days to 83 years (median: 34 years). Among them, there were 90 Chinese, 10 Filipinos, 4 Nepalese, 3 Pakistani, 2 Caucasian, 2 Indonesian, 1 Thai and 2 of unknown ethnicity.

One hundred and thirteen cases presented with uncomplicated skin and soft tissue infections while the remaining case had severe CA-MRSA infection. The severe case affected an 83-year-old man with underlying illnesses. He presented with fever, left lower limb painful swelling and decreased general condition since June 20. He was admitted to a public hospital on June 23 and was diagnosed to have left lower limb necrotising fasciitis with multiple excisional debridement of wound done. Tissue sample collected from his left foot on June 24 was cultured positive for CA-MRSA. He was treated with antibiotics and his condition was stable. His home contact remained asymptomatic.

Besides, two household clusters, with each affecting two persons, were identified. No cases involving healthcare worker were reported in July.

Scarlet fever update (July 1, 2017 – July 31, 2017)

Scarlet fever activity in July decreased as compared with that in June. CHP recorded 177 cases of scarlet fever in July as compared with 223 cases in June. The cases recorded in July included 106 males and 71 females aged between eight months and 40 years (median: six years). There were four institutional clusters occurring in kindergartens, with each affecting two children. No fatal cases were reported in July.

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Communicable Diseases WATCH

衛生防護中心 Centre for Health Protection 衛生署 Department of Health

FEATURE IN FOCUS

Summary of 2017 Summer Influenza Season in Hong Kong

Reported by Ms Vera CHOW, Scientific Officer, Respiratory Disease Office, and Mr Desmond CHAN, Scientific Officer, Vaccine Preventable Disease Office, Surveillance and Epidemiology Branch, CHP.

Overview

While the winter influenza season this year was relatively mild, Hong Kong experienced a major summer influenza season. The summer influenza season arrived in Hong Kong in mid-May 2017. It arrived earlier than the traditional summer influenza seasons that usually occurred between July and September in the past. The influenza activity continued to increase steadily in June and exceeded the peak level recorded during the winter season this year. It further increased sharply from late June to mid-July and reached a very high level with some of the surveillance parameters exceeding the highest levels recorded in recent years. The influenza activity started to decrease in late July and subsequently returned to a baseline level in late August. This summer season lasted for about 16 weeks, which was similar to the two winter influenza seasons in 2015 and 2016 (about 17 weeks in both seasons).

Similar to Hong Kong, sharp increase in influenza activity was also recorded in June and July 2017 in Guangdong and Macau. The seasonal influenza activity in Guangdong and Macau has returned to a low level in September.

Laboratory surveillance

The weekly percentage tested positive for seasonal influenza viruses among respiratory specimens received by the Public Health Laboratory Services Branch (PHLSB) of the Centre for Health Protection (CHP) of the Department of Health rose from 12.10% in the week ending May 13 to the peak of 40.86% in the week ending July 15 (Figure 1). This peak exceeded the previous maximum level recorded since 2014 (38.71% during the 2015 winter season). It then decreased to 8.92% in the week ending August 26.

Influenza A(H3N2) virus predominated in this summer season. From May 7 to August 26, majority of influenza viruses detected by PHLSB was influenza A(H3N2) (89.1%), whereas the proportions of influenza A(H1N1)pdm09, influenza B and influenza C were 6.2%, 3.7% and 0.9% respectively. The influenza A(H3N2) viruses remained antigenically similar to the strain contained in the seasonal influenza vaccine (SIV) recommended for the 2016/17 Northern Hemisphere season.

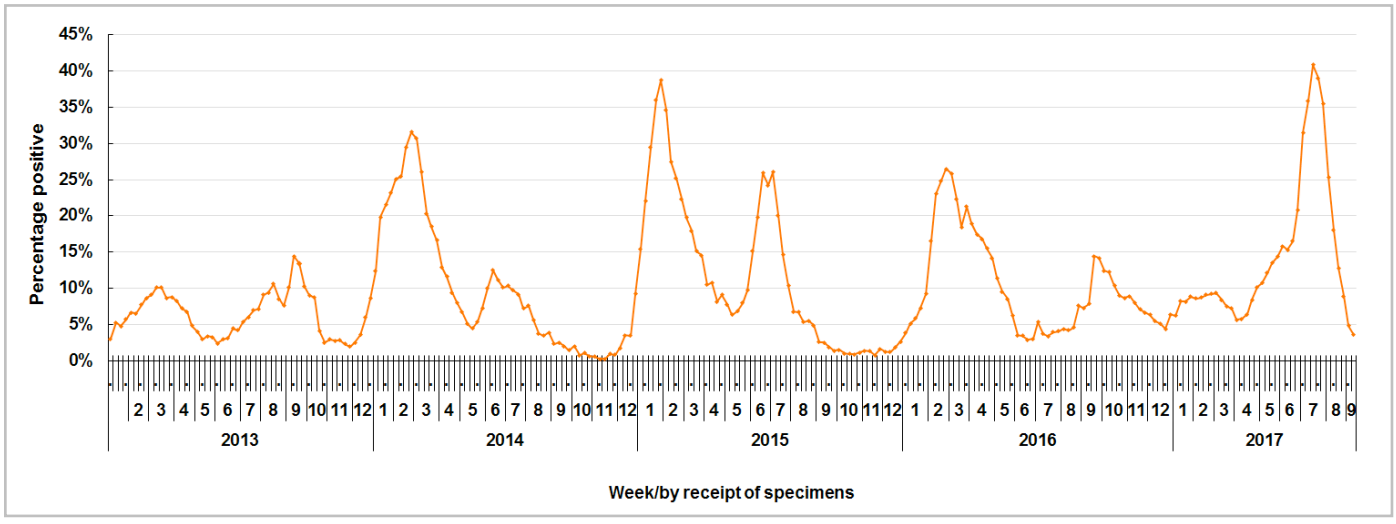

Figure 1 - Percentage of respiratory specimens tested positive for influenza viruses, 2013-2017.

Influenza-like illness (ILI) surveillance among sentinel general out-patient clinics (GOPC) and private doctors

The average weekly ILI consultation rate among sentinel GOPC reached the peak level of 14.2 (per 1 000 consultations) in the week ending July 15, which was the highest level recorded after the 2009 pandemic (higher than 12.7 and 11.7 recorded in the 2015 and 2016 winter seasons respectively) (Figure 2). The rate among sentinel private doctors reached the peak of 76.4 (per 1 000 consultations) in the week ending July 22, which was similar to the peak of 71.0 and 82.3 recorded in the 2015 and 2016 winter seasons respectively (Figure 3).

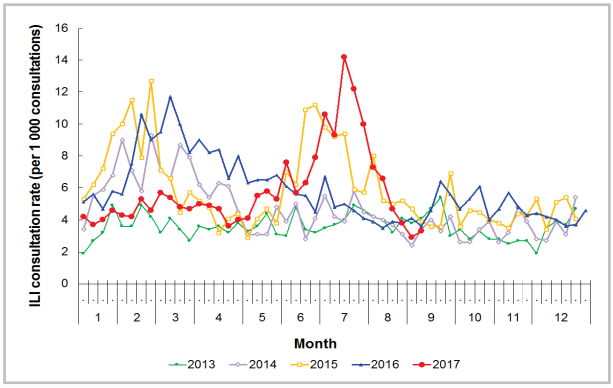

Figure 2 - Average weekly ILI consultation rate among sentinel GOPC, 2013-2017.

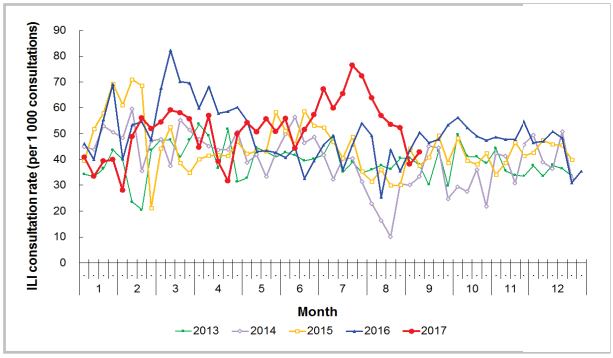

Figure 3 - Average weekly ILI consultation rate among sentinel private doctors, 2013-2017.

ILI outbreaks in schools and institutions

The weekly number of institutional ILI outbreaks reported to CHP reached a high level in July, ranging between 40 and 44 during the four-week period from June 25 to July 22 (Figure 4). The number of reported outbreaks decreased markedly in August. During the period between May 7 and August 26, a total of 400 ILI outbreaks were recorded. Majority of the outbreaks occurred in residential care homes for the elderly (RCHE) (50.0%), followed by primary schools (PS) (18.3%), kindergartens/child care centres (KG/CCC) (15.0%), residential care homes for the disabled (RCHD) (5.5%), secondary schools (SS) (4.5%) and other institutions (6.8%). This was similar to the situation in the 2015 winter season predominated by influenza A(H3N2). In that season, 46.3% of ILI outbreaks occurred in RCHE. In contrast, 87.0% of ILI outbreaks occurred in schools (KG/CCC, PS and SS) in the 2016 winter season predominated by influenza A(H1N1)pdm09.

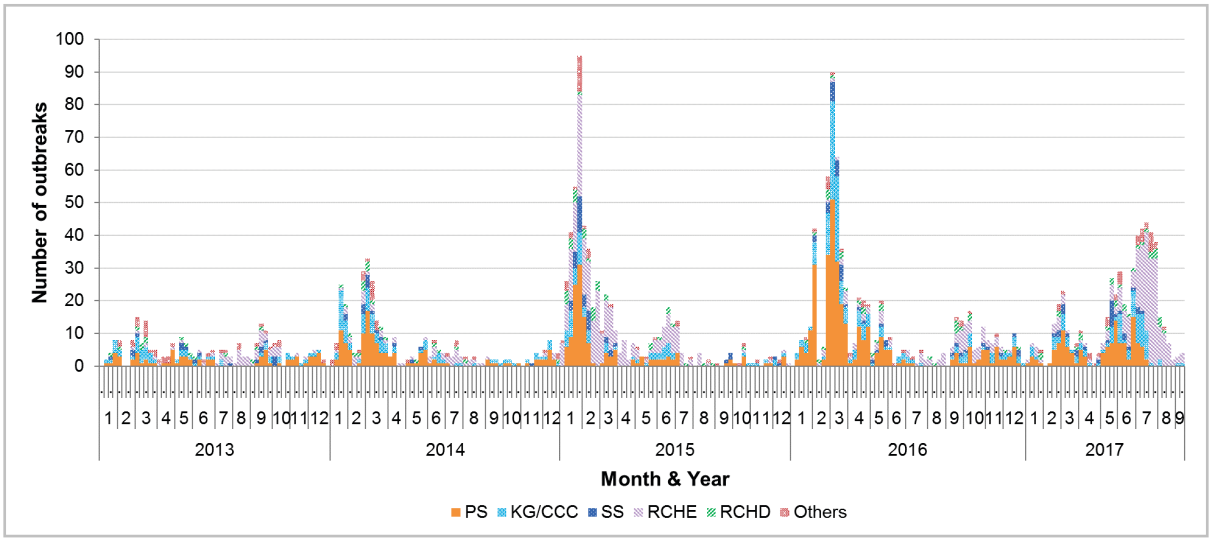

Figure 4 - Weekly number of ILI outbreaks in schools and institutions, 2013-2017.

Influenza-associated hospital admissions

In public hospitals, the weekly admission rates with principal diagnosis of influenza had reached very high levels in mid-July (Figure 5). In this season, the peak admission rate was highest among children aged below five years (10.13 admitted cases per 10 000 population in the week ending July 15), followed by elderly aged 65 years or above (6.65 in the week ending July 15) and children aged five to nine years (2.43 in the week ending July 1). The peak rates among children aged below five years and elderly aged 65 years or above exceeded the previous highest rates recorded after the 2009 pandemic (6.73 among children aged below five years in the 2016 winter season and 5.34 among elderly aged 65 years or above in the 2015 winter season). The rates among all age groups returned to baseline levels in late August.

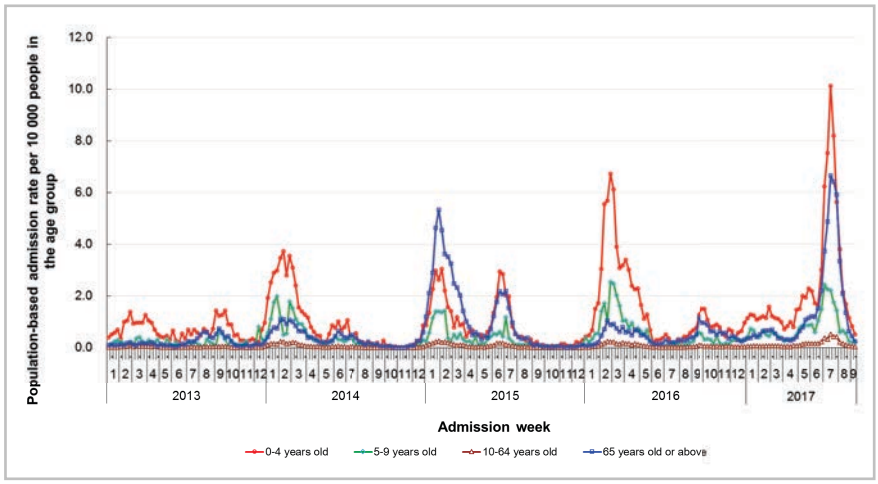

Figure 5 - Weekly admission rates with principal diagnosis of influenza in public hospitals by age groups, 2013-2017.

Enhanced surveillance of severe influenza cases

CHP collaborated with the Hospital Authority (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 between May 5 to September 1. During this period, a total of 582 ICU admissions or deaths (including 430 deaths) with laboratory diagnosis of influenza had been recorded among adult patients. The male to female ratio was 1: 0.82. Their ages ranged from 18 to 105 years (median: 82 years). The majority (79.7%) of the severe cases were elderly aged 65 years or above. Four hundred and eighty-one (82.6%) of the severe cases were known to have pre-existing chronic diseases. Among the cases aged 18 to 64 years, 9.3% were known to have received SIV for the 2016/17 season, whereas among the elderly aged 65 years or above who lived in RCHE and in the community, 70.2% and 34.7% were known to have received SIV for the 2016/17 season respectively. The total number of severe cases recorded among adult patients in this season was lower than that in the 2015 winter season (predominated by H3N2) but higher than that in the 2016 winter season (predominated by H1N1pdm09) (Table 1).

Table 1 - Number of severe cases recorded during the enhanced surveillance periods in the 2015 winter season, 2016 winter season and 2017 summer season.

Season	2015 winter (17 weeks)*	2016 winter (17 weeks)#	2017 summer (18 weeks)^
Adult severe cases (including deaths)	647	409	582
Adult death cases	501	211	430
Paediatric cases of influenza-associated complication/death	18	27	19
Paediatric cases of influenza-associated death	1	3	3

**2015 winter season enhanced surveillance period: 2/1/2015 - 24/4/2015*
#2016 winter season enhanced surveillance period: 29/1/2016 - 20/5/2016
^The enhanced surveillance started two weeks before the influenza season.

Separately, 19 paediatric cases of influenza-associated complication/death (including three fatal cases) were reported to CHP among people aged below 18 years during the same period. They included 12 boys and seven girls. Their ages ranged from six months to 15 years (median: two years). Six cases (31.6%) had pre-existing chronic diseases. Seventeen cases (89.5%) had not received SIV for the 2016/17 season. In 2017, a total of 27 cases (including four deaths) have been recorded so far. The total number of severe cases recorded among paediatric patients in this season was less than that in the 2016 winter season but similar to that in the 2015 winter season (Table 1).

In total, 601 severe cases (including 433 deaths) with laboratory confirmation of influenza were recorded among all ages in this season. The average daily number of severe cases reported reached the peak of 11.3 cases per day between July 12 and July 18 and then decreased in August. Among patients with laboratory confirmation of influenza admitted to public hospitals under HA in this season, 2.6% of the admitted cases died during the same episode of admission, which was comparable to the percentages recorded in previous seasons (2.5% in the 2016 summer season, 1.9% in the 2016 winter season and 3.3% in the 2015 summer season).

Very old elderly aged 85 years or above constituted the majority of the disease burden of severe and fatal cases (Table 2). The cumulative incidence of severe cases in this season was the highest among elderly aged 85 years or above (143.7 cases per 100 000 population), followed by elderly aged 65 to 84 years (21.7), adults aged 50 to 64 years (5.1) and young children aged below six years (4.3). The rates among people aged six to 49 years were much lower than the above age groups. Similarly, the cumulative incidence of fatal cases in this season was the highest among elderly aged 85 years or above (135.6 cases per 100 000 population), followed by elderly aged 65 to 84 years (15.7), adults aged 50 to 64 years (1.8) and young children aged below six years (0.9) (Table 2).

Table 2 - Age distribution and cumulative incidences of severe influenza cases and deaths recorded from May 5 to September 1, 2017.

Age group (year)	Number of severe cases (including deaths)	Cumulative incidence of severe cases (per 100,000 population)	Number of deaths	Cumulative incidence of fatal cases (per 100 000 population)
0 - 5	15	4.3	3	0.9
6 - 11	2	0.6	0	0
12 - 17	2	0.6	0	0
18 - 49	29	0.9	9	0.3
50 - 64	89	5.1	31	1.8
65 - 85	215	21.7	155	15.7
85 or above	249	143.7	235	135.6
Total	601	8.2	433	5.9

Effectiveness of seasonal influenza vaccine in elderly in Resident Care Homes 2011/12 to 2016/17 influenza season

The vaccine effectiveness (VE) of SIV against laboratory-confirmed influenza infections with severe outcomes (ICU admission and/or deaths) among elderly aged 65 years or above who resided in residential care homes (RCH) was estimated for the 2011/12 to 2016/17 influenza seasons. Screening method proposed by Orenstein[1], was adopted for which VE was estimated by comparing the proportion of population vaccinated (PPV) with the proportion of case vaccinated (PCV), using the following formula:

$$VE=1-(PCV)(1-PPV)/(1-PCV)(PPV)$$

PPV was estimated by dividing the number of SIV administered through Government Vaccination Programme (GVP) to elderly (i.e. aged 65 years or above) by the total number of elderly living in the RCH in the corresponding influenza seasons. PCV was obtained by the proportion of cases vaccinated for RCH elderly aged 65 years or above who were reported to the enhanced surveillance system during the influenza seasons. Vaccination status was ascertained by matching with vaccination records under GVP. We computed the 95% CI of PCV by using the exact confidence interval method with binomial distribution.

