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FEATURE IN FOCUS

Consensus Recommendations on School Closure due to Seasonal Influenza

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School closure has been adopted from time to time as a non-pharmacological intervention during influenza pandemic as well as seasonal influenza epidemics[1,2]. It had been recognised that in pandemic preparedness plans, rationales for school closure were that children are thought to be important vectors of transmission and more infectious and susceptible to most influenza strains than adults, and high contact rates in schools favour transmission[1].

In general, there are two types of school closure namely reactive school closure or proactive school closure[3]. Reactive school closure refers to closure of a school (or suspension of classes) when many students and/ or staff are ill or absent. Proactive school closure refers to closure of a school (or suspension of classes) before substantial transmission among students occurs.

Scientific evidence on the impact on influenza transmission by school closure

The United Kingdom (UK) Department of Health, the Australian Department of Health and Ageing, and the National Collaborating Centre for Infectious Diseases in Canada had conducted three separate systematic reviews on the effectiveness of school closure for influenza control with consistent findings regarding the effectiveness of school closure for influenza control, the threshold triggering school closure as well as the duration of closure[4-9].

Published evidence suggested that school closure is able to reduce influenza transmission amongst children. In contrast, evidence regarding the effects on adults is less consistent, but generally transmission amongst adults appears to be relatively unaffected by school closure. The effect of school closure is greater on peak incidence (20 to 60% reduction) than on cumulative attack rate (0 to 40% reduction). It suggests that school closure may have utility as a short-term strategy to forestall the impacts of influenza on healthcare services.

Studies also showed that closing schools would delay the peak of the epidemic, usually by no more than one to three weeks. However, increase in the overall duration of the epidemic of one to three weeks was commonly predicted. School closure is more likely to have the greatest effect if the virus has low transmissibility and if age-specific attack rates are higher in children than in adults. In addition, school closure is also likely to be more effective if it is implemented relatively early in the epidemic.

There is little evidence to suggest an appropriate threshold to trigger school closure. School closure duration of less than two weeks may have limited influence on community transmission and the published evidence does not allow an estimate of the optimum duration of school closure to be made.

Given the aim of school closure is to reduce contact between students in the school, school closure should be accompanied by advice that children should avoid gathering in large groups[3,5]. If students congregate in a setting other than a school, they will continue to spread the virus, and the benefits of school closure will be greatly reduced, if not negated[3].

Overseas practice

Review of practice elsewhere found that most health authorities including Mainland China, Macao, Taiwan, United States of America (US), UK, Singapore and Japan do not have established criteria for triggering territory-wide school closure due to seasonal influenza epidemics.

Local situation

Territory-wide school closure for primary schools and pre-primary institutions due to influenza was implemented in 2008, 2009 and 2018 in Hong Kong. The decisions were made based on the prevailing situations and there have been no established criteria to trigger territory-wide school closure locally.

A local study was conducted after the territory-wide closure of primary schools and pre-primary institutions in response to the three paediatric deaths due to seasonal influenza in March 2008, which could not find a substantial effect on community transmission[10]. Regarding the territory-wide closure of primary schools and pre-primary institutions in June 2009 in response to the influenza pandemic due to influenza A(H1N1)pdm09 virus, a local study found that only after subsequent closure of secondary schools for the summer vacation was associated with substantially lower transmission across all age groups[11].

Potential negative impact associated with school closure

School closure is associated with high economic, social and educational costs and could potentially disrupt healthcare provision via increased absenteeism of clinical staff attending to their children[9]. Studies from US, Australia and Taiwan suggested that 16 to 45% of parents would need to take leave to supervise children at home, 16 to 18% of parents would lose income, and about 20% of households would have difficulty arranging childcare[12].

Recommendation on territory-wide school closure due to seasonal influenza epidemics

The Scientific Committee on Vaccine Preventable Diseases (SCVPD) of the Centre for Health Protection (CHP) of the Department of Health held a meeting on July 20, 2018 to discuss the scientific evidence and practice on the criteria for triggering territory-wide school closure due to seasonal influenza epidemics. The Committee noted that there is so far no scientific evidence or international guidelines/ consensus to suggest an appropriate threshold to trigger territory-wide school closure due to seasonal influenza epidemics. Hence, SCVPD concluded that there is no scientific basis to establish local criteria for territory-wide school closure due to seasonal influenza epidemics.

