



衛生防護中心
Centre for Health Protection

Scientific Committee on Vaccine Preventable Diseases

Recommendations on Seasonal Influenza Vaccination for the 2018/19 Season in Hong Kong (As of April 27, 2018)

Introduction

Seasonal influenza causes a significant disease burden in Hong Kong. Since 2004, the Scientific Committee on Vaccine Preventable Diseases (SCVPD) has been reviewing the scientific evidence of influenza vaccination and recommended the priority groups for influenza vaccinations annually. This document sets out the scientific evidence, local data as well as overseas practice, and provides recommendations in relation to the application of influenza vaccination in Hong Kong for the 2018/19 season.

Global Situation of the 2017/18 Winter Influenza Season

2. In the temperate countries of the northern hemisphere, influenza activity started early in North America from November 2017 with predominantly influenza A(H3N2) viruses in the initial period of the 2017/18 winter season. In the United States, there were very high levels of influenza-like illness (ILI), hospitalisations and mortality due to influenza as compared with recent seasons. The highest rate of hospitalisation was among adults aged 65 years or above, followed by adults aged 50-64 and children aged 0-4 years. The overall hospitalisation rate was the highest ever recorded, breaking the highest rate recorded previously during the 2014/15 season. The proportion of influenza B increased in the later phase of the 2017/18 season.

3. In Canada, the 2017/18 influenza season began earlier than



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previous seasons, with national influenza activity crossing the seasonal threshold in mid-November 2017. It peaked in mid-February 2018. Influenza A(H3N2) and B viruses co-circulated with increasing proportion of influenza B in the later phase of the season. The majority of laboratory confirmations, hospitalisations and deaths have been among adults 65 years of age and older.

4. Influenza activity in Europe started in December 2017 in the south and west followed by the north and east. Influenza B viruses (Yamagata lineage) predominated followed by influenza A viruses. The dominant subtype of influenza A viruses varied depending on the country. The majority of countries reported ILI reaching moderate levels in comparison with recent years, with few countries reaching levels exceeding those of recent years. Some countries reported levels of hospitalisation and intensive care unit (ICU) admissions reaching or exceeding peak levels of recent influenza seasons.

5. In East Asia, influenza activity started to increase from December 2017 with circulation of influenza A(H1N1)pdm09 and B (Yamagata lineage) viruses with the exception of Korea which had predominantly influenza A(H3N2) and B viruses. Influenza activity in Mainland China (northern and southern) and Japan also reached levels higher than recent influenza seasons.

Summary of the 2017/18 Winter Influenza Season in Hong Kong

6. The 2017/18 winter influenza season in Hong Kong started in the second week of 2018. The overall seasonal influenza activity had increased gradually to the peak level around mid-February. It had continued to decrease since early March and returned to the baseline level in late March.

7. The laboratory surveillance data of the Centre for Health Protection (CHP) of the Department of Health showed that the percentage of respiratory specimens tested positive for influenza viruses by the Public Health Laboratory Services Branch reached the peak of about 27% in mid-February. In this season, about 75% of the positive influenza detections were influenza B, and among the influenza B detections, about 95% belonged to the Yamagata lineage. The percentage of respiratory specimens tested positive for influenza

A(H1N1)pdm09 and influenza A(H3N2) viruses remained at a low level throughout this season.

8. In this season, large number of institutional outbreaks of ILI was recorded with the majority occurring in schools including kindergartens/child care centres and primary schools. Up to mid-March, nearly 600 ILI outbreaks have been recorded in this season, which already exceeded the total numbers recorded in major influenza seasons since 2013. About 38% of the reported outbreaks occurred in kindergartens/child care centres and about 35% in primary schools.

9. The influenza-associated hospital admission rates reached the peak in mid-February. The peak weekly rate was highest among young children aged 5 years or less, followed by elderly aged 65 years or above and children 6-11 years. The peak rates among children 6-17 years in this season had greatly exceeded the respective highest level recorded in previous seasons by more than one-fold.

10. For the surveillance of severe adult influenza cases (ICU admission or death), a total 570 cases (including 382 deaths) were recorded in this season. The number of adult severe influenza cases was comparable to that recorded in the 2014/15 winter season. About 72% of the cases affected elderly aged 65 years or above, and the percentage was 87% for death cases. About 75% had pre-existing chronic medical diseases. Only 26% were known to have received the seasonal influenza vaccine (SIV) for the 2017/18 season.

11. For paediatric cases of influenza-associated severe complications and deaths, 20 cases (including 2 deaths) were recorded in this season. The number of cases was within the range recorded in major influenza seasons in the past few seasons. Their ages ranged from 19 months to 15 years with a median of 4.5 years. Thirteen (65%), five (25%) and two (10%) cases were aged 0-5, 6-11 and 12-17 years respectively. Of note, only one patient aged 15 years (5%) had received any SIV in the 2017/18 season, which was much lower than the SIV coverage of 13.2% among children 6 months to 17 years revealed by a local survey in the 2015/16 season and 22.8% among children 6 months to 11 years who received free or subsidised SIV in the 2017/18 season.

The Influenza Vaccine

Vaccine Types

12. Influenza vaccination is one of the effective means in preventing influenza and its complications together with reduction in influenza-associated hospitalisation and death. Available SIVs can be broadly classified into inactivated influenza vaccines (IIVs) and live attenuated influenza vaccines (LAIV). In Hong Kong, currently registered SIVs include both IIVs and LAIV¹.

13. Two distinct lineages of influenza B (namely the Yamagata and Victoria lineages) have circulated worldwide. Trivalent influenza vaccines (TIV) consist of three seasonal influenza viruses: one influenza A (H1N1)pdm09 virus, one influenza A (H3N2) virus and one influenza B virus (either a Yamagata or Victoria lineage), while quadrivalent influenza vaccines (QIV) consist of an additional influenza B virus of the lineage not contained in the TIV. Studies on QIV showed that the addition of the second influenza B strain did not result in immune interference to other strains included in the vaccine. Moreover, the rates of adverse events following TIV and QIV were similar.