For the elderly aged ≥ 65 living in RCHs, the estimated overall vaccine effectiveness varied by influenza seasons and ranged from 14% (95% CI: -2 to 70) to 69% (95% CI: 38 to 84) (Table 3). VE estimates of 50% or higher were observed in 2015/16 and 2016/17 seasons. Albeit with small number of cases, the VE for 2016/17 winter season [68.5% (95%CI: -10.1 to 90.4)] was comparable to that of 2015/16 winter season [68.9% (95%CI: 38.4 to 84.1)] but higher than that in 2016/17 summer season [45.1% (95%CI: 20.6 to 61.5)].

Our estimation showed that the protection of SIV in elderly living in RCH was low to moderate in all influenza seasons studied. VE estimates varied with influenza seasons and this might be related to the degree of matching between vaccine and circulating strains, strains circulating in previous seasons and the timing of influenza seasons. In contrast to other seasons in which most influenza infection occurred during winter, the 2016/17 season in Hong Kong was atypical with most cases presented after May 2017. Cases in the 2016/17 summer season might have had their SIV received more than six months ago. Immunity may wane with duration between vaccination and arrival of influenza seasons and hence contributed to a lower vaccine effectiveness in this season[2]. This was evident by the higher VE estimates in the 2016/17 winter season (February to April 2017) when compared to the 2016/17 summer season (May to August 2017).

Table 3 - Vaccine effectiveness of seasonal influenza vaccine in elderly in Residential Care Homes in Hong Kong, 2011/12 to 2016/17 influenza seasons.

Influenza season	Proportion of population vaccinated (PPV)	Number of cases	Number of cases vaccinated	Proportion of cases vaccinated (PCV)	VE (%)	95% CI* of VE
2011/12 winter	0.79	103	70	0.68	43.6	11.9 to 63.2
2012/13 winter^	0.80	4	3	0.75	25.0	-38.7 to 94.0
2013/14 winter^	0.80	22	17	0.77	13.9	-2.0 to 69.5
2014/15 winter^	0.76	203	130	0.64	42.8	22.8 to 57.4
2015/16 winter	0.80	40	22	0.55	68.9	38.4 to 84.1
2016/17 winter	0.81	14	8	0.57	68.5	-10.1 to 90.4
2016/17 summer	0.81	153	107	0.70	45.1	20.6 to 61.5

**confidence interval*
^last updated July 25, 2018

The screening method enables a rapid estimation with existing data. It is applicable to VE estimation when accurate estimates of PPV and PCV are available. As SIV was delivered to elderly in RCH through visiting medical doctors under GVP, the vaccination uptake was well reflected in the administrative statistics. In addition, most RCH elderly would attend Accident & Emergency Departments of public hospitals under HA for medical consultation and subsequent management in acute respiratory illnesses. Thus the enhanced surveillance should capture most of the severe influenza infections in this population. Thus VE estimation by screening method is feasible on elderly living in RCH.

Discussion

The seasonal influenza activity in Hong Kong this year was different from the typical epidemiological patterns in the past few years. In Hong Kong, summer influenza seasons were usually milder than winter seasons. The influenza activity in this summer season was higher than previous summer seasons and also higher than that recorded in the winter season in 2017. This summer season was a severe season comparable to the 2015 and 2016 winter seasons. The attack rate among the population was high as reflected by very high ILI consultation rates in out-patients settings. Nonetheless, there was no evidence of increased virulence as the proportion of deaths among the influenza cases admitted to public hospitals was similar to previous few seasons. Besides, the number of severe cases was within the range recorded in the 2015 and 2016 winter seasons.

Several factors might account for the severity of this season. A mild winter season in early 2017 might lead to accumulation of susceptible persons in the population. Influenza A(H3N2) predominated in this summer influenza season, which is known to cause more severe disease in the elderly as compared with other influenza types. The aging population in Hong Kong has resulted in an increasing number of frail elderly who are more prone to influenza infection and its complications. Furthermore, the immunity induced by seasonal influenza vaccination in late 2016 has been waning in the elderly population, making them susceptible to influenza infection in the summer season.

CHP will continue to closely monitor the influenza situation in Hong Kong and overseas countries. All persons aged six months or above except those with known contraindications are recommended to receive SIV for personal protection. In the coming 2017/18 season, the Vaccination Subsidy Scheme will continue to provide subsidised vaccination to children aged six months to under 12 years, elderly aged 65 years or above, pregnant women, persons with intellectual disabilities and recipients of Disability Allowance. GVP will continue to provide free vaccination to the eligible groups. The various vaccination programmes will be launched in October 2017 and the details will be announced in due course.

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DOI: http://dx.doi.org/10.2807/1560-7917.ES.2016.21.16.30201

Review of Japanese Encephalitis in Hong Kong, 2007-2017 (as of August 31, 2017)

Reported by Dr Terence LAM, Scientific Officer, Enteric and Vector-borne Disease Office, Surveillance and Epidemiology Branch, CHP.

Japanese encephalitis (JE) has been made notifiable since July 16, 2004 and all medical practitioners are required to report probable or confirmed cases to the Centre for Health Protection (CHP) of the Department of Health (DH). This paper will provide an update on the JE cases recorded from 2007 till August 31, 2017.

From 2007 to 2016, CHP recorded 21 JE cases. The annual number of cases ranged from zero to six. In 2017 (as of August 31), four local cases were recorded, including the first local blood-borne case (Figure 1).

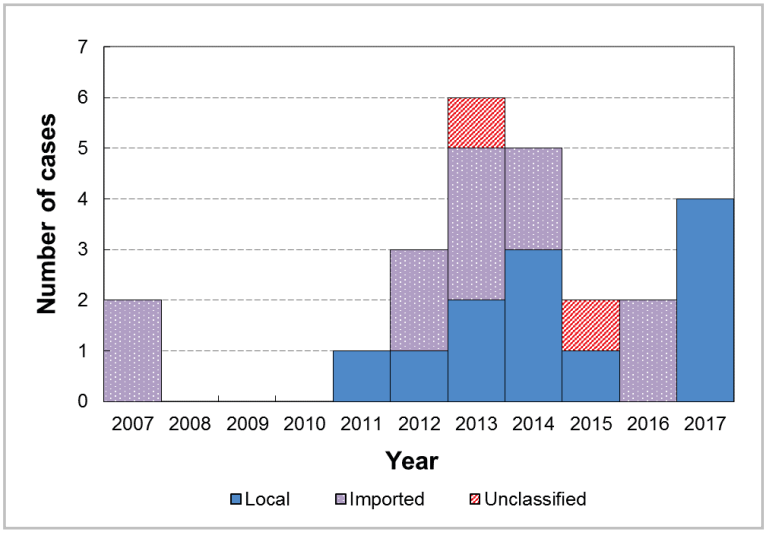

Figure 1 - JE cases recorded from 2007 to 2017 (as of August 31, 2017).

The ages of these 25 patients recorded from 2007 to 2017 ranged from four to 69 years (median: 38 years). More males (n=17, 68%) were affected than females (n=8, 32%). Among them, 12 (48%) were local cases, 11 (44%) contracted the disease overseas and the source of infection for the remaining two cases (8%) could not be determined. All cases were sporadic infection without epidemiological linkage. All 12 local cases had their symptoms onset from May to July (Figure 2). Eight (67%) patients resided in Yuen Long during the incubation period where pig farms were found within the two kilometres of their residences. The remaining four local cases (33%) lived in North, Sai Kung, Southern and Tuen Mun Districts, respectively, where no pig farms were located within two kilometres from their residences. Among the 11 imported cases, eight, two and one cases were imported from Mainland China, Myanmar and Thailand, respectively. The two unclassified cases were recorded in 2013 and 2015 respectively. The patient recorded in 2013 had stayed in both Tokyo and Hong Kong during the incubation period, while for the latter case recorded in 2015 had stayed in both Guangdong and Hong Kong.

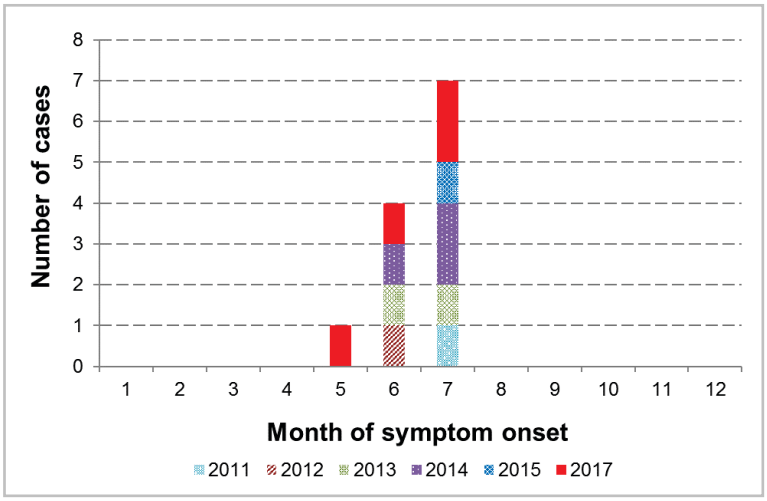

Figure 2 - Distribution of local JE cases by month of symptom onset from 2007 to 2017 (as of August 31, 2017).

Among the 25 cases, the five most common symptoms were fever (n=25, 100%), followed by headache (n=16, 64%), vomiting (n=11, 44%), drowsiness (n=6, 24%) and seizure (n=4, 16%). All were admitted to hospitals for management. Twelve patients (48%) required intensive care treatment. Three patients (12%) passed away due to JE. One patient was transferred back to the home country for further management and two were still in hospital at the time of reporting. For the remaining 19 patients have been discharged, neurological sequelae were documented in four (21%) of them.

Among these 25 cases, there was a blood-borne case recorded in July this year involving a 52-year-old man who stayed in Grantham Hospital (GH) in the entire incubation period. He was admitted to Queen Mary Hospital (QMH) on May 10 for organ transplant for his underlying illness. He had fever and decreased consciousness on July 6 after receiving blood transfusion in GH, followed by acute confusion and myoclonus on July 8. He developed seizures in unconscious condition on July 9. He was transferred to the Intensive Care Unit of QMH for further management on July 14. Both his cerebrospinal fluid and blood sample tested positive for IgM antibodies to JE virus. Investigations revealed that he had received a number of blood transfusions during hospitalisation. Residual samples of the blood transfused to the patient on June 22 were tested positive for JE virus. This was the first documented case of transfusion transmitted JE in literature. Source tracing identified the blood donor as a 46-year-old man who lived in Tin Shui Wai and had donated blood on May 29. He had no travel history to JE-endemic areas and has been asymptomatic all along.

In Hong Kong, the principal vector for JE, *Culex tritaeniorhynchus*, is widely distributed in both rural and urban areas. Currently, there are 43 registered pig farms in Hong Kong. Majority are located in Yuen Long (34 farms) and North District (8 farms) with the remaining one in Sai Kung. Besides, the wetlands in the territory provides favourable natural habitat for wading birds. With the presence of vectors, amplifying and reservoir hosts, there is always the risk of human infection of JE.

To prevent contracting the disease, one should take general measures to prevent mosquito bites. JE vaccine is recommended for travellers who plan to stay one month or longer in endemic areas in Asia and Western Pacific Region, particularly in rural areas; 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 of the disease. For further information on JE prevention, please visit the CHP website at: http://www.chp.gov.hk/en/content/9/24/28.html

Facts on Japanese encephalitis

JE is a mosquito-borne disease caused by the JE virus. The JE virus transmission cycle involves *Culex* mosquitoes that lay eggs in fields with wet cultivation, pools, ditches and other large water bodies. Pigs and wading birds act as principal vertebrate amplifying hosts and reservoir hosts respectively. Humans get infected when bitten by an infected mosquito. Since humans seldom develop enough viremia to infect feeding mosquitoes, they are considered a dead-end host for viral transmission. While JE is principally mosquito-borne, overseas scientific literature show that, based on nature of similar flaviviruses, blood transfusion and organ transplant are considered to be potential modes of transmission of JE virus.

Most JE infections are asymptomatic or present as a mild non-specific febrile illness, and only one in approximately 250 infections results in severe disease with rapid onset of high fever, headache, neck stiffness, disorientation, coma, seizures, spastic paralysis and death. Among clinical cases, the case-fatality rate can be as high as 30%. About 20% to 30% of survivors suffer permanent intellectual, behavioural or neurological problems such as paralysis, recurrent seizures or inability to speak.

NEWS IN BRIEF

A probable case of sporadic Creutzfeldt-Jakob disease

The Centre for Health Protection (CHP) recorded a probable case of sporadic Creutzfeldt-Jakob disease (CJD) on August 31, 2017, affecting a 53-year-old man with underlying medical illness. He presented with non-specific dizziness in July 2017. Subsequently, he developed progressive dementia, visual disturbance, abnormal speech, difficulty in walking and myoclonus. He was admitted to a public hospital on August 19 for further management. Findings from magnetic resonance imaging of the brain and electroencephalography were suggestive of CJD. His condition was stable. He had no known family history of CJD. No risk factors for either iatrogenic or variant CJD were identified.

A sporadic case of listeriosis

On September 6, 2017, CHP recorded a case of listeriosis affecting an 82-year-old man with pre-existing medical conditions. He presented with fever, chills, rigor and generalised malaise on September 2, and was admitted to a public hospital on September 3. His blood specimen collected on September 3 grew *Listeria monocytogenes*. The clinical diagnosis was sepsis and he was treated with antibiotics. He was stable and discharged on September 7. He had not travelled outside Hong Kong recently. He reported consumption of ice-cream during the incubation period. His household contacts and food collaterals were all asymptomatic.

A sporadic case of *Streptococcus suis* infection

On September 6, 2017, CHP recorded a sporadic case of *Streptococcus suis* infection affecting a 64-year-old man with good past health. He presented with fever and right wrist pain since August 30. He was admitted to a private hospital on September 4. His blood collected on September 4 grew *Streptococcus suis*. The clinical diagnosis was septic arthritis. He was treated with antibiotics and his condition remained stable. He was transferred to a public hospital on September 7 for further management. He denied any previous skin wounds or history of handling raw pork during incubation period. His home contact remained asymptomatic.

Sep 10 - Sep 23 2017 WEEKS 37 - 38 VOL 14 ISSUE Nº 19

FEATURE IN FOCUS

Update of Creutzfeldt-Jakob disease in Hong Kong

Reported by Ms Sheree CHONG, Scientific Officer, Communicable Disease Surveillance and Intelligence Office, Surveillance and Epidemiology Branch, CHP.

Creutzfeldt-Jakob disease (CJD) is a rapidly progressive, invariably fatal neurodegenerative disease. It belongs to a family of human and animal diseases known as the transmissible spongiform encephalopathies (TSEs) or prion disease. CJD is the most common form of TSE in human and there are other TSEs found in specific kinds of animals. For example, bovine spongiform encephalopathy (BSE) is found in cows and is often referred to as "mad cow" disease, and scrapie affects sheep and goats.

According to the aetiology, CJD is classified into four forms[1-3]:

- *Sporadic CJD* - It is the most common type of CJD and accounts for at least 85% of cases. The causes of the disease remain unknown;
- *Familial CJD* - It is associated with inherited mutations of the prion protein gene and makes up 5 to 15% of CJD cases;
- *Iatrogenic CJD* - It is caused by accidental transmission via the use of contaminated surgical equipment or as a result of corneal or meningeal transplants or the administration of human-derived pituitary growth hormones. This form of CJD accounts for less than 5% of cases; and
- *Variant CJD (vCJD)* – It was first reported in the United Kingdom (UK) in March 1996. The occurrence of the disease is strongly linked to the consumption of food of bovine origin contaminated with the BSE agent. There were also four cases of vCJD infection identified in the UK that were associated with blood transfusion.

CJD affects about one person in every million people per year worldwide[2]. The onset of symptoms typically occurs above age 60 and the vast majority of CJD patients die within one year of illness onset. The incubation period of CJD is long, usually in terms of years and can be as long as 30 years. Most cases of the sporadic, familial and iatrogenic forms are seen in older people and have a relatively shorter duration of illness. These CJD cases are characterised by personality changes and progressive dementia.

On the other hand, vCJD tends to affect younger patients and tends to present with depressive symptoms or a schizophrenia-like psychosis. The duration of illness is usually longer with a median of 14 months as opposed to 4.5 months in the traditional forms of CJD[1]. Patients of all four forms will then develop more and more neurological signs including unsteadiness, involuntary movements and difficulty in walking. There is no curative treatment for any forms of CJD. Management of CJD remains supportive and is aimed at alleviating symptoms and stopping the progression of the disease.

Diagnosis of CJD is based on the fulfilment of a set of clinical and epidemiological criterias as well as findings of neurological studies. The Centre for Health Protection (CHP) of the Department of Health (DH) has adopted the case definitions for the classification of human TSEs published by the World Health Organization (WHO)[4]. A CJD case is classified as a "definite", "probable", or "possible" case based on the clinical, laboratory and electroencephalogram criteria. These criteria can be found in the Communicable Disease Surveillance Case Definition of CHP/DH available at https://cdis.chp.gov.hk/CDIS_CENO_ONLINE/disease.html. Confirmatory diagnosis requires neuropathological and/or immunodiagnostic testing of brain tissue obtained either at biopsy or autopsy.

CJD is a rare disease in Hong Kong. It has been made notifiable since July 14, 2008. All medical practitioners are required to report any suspected and confirmed cases to CHP/DH. From July 2008 to August 2017, a total of 64 cases of CJD were recorded (Figure 1). The annual number of cases ranged from one to nine during the period from 2008 to 2016.

This article summarises the epidemiology of the CJD cases recorded in the past five years. The annual number of cases from 2012 to 2016 ranged from five to nine cases. This year, there were seven cases recorded so far (as of August 31). All of these 46 cases were sporadic form; among them, one was definite, 41 were probable and four were possible according to WHO classification. They were 17 (37.0%) males and 29 (63.0%) females. Their ages at disease onset ranged from 46 to 90 years with a median age of 70 years. Except for a Filipino lady, all other cases were of Chinese ethnicity. Among these 46 cases, 42 passed away, and CJD was the underlying cause of death for 40 of them. Two cases died of other disease conditions and four remained alive (one case reported in 2016 and three cases reported in 2017). The survival duration after disease onset of the 40 fatal cases ranged from 73 days to 846 days (median: 160 days), while most (29 cases, 72.5%) of them died within one year from disease onset.