Recommendations on reactive closure of an individual school with influenza outbreaks

In 2008, an Expert Group was set up to investigate the three paediatric deaths due to seasonal influenza. The Expert Group recommended that closure of an individual school during influenza outbreaks may be considered taking reference from (but not solely dictated by) certain indicators such as[13]:

(i) Any death in the school due to influenza in otherwise healthy children;
(ii) There are two or more intensive care unit admissions;
(iii) The hospitalisation rate is more than 1%; or
(iv) The sick leave rate is 10% or more.

According to the experience in investigation and management of influenza/ influenza-like illness (ILI) outbreaks in schools and pre-primary institutions in the past ten years, CHP found that the indicators concerning hospitalisation rate and sick leave rate respectively are not practicable owing to the relatively small capacity of students among pre-primary institutions in Hong Kong. If such indicators were implemented, at least 7 to 21% of the pre-primary institutions with influenza/ ILI outbreaks in the recent three years would have been closed which was not warranted from the public health perspective (Table 1). Moreover, the suggested duration of closure was not specified in the recommendation.

	2016	2017	2018	Total
Outbreaks with ILI attack rate ≥ 10%	17 (11%)	4 (4%)	10 (4%)	31 (7%)
Outbreaks with hospitalisation rate > 1%	32 (21%)	25 (27%)	42 (19%)	99 (21%)

Table 1 - Number of influenza/ILI outbreaks in pre-primary institutions with attack rate ≥ 10% or hospitalisation rate > 1% in 2016 to 2018 (up to March).

Based on the review of the local epidemiology, scientific literature and overseas practice, SCVPD recommended that closure of an individual school with influenza/ ILI outbreaks may be considered taking reference from the following indicators:

(i) Any death of healthy children in the school due to influenza;
(ii) Two or more children required intensive care unit admission due to influenza; or
(iii) ILI attack rate among children is 20% or more.

In addition to the above indicators, factors including the number of staff affected (which may potentially affect operation of the school), epidemic trend of the outbreak and effectiveness of control measures etc., should also be taken into consideration for advising school closure during an influenza/ ILI outbreak.

SCVPD also noted that there is no international consensus/ guidelines on the optimum closure duration regarding closure of an individual school due to influenza/ ILI outbreak. As influenza has an incubation period of about one to four days and a communicable period of about three to five days in general, SCVPD considered that seven days of school closure is appropriate for interrupting influenza transmission within the affected school.

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The 18th Tripartite Meeting on Prevention and Control of Infectious Diseases and Joint Emergency Response Exercise

Reported by the Emergency Response and Information Branch and the Communicable Disease Surveillance and Intelligence Office, Communicable Disease Division, Surveillance and Epidemiology Branch, CHP.

The 18th Tripartite Meeting on Prevention and Control of Infectious Diseases hosted by the Health and Family Planning Commission of Guangdong Province was successfully held in Zhuhai, Guangdong on August 2 and 3, 2018.

More than 60 public health and medical experts from the health authorities of Guangdong, Hong Kong and Macao attended the two-day meeting. The participants had in-depth discussion and experience sharing in various issues including the updated situation of communicable diseases in the three places, prevention and control of vaccine preventable diseases, and capacity building on public health emergency.

Guangdong, Hong Kong and Macao had also reviewed the co-operation and preparedness of the three places against communicable diseases and reached consensus at the meeting to further enhance the tripartite co-operation and communication on prevention and control of communicable diseases.

As part of the 18th Tripartite Meeting on Prevention and Control of Communicable Diseases, the three health authorities conducted a joint emergency response exercise code-named "Whirlwind" to test the responses to emerging infectious diseases on August 3, 2018. This was the first time Guangdong, Hong Kong and Macao ever conducted a joint emergency response exercise on the prevention and control of infectious diseases.

The exercise simulated the scenario of an imported case of Middle East respiratory syndrome (MERS) occurring in Guangdong with close contacts travelling to Hong Kong and Macao. MERS is one of blueprint priority diseases for research and development identified by the World Health Organization (WHO). Those diseases pose a public health risk because of their epidemic potential and for which there are no, or insufficient, countermeasures. The three places executed a joint response to the health emergency in accordance with the "Agreement of Co-operation on Emergency Public Health Incidents in Hong Kong, Guangdong and Macao".