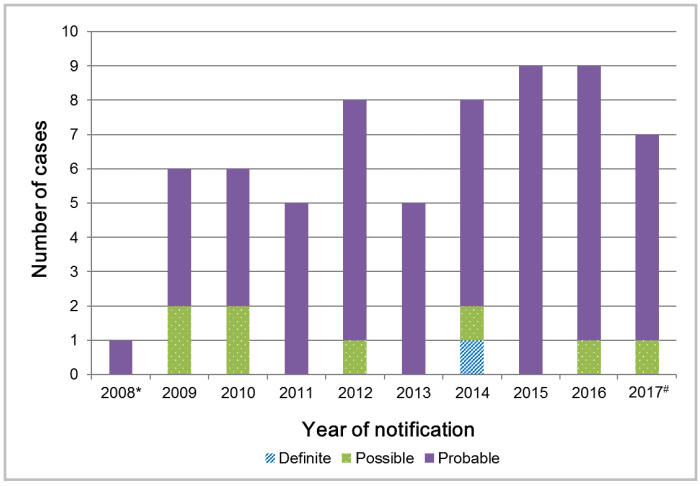

*Figure 1 - Number of CJD cases in Hong Kong, 2008 (*from July 2008 after CJD was made notifiable) to 2017 (#as of August 31, 2017).*

For the 46 cases recorded from 2012 to August 31, 2017, majority of cases (40, 90.0%) did not have history of travel to the UK. There was no family history of CJD for all the cases. They also had no known history of blood product transfusion or donation. Of the 27 cases who reported to have history of medical procedures performed, none of them was neurosurgery, corneal transplantation or injection of growth hormone.

The definite sporadic case in 2014 was a 64-year-old Chinese man, who presented with rapid decrease in cognitive function since December 2013. His brain biopsies showed spongiform encephalopathy, which was consistent with CJD, and prion protein staining showed diffuse granular staining and vacuolar staining. He had no known family history of CJD and there were no risk factors for iatrogenic CJD. All surgical equipment for the brain biopsies had gone through autoclaving cycle at 134 degree Celsius and was quarantined for re-use exclusively on this patient. After the death of this patient in January 2015, all the equipment was destroyed.

To prevent the disease from spreading, tissue or organ transplant from any CJD patients or re-use of potentially contaminated surgical instruments should be avoided. Based on the understanding that vCJD is linked to the consumption of bovine products contaminated with the BSE agent, WHO recommends that countries should not permit tissues that are likely to contain the BSE agent to enter the food chain.

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Review of invasive *Haemophilus influenzae* type b infection

Reported by Ms Fanny WS HO, Scientific Officer, Vaccine Preventable Disease Office, Surveillance and Epidemiology Branch, CHP.

Invasive *Haemophilus influenzae* type b (Hib) infection is caused by the bacterium *Haemophilus influenzae* type b, mostly affecting children under five years of age, though infection may occasionally occur in older age groups. The disease is usually spread by contact with nose or throat secretion of an infected person. *Haemophilus influenzae* type b can cause a range of serious infections, depending on the organ that it affects. The most common clinical manifestations caused by invasive Hib infection include meningitis, pneumonia, bacteraemia, epiglottitis, septic arthritis, cellulitis and osteomyelitis.

Invasive Hib infection is uncommon in Hong Kong as compared to western countries, and incidence has remained low since the disease became notifiable in 2008. Between January 1, 2012 and September 24, 2017, 13 cases of invasive Hib infection were reported to the Centre for Health Protection (CHP) of the Department of Health. The annual notifications varied from zero to six cases, corresponding to an incidence rate of 0 to 0.08 cases per 100 000 population per year (Figure 1). More males (eight cases, 62%) than females were affected. All cases were sporadic infections, eleven (85%) of which acquired the infection locally while two were imported from Mainland China and the Philippines.

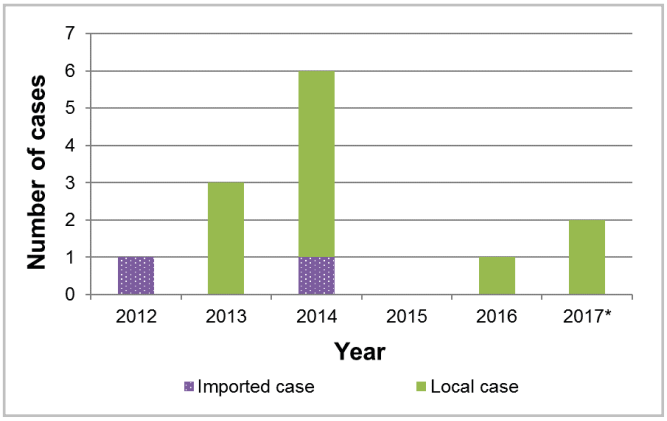

*Figure 1 - Notifications of invasive Hib infection in Hong Kong, 2012-2017 (*as of September 24, 2017).*

Cases of invasive Hib infection occurred in all ages from 25 days up to 92 years (median: 21 years). Six of these cases (46%) were children, five of whom were less than two years of age. All the children were previously healthy, except a 25-day-old infant who was prematurely born at 32 weeks' gestation and cared in the neonatal intensive care unit since birth. As for the seven adult cases (aged 21 to 92 years), six of them had one or more pre-existing medical conditions, including diabetes mellitus, hypertension, hyperlipidemia, and recurrent pyogenic cholangitis, etc.

Sepsis due to Hib was the most common presentation, accounting for 69% (9/13 cases) of the cases overall. Meningitis was reported in seven (54%) cases, pneumonia in four (31%) and suppurative pericarditis with pericardial effusion and empyema in one case (4%). The diagnoses of eight (61%) cases were confirmed by blood culture, three (23%) by positive culture or detection of Hib antigen in cerebrospinal fluid, one by positive pleural fluid culture (8%), and one by culture from both blood and tracheal aspirate (8%).

All of the cases were hospitalised for treatment, six of whom required intensive care. There were two (15%) fatalities recorded. One occurred in 2013 involving a 32-year-old man with pre-existing medical conditions and was living in a residential care home for the disabled. He presented with shortness of breath and died of sepsis one day after admission. The second death was recorded in 2016 involving an 85-year-old man with underlying illnesses, who presented with pneumonia and sepsis. Blood culture of both fatal cases showed the presence of *H. influenzae* serotype b. Ten patients recovered and were discharged after 11 to 62 days of hospitalisation. The remaining patient who is still hospitalised is a 25-day-old neonate born prematurely at 32 weeks of gestation, who presented with sepsis and meningitis and required prolonged ventilator support.

In Hong Kong, the Hib vaccines are available in either monovalent form, or in combination with other vaccine components. In general, a two or three-dose primary series is given at the age of two to six months, followed by a booster dose at 12 to 18 months. Members of the public may consult their family doctors for Hib vaccination for personal protection of their children. In addition to active immunisation, good personal and environmental hygiene are essential in preventing the spread of disease. Clinicians are also encouraged to continue reporting of any suspected Hib cases to CHP. For more details on invasive Hib infection, please visit the CHP website: http://www.chp.gov.hk/en/content/9/24/8870.html.

NEWS IN BRIEF

A case of neonatal listeriosis

On September 11, 2017, the Centre for Health Protection (CHP) recorded a case of listeriosis affecting a 2-day-old baby girl. She was born on September 9 by emergency Caesarean section in a private hospital at 34 weeks of gestation for reduced fetal movement. She developed respiratory distress and hypotension at birth and was intubated and required inotropic support. She was transferred to a public hospital for intensive care after birth. Her blood culture collected on September 9 and 10 both grew *Listeria monocytogenes*. She was treated with antibiotics. Her condition gradually improved and was transferred to special care baby unit since September 22. She was in stable condition. Investigation revealed that the baby's mother had uneventful antenatal course and had diarrhoea on the day of delivery. Cultures of her high vaginal swab and breast milk were negative but blood and stool specimens were not collected for culture then. The mother denied consumption of high risk food item during incubation period. Other household contacts remained asymptomatic.

A sporadic case of *Streptococcus suis* infection

On September 11, 2017, CHP recorded a case of *Streptococcus suis* infection affecting a 49-year-old man with underlying illnesses. He presented with fever and shortness of breath on September 7 and was admitted to a public hospital on September 8. His blood sample collected grew *Streptococcus suis*. He was treated with antibiotics and his condition was stable. He worked as a butcher in wet markets and had handled raw pork during the incubation period. He recalled laceration injury over his left ring finger two weeks before illness onset. His home contacts and colleagues were asymptomatic.

A probable case of sporadic Creutzfeldt-Jakob disease

On September 20, 2017, CHP recorded a probable case of sporadic Creutzfeldt-Jakob disease (CJD) affecting a 66-year-old woman with underlying medical illness. She presented with progressive decline in cognitive function and delusion in May 2017. She was admitted to a public hospital on August 15 for confusion and was found to have akinetic mutism, cerebellar disturbance, myoclonus and extrapyramidal signs. Finding of electroencephalography was suggestive of CJD. Her condition was stable. She had no known family history of CJD. No risk factors for either iatrogenic or variant CJD were identified.

Field Epidemiology Training Programme (FETP) training course 2017

The Hong Kong FETP of CHP organised a five-day training course for public health professionals on the topic of "Surveillance" during September 11 to 15, 2017. The objective of the course was to equip participants with knowledge of the principles of surveillance, how to set up and evaluate surveillance systems, and skills to analyse surveillance data using relevant IT tools. The training course included presentations by the facilitators, practical exercises, case studies and hands-on practices on data analysis using different softwares. A total of 10 public health professionals attended the course and it was well received by the participants.

CA-MRSA cases in August 2017

In August 2017, CHP recorded a total of 87 cases of community-associated methicillin resistant *Staphylococcus aureus* (CA-MRSA) infection, affecting 50 males and 37 females with ages ranging from eight months to 76 years (median: 33 years). Among them, there were 64 Chinese, 4 Caucasian, 4 Indian, 4 Pakistani, 3 Filipinos, 1 Korean, 1 Nepalese, 1 Singaporean, 1 Vietnamese and 4 of unknown ethnicity.

Eighty-five cases presented with uncomplicated skin and soft tissue infections while the remaining two cases had severe CA-MRSA infections. The first severe case affected a 63-year-old man with underlying illnesses. He presented with fever, epigastric pain, diarrhoea and vomiting on July 29 and was admitted to a private hospital on the same day. Both chest X-ray and computed tomography showed right lower zone consolidation and pleural effusion. He was diagnosed to have pneumonia with septic shock and was transferred to intensive care unit of a public hospital on July 29 for further management. His sputum specimen collected on July 29 was cultured positive for CA-MRSA. His condition improved after antibiotic treatment and he was discharged on August 21. The second severe case affected a 52-year-old man with good past health. He presented with fever, cough with sputum, runny nose and sore throat on July 20. He attended the outpatient department of a private hospital for persistent symptoms on August 3. His chest X-ray showed right middle and lower zone consolidation. He was diagnosed with pneumonia and was admitted for management. His sputum specimen collected on August 3 was cultured positive for CA-MRSA. He was treated with antibiotics and was discharged on August 8.

Among the 87 cases, one was a nurse working in a public hospital. Investigation did not reveal any epidemiologically linked cases. Besides, two household clusters, with each affecting two persons, were identified in August 2017.

Scarlet fever update (August 1, 2017 – August 31, 2017)

Scarlet fever activity in August decreased as compared with that in July. CHP recorded 56 cases of scarlet fever in August as compared with 177 cases in July. The cases recorded in August included 28 males and 28 females aged between three and 20 years (median: five years). There was one institutional cluster occurring in a kindergarten, affecting two children. No fatal cases were reported in August.

Sep 24 - Oct 7 2017 WEEKS 39 - 40 VOL 14 ISSUE N⁰ 20

FEATURE IN FOCUS

Vaccination Practice for Health Care Workers in Hong Kong

Reported by Dr CHAN Hong-lam, Medical and Health Officer, Vaccine Preventable Disease Office, Surveillance and Epidemiology Branch, CHP.

Vaccination is one of the most effective tools to prevent infectious diseases. Health care workers (HCW) are at risk for exposure to infectious diseases. HCW who work with patients or handle infectious material could not only get infected, but also spread infections to susceptible patients. For example, nosocomial transmission has constituted an important part of large measles outbreaks in some European countries this year[1,2]. While the practices on vaccination of infectious diseases for HCW for overseas countries vary, besides for seasonal influenza, vaccination against hepatitis B, measles, rubella and chickenpox among HCW were generally recommended.

In June 2017, Scientific Committee on Vaccine Preventable Diseases (SCVPD) discussed on vaccination practice for HCW in Hong Kong. In this context, HCW refers to personnel (including students and volunteers in health care disciplines) involving potential contact with patients, their blood or body substances in health care settings, and hence at potential risk of acquiring and transmitting infections in such settings.

SCVPD has made the following recommendations:

a. HCW should be immune to hepatitis B and their post-vaccination serological status should be ascertained;

b. HCW should be immune to measles and rubella, by either vaccination or medical evaluation;

c. HCW should be immune to varicella. HCW with negative or uncertain history of receiving two doses of varicella vaccines or disease of varicella or herpes zoster should be serologically tested. Vaccines should be offered to those without varicella zoster antibody; and

d. All HCW should receive seasonal influenza vaccination annually once the vaccine is available.

SCVPD also recommended that immune status of individual HCW should be assessed at the time of initial employment. A full vaccination history should be obtained and with documentation. The records of vaccination and serological tests of each HCW should be kept by both employer and employee.

Local health care organisations, in both public and private sectors, should assess staff's risk of acquiring and transmitting infections and review their vaccination practice. For details of SCVPD's *Summary Statement on Vaccination Practice for Health Care Workers in Hong Kong*, please visit CHP website:
http://www.chp.gov.hk/files/pdf/summary_statement_on_vaccination_practice_for_health_care_workers_in_hong_kong_september_2017.pdf

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Update on rabies in Hong Kong

Reported by Dr Eric LAM, Medical and Health Officer, Communicable Disease Surveillance and Intelligence Office, Surveillance and Epidemiology Branch, CHP.

Background

Rabies is a zoonotic disease with acute infection of the central nervous system caused by rabies virus. It almost invariably causes fatal encephalitis in humans. Dogs are the main reservoir of rabies virus, although all species of mammals, including cats, foxes, bats etc. are also susceptible to rabies virus infection[1].

After one gets bitten, scratched or has the broken skin licked over by an infected animal, the virus in the animal's saliva enters from the wound and travels through the peripheral nervous system to the central nervous system, resulting in more serious clinical sequelae. Rarely, rabies may also be transmitted by inhalation of virus-containing aerosol or via transplantation of an infected organ.

Depending on the viral load and site of entry, the incubation period on average is about one to three months, but may vary from less than one week to over one year.

The early presenting symptoms could be non-specific, there could be fever, headache and malaise, with some prickling or itching sensation around the site of wound. With the progress of disease, within days the person may experience anxiety, confusion and agitation, followed by development of abnormal behaviour, delirium, hydrophobia, muscle spasm and coma. Once the clinical signs of rabies appear, the disease is almost always fatal. According to the World Health Organization (WHO), approximately 59 000 people die from rabies every year. While the disease is likely to be underreported in many developing countries due to suboptimal surveillance system and political neglect, it is estimated that nowadays the disease is mostly reported in Asia and Africa, with the highest incidence and deaths reported in India[2]. China has the second highest number of reported rabies cases in the world, with most of the cases currently reported in the southeastern part of the country[3]. With the awareness and strong commitment in the Chinese government to controlling rabies, since reaching the peak in 2007, the incidence of rabies steadily declined to fewer than 1 000 cases in 2016[4]. In fact, many other countries where rabies is of concern, as well as key international organisations including WHO, also recognise rabies as a priority communicable disease with significant impact on people's health and their country's economy. On September 28, 2017, World Rabies Day, WHO and the World Organization for Animal Health (OIE) etc. announced their plan to end human deaths from dog-transmitted rabies by 2030. Among others, one of the aims is to prevent dog-transmitted rabies by improving awareness and education, expanding dog vaccinations, and improving access to healthcare for populations at risk[5].

Local situation

In Hong Kong human rabies is notifiable under the Prevention and Control of Disease Ordinance (Chapter 599). All registered medical practitioners are required to notify the Centre for Health Protection (CHP) of the Department of Health all suspected or confirmed cases of human rabies. Ever since the last local case of human rabies was reported back in 1981, eight imported cases have been recorded (Figure 1). The latest imported case was notified to CHP in December 2014. The patient was a 28-year-old man who worked in Indonesia and sustained dog bite at his workplace in Indonesia in July 2014. He returned to Hong Kong to seek medical management on presentation of neurological symptoms in December 2014, but finally succumbed about three weeks after admission to hospital. All the other previously reported cases were also fatal.

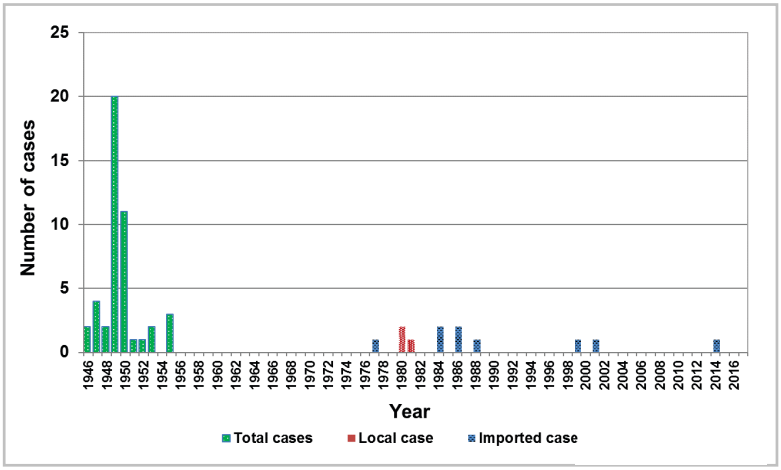

Figure 1 - Number of human rabies cases in Hong Kong, 1946-2017.

Despite a high case fatality, rabies can be effectively prevented through vaccination and proper wound management. Wound cleansing with plain water and soap should be done immediately after sustaining animal bite. Medical attention should be sought as soon as possible at the nearest Accident and Emergency Department. Depending on various factors such as wound condition and degree of suspicion on rabies infection in the biting animal, rabies vaccine and immunoglobulin may be indicated[6]. Pre-exposure prophylaxis, through immunisation, is recommended for people going on prolonged trip to rabies-endemic areas which involve visiting remote rural regions with no medical facilities, or people who will travel for a short period in rabies affected areas, but high-risk activities such as hiking, trekking or animal handling are anticipated.

Hong Kong has been free of animal rabies since 1988. To prevent the disease occurring in animals in Hong Kong, a number of measures which focus on dogs and cats, have been put in place. These include importation control for animals and animal products and prevention of animal smuggling; dogs must be licensed, microchipped, vaccinated against rabies and properly under control in public places; quarantine of biter animals; rabies surveillance on any animals that die or display clinical signs consistent with rabies within the seven day observation period; taking enforcement action against owners who abandoned their animals and stray animal management with the aim to minimise the number of susceptible stray animals at large. According to a Thematic Household Survey on Keeping of Dogs and Cats commissioned by the Census and Statistics Department, it was estimated that in the pet owning population, 85.7% of dogs had been vaccinated against rabies, microchipped and licensed.

To prevent rabies, members of the public should:

- ✦ Avoid stray animals such as dogs, cats, monkeys etc.;
- ✦ After being bitten by animal, wash wound thoroughly with plain water and soap immediately; and
- ✦ Seek medical attention at the nearest Accident and Emergency Department.

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NEWS IN BRIEF

Two sporadic cases of necrotising fasciitis caused by *Vibrio vulnificus*

The Centre for Health Protection (CHP) recorded two cases of necrotising fasciitis caused by *Vibrio vulnificus* in late September 2017.

The first patient was a 65-year-old man with underlying illnesses. He presented with fever and left forearm swelling on September 23 and was admitted to a public hospital on the same day. The clinical diagnosis was left forearm necrotising fasciitis. Excisional debridement of left forearm was performed on September 23, 24 and 26 respectively. His left forearm tissue collected on September 23 yielded *Vibrio vulnificus*. He required post-operative high dependency unit care and was treated with antibiotics. His condition subsequently stabilised. He was a fisherman. Before onset of illness, he worked in the South China Sea and he transported the harvest to a fish market in Zhuhai. He handled raw fish with bare hands but he did not recall recent injuries. His home contacts were asymptomatic.

The second patient was a 79-year-old man with underlying illnesses. He presented with fever, right leg pain and swelling on September 28 and was admitted to a public hospital on the same day. The clinical diagnosis was right lower limb necrotising fasciitis. His condition deteriorated and emergency right leg amputation was performed on September 29. His blood specimen collected on September 28 and wound specimens collected on September 29 yielded *Vibrio vulnificus*. He required post-operative intensive care and was treated with antibiotics. His condition subsequently stabilised. He had been to wet market but did not recall recent injuries. His home contacts were asymptomatic.

Communicable Diseases WATCH

衛生防護中心 Centre for Health Protection 衛生署 Department of Health

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FEATURE IN FOCUS

Free or Subsidised Seasonal Influenza Vaccination and Pneumococcal Vaccination 2017/18

Reported by Dr Grace NW TONG, Senior Medical Officer, Programme Management and Professional Development Branch, CHP.

In 2017/18 season, the Government continues to provide free or subsidised seasonal influenza vaccination (SIV) to priority groups to lower their risk of serious complications, hospitalisation and even death. In addition, it enhances the pneumococcal vaccination to increase protection in elderly with high-risk conditions.

Seasonal Influenza Vaccination (SIV)

With reference to recommendation by the Scientific Committee on Vaccine Preventable Diseases (SCVPD) (http://www.chp.gov.hk/files/pdf/short_version_of_recommendations_on_seasonal_influenza_vaccination_for_the_2017_18.pdf), the eligible target groups for receiving SIV under the Government Vaccination Programme (GVP) including the Residential Care Home Vaccination Programme (RVP), and the Vaccination Subsidy Scheme (VSS) are the same as in last year. As early as in June, announcement of the vaccination arrangement was made to facilitate VSS enrolled doctors to secure their vaccine stock ahead of time.

Children and elderly people are at increased risk of severe influenza, complications like bronchitis, pneumonia or even death and they should have higher priority for SIV. Health care workers should also get vaccinated to protect themselves and to reduce the risk of transmitting influenza to patients who are at high risk of complications and mortality from influenza. Therefore, in addition to continuation of previous efforts, more targeted measures are taken to boost up coverage of target groups.

School organisations and individual primary schools are approached to enlist their support in arranging vaccination activity in schools and in encouraging parents/guardians, through their channels, to bring their children to get vaccination in enrolled VSS private doctors' clinics.

Messages on vaccination are disseminated to community-living elderly through Elder Academy, NGOs and Personal Emergency Link Service (平安鐘). For free vaccination under GVP, four more Elderly Health Centres (EHCs) under Elderly Health Service are opened to provide vaccination to non-member elderly (on top of those opened in previous seasons) and briefings were conducted to residential care homes to facilitate their preparation in providing vaccination to elderly.

Through a lively and informative briefing that addressed the concerns about SIV and new arrangement of pneumococcal vaccination, health care workers and medical/nursing students gained better understanding and are more confident and convinced to provide vaccination to clients/patients.

New initiative of pneumococcal vaccination

Streptococcus pneumoniae causes a wide range of pneumococcal diseases. The invasive pneumococcal diseases (IPD), such as bacteraemic pneumonia, meningitis and sepsis can occur in persons of any age but the risk is substantially higher in the elderly. With the problem of increasing resistance to antibiotics, pneumococcal vaccination, as one of the most effective means of preventing pneumococcal infections, becomes important.

Both 13-valent pneumococcal conjugate vaccine (PCV13) and 23-valent pneumococcal polysaccharide vaccine (23vPPV) are safe and can prevent IPD. Clinical studies showed that PCV13 is effective against both IPD and non-invasive

Figures: VSS scheme logo (Top) and price poster (Bottom).

pneumococcal pneumonia, and has a better efficacy against non-invasive pneumococcal pneumonia when compared with 23vPPV. Nevertheless, 23vPPV contains more serotypes and may offer extra protection.

The new initiative of the Government this year, with recommendations from the SCVPD, is to provide one dose of free or subsidised PCV13 followed by one dose of 23vPPV one year later to elderly with high-risk conditions* to strengthen their immunity against pneumococcal infection (http://www.chp.gov.hk/files/pdf/updated_recommendations_on_the_use_of_pneumococcal_vaccines_amended_120116_clean_2.pdf).

As free or subsidised 23vPPV has been provided by the Government since 2009, if eligible elderly with high-risk conditions have already received 23vPPV, mop-up PCV13 will be given a year later. For those without high-risk conditions and have not received pneumococcal vaccination, subsidised 23vPPV will continue to be provided.

New arrangement of pneumococcal vaccination has started concurrently with SIV under GVP and VSS launched in October 2017, whilst the mop-up PCV13 vaccination under the Hospital Authority will be launched in late March 2018. For more details about the vaccinations, please visit the CHP website at http://www.chp.gov.hk/en/view_content/17980.html.

*High-risk conditions include:

- History of invasive pneumococcal disease, cerebrospinal fluid leakage or cochlear implants;
- Chronic cardiovascular (except hypertension without complications), lung, liver or kidney disease;
- Metabolic diseases including diabetes mellitus or obesity (BMI 30 or above);
- Immunocompromised states related to weakened immune system due to conditions such as asplenia, HIV/AIDS , or cancer/steroid treatment; and
- Chronic neurological conditions that can compromise respiratory functions or the handling of respiratory secretions, or increase the risk of aspiration, or those who lack the ability to take care of themselves.

Update of hand, foot and mouth disease (HFMD) activities in Hong Kong

Reported by Dr KONG Wai-chi, Scientific Officer, Enteric and Vector-borne Disease Office, Surveillance and Epidemiology Branch, CHP.

Hand, foot and mouth disease (HFMD) is a viral infection commonly seen in children. In Hong Kong, HFMD occurs throughout the year but the disease activity usually peaks from May to July. A smaller peak may also occur from October to December. The HFMD activity in 2015 was unusual in that it remained at persistently high level since the summer peak and further increased in December.

The HFMD activity in 2017 so far followed an epidemiology pattern similar to that observed in the past years. The HFMD summer peak started to increase since June, peaked in July and declined to baseline level in August. The HFMD activity started to increase again in mid-September (Figures 1 to 3).

During the summer peak from June to August in 2017, the Centre for Health Protection (CHP) of the Department of Health (DH) recorded a total of 112 HFMD/herpangina institutional outbreaks, compared with 258 outbreaks recorded in the same period of 2016. An average of 9.2 outbreaks per week was recorded (range: one to 18 cases). Among the 112 outbreaks, 83 (74.1%) occurred in child care centres/ kindergartens, 21 (18.7%) in primary schools and four (3.6%) in secondary schools. The remaining four (3.6%) outbreaks occurred in other institutions such as special school and vocational training centres. The size of outbreaks ranged from two to 19 persons (median: four persons). From September to October (as of October 21), there were 115 outbreaks recorded, compared with 126 outbreaks recorded in the same period in 2016. An average of 14.4 outbreaks per week was recorded (range: zero to 36 cases). The majority of outbreaks occurred in child care centres/ kindergartens (68, 59.1%), followed by primary schools (32, 27.8%) and secondary schools (13, 11.3%). The remaining two outbreaks (1.8%) occurred in hostel and university hall respectively.

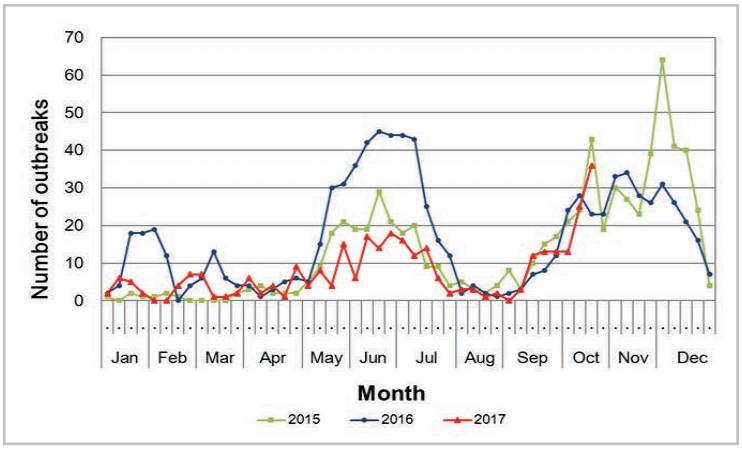

Figure 1 - Number of institutional HFMD/herpangina outbreaks recorded by CHP, 2015 to 2017 (as of October 21, 2017).

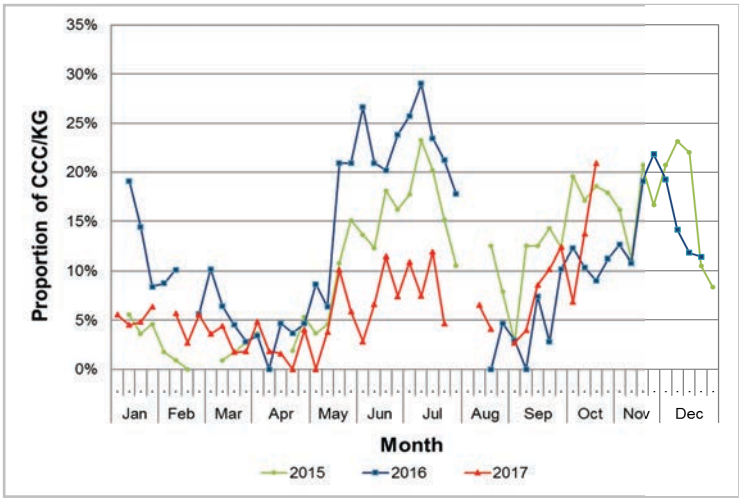

Figure 2 - Occurrence of HFMD in sentinel child care centres/kindergartens (CCC/KG), under sentinel surveillance of infectious diseases, 2015 to 2017 (as of October 21, 2017).
**Note: Gaps in the graph represented suspension of reports due to school holidays.*

As of October 21, a total of 47 cases of enterovirus 71 (EV71) infection were recorded in 2017. Among these 47 cases, 29 were recorded during the summer peak (June to August), compared with 15 cases recorded in the same period in 2016. From September to October (as of October 21), a total of one EV71 case was recorded, compared with 11 cases recorded in the same period in 2016. The 47 cases recorded in 2017 comprised 26 (55.3%) males and 21 (44.7%) females. The patients' ages ranged from one month to 36 years (median: two years). Two cases developed complications of meningoencephalitis and encephalitis respectively. No fatal case was recorded in 2017 so far.

As of October 21, a total of six cases of severe paediatric enterovirus infections (SE) other than EV71 and poliovirus were recorded in 2017. Among these six cases, two were recorded during the summer peak (June to August), which was the same as the number recorded in the same period in 2016. From September to October (as of October 21), a total of three SE cases were recorded, compared with six cases recorded in the same period in 2016. The six SE cases recorded in 2017 comprised three males and three females. The patients' ages ranged from six days to three years (median: two months). The complications of the SE cases were meningitis (four cases) and transverse myelitis (two cases). The laboratory results revealed that four cases were associated with coxsackievirus B1, coxsackievirus B5, echovirus 30 and entervovirus D68 respectively while the remaining two cases were associated with enetroviruses other than EV71. No fatal case was recorded in 2017 so far.

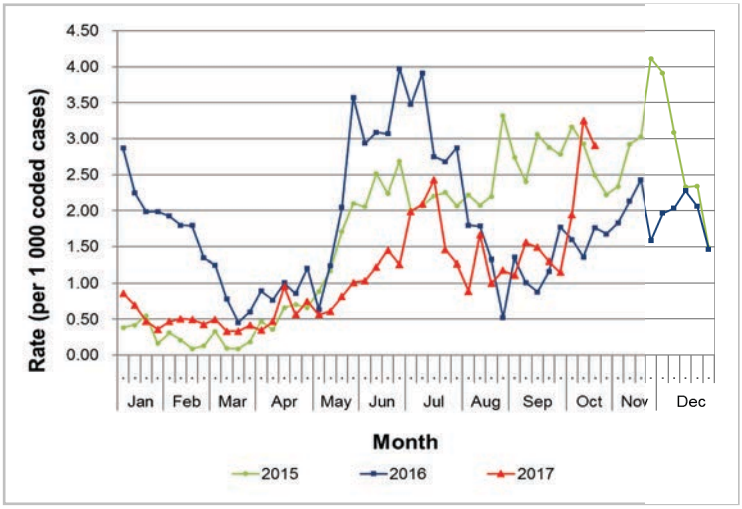

Figure 3 - Accident & Emergency Departments surveillance of HFMD syndrome, 2015 to 2017 (as of October 21, 2017).

The Public Health Laboratory Services Branch of CHP conducted laboratory surveillance to provide a profile of enterovirus circulation based on typing results from respiratory specimens. In 2017 (as of September), the most common strain of non-polio enterovirus identified was coxsackievirus A6.

Currently, the HFMD activity is at high level. CHP will continue to closely monitor the situation. Members of the public are reminded to continue to stay vigilant and observe good personal and environmental hygiene to prevent the disease. The latest surveillance data on HFMD and EV71 are published in the weekly "EV Scan" (http://www.chp.gov.hk/en/guideline1_year/29/134/441/502.html). Further information can be found in the following webpage: http://www.chp.gov.hk/en/view_content/16354.html.

Prevention of HFMD

Good hygiene practices are the mainstay of prevention:

- ☑ Maintain good personal hygiene;
- ☑ Wash hands with liquid soap and water especially:
  - ✦ before touching nose and mouth;
  - ✦ before eating or handling food;
  - ✦ after touching blister;
  - ✦ after using the toilet;
  - ✦ when hands are contaminated by respiratory secretions e.g. after coughing or sneezing; and
  - ✦ after changing diapers or handling soiled articles;
- ☑ Cover both the nose and mouth with tissue paper when coughing or sneezing, and wash hands thoroughly afterwards. Dispose soiled tissue paper in a lidded rubbish bin;
- ☑ Do not share towels and other personal items;
- ☑ Regularly clean and disinfect frequently touched surface such as furniture, toys and commonly shared items with 1:99 diluted household bleach (mixing one part of 5.25% bleach with 99 parts of water), leave for 15 to 30 minutes, and then rinse with water and keep dry. For metallic surface, disinfect with 70% alcohol;
- ☑ Use absorbent disposable towels to wipe away obvious contaminants such as respiratory secretions, vomitus or excreta, and then disinfect the surface and neighbouring areas with 1:49 diluted household bleach (mixing one part of 5.25% bleach with 49 parts of water), leave for 15 to 30 minutes and then rinse with water and keep dry. For metallic surface, disinfect with 70% alcohol;
- ☑ Avoid group activities when HFMD outbreak occurs in the school or institution. Besides, minimise staff movement and arrange the same group of staff to take care of the same group of children as far as possible; and
- ☑ Avoid close contact (such as kissing, hugging) with infected persons.

NEWS IN BRIEF

A sporadic case of leptospirosis

On October 9, 2017, the Centre for Health Protection (CHP) recorded a sporadic case of leptospirosis affecting a 23-year-old man with good past health. He presented with fever, diarrhoea, vomiting and myalgia on September 21 and was admitted to a public hospital on September 25. Blood tests showed thrombocytopenia, derangement of liver and renal function. He was transferred to intensive care unit for further management on the same day. He was treated with antibiotics and put on haemodialysis. His condition gradually improved and he was currently in stable condition.

His paired sera on September 26 and October 3 showed more than four-fold increase in antibody titre against *Leptospira* by microscopic agglutination test. Epidemiological investigation revealed that the patient had swimming in rivers and bays in Hoi Ha Wan with his friends in mid-August. He sustained an abrasion wound over his right lower limb during swimming. His friends and household members remained asymptomatic.

A sporadic case of necrotising fasciitis caused by *Vibrio vulnificus*

On October 10, 2017, CHP recorded a case of necrotising fasciitis caused by *Vibrio vulnificus* affecting a 75-year-old woman with underlying illness. She had fish sting injury to her right hand during food preparation on October 5. She presented with fever, right hand pain and swelling on October 6 and was admitted to a public hospital on the same day. Her blood specimen collected on October 6 yielded *Vibrio vulnificus*. The clinical diagnosis was necrotising fasciitis. She was treated with antibiotics. Wound debridement was performed on October 7 and 9, and she required post-operative intensive care. She remained in stable condition. Her home contacts were asymptomatic.

A sporadic case of *Streptococcus suis* infection

On October 14, 2017, CHP recorded a case of *Streptococcus suis* infection affecting a 50-year-old male butcher with good past health. He presented with malaise on October 9, and then fever, headache, bone pain and hearing loss on October 10. He was admitted to a public hospital on October 12. His cerebrospinal fluid sample collected on October 13 grew *Streptococcus suis*. His clinical diagnosis was meningitis and he was treated with antibiotics. He remained in stable condition. He had handled raw pork with bare hands and had a superficial cut wound on his left hand about two weeks prior to symptoms onset. According to his wife, his home contacts and colleagues were asymptomatic.

CA-MRSA cases in September 2017

In September 2017, CHP recorded a total of 118 cases of community-associated methicillin resistant *Staphylococcus aureus* (CA-MRSA) infection, affecting 67 males and 51 females with ages ranging from 10 days to 87 years (median: 38 years). Among them, there were 80 Chinese, 13 Filipinos, 7 Indian, 4 Pakistani, 3 Caucasian, 1 Indonesian, 1 Malaysian, 1 Nepalese and 8 of unknown ethnicity.