This exercise comprised a table-top exercise integrated with an on-site drill component. The three places exchanged views on the case detection, communication, responses, co-operation and improvement measures with respect to emerging infectious diseases. Experience of managing emerging infectious diseases of the three places were also shared, with issues relating to macro-management, among others, were thoroughly discussed. Apart from introducing the approach to dealing with MERS, the representatives from Guangdong also introduced their approach to preventing the outbreak of Ebola virus disease in West Africa and preventing Zika virus transmission, and shared their experience of adopting the collaborative prevention and control mechanism, setting up health emergency response teams, as well as notification of epidemics.

During the exercise, the health emergency response co-operation mechanism among the three places was thoroughly examined. The exercise not only enhanced the capacities of three places in carrying out joint response actions, but also helped fine-tuning the joint response to emerging infectious diseases for the Guangdong-Hong Kong-Macao Greater Bay Area. In the exercise, implementation of various emergency response measures was successfully tested, including alert monitoring and analysis, case detection and notification, on-site investigation and emergency response, as well as identification and management of close contacts.

With the ongoing implementation of the "Belt and Road Initiative" and development of the "Guangdong-Hong Kong-Macao Greater Bay Area", transboundary trade and traffic in the three places are expected to become increasingly frequent. The need to formulate a comprehensive mechanism to counter the threats of imported emerging infectious diseases therefore has become an increasingly pressing public health issue. The exercise provided a valuable experience to facilitate the formulation of a comprehensive plan in this regard.

Photo 1 - The Director General of the Guangdong Provincial Health and Family Planning Commission, Mr Duan Yufei (centre); the Director of Health of Hong Kong, Dr Constance Chan (right); and the Director of the Health Bureau of Macao, Dr Lei Chin-ion (left), signed the joint minutes of the 18th Tripartite Meeting on Prevention and Control of Communicable Diseases.

Photo 2 - Representatives from the health authorities of Guangdong, Hong Kong and Macao participated in the joint emergency response exercise code-named "Whirlwind" to test the responses to emerging infectious diseases.

Photo 3 - Participants at the 18th Tripartite Meeting on Prevention and Control of Communicable Diseases.

NEWS IN BRIEF

An imported case of leptospirosis

On July 30, 2018, the Centre for Health Protection (CHP) recorded a case of leptospirosis affecting a 69-year-old man with good past health. He presented with fever, arthralgia, vomiting and diarrhoea on July 3, 2018. He was admitted to a public hospital on July 5. Blood tests showed thrombocytopenia and derangement of liver function. His condition was stable. Paired sera on July 6 and July 10 showed more than four-fold increase in antibody titre against Leptospira serogroup Autumnalis by microscopic agglutination test. He was treated with antibiotics and was discharged on July 12.

Epidemiological investigation revealed that the patient lived in Guangdong and came to Hong Kong to seek medical treatment after disease onset. While in Guangdong, he went swimming in a local river daily and reported drinking filtered tap water at home without boiling. He also had gardening activities and kept a cat at home. He recalled no exposure to rodents or stray dogs. His wife and daughter presented with similar symptoms on July 1 and June 10 respectively. Both had sought medical attention in Guangdong and had recovered. Other home contact remained asymptomatic.

A sporadic case of necrotising fasciitis caused by *Vibrio vulnificus*

On August 2, 2018, CHP recorded a sporadic case of necrotising fasciitis caused by *Vibrio vulnificus* affecting an 81-year-old man with underlying illnesses. He presented with fever and left hand painful swelling on July 29, and was admitted to a public hospital on July 31. The clinical diagnosis was necrotising fasciitis and he was transferred to another public hospital on the same day for further management. Multiple surgical debridement operations were performed and he was managed in the intensive care unit post-operatively. His left hand tissue collected on August 1 grew *Vibrio vulnificus*. He was treated with antibiotics and his condition was critical. Epidemiological investigation revealed that the patient swam daily at Tung Wan Beach in Cheung Chau. There was no history of wound or injury. He had no recent travel history. He lived with his wife who remained asymptomatic.