One hundred and fifteen cases presented with uncomplicated skin and soft tissue infections while the remaining three cases had severe CA-MRSA infections. The first severe case affected a 57-year-old woman with underlying illness. She was admitted to a public hospital on August 22 for management of her underlying illness. She had persistent low grade fever with intermittent haemoptysis after admission. Her bronchoalveolar lavage collected on August 25 was cultured positive for CA-MRSA. Her clinical diagnosis was pneumonia. Her condition was stable after treatment with antbiotics and she was transferred to another public hospital for ongoing care of her underlying illness on September 24. She passed away on October 11 due to other medical condition.

The second severe case affected an 87-year-old woman with underlying illness. She was admitted to a public hospital on June 19 for management of her underlying illness. She developed pneumonia complicated with shock on August 8. She showed clinical improvement with antibiotics treatment. Her sputum sample collected on August 27 was cultured positive for CA-MRSA. She passed away on August 28 due to other medical condition.

The third severe case affected a 40-year-old man with history of drug abuse. He has presented with fever, cough, shortness of breath and left facial swelling since September 2. He attended the Accident and Emergency Department of a public hospital on September 5 and was admitted to the intensive care unit for management. Blood sample collected on September 8 was cultured positive for CA-MRSA. His clinical diagnoses were peri-orbital cellulitis and sepsis. He was treated with antibiotics and was transferred to the general ward on September 11. His condition was stable.

Among the 118 cases, three sporadic cases involved healthcare workers were recorded, including two healthcare assistants and a nurse working in different hospitals. Investigation did not reveal any epidemiologically linked cases. Besides, three household clusters, with each affecting two persons, were identified in September 2017.

Scarlet fever update (September 1, 2017 – September 30, 2017)

Scarlet fever activity in September increased as compared with that in August. CHP recorded 92 cases of scarlet fever in September as compared with 56 cases in August. The cases recorded in September included 53 males and 39 females aged between one and 17 years (median: five years). There were two institutional clusters occurring in a kindergarten and a primary school, each affecting two children. No fatal cases were reported in September.

Oct 22 - Nov 4 2017 WEEKS 43 - 44 VOL 14 ISSUE N⁰ 22

Communicable Diseases WATCH

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FEATURE IN FOCUS

Plague outbreak in Madagascar

Reported by Ms Doris CHOI, Scientific Officer, Enteric and Vector-borne Disease Office, Surveillance and Epidemiology Branch, CHP.

Plague is a communicable disease caused by the bacterium, *Yersinia pestis (Y. pestis)*, that is usually found in small mammals (mainly rodents) and their fleas. There are three main forms of plague infection: bubonic, pneumonic and septicaemic. Bubonic plague is the most common form of plague and is caused by the bite of an infected flea. It is rarely transmitted directly from person to person unless there is direct contact with infected tissue. Pneumonic plague is transmitted between humans by inhalation of respiratory droplets from an infected person and is highly contagious. The incubation period of bubonic plague is usually two to six days while the incubation period for primary pneumonic plague is usually one to four days. Patients with bubonic plague typically experience a sudden onset of illness with headache, shaking chills, fever, malaise and painful swelling of the affected regional lymph nodes. The infection can progress to septicaemic plague when the bacteria invade the blood stream. The infection can be spread to other organs and cause serious complications. Patients with pneumonic plague typically present with chills, fever, headache, body pains, weakness, chest discomfort, cough with blood-stained sputum, difficulty in breathing and may die shortly after infection if not treated immediately. The patient is highly infectious in this most serious form of plague. Plague is a very severe disease in human, with a case-fatality ratio of 30% to 60% for the bubonic type and 30% to 100% for the pneumonic and septicaemic types, if left untreated. Antibiotic treatment is effective against plague bacteria, and therefore, lives can be saved with early diagnosis and treatment[1].

Plague is an animal disease that was found in all continents, except Oceania. In recent years, most human cases mainly occur in Africa. According to the World Health Organization (WHO), 3 248 cases were reported worldwide between 2010 and 2015, including 584 deaths[2]. Currently, the three most endemic countries are Democratic Republic of the Congo, Madagascar and Peru. Madagascar has been experiencing a large epidemic since August 2017, and this article reports the latest situation of the outbreak[1].

In Madagascar, plague is endemic on the Plateaux of Madagascar, including Ankazobe District, where the current outbreak originated. A seasonal upsurge, predominantly of the bubonic form, usually occurs annually between September and April and a total of 7 757 cases were reported between 1997 and 2001, giving an average of 1 511 cases per year[3]. However, for the current outbreak, it began in August and is predominantly pneumonic, affecting both endemic and non-endemic areas, including major urban centres[4].

According to WHO's External Situation Report issued on November 6, 2017, a total of 1 947 suspected cases of plague were reported from August 1 to November 3, 2017, including 143 deaths (case fatality rate: 7%) were reported. A total of 1 437 cases (74%) were clinically classified as pneumonic plague, 295(15%) were bubonic plague, one (0.0%) was septicaemic, and 211 (11%) were unspecified as classification of these cases were in progress. A total of 71 healthcare workers were affected but no fatal case was recorded. Of note, among those 1 473 clinical cases of pneumonic plague, 364 (25%) were laboratory confirmed either by polymerase chain reaction (PCR) or bacteriological culture, 555 (39%) were classified as probable after testing positive on rapid diagnostic tests (RDT) and 518 (36%) remained suspected as additional laboratory results are in progress. Among those laboratory confirmed cases, twenty-three strains of *Y. pestis* have been isolated and all were sensitive to antibiotics recommended by the National Program for the Control of Plague. Confirmed and probable pneumonic plague cases have been reported from 16 of 22 (73%) regions and the Analamanga Region has been the most affected, with 72% (1405) of all recorded cases[4] (Figure 1). Since mid- October 2017, the incidence of pneumonic plague and the overall hospitalisations due to plague infection have been declined across the country.

Figure 1 - Affected areas of plague in Madagascar, as of November 3, 2017. The small diagram indicates the most affected area (District of Antananarivo Renirohitra in Analamanga Region).

This outbreak is currently confined in Madagascar. Previously, there was a probable case of pneumonic plague reported to WHO from Seychelles MoH. The patient's specimen was tested negative on October 17, 2017. As of November 2, no plague cases have been confirmed in Seychelles or among other travelers from Madagascar.

Due to the increased risk of further spread and the severe nature of the disease, WHO considers the overall risk at the national level in Madagascar as very high. However, the risk of regional spread is moderate considering the occurrence of frequent travel by air and sea to neighbouring Indian Ocean islands and other southern and eastern African countries, and the observation of a limited number of cases in travellers. Based on the available information to date, the risk of international spread of plague appears very low. WHO advises against any restriction on travel or trade on Madagascar based on the available information.

At present, there is no airline with direct flight from Madagascar to Hong Kong. As a preventive measure, the Port Health Office (PHO) of the Centre for Health Protection (CHP) of the Department of Health regularly conducts body temperature screening at boundary control points with thermal imaging systems on inbound travellers. Suspected cases will be assessed and referred to healthcare facilities for further management. PHO provides the latest plague situation to travel agencies through the Travel Industry Council (TIC) of Hong Kong. Travel agencies were alerted about the outbreak of plague in Madagascar and to take appropriate precautionary measures in line with WHO's latest advice. Information was also published on the Security Bureau's Outbound Travel Alert webpage to remind travellers of the outbreak of plague in Madagascar, and to urge travellers to observe heightened vigilance on rodents, anti-flea precautions and strict environmental hygiene.

In Hong Kong, plague was epidemic from 1895 to 1929. Since then, Hong Kong has been free from plague. Plague is a notifiable infectious disease under the Prevention and Control of Disease Ordinance (Cap. 599) and doctors are required to report suspected or confirmed cases to CHP for investigations and control. CHP has been, and will continue to monitor the development of the disease outside Hong Kong and maintain a close communication with international health authorities for updated information as necessary.

In consideration of the growth in international travel and trade and the recent spread of disease to non-endemic areas, all travellers should be cautious about the disease especially when visiting Madagascar. Travellers should take heed of the health advice below during travel:

- Prevent flea bites by wearing long-sleeved shirts and trousers, and applying insect repellent/insecticide. DEET-containing insect repellent can be applied to exposed skin and clothing, while insecticide containing permethrin can be applied to clothing, not the skin;
- Avoid going to rural areas, camping or hunting;
- Never touch rodents, dead animals and their tissues or contaminated materials;
- Avoid close contact with patients, especially those with cough or chest infection;
- Avoid going to crowded areas;
- Seek medical care immediately in case of sudden onset of fever, chills, painful lumps, shortness of breath with coughing and/or blood-tainted sputum; and
- Consult a doctor immediately after contact or exposure to pneumonic plague patients or high-risk exposures, such as bites from fleas or direct contact with body fluids or tissues of potentially infected animals, for prompt assessment of the need for preventive medication.

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Recommendations on the Prevention and Control of Japanese Encephalitis (JE)

Reported by Dr Gladys YEUNG, Senior Medical and Health Officer, Enteric and Vector-borne Disease Office, Surveillance and Epidemiology Branch, CHP.

The Scientific Committee on Vector-borne Diseases (SCVBD) under the Centre for Health Protection (CHP) of the Department of Health has recently discussed the local epidemiology of JE and examined the current prevention and control measures, including JE vaccination and mosquito control.

Situation in Hong Kong

In Hong Kong, CHP recorded a total of 13 local JE cases from 2008 to 2017 (as of October 7, 2017), with the annual number ranging from zero to five (Figure 1). The territory-wide incidence for local JE cases was 0.017 per 100 000 population, which was lower than the JE incidence in Mainland China, Taiwan and Thailand after introduction of JE vaccination programme (0.07 to 0.12 per 100 000 population). SCVBD considered the territory-wide incidence rate of local JE cases in Hong Kong to be low.

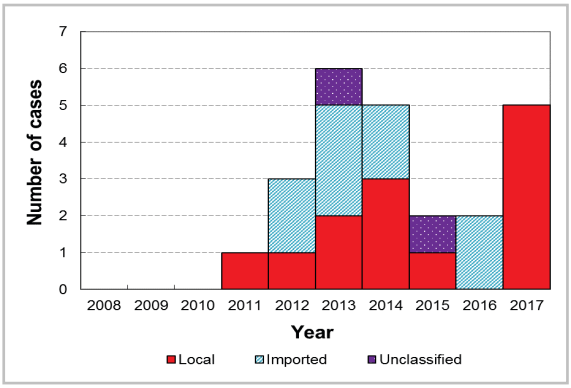

Figure 1 - Annual number of JE cases recorded by CHP from 2008 to 2017 (as of October 7, 2017).

In 2015, the World Health Organization (WHO) recommended that JE vaccination should be integrated into the immunisation programme where JE is recognised as a public health priority[1]. For the most affected age group in endemic areas, namely children under 15 years old, an incidence target of less than 0.5 per 100 000 was proposed. In Hong Kong, the incidence of local JE cases for the population living within 2 km of pig farms in Hong Kong (0.13 per 100 000 population) was 20 times higher than the incidence for population living outside 2 km from pig farms in Hong Kong (0.0062 per 100 000 population). Even for this high-risk area, the incidence rate was comparable to the incidence rates in some countries and areas where JE vaccination has been used to prevent JE after incorporation of the JE vaccine into the immunisation programmes in those countries and areas and lower than the target incidence of 0.5 per 100 000.

JE vaccine

Currently, an inactivated Vero cell derived JE vaccine (JE-VC)) and a live recombinant JE vaccine (JE-CV) are registered in Hong Kong. Both vaccines were found to have acceptable safety profiles by WHO. Although serious side effects are uncommon with these modern JE vaccines, the number of such serious side effects is directly proportional to the number of people vaccinated. A post-marketing surveillance study for JE-VC indicated that the rate of serious adverse events, hypersensitivity, and central nervous system adverse events were 1.8, 4.4 and 1.1 per 100 000 doses distributed, respectively[2].

SCVBD estimated that the number of serious side effects due to the JE vaccine may outweigh the protective benefits of the vaccine in preventing JE in areas where JE occurs infrequently. SCVBD has thus concluded that the risks of using JE vaccine in the Hong Kong population (including the population living within 2 km of pig farms) to prevent JE outweigh its benefits.

In Hong Kong, mosquito control is important for prevention of JE. An integrated approach, including using a JE vector surveillance programme for proactive response, and heightening of public awareness via annual anti-mosquito campaigns, which includes advice on personal protection, as well as adulticiding and larviciding at potential breeding places is adopted. In order to reduce number of adult mosquitoes and contact between mosquitoes and their hosts, the use of mosquito trapping devices would be further extended to housing estates, parks, and pig farms.

SCVBD recommended that measures for JE control should target areas around pig farms. Efforts for mosquito control for prevention of JE should continue with special attention to areas where pig farms, *Ardeid* birds and vector mosquitoes are known to be present. The current recommendation for travellers to endemic areas of JE should be maintained, i.e., 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. CHP will continue to keep abreast of relevant scientific literature on JE and review the recommendations in due course.

The Consensus Statement on Prevention and control of JE can be accessed from the CHP website at:
http://www.chp.gov.hk/files/pdf/consensus_statement_japanese_encephalitis_oct_2017.pdf.

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NEWS IN BRIEF

Human myiasis reported from May 1 to October 31, 2017

From May 1 to October 31, 2017, the Centre for Health Protection (CHP) of the Department of Health recorded seven cases of human myiasis, affecting three females and four males with age ranging from 40 to 99 years (median: 62 years). All of them had underlying illnesses. Most of patients (6, 85.7%) stayed in institutions including hospitals (3), elderly home (2), and rehabilitation centre (1), while one of them lived at home. Activities of daily living (ADL) of one patient and five patients were partially dependent and dependent respectively and one was ADL independent. Maggots were found from chronic wounds (2), tissue of gangrene toes (2), tracheostomy wounds (2) and ear external auditory canal (1) of the patients respectively. Six patients required hospitalisation and all patients were in stable condition. None of them have any recent travel history. Health advice on wound care as well as personal and environmental hygiene was given to the patients and the institutions.

A local sporadic case of listeriosis

On October 27, 2017, CHP recorded a case of listeriosis affecting a 38-year-old pregnant woman at 36 weeks of gestation with good past health. She presented with fever, chills, headache, myalgia, cough and runny nose on October 20. She was admitted to a public hospital on October 24. Her blood culture yielded *Listeria monocytogenes* and she was treated with antibiotics. Her condition remained stable and fetal assessment revealed no abnormalities. She had no recent travel history. She had consumed cream cheese during the incubation period and further investigation is underway. Her home contact was asymptomatic.

A probable case of sporadic Creutzfeldt-Jakob disease

CHP recorded a probable case of sporadic Creutzfeldt-Jakob disease (CJD) on November 1, 2017, affecting a 57 year-old man with underlying illnesses. He presented with dizziness and blurred vision on September 1, 2017, and was admitted to a public hospital on September 11. Subsequently, he developed progressive cognitive decline, visual disturbance, extrapyramidal symptoms, myoclonus and cerebellar signs. Findings from electroencephalography and magnetic resonance imaging of the brain were compatible with CJD. His condition was stable. No risk factors for either iatrogenic or variant CJD were identified. He was classified as a probable case of sporadic CJD.

Nov 5 - Nov 18 2017 WEEKS 45 - 46 VOL 14 ISSUE Nº 23

Communicable Diseases WATCH

衛生防護中心 Centre for Health Protection 衛生署 Department of Health

FEATURE IN FOCUS

Antibiotic Awareness Week 2017

Reported by Dr Edman TK LAM, Senior Medical and Health Officer, and Dr TY WONG, Head, Infection Control Branch, CHP.

Antibiotic Awareness Week 2017 (November 13 to 19, 2017)

The Centre for Health Protection (CHP) of the Department of Health launched the Antibiotic Awareness Week (AAW) 2017 on November 13 to 19, 2017 to tie in with the third World AAW initiated by the World Health Organization (WHO), to increase awareness of global antimicrobial resistance (AMR) and to encourage best practices among the general public, health workers and policy makers to avoid the further emergence and spread of AMR. The theme of this year "Seek advice from a qualified healthcare professional before taking antibiotics" is to raise awareness of the need to preserve the power of antibiotics through appropriate use.

AMR is considered as one of the greatest threats to global health and economy. WHO has come up with the Global Action Plan on AMR in 2015. The Government of Hong Kong Special Administrative Region announced in the 2016 Policy Address to set up a multi-sectoral High-Level Steering Committee on AMR to formulate strategies and implement actions. The Hong Kong Strategy and Action Plan on AMR (2017-2022) was formulated under the 'One Health' framework in July 2017. It outlines key areas, objectives and actions to contain the growing threats of AMR in Hong Kong. One of its key areas is to optimise the use of antibiotics through implementation of Antibiotic Stewardship Programme (ASP).

CHP organised a half day event "AAW 2017 cum Seminar on ASP in Primary Care and Hospital Settings" in the lecture theater of CHP on November 13, 2017 as part of the publicity activities of AAW. During the event, the Controller of CHP, Dr WONG Ka-hing, together with representatives from medical and pharmacology sectors officiated the launching ceremony of AAW 2017. ASP in Primary Care and the fifth edition of Interhospital Multi-disciplinary Programme on Antimicrobial ChemoTherapy (IMPACT) were officially launched. Furthermore, experts in Clinical Microbiology and Infection, Infectious Diseases and Family Medicine held presentation and discussion sessions on antibiotic resistance and stewardship in primary care and hospital settings.

An Advisory Group on Antibiotic Stewardship in Primary Care chaired by Dr Angus MW CHAN, the President of the Hong Kong College of Family Physicians, was formed early this year. It comprises of key stakeholders in public and private sectors, academia and major professional societies, to formulate guidance notes and to advise on strategies to enhance ASP in primary care. Guidance notes on antibiotic treatments for different common infections including acute pharyngitis, acute uncomplicated cystitis in women and simple (uncomplicated) skin and soft tissue infections are developed, based on the best available clinical evidence and common local practice for each infection. As the guidance notes are developed in consultation with key stakeholders in primary care settings, the recommendations can be tailored to their needs. The guidance notes will be continuously reviewed and updated with reference to the latest research, together with local prevalence of pathogens and associated antibiotic susceptibility profiles, so that family doctors and healthcare professionals can have updated information as reference. New guidance notes will also be developed in due course. In addition, patient education materials are available for patients to raise their awareness and enable them to use

antibiotics appropriately. Family doctors in primary care play an important role in AMR containment measures, not only by practicing rational antibiotics prescription, but also educating and empowering patients on safe use of antibiotics during clinical encounters. The guidance notes and related materials could be accessed through the thematic website of ASP in primary care. Territory-wide medical education and training sessions will be arranged to promulgate the programme.

The IMPACT guidelines have been regularly reviewed and updated, since its first edition published in 1999, and served as invaluable reference tools for medical and health professionals in hospitals to guide appropriate clinical management of infectious diseases in hospitals and thus reduce unnecessary antibiotic prescriptions. An IMPACT Editorial Board chaired by Dr HO Pak-leung was formed in 2016 to revise the IMPACT. All parts have been updated base on the local epidemiology and international recommendations. A new section on tuberculosis has also been added. A new website has been launched as a one-stop portal for the IMPACT guidelines, with interactive medical calculators and easy-to-read antibiograms of public and private hospitals to enhance its accessibility for healthcare professionals. Mobile applications in iPhone and Android interfaces have also been updated.

Alongside, CHP is going to launch a mass media campaign to promulgate the importance of judicious use of antibiotics to the general public through diverse medium including broadcast of health messages in TV, Radio, public transportations and social media. Act now to preserve the power of antibiotics! Do show your commitment and support on responsible use of antibiotics by signing "I Pledge".

Please visit our miniwebs for further information:

- Antibiotic Awareness Week 2017 (http://www.chp.gov.hk/en/view_content/49851.html)
- Antibiotic Stewardship Programme in Primary Care (http://www.chp.gov.hk/en/view_content/49811.html)
- IMPACT (http://impact.chp.gov.hk/)

Photo 1 - Dr WONG Ka-hing (centre), Controller, CHP and other guests officiated the launching ceremony during Antibiotic Awareness Week 2017 cum Seminar on Antibiotic Stewardship Programme in Primary Care and Hospital Settings on November 13, 2017.

Photo 2 - Dr Angus MW CHAN (5th from the left), Chairman, Advisory Group on Antibiotic Stewardship in Primary Care and other members attending the Antibiotic Awareness Week 2017 cum Seminar on Antibiotic Stewardship Programme in Primary Care and Hospital Settings on November 13, 2017.

Photo 3 - Dr HO Pak-leung (6th from the left), JP, Chairman, IMPACT Editorial Board and other members attending the Antibiotic Awareness Week 2017 cum Seminar on Antibiotic Stewardship Programme in Primary Care and Hospital Settings on November 13, 2017.

Update on novel influenza A infection

Reported by Ms Chloe POON, Scientific Officer, Respiratory Disease Office, Surveillance and Epidemiology Branch, CHP.

Overview

There are various subtypes of influenza A viruses. Apart from seasonal influenza A viruses (i.e. H3N2 and H1N1pdm09) circulating among humans, there are many other non-seasonal influenza A viruses that are mainly found in animals. These viruses are distinct from the seasonal influenza viruses and are not easily transmitted to humans. However, some of them may occasionally cross the species barrier and infect humans, causing diseases of different severity. These viruses are known as novel influenza A viruses. The human population generally has little or no immunity against them. A pandemic will occur if a novel influenza virus acquires the ability of efficient human-to-human transmission through genetic changes. In this article, we reviewed the global situation of novel influenza A infections in humans in the recent one year.

Avian influenza viruses

Avian influenza viruses mainly affect birds and poultry. Birds and waterfowl are natural reservoirs of avian influenza viruses. Human infections with various subtypes of influenza A have occurred in the past, including H5N1, H5N6, H6N1, H7N2, H7N3, H7N7, H7N9, H9N2, H10N7 and H10N8. In 2017 (as of November 20), human infections with H5N1, H5N6, H7N9 and H9N2 viruses have been reported so far.

H5N1

Four human H5N1 cases have been reported to the World Health Organization (WHO) in 2017 (as of October 30), as compared with 10 cases and 145 cases reported in 2016 and 2015 respectively (according to onset date). The four cases occurred in Egypt (3) and Indonesia (1). Among them, two cases recovered and two cases died. No human H5N1 case has been detected in Hong Kong in the past five years. The last case in Hong Kong was an imported case from Guangdong (廣東) detected in June 2012. No locally acquired human H5N1 case has been detected after 1997.

H5N6

One human H5N6 case has been reported by the National Health and Family Planning Commission (NHFPC) in 2017 so far. The case affected was a 33-year-old male from Guangxi (廣西) with live poultry exposure before onset, and he was in serious condition at time of reporting. Since 2014, a total of 17 sporadic human cases (including at least 11 deaths) have been reported by NHFPC and all occurred in Mainland China. No human H5N6 case has been detected in Hong Kong so far.

H7N9

Since the emergence of human cases of H7N9 infection in Mainland China in March 2013, there have been five distinct waves of human infection (Figure 1). The most recent wave (fifth wave) occurred from October 2016 to September 2017. It was the most severe one among the five waves, with 766 human H7N9 cases reported globally (Table 1) as compared with a total of 798 cases reported during all the previous four waves combined.

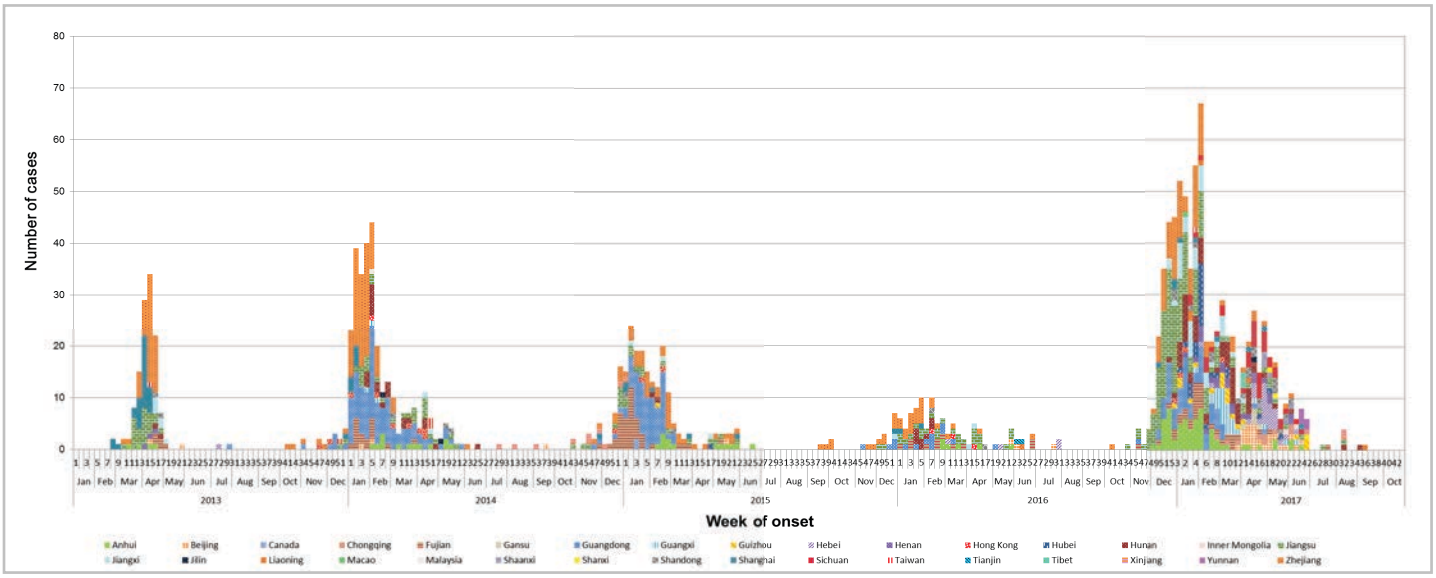

Figure 1 - Weekly number of human H7N9 cases by onset date, 2013-2017.

In the fifth wave, Jiangsu (江蘇), Zhejiang (浙江), Anhui (安徽) and Guangdong were the provinces that reported the greatest numbers of cases (148, 91, 63 and 63 respectively). Besides, the affected areas have spread to western China with eight provinces/ municipalities/autonomous regions (Chongqing (重慶), Gansu (甘肅), Inner Mongolia (內蒙古), Shaanxi (陝西), Shanxi (山西), Sichuan (四川), Tibet (西藏) and Yunnan (雲南)) reported cases for the first time in this wave (Figure 2).

Locally, five imported human H7N9 cases were reported in the fifth wave with the last case confirmed on March 7, 2017. Two cases died while the remaining cases recovered. In comparison, zero, 10, three and three cases had been reported in the first, second, third and fourth wave respectively.

The epidemiological and clinical characteristics of the cases reported in the fifth wave were similar to those in the previous waves[1]. Among the 766 reported cases, their ages ranged from three to 91 years (median: 57 years). The male-to-female ratio was 2.5:1. Most cases presented with severe conditions, and were known to have exposure to live poultry or contaminated environments such as live poultry markets. At least 313 cases (41%) were reported to be fatal cases.

Among the cases reported from Mainland China in the fifth wave, a total of 14 clusters of human cases were detected, compared with an average of 6.5 clusters in each of the previous waves (range four to 11 clusters)[2] (Table 2). Twenty-nine of the 758 cases (3.8%) were involved in clusters in the fifth wave as compared with 55 of the 775 cases (7.1%) in the previous four waves. According to WHO, even though small clusters of cases have been reported, including those involving healthcare workers, current epidemiological and virological evidence suggested that avian influenza viruses have not acquired the ability of sustained transmission among humans.

Table 1 - Human H7N9 cases reported in the fifth wave (October 1, 2016-September 30, 2017) by place of report.

Place of report	Number of cases	Onset date of the last reported case	Remark
Mainland China	758	September 3, 2017	Occurred in 27 provinces/ municipalities/ autonomous regions
Hong Kong	5	March 3, 2017	Four cases imported from Guangdong and one case imported from Fujian (福建)
Macau	2	January 8, 2017	One case imported from Guangdong and one case having exposure to poultry imported from Guangdong
Taiwan	1	January 23, 2017	Imported from Guangdong

Figure 2 - Places with human H7N9 cases reported in the fifth wave.

According to the United States (US) Centers for Disease Control and Prevention (CDC), based on publically available genetic data, about 10% of viruses from the fifth wave carried genetic markers indicating reduced susceptibility to one or more neuraminidase inhibitor antiviral medications[4]. In Hong Kong, analysis of the neuraminidase gene of the H7N9 viruses from the imported cases did not reveal any mutation associated with reduced susceptibility to neuraminidase inhibitors.

Before the fifth wave, H7N9 viruses were known to be low pathogenic viruses in poultry and birds, and infected poultry and birds usually did not display any symptoms. In the fifth wave, outbreaks of highly pathogenic avian influenza (HPAI) A(H7N9) have occurred in multiple areas in Mainland China. The emerging HPAI viruses possessed multiple amino acid insertions at the haemagglutinin protein cleavage site and have caused high mortality in birds and poultry. In the fifth wave (as of July 14, 2017), 28 human cases of HPAI H7N9 infection (including 16 deaths) have been identified[5]. Human infection with HPAI H7N9 was associated with exposure to sick and dead backyard poultry in rural areas. The epidemiologic characteristics and disease severity of the HPAI H7N9 case-patients were found to be similar to those observed in patients infected with low pathogenic H7N9 viruses[6].

Table 2 - Comparison of clusters of human H7N9 cases[3].

		Previous four waves	Fifth wave
Total number of clusters		26	14
Total number of cases involved in clusters (% of total reported cases)		55(7.1%)	29 (3.8%)
Number of cases in each cluster (median)		2-3 (2)	2-3 (2)
Number of secondary cases		29	15
Exposure history of secondary cases	Contact with index case-patient only but without poultry exposure	10	4
	Contact with index case-patient and known poultry exposure	19	11

According to WHO, most human cases were exposed to avian influenza viruses through contact with infected poultry or contaminated environments, including live poultry markets. Since the H7N9 viruses continue to be detected in poultry and environments in Mainland China, further human cases are expected to occur from time to time, but the likelihood of sustained human-to-human transmission remains low. Based on past epidemiological pattern, it is expected that the activity of H7N9 will increase again when the winter approaches.

H9N2

Four sporadic cases of human H9N2 infection have been reported by NHFPC in 2017 so far. Three cases affected young children aged less than one year while the remaining case affected a 32-year-old man. All cases presented with mild illness. Two cases reported poultry exposure prior to symptom onset. Locally, the latest human H9N2 case was an imported case from Shenzhen (深圳) reported in December 2013.

Swine influenza viruses

Influenza viruses of swine origin circulate and cause outbreaks in pigs, and may occasionally infect humans. When these viruses are found in humans, they are called 'variant viruses' in order to distinguish them from human seasonal influenza viruses. Examples of human infection with swine influenza viruses are influenza A(H1N1) variant virus (H1N1v), influenza A(H1N2) variant virus (H1N2v) and influenza A(H3N2) variant virus (H3N2v). In 2017, human cases of H1N1v, H1N2v and H3N2v have been reported.

H1N1v

Two human cases of H1N1v have been reported in 2017[7]. The first case was an Italian male in his 40's with obesity who developed severe acute distress respiratory syndrome in October 2016. The patient required mechanically ventilation and extracorporeal membrane oxygenation. He subsequently recovered. He had contact with pigs on a pig farm[8]. The second case was reported from Switzerland in February 2017 affecting a 23-year-old male farm worker who presented with mild acute respiratory symptoms. Samples from the swine at the farm where the patient worked also tested positive for swine H1N1 viruses.

H1N2v

Four human H1N2v cases were reported in 2017 (as of October 31) and all occurred in the US (Ohio [3] and Colorado [1]). All cases reported contact with swine at agricultural events prior to onset of illness. They did not require hospitalisation and had fully recovered. Since 2005, 13 cases have been reported by US CDC. Most cases were associated with mild illness and two had been hospitalised but had recovered. There has been no confirmed human H1N2v case in Hong Kong so far.

H3N2v

In 2017 (as of October 31), 61 human H3N2v cases have been reported and all occurred in the US (Maryland [39], Ohio [15], Michigan [2], Delaware [1], Nebraska [1], North Dakota [1], Pennsylvania [1] and Texas [1]). There was a large outbreak in Maryland in September 2017 affecting 39 individuals. The majority of the cases reported exposure to swine in fair settings during the week preceding illness onset. The case in Nebraska reported no contact with swine during the week preceding illness onset, however a household member did report exposure to swine. The latest case in Michigan was a close contact of a previously reported laboratory-confirmed H3N2v case. It is possible that limited human-to-human transmission occurred, however no ongoing human-to-human transmission has been identified[9]. Only five out of the 61 patients required hospitalisation and all cases recovered[10].

Up to the end of October 2017, a total of 413 cases with H3N2v infections have been recorded by US CDC since 2012 (Figure 3). In Hong Kong, a case of H3N2v was detected in 1999 affecting a 10-month-old girl who had fully recovered[11]. No other H3N2v case has been detected in Hong Kong after this case.

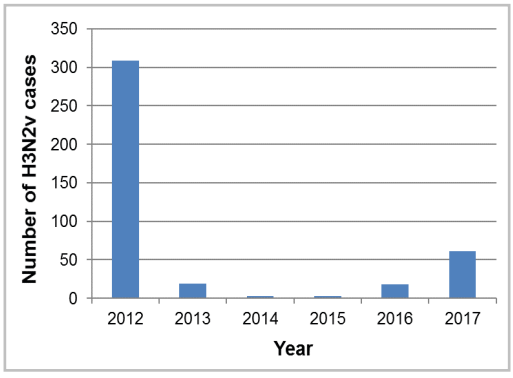

Figure 3 - Annual number of H3N2v infections reported by US CDC, 2012-2017 (as of October 31, 2017).

According to WHO, swine influenza viruses circulate in swine populations in many regions of the world. Most human infections with swine influenza viruses were exposed to the swine influenza viruses through contact with infected swine or contaminated environments. Human infection tends to result in mild clinical illness. Since these viruses continue to be detected in swine populations, further human cases or outbreaks can be expected. Current evidence suggests that these viruses have not acquired the ability of sustained transmission among humans, so the risk of community-level spread is considered low.

The Centre for Health Protection of the Department of Health will continue to closely monitor the latest development of avian and other novel influenza viruses around the world and maintain close liaison with WHO, NHFPC, and the health authorities of Guangdong, Macau, neighbouring and overseas countries to obtain the latest information.

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NEWS IN BRIEF

A sporadic case of listeriosis

On November 13, 2017, the Centre for Health Protection (CHP) recorded a sporadic case of listeriosis affecting a 75-year-old woman with underlying illnesses. She was admitted to a public hospital for management of her underlying illnesses on November 1. She developed diarrhoea since November 8. Her blood culture collected on November 9 grew *Listeria monocytogenes*. She was treated with courses of antibiotics. Her condition gradually deteriorated and she passed away on November 19 due to underlying illness. Investigation could not identify any high risk food item consumed by her during the incubation period. She had no recent travel history and her household contacts remained asymptomatic.

CA-MRSA cases in October 2017

In October 2017, CHP recorded a total of 103 cases of community-associated methicillin resistant *Staphylococcus aureus* (CA-MRSA) infection, affecting 58 males and 45 females with ages ranging from seven months to 92 years (median: 36 years). Among them, there were 72 Chinese, 10 Filipinos, 5 Caucasian, 4 Pakistani, 3 Indian, 1 Indonesian, 1 Korean, 1 Nepalese and 6 of unknown ethnicity. All cases presented with uncomplicated skin and soft tissue infections.

Separately, the isolate of one case affecting a six-year-old girl was found to be resistant to mupirocin. The patient presented with skin infection on her left chest and recovered after antibiotic treatment.

Besides, there were two clusters identified. One was the household contact of another case recorded in June. One case lived in a drug treatment and rehabilitation centre and was epidemiologically linked to another case in the same centre previously reported in September. Decolonisation was provided to the close contacts in this centre. No cases involving healthcare worker were reported during this reporting period.

Scarlet fever update (October 1, 2017 – October 31, 2017)

Scarlet fever activity in October increased as compared with that in September. CHP recorded 154 cases of scarlet fever in October as compared with 91 cases in September. The cases recorded in October included 95 males and 59 females aged between four months and 39 years (median: six years). There were six institutional clusters occurring in two kindergartens and four primary schools, affecting a total of 15 children. No fatal cases were reported in October. Of note, there has been a marked increase in scarlet fever activity since late October. Based on the past epidemiological pattern, the activity of scarlet fever is expected to remain at a high level in the coming few months. Parents have to take extra care of their children in maintaining strict personal, hand and environmental hygiene. People suspected to have scarlet fever should consult a doctor promptly.

Nov 19 - Dec 2 2017 WEEKS 47 - 48 VOL 14 ISSUE Nº 24

Communicable Diseases WATCH

衛生防護中心 Centre for Health Protection 衛生署 Department of Health

FEATURE IN FOCUS

Exercise "Garnet" tests government response to novel influenza

Reported by Emergency Response and Information Branch, CHP.