A probable case of sporadic Creutzfeldt-Jakob disease

CHP recorded a probable case of sporadic Creutzfeldt-Jakob disease (CJD) on August 9, 2018, affecting a 61-year-old woman with good past health. She presented with rapidly progressive dementia, dullness and confusion since early May 2018. Subsequently, she developed left-sided weakness and slurred speech, and was admitted to a public hospital on June 3. She was noted to have akinetic mutism, myoclonus and choreoathetoid movement. Findings of electroencephalography were compatible with CJD. She was discharged on August 2. On August 7, she was admitted to another public hospital for increase in myoclonic jerks. Her condition was stable. No risk factors for either iatrogenic or variant CJD were identified. She was classified as a probable case of sporadic CJD.

IMPACT Mobile APP: Interactive Media Awards 2018

The Fifth edition of the Interhospital Multi-disciplinary Programme on Antimicrobial Chemotherapy (IMPACT) was launched in November 2017. With support from CHP, IMPACT has its own website version as well as mobile applications (Android and iOS). This facilitates health professionals to obtain useful information from their computers or smartphones. The new IMPACT Mobile APP and Website excels its printed version as they contain value-added features: 1) medical calculators; 2) antibiograms from the Public Health Laboratory Services Branch of the Department of Health, Hospital Authority and private hospitals; and 3) search function.

Figure 1 - IMA Award 2018 plaque - IMPACT Mobile APP .

Figure 2 - QR codes to download IMPACT.

The Infection Control Branch (ICB) of CHP has been providing secretariat and technical support to the Editorial Board of IMPACT. Dr WONG Tin-yau, Head of ICB, is delighted to announce that the IMPACT Mobile APP has received the "Outstanding Achievement" in both Healthcare and Education categories in the Interactive Media AwardsTM (IMA) 2018. IMA is an international awards competition recognising excellence in web design, development, management, support and promotion. The "Outstanding Achievement" award is the second highest honor bestowed by IMA. Amongst the 216 entries in the "Healthcare" category and 202 entries in the "Education" category, IMPACT Mobile APP was selected to be awarded as judges considered the APP achieved a very high standard in most criteria including planning, execution and overall professionalism.

CA-MRSA cases in July 2018

In July 2018, CHP recorded a total of 91 cases of community-associated methicillin resistant *Staphylococcus aureus* (CA-MRSA) infection, affecting 55 males and 36 females with ages ranging from nine days to 83 years (median: 31 years). Among them, there were 66 Chinese, 10 Filipinos, 5 Pakistani, 2 Indian, 1 Caucasian, 1 Bangladeshi, 1 Indonesian and 5 of unknown ethnicity.

Ninety cases presented with uncomplicated skin and soft tissue infections while the remaining case had invasive CA-MRSA infection. The invasive case affected a 20-year-old woman with history of left knee injury. She presented with left knee pain and swelling since July 20. She attended the outpatient department of a private hospital and was admitted from July 21 to 22 for management. Left knee arthroscopy performed on July 21 showed active inflammation and synovitis with turbid joint fluid. Joint fluid collected during arthroscopy was cultured positive for CA-MRSA. She was diagnosed with septic arthritis of left knee. She was re-admitted on July 26 for further surgical and antibiotic treatments. She remained in a stable condition and was discharged on August 4.

Separately, the isolate of one case affecting a 73-year-old woman was found to be resistant to mupirocin. The patient presented with carbuncle on her right shoulder in early July. Her symptoms improved after treatment with antibiotics and wound drainage. The patient was a tourist and left Hong Kong on July 22, 2018.

Among the 91 cases, two sporadic cases involved healthcare workers who were nurses working in a public hospital and a private clinic. Investigation did not reveal any epidemiologically linked cases. Besides, three household clusters, with each affecting two persons, were identified in July.

Scarlet fever update (July 1, 2018 – July 31, 2018)

Scarlet fever activity in July decreased as compared with that in June. CHP recorded 153 cases of scarlet fever in July as compared with 196 cases in June. The cases recorded in July included 83 males and 70 females aged between one and 37 years (median: six years). There were three institutional clusters occurring in two kindergartens/ child care centres and a primary school, affecting a total of eight children. No fatal cases were reported in July.