The Centre for Health Protection of the Department of Health (DH), in collaboration with other government departments and organisations, tested its preparedness for the scenario of detection of a novel human influenza case in November 2017 during an exercise code-named "Garnet".

The exercise was aimed at assessing the interoperability of government departments and organisations in response to the detection of a case of novel human influenza, testing their execution of the Preparedness Plan for Influenza Pandemic, as well as enhancing the alertness and readiness of relevant stakeholders in guarding Hong Kong against novel influenza and the threat of the spread of communicable disease.

The exercise consisted of two parts. The first part was a table-top exercise conducted on November 15, 2017, in which relevant departments and organisations discussed and co-ordinated the communicable disease response measures required in the simulated scenario of detection of a confirmed case of novel human influenza in Hong Kong.

The second part was a ground movement exercise conducted on November 30, 2017. Under the exercise simulation, a staff member of a telecommunications company working at Wo Che Plaza, Sha Tin, was tested positive for novel influenza virus. Initial epidemiological investigations revealed that the staff member had no poultry contact locally, but she had travelled to a country with a novel influenza outbreak. Among other staff members who had close contact with her, some had also developed symptoms of novel influenza.

DH responded immediately and co-ordinated with relevant departments and organisations to formulate and implement corresponding measures. In addition to conducting on-site assessment and epidemiological investigations by its Public Health Team, DH also advised relevant stakeholders on infection control measures, prescribed antiviral prophylaxis for the close contacts, and instructed the shopping mall operator and its cleaning services company to disinfect the contaminated areas (Photo 1 - 3).

About 50 participants from relevant government departments and organisations took part in the exercise, including 11 experts from the Mainland and Macau health authorities as observers. The exercise provided a valuable opportunity for relevant government departments and organisations to test and assess the effectiveness of the Government's preparedness and response plans as well as procedures for communicable diseases, and carry out preventive measures with dedication. It also helped to enhance preparedness of relevant stakeholders in the control and prevention of communicable diseases.

Photo 1 - Director of Health, Dr Constance Chan (front row, second right), and Controller, Centre for Health Protection, Dr Wong Ka-hing (front row, first right), were inspecting the exercise at the plaza, during which a close contact in the simulated scenario was transferred from the plaza to an ambulance by Fire Services Department officers.

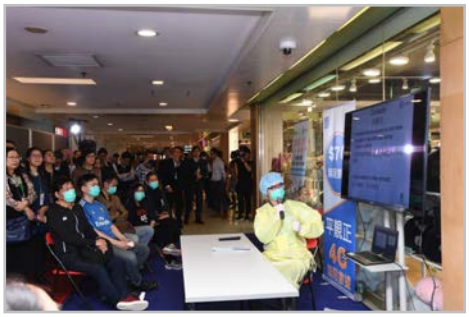

Photo 2 - DH was holding a briefing for the staff members concerned in the simulated scenario under the exercise and advising them on infection control measures.

Photo 3 - The cleaning services company of the shopping mall operator was conducting cleaning and disinfection work in the affected areas under the supervision of personnel from DH.

Summary on the recent upsurge of hepatitis A infection among MSM in Hong Kong

Reported by Dr Billy HO, Senior Medical and Health Officer, Communicable Disease Division, Surveillance and Epidemiology Branch, and Dr Bonnie WONG, Senior Medical and Health Officer, Dr Kenny CHAN, Consultant, Special Preventive Programme, Public Health Services Branch, CHP.

The Centre for Health Protection (CHP) of the Department of Health (DH) has recorded an unusual upsurge of acute hepatitis A (HAV) infection affecting men who have sex with men (MSM) since August 2016. Initially the upsurge of cases was identified among the attendees of Integrated Treatment Centre (ITC), Special Preventive Programme of CHP who were human immunodeficiency virus (HIV) positive. More cases were subsequently identified via retrospective investigations and prospective reporting, which were shown to affect HIV negative MSM as well.

CHP published two articles in *Communicable Disease Watch* reporting this outbreak and updating the number of reported HAV infection cases among MSM in Hong Kong in February and June, 2017 respectively. (Volume 14, Number 3; Jan 29 – Feb 11, 2017 at http://www.chp.gov.hk/files/pdf/cdw_v14_3.pdf and Volume 14, Number 12; Jun 4 – Jun 17, 2017 at http://www.chp.gov.hk/files/pdf/cdw_v14_12.pdf). In this article, we provide an update of the progress of the outbreak and the public health control measures the CHP have implemented so far.

Epidemiological update on the outbreak

A confirmed case was defined as a laboratory-confirmed HAV infection with clinical symptoms in an individual identified as MSM. Between September 2015 and November 24, 2017, CHP recorded 53 cases, peaking in end 2016 to early 2017 when three to seven cases were recorded each month (Figure 1 and 2). It was noted that the number of HAV cases among MSMs has now stabilised to a low level (zero to one case per month) since August 2017, after implementation of control measures. Reviewing the trend of outbreak in Hong Kong and similar reports in overseas countries and areas, MSM has become a significant risk factor for HAV infection and we considered this factor will persist in local community.

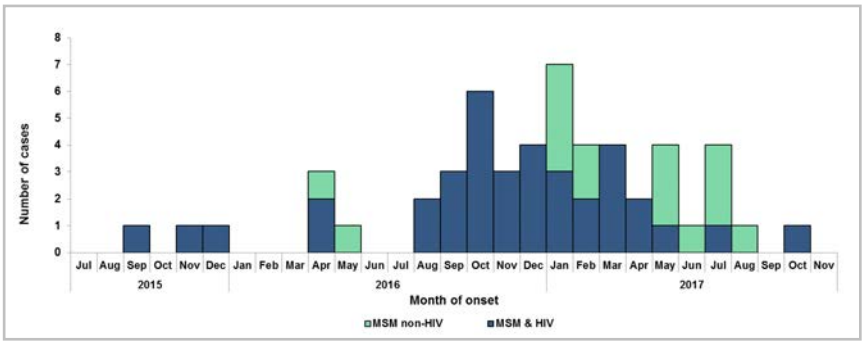

Figure 1 - Hepatitis A cases among known MSM, by HIV status, July 2015 – November 2017 (as of November 24, 2017).

Descriptive epidemiology of the confirmed cases

The age range of the 53 cases was 20 to 55 years (median: 33 years). They had symptom onset from September 2015 to October 2017. Forty-five (84.9%) required hospitalisation and no fatalities were recorded. Thirty-seven cases (69.8%) were known to be HIV positive attending one of the three designated public HIV clinics.

Apart from two cases (3.8%) who had received hepatitis A vaccine two weeks and one year prior to symptom onset respectively, the rest (51 cases, 96.2%) did not report history of HAV vaccination. Eighteen (33.9%) of the 53 cases reported travel history within the incubation period, and the most common regions they had visited were Mainland China (5), Japan (4) and Taiwan (4).

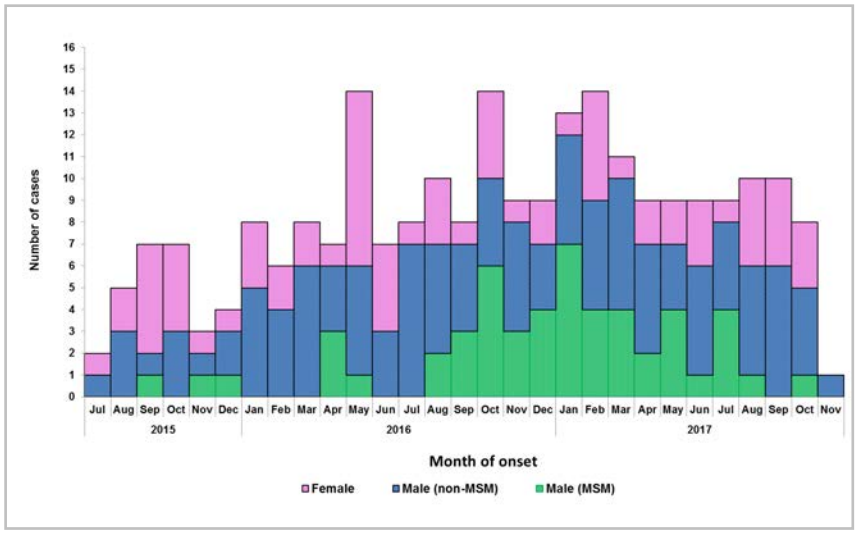

Figure 2 - Hepatitis A cases recorded by CHP, July 2015 - November 2017 (as of November 24, 2017).

Thirteen cases (24.5%) had undergone screening of sexually transmitted infections (STIs) and were diagnosed to have concurrent infections (including syphilis, gonorrhea, chlamydia infection) during or within one month of their HAV diagnosis. Fourteen cases (26.4%) admitted to have oral-anal sex with their sexual partners during the incubation period.

Regarding microbiological investigations, forty-three (81.1%) cases had specimen available for laboratory analysis, all of which belonged to genotype IA, while 27 (62.8%) had identical nucleotide sequences within the genotyping window.

Apart from one cluster affecting two patients who were sex partners residing together, no other epidemiological linkage among these cases could be found. No common food nor water source or social gathering was identified among these cases. Epidemiological investigations thus far suggested that the outbreak was contributed by transmission by way of sexual contact between men, a high proportion of whom were HIV-infected.

Hepatitis A vaccination for MSM

To control the outbreak, a hepatitis A vaccination campaign was launched in February 2017 for around 2 000 eligible HIV-infected MSM clients attending the three HIV clinics of the DH and Hospital Authority (HA). Vaccination was also offered to MSM attending designated Social Hygiene Clinics (SHCs). Vaccination coverage had reached over 90% among HIV-infected MSM who have been linked to clinical care in public sector.

To date, the vaccination arrangements have reached their objectives and the number of MSM reported to have hepatitis A has stabilised to a low level in recent months. Nonetheless, the Scientific Committee on AIDS and STI, and Scientific Committee on Vaccine Preventable Diseases extended their recommendation for hepatitis A vaccine to MSM. Therefore, DH will, where appropriate, continue to provide hepatitis A vaccination for MSM attendees, not only at ITC, but also at Male SHCs in Wan Chai, Yau Ma Tei and Fanling, as well as STI screening and treatment.

Risk assessment and publicity

Despite a decreasing number of cases reported in recent months, CHP will continue to keep abreast of the progress of the outbreak and will review control strategy in due course.

HAV outbreak among MSM is still ongoing in low HAV endemicity countries in the European Region[1] and in the Americas[2]. Given the higher potential of acquiring HAV in the MSM community and the high interconnectedness through global travel of this risk group, CHP will continue to closely monitor the global situation and remain vigilant at all time.

Apart from continual health education and counselling to MSM that have already been linked to clinical care, promotion of HAV vaccination would be further reinforced, especially among non-HIV infected MSM, via collaboration with NGOs serving the MSM community and via different communication platforms.

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NEWS IN BRIEF

A local sporadic case of psittacosis

On November 21, 2017, the Centre for Health Protection (CHP) recorded a local sporadic case of psittacosis affecting a 46-year-old man with underlying illnesses. He developed fever, chills and rigors on November 5. He attended the Accident and Emergency Department of a public hospital on November 9 and was admitted on the same day for management. His sputum collected on November 10 was tested positive for *Chlamydophila psittaci* DNA by polymerase chain reaction (PCR). He was treated with course of antibiotics. He recovered and was discharged on November 15.

Epidemiological investigation revealed that the patient had reared two pet birds at home during incubation period. According to the patient, the birds remained asymptomatic. He denied contact with any sick bird or bird carcass during the incubation period. He had no recent travel history and his home contacts remained asymptomatic. CHP visited the patient's home with the Agricultural, Fisheries and Conservation Department (AFCD) on November 23. Swabs taken from the birds' cages and their droppings were tested negative for *Chlamydophila psittaci* DNA by PCR.

NEWS IN BRIEF

A sporadic case of necrotizing fasciitis due to *Vibrio vulnificus* infection

On November 30, 2017, CHP recorded a sporadic case of necrotizing fasciitis caused by *Vibrio vulnificus* affecting an 84-year-old woman with pre-existing medical conditions. She presented with fever, left shin redness and painful swelling on November 26. She was admitted to a public hospital on November 27 and the diagnosis was necrotizing fasciitis. She was treated with antibiotics and surgical debridement. Necrotic tissue collected from her left shin was tested positive for *Vibrio vulnificus*. Her current condition was stable. According to the patient's relatives, the patient cut her left shin accidentally by a knife at home and had handled raw fish during incubation period. She had no recent travel history.

Infectious Disease Forum on Plague on November 28, 2017

An infectious disease forum on 'Plague outbreak in Madagascar' was conducted on the November 28, 2017 in view of the unusually large outbreak that occurred there recently. The aim of the event was to familiarise healthcare workers with important aspects of the infectious disease, including port health control measures, epidemiological investigations, clinical management, infection prevention and pest control, so that we can be better equipped for the possible event of an imported case. Local speakers from the Centre for Health Protection (Port Health Office, Surveillance and Epidemiology Branch and Infection Control Branch), Hospital Authority (Infectious Disease Centre of Princess Margaret Hospital) as well as Food and Environmental Hygiene Department were invited to give talks on their own specialty areas. The forum was well received by the audience, which consisted of medical and nursing staff from both public and private sectors. Presentation materials have been uploaded to the Hong Kong Training Portal on Infection Control and Infectious Diseases (http://icidportal.ha.org.hk/).

Photo 1 - Speakers and audience were listening to welcome remarks by Dr. TY Wong, Head of Infection Control Branch, Centre for Health Protection.

Photo 2 - Ms. MY Fok, Head of Disease Response & Education Unit, Food and Environmental Hygiene Department gave a presentation on Rodent Situation and Control Strategy in Hong Kong.

Dec 3 - Dec 16 2017 WEEKS 49 - 50 VOL 14 ISSUE Nº 25

FEATURE IN FOCUS

Review of Monkeypox and Smallpox

Reported by Dr Eric LAM, Medical and Health Officer, Communicable Disease Surveillance and Intelligence Office, Surveillance and Epidemiology Branch, CHP.

Smallpox is a serious, acute infectious disease caused by variola virus which is under the genus of orthopoxvirus. It is transmitted through respiratory droplets from infected persons. The incubation period is usually 10 to 14 days, with a range from seven to 19 days[1]. Early symptoms include high fever and headache, followed by maculopapular rash two to four days later which spreads from the face to all parts of the body. The skin sores sequentially become vesicular and pustular, before they turn into crusts and scab over. Smallpox has a case fatality of up to 30%[2]. There is no cure for smallpox, but vaccination can effectively prevent infection if given within four days after exposure to the virus[2].

Smallpox was once one of the most feared infectious diseases in human history. It was declared eradicated on May 8, 1980 by the 33rd World Health Assembly following a global immunisation campaign led by the World Health Organization (WHO). The last natural case of smallpox occurred in Somalia in 1977. Since then, one smallpox outbreak involving two cases and one fatality has been reported in Birmingham, England, in 1978, which was due to accidental exposure to variola virus in a research laboratory. In the wake of this accident, it was agreed by the international community to gradually reduce the number of laboratories holding stocks of variola virus. Today all the stocks of variola virus are stored in two secure WHO reference laboratories, one in the United States and the other in the Russian Federation[1,2].

Eradication eventually led to the global cessation of vaccination with the smallpox vaccine. Currently the majority of the global population <40 years has been neither vaccinated against, nor exposed to, smallpox and therefore remains vulnerable to the virus today. In the past 15 years, attention has shifted from the risk of a laboratory accident to the possibility of a deliberate release of the virus as an act of bioterrorism[3].

Smallpox is a notifiable infectious disease in Hong Kong. It has been once made non-notifiable in 1994 but made notifiable in 2008 again. The last Smallpox case in Hong Kong was reported in 1952.

Monkeypox is a rare zoonosis caused by monkeypox virus which, like the variola virus causing smallpox, also belongs to the genus of orthopoxvirus. The virus was first discovered in 1958 in monkeys kept for research, hence the disease was named 'monkeypox'.

Infection could occur when a person comes into contact with the virus from animals, humans or contaminated materials. Humans could get infected from various wild animals, such as some species of primates, rodents and squirrels, etc., through bite or scratch, or direct contact with their body fluids. Human-to-human transmission is also possible through respiratory droplets during prolonged face-to-face contact or direct contact with body fluids.

The incubation period is usually from six to 16 days, with a range from five to 21 days[4]. The symptoms are similar to those of smallpox, but in milder forms. The first few days after infection with monkeypox are characterised by fever, intense headache, myalgia and lymphadenopathy. Rash appears about one to three days after onset of fever, and spreads from the face to other parts of the body. The case fatality in previous monkeypox outbreaks has been between 1% and 10%[4].

Some patients with monkeypox develop severe swollen lymph nodes before the appearance of the rash, which is a distinctive feature of monkeypox compared to other similar diseases such as chickenpox. In addition, monkeypox can only be diagnosed definitively in the laboratory through virus isolation, antigen and nucleic acid detection, etc[4].

Since first reported in humans in 1970 in the Democratic Republic of Congo (then known as Zaire), most of the reported monkeypox outbreaks have occurred in Central and West Africa. While smallpox has been eradicated for more than three decades, today monkeypox still occurs in some remote parts of Central and West Africa[4]. In 2003, a shipment of animals from Ghana introduced monkeypox virus into the United States which caused an outbreak affecting 47 persons. It was the first time human monkeypox case reported outside Africa[4,5,6].

More recently in October 2017, a major monkeypox outbreak was reported in Nigeria. The investigation established that the initial cluster of cases had regularly played with a captured monkey in their neighbourhood, which was killed and eaten by them about one month prior to onset of their illness. The initial confirmation of this outbreak had been challenged by long delays in the collection, referral and testing of samples[7]. However with the support of the international community led by WHO, the Nigerian State Ministry of Health rapidly scaled up its outbreak response and contained further spread of the disease, through strengthened surveillance, case management, contact tracing and public education. As of December 9, 2017, there were a total of 172 cases reported from 22 states and the Federal Capital Territory across Nigeria, among them 61 were laboratory confirmed, with one fatality recorded in a case with immunocompromised condition[8] (Figure 1).

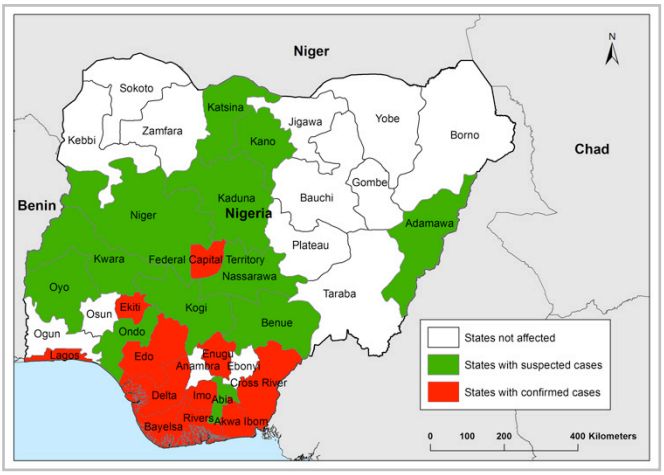

Figure 1 – Distribution of Monkeypox Cases in Nigeria, as of December 9, 2017.

There is currently no treatment or vaccine available for monkeypox, although previously it has been shown that smallpox vaccine may also be effective in preventing monkeypox. To reduce the risk of infection during human monkeypox outbreaks, members of the public should:

- Avoid close physical contact with sick persons or animals;
- Wear protective clothing and equipment including gloves and surgical masks when taking care of ill people or handling animals, and carry out regular hand washing after these procedures;
- Thoroughly cook all animal products before eating; and
- Seek medical advice promptly for any suspicious symptoms.

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NEWS IN BRIEF

A domestic cluster of pertussis

In December 2017, the Centre for Health Protection (CHP) recorded a domestic cluster of pertussis affecting a two-month-old girl and her 22-month-old elder sister. The baby girl presented with cough, runny nose with reduced appetite since December 1 and was admitted to a public hospital on December 10. Her pernasal swab was tested positive for *Bordetella pertussis*. She was treated with antibiotic and was discharged on December 17. Contact tracing revealed her 22-month-old elder sister had cough since November 28. She was then referred to the Accident and Emergency Department of a public hospital on December 12. She did not require hospital admission. She was given antibiotics and remained in stable condition. Her pernasal swab was also tested positive for *Bordetella pertussis*.

Epidemiological investigation revealed that both children did not travel outside Hong Kong during the incubation period. The two-month-old girl was not yet due for her first dose of diphtheria, tetanus, acellular pertussis and inactivated poliovirus (DTaP-IPV) vaccine while her elder sister had received four doses of DTaP-IPV vaccine according to the Childhood Immunisation Programme of Hong Kong. Their other household contacts remained asymptomatic. The parents of these two cases were given chemoprophylaxis.

A probable case of sporadic Creutzfeldt-Jakob disease

CHP recorded a probable case of sporadic Creutzfeldt-Jakob disease (CJD) on December 6, 2017, affecting a 60-year-old female with unremarkable past health who lived in the United States of America. She presented with progressive memory loss and right-sided numbness in late October 2017. She was admitted to a local hospital there and was suspected to have CJD. She came to Hong Kong on November 28 and was admitted to a public hospital on December 6. She was found to have rapidly progressive dementia, cerebellar signs, myoclonus, pyramidal and extrapyramidal signs, and akinetic mutism. Findings of electroencephalography were compatible with CJD. Her condition was stable. Subsequently, she was discharged and was transferred to a hospital in Macau for further management on December 7. No risk factors for either iatrogenic or variant CJD were identified. She was classified as a probable case of sporadic CJD.

Two sporadic cases of listeriosis

CHP recorded two sporadic cases of listeriosis in December 2017. The first patient was a 28-year-old pregnant woman at 35 weeks of gestation with good past health. She presented with spontaneous onset of labour and fever on December 4 and was admitted to a private hospital on the same day. She had an uncomplicated normal vaginal delivery on December 4. Placental swab taken on delivery yielded *Listeria monocytogenes*. The clinical diagnosis was intrauterine infection. She was treated with antibiotics and her condition was stable. She was discharged home on December 6 and her newborn baby girl was transferred to another public hospital for further management on the same day. Blood culture collected from the baby girl showed no bacterial growth. The baby remained in stable condition and was discharged home on December 13. The woman reported no history of high-risk food consumption during the incubation period. Other household contacts remained asymptomatic.

The second case was a 68-year-old woman with underlying medical condition. The patient was admitted to a public hospital on December 8 for management of her underlying medical condition. She developed fever, chills and fatigue on December 11. Blood culture collected on December 11 yielded *Listeria monocytogenes*. She was treated with antibiotics and her condition was stable. She consumed ready-to-eat fermented bean curd occasionally; otherwise, she did not report consumption of other high-risk food items during incubation period. Her household contacts remained asymptomatic.

So far, no epidemiological linkages have been identified among these two cases.

CA-MRSA cases in November 2017

In November 2017, CHP recorded a total of 95 cases of community-associated methicillin resistant *Staphylococcus aureus* (CA-MRSA) infection, affecting 51 males and 44 females with ages ranging from 24 days to 82 years (median: 34 years). Among them, there were 67 Chinese, 6 Filipinos, 4 Pakistani, 3 Caucasian, 3 Indian, 3 Nepalese, 2 Indonesian, 1 African, and 6 of unknown ethnicity.

Ninety-three cases presented with uncomplicated skin and soft tissue infections while the remaining two cases had severe CA-MRSA infections. The first severe case affected an eight-year-old girl with good past health. She presented with right neck swelling and fever since October 19. She attended the Accident and Emergency Department of a public hospital on October 23 and was admitted for management. Her blood specimen collected on October 25 was cultured positive for CA-MRSA. She was diagnosed to have right neck abscess and sepsis. She was treated with antibiotics. Her condition was stable and she was discharged on November 13.

The second severe case affected a male neonate with underlying medical condition. He was born in a private hospital on October 10. He had decreased consciousness since birth and was transferred to the Neonatal Intensive Care Unit (NICU) of a public hospital on October 11 for further management. Chest X-ray taken on October 27 showed signs of pneumonia. His endotracheal aspirate and blood specimen collected on the same day were cultured positive for CA-MRSA. He was diagnosed to have pneumonia and sepsis. He was treated with antibiotics and his condition was stable. This case was epidemiologically linked with two CA-MRSA cases presented with uncomplicated skin and soft tissue infection identified in the same public hospital's unit in September.

Apart from the above hospital cluster, two household clusters, with each affecting two persons, were identified in November. No cases involving healthcare worker were reported in November.

Scarlet fever update (November 1, 2017 – November 30, 2017)

Scarlet fever activity in November markedly increased as compared with that in October. CHP recorded 264 cases of scarlet fever in November as compared with 153 cases in October. The cases recorded in November included 179 males and 85 females aged between 18 months and 40 years (median: five years). There were eight institutional clusters occurring in five kindergartens/child care centres and three primary schools, affecting a total of 22 children. No fatal cases were reported in November. Of note, scarlet fever activity sharply increased since late October and remained high in November. Based on the past epidemiological pattern, the activity of scarlet fever is expected to remain at a high level in the coming few months. Parents have to take extra care of their children in maintaining strict personal, hand and environmental hygiene. People suspected to have scarlet fever should consult a doctor promptly.

Dec 17 - Dec 30 2017 WEEKS 51 - 52 VOL 14 ISSUE Nº 26

Communicable Diseases WATCH

衞生防護中心 Centre for Health Protection 衞生署 Department of Health

FEATURE IN FOCUS

Update on human myiasis in Hong Kong

Reported by Dr Zenith WU, Medical and Health Officer, Enteric and Vector-borne Disease Office, Surveillance and Epidemiology Branch, CHP.

Myiasis is the invasion of body of humans or animals by larvae of dipterous flies (maggots)[1]. Female adult flies lay eggs in wounds, open sores, scabs, ulcers, gums, scratches or mucous membranes. Once the eggs hatch, the larvae will burrow into and feed on host tissue until mature, then leave the host and pupate into adult flies[2]. Human myiasis is uncommon and mostly affects debilitated people, for example, bed-bound elders or those with physical disability who are unable to fend off flies from laying eggs on wounds or mucosal surfaces.

The disease can be classified into two types, namely, obligatory myiasis and facultative myiasis, based on the preference of flies on host's tissues for feeding[1]. Obligatory myiasis is caused by fly larvae that require living tissue to complete their life cycle and may result in severe tissue or organ damages. *Chrysomya bezziana* is the dominant species causing obligatory myiasis in Hong Kong. Facultative myiasis is caused by maggots that infest on necrotic tissues, decaying matter or excreta and usually do not result in serious damage to the host directly. Examples of species causing facultative myiasis include *Sarcophaga spp.* (flesh flies) and *Lucilia spp.* (greenbottle flies).

From 2013 to 2017, the Centre for Health Protection of the Department of Health recorded a total of 42 cases of human myiasis based on voluntary reporting. The annual number of cases remained stable and ranged from eight to nine cases per year (Figure 1). The cases were distributed over the territory without geographical clustering. Cases were recorded all year round (Figure 2). Among the 42 cases, 20 were caused by flies associated with obligatory myiasis (*Chrysomya bezziana*) and nine were caused by flies related to facultative myiasis (Phoridae family and *Sarcophaga spp*). Thirteen could not be classified by the particular taxonomic rank identified from their infested flies (Sarcophagidae family).

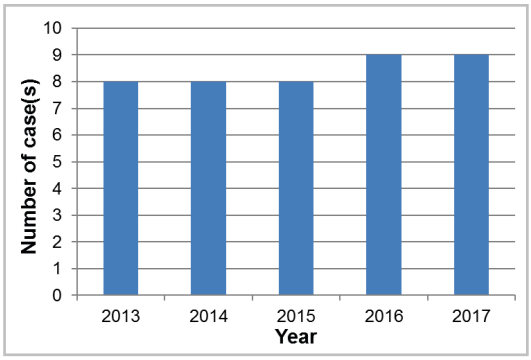

Figure 1 - Annual number of human myiasis cases, 2013 to 2017.

The cases comprised 20 males and 22 females, with ages ranging from 40 to 99 years (median: 80 years). Elderly people aged 65 years or above accounted for the majority (32 cases, 76.2%) of the recorded cases. More than half of the patients lived in residential care homes, including 24 (57.1%) in residential care homes for the elderly and one (2.4%) in a residential care home for the disabled.

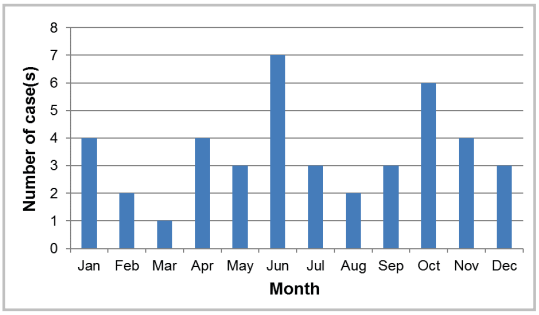

Figure 2 - Number of human myiasis cases by month, 2013 to 2017.

The majority of the patients (31, 73.8%) were either non-ambulatory or whose activities of daily living (ADL) were dependent or partially dependent. Among them, the oral cavity was the most common site of infestation (13 cases, 41.9%). Other sites included the lower limbs (9 cases, 29.0%), tracheostomy wound (2 cases, 6.5%), nasal cavity (2 cases, 6.5%), upper limbs (2 cases, 6.5%), ear canal (1 case, 3.2%), sacral area (1 case, 3.2%) and scalp (1 case, 3.2%). Among the eleven ambulatory and ADL-independent patients, the lower limbs were the most common site of infestation (8 cases, 72.7%), followed by the breasts (3 cases, 27.3%), and the affected lower limbs were gangrenous in four cases. The common clinical presentations include bleeding, pain and swelling at the affected sites.

Various underlying medical conditions predisposed the patients to human myiasis. All patients with lower limb infestation had underlying medical conditions affecting peripheral circulation such as diabetes mellitus, hypertension, peripheral vascular disease and varicose vein. All patients with oral infestation had been on nasogastric tube feeding. Malignancies of the head and neck and breast regions also predisposed infestations at the respective sites. All patients were treated with surgical removal of the maggots. No death due to human myiasis was recorded from 2013 to 2017.

Among the specimens collected from all 42 cases, *Chrysomya bezziana* was the most common species accounting for 20 cases (47.6%), followed by Sarcophagidae family (13 cases, 31.0%). The remaining cases were attributed to Phorisae family (5 cases, 11.9%) and *Sarcophaga spp.* (4 cases, 9.5%). Of note, *Chrysomya bezziana* caused all 13 cases of oral infestation. It also accounted for 51.6% of myiasis cases among patients who were either non-ambulatory or ADL-dependent or partially dependent.

To prevent human myiasis, members of the public should maintain good personal and environmental hygiene. All wounds should be treated immediately and dressed properly. Wounds should also be examined regularly and dressings should be kept clean and dry. As people who are ADL-dependent or partially dependent are more susceptible to the disease, their care-takers should pay special attention to their oral hygiene especially if they are on nasogastric tube feeding, and remove soiled bedding and clothing promptly. Measures to ensure the hygiene of the environment should also be carried out. For example, food should be stored in refrigerator or covered with screen, and refuse should be kept in containers with tight-fit lid and disposed of properly. Fly-proof measures such as installation of window screens, insect electrocuting devices or fly traps should be considered. If there are signs of maggot infestation, medical advice should be sought promptly for early treatment to prevent further tissue destruction.

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Review of Marburg virus disease

Reported by Dr Eric LAM, Medical and Health Officer, Communicable Disease Surveillance and Intelligence Office, Surveillance and Epidemiology Branch, CHP.

Marburg virus disease (MVD), also known as Marburg haemorrhagic fever, is a serious and often fatal infectious disease caused by Marburg virus under the family *Filoviridae*. It is one type of viral haemorrhagic fever which is associated with bleeding.

MVD was first recognised in 1967 after simultaneous outbreaks reported in Marburg and Frankfurt in Germany and in Belgrade, Serbia. The first patient had been exposed to imported African green monkeys or their tissues while conducting research[1].

MVD is a zoonotic disease. It is believed that initial MVD infection in humans resulted from prolonged exposure to mines or caves inhabited by fruit bats[2]. Contact with infected bat faeces or contaminated aerosols are the most common routes of infection[1]. Hence travelers who have contact with fruit bats or enter caves/mines inhabited by fruit bats in MVD endemic regions in Africa are at higher risk of contracting the disease.

Besides, the virus could spread through human-to-human transmission via direct contact (through broken skin or mucous membrane) with the blood, secretions, organs, dead bodies or other bodily fluids of infected people, or with the materials contaminated with the virus. Marburg virus transmission via semen has been documented up to seven weeks after clinical recovery. However, the risk of sexual transmission of MVD is yet to be further assessed with more surveillance data and research.

The incubation period ranges from two to 21 days[2]. Early symptoms include sudden high fever, severe headache and muscle pain, followed by abdominal symptoms such as cramping, severe watery diarrhea, nausea and vomiting. In many cases, severe haemorrhagic manifestations occur between five and seven days[2], in the form of bleeding as fresh blood in vomitus and faeces, as well as bleeding from the nose, gums, and vagina. Severe cases could result in fatalities which are usually preceded by severe blood loss and shock. The case fatality rate of MVD is around 50% on average (ranging from 23 to 90%)[1,2].

It is difficult to distinguish MVD clinically from other infectious diseases such as other types of viral haemorrhagic fever in the early phase of infection as many of the symptoms of MVD are similar to those of other common infectious diseases. MVD can be diagnosed with a number of laboratory tests such as antibody enzyme-linked immunosorbent assay, antigen detection test, reverse-transcriptase polymerase chain reaction assay, and virus isolation, etc.

In the past, outbreaks and sporadic cases of MVD have been mostly reported in African countries, including Angola, Democratic Republic of the Congo, Kenya, South Africa and Uganda. Recently in October 2017, there was an outbreak of MVD reported in Uganda with the first case involving a 50-year-old woman with laboratory tests confirmed of MVD infection on October 17, 2017[3] (Figure 1). A total of three confirmed and one probable case, who were found to belong to the same family were involved in this outbreak. Among them, three died, giving the case fatality rate of 75%[4].

On the notification of this latest MVD outbreak by the Ugandan Ministry of Health, the World Health Organization (WHO) immediately provided support to the government of Uganda to mount quick and robust responses, through supporting laboratory testing and surveillance, searching for new cases and their contacts, establishing infection prevention measures in health facilities, managing and treating cases, and engaging with communities to reduce stigma and encourage early healthcare seeking behaviours. These rapidly implemented measures prevented further spread soon after a case was first detected, and were successful in controlling the outbreak. WHO declared the end of this disease outbreak on December 8, 2017, which came 42 days (two 21-day incubation period of MVD) since the last confirmed case died on October 26, 2017[4].

Figure 1 - Affected districts in the MVD outbreak in Uganda.

In Hong Kong, MVD is a notifiable disease under the disease group of "viral haemorrhagic fever" since 2008. All registered medical practitioners are required to notify the Centre for Health Protection of the Department of Health all suspected or confirmed cases of MVD. As of January 1, 2018, there has been no confirmed case of MVD recorded locally.

While further study is still warranted to better understand the prevalence of viable and transmissible Marburg virus in semen over time, based on the present evidence, WHO recommends that all survivors of MVD and their sexual partners should either abstain from all sexual activities or observe safe sex practices such as correct and consistent condom use until their semen has twice tested negative for Marburg virus[2].

Although supportive care such as rehydration and other symptomatic relief might improve survival, there is no definitive treatment for MVD. To prevent viral haemorrhagic fever including MVD, it is important for members of the public to observe the following:

- Maintain good personal and environmental hygiene;
- Wash hands with liquid soap and water properly whenever possibly contaminated;
- When hands are not visibly soiled, clean them with 70 to 80 per cent alcohol-based handrub as an effective alternative;
- Avoid close contact with feverish or ill persons, and avoid contact with blood or bodily fluids of patients, including items which may have come in contact with an infected person's blood or bodily fluids;
- Cook food thoroughly before consumption;
- Avoid contact with animals and their excreta; and
- Avoid entering caves or mines inhabited by fruit bats.

References

[1]Marburg haemorrhagic fever (Marburg HF). US Centers for Disease Control and Prevention. Available at: https://www.cdc.gov/vhf/marburg/.
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[3]Weekly Bulletin on Outbreaks and Other Emergencies (October 14 to 20, 2017). World Health Organization Regional Office for Africa. Available at: http://apps.who.int/iris/bitstream/10665/259352/1/OEW42-1420102017.pdf.
[4]Weekly Bulletin on Outbreaks and Other Emergencies (December 2 to 9, 2017). World Health Organization Regional Office for Africa. Available at: http://apps.who.int/iris/bitstream/10665/259635/1/OEW49-29122017.pdf.

NEWS IN BRIEF

A local sporadic case of listeriosis

On December 29, 2017, the Centre for Health Protection recorded a case of listeriosis affecting a 93-year-old woman with underlying illnesses. She presented with fever, chills, rigor, confusion and shortness of breath on December 22, and was admitted to a public hospital on December 24. Her blood culture yielded *Listeria monocytogenes*. She was treated with antibiotics and her condition was stable. She had no recent travel history. She had consumed sashimi during the incubation period. Her home contacts were asymptomatic. Investigations are on-going.