14. SIV requires annual administration. Most IIVs are given via the intramuscular route and are recommended for use in individuals six months of age or above except those with known contraindications (depending on individual brand). Only one type of LAIV (Flumist) is available on the market and it should be given intranasally and is for use in individuals aged two to 49 years.

Vaccine Effectiveness

15. Vaccination remains one of the most efficacious public health tools currently available to protect individuals against influenza. Vaccine effectiveness (VE) depends on the similarity between the virus strains present in the vaccine and those circulating in the community. According to the World

¹ In Hong Kong, LAIV was once available from 2009 to 2013 but it was discontinued after 2013. It has been registered again in Hong Kong in April 2018.

Health Organization (WHO), when the vaccine strains closely match the circulating influenza viruses, efficacy of IIV in individuals younger than 65 years of age typically range from 70% to 90%, whereas the efficacy of IIV to prevent influenza infection in individuals aged 65 years or above is at best modest, irrespective of setting, population and study design. For elderly, a recently published meta-analysis study found that the VE of SIV against laboratory-confirmed influenza in community-dwelling elderly people during influenza seasons was 44% in matched seasons and 20% in mismatched seasons.² Another meta-analysis study showed that the pooled VE of SIV against influenza-associated hospitalisations was 37% among adults aged 65 years or above between 2010/11 and 2014/15.³

16. For LAIV, overseas studies and clinical experience had generally indicated LAIV to be a safe vaccine, providing comparable protection against influenza to that afforded by IIV. The current evidence does not support a recommendation for the preferential use of LAIV.

17. Of note, the Advisory Committee on Immunization Practices (ACIP) of the United States had decided to recommend against the use of LAIV for the 2016/17 and 2017/18 season because of the vaccine's reduced efficacy. Data from the United States for the 2013/14 and 2015/16 seasons showed poor VE of LAIV against influenza A(H1N1)pdm09. In the 2013/14 season, there was no measurable effectiveness for LAIV against H1N1 among children while VE of IIV against H1N1 in children 2 through 8 years was 60%. In the 2015/16 season, VE of LAIV among children 2-17 years against H1N1 was -21%, as compared with 65% for IIV.

18. In its meeting in February 2018, the ACIP recommended that quadrivalent LAIV is an option for influenza vaccination for persons for whom

² Darvishian M, van den Heuvel ER, Bissielo A, et al. Effectiveness of seasonal influenza vaccination in community-dwelling elderly people: an individual participant data meta-analysis of test-negative design case-control studies. *Lancet Respir Med.* 2017 Mar;5(3):200-211.

³ Rondy M, El Omeiri N, Thompson MG, et al. Effectiveness of influenza vaccines in preventing severe influenza illness among adults: A systematic review and meta-analysis of test-negative design case-control studies. *J Infect.* 2017 Nov;75(5):381-394.

it is otherwise appropriate in the 2018/19 influenza season based on the latest research finding in the 2017/18 season. The vaccine manufacturer changed the H1N1 component to A/Slovenia in the vaccine for 2017/18 season from A/Bolivia in that for the 2015/16 season. A clinical trial among young children in the United States found that the new A/Slovenia strain induced antibody responses that were significantly higher than those seen with the 2015/16 H1N1 strain. On the other hand, LAIV has been widely used among children in the United Kingdom in recent years.

19. Locally, in the 2017/18 season, the CHP has collaborated with the private medical practitioners participating in the sentinel surveillance system to study the VE of IIV at the local primary care setting using the test-negative case-control method. Nearly 700 specimens were received in the four months from November 2017 to February 2018, with 58% tested positive for influenza and 80% of the positive influenza detections were influenza B. The interim estimates revealed that the overall VE among all ages was 63.4% against all influenza, and 59.3% against influenza B. The results showed that the IIV for the 2017/18 season offered a moderate to good protection against laboratory-confirmed influenza at primary care level in the 2017/18 winter influenza season in Hong Kong. Another local hospital-based test-negative study including data on about 1,000 children admitted to public hospitals between December 2017 and January 2018 with febrile acute respiratory illness and tested for influenza found that the interim VE was 66% overall, and 65% against influenza B.⁴

Adverse Events

20. Adverse events following IIV administration may include local reactions including pain, redness and swelling at the site of injection (15-20%). Non-specific systemic symptoms including fever, chills, malaise and myalgia are reported in less than 1% of IIV recipients. Other rare adverse events may include anaphylaxis (nine per ten million doses distributed) and Guillain-Barré syndrome (GBS).

21. GBS is an acute paralyzing illness, usually provoked by a

⁴ Chiu SS, Kwan MYW, Feng S, et al. Interim estimate of influenza vaccine effectiveness in hospitalised children, Hong Kong, 2017/18. Euro Surveill. 2018 Feb;23(8).

preceding infection, surgery or rarely after immunisation. It is characterised by progressive weakness of all limbs and areflexia. Recent extensive review which evaluated the risk of GBS after administration of influenza vaccines (excluding the 1976-1977 swine influenza vaccine) concluded that the evidence is inadequate to accept or reject a causal relationship between influenza vaccine and GBS.

22. Scientific studies over the years have shown an increased risk of GBS following influenza infection, and the magnitude of risk is much greater than that following influenza vaccination. Overseas studies have estimated that the risk of GBS following influenza vaccination was about one to two GBS case per million vaccine recipients. This is much lower than the influenza mortality rates (number of death with laboratory confirmation of influenza within the same hospital admission per million population) of 79.89, 33.38 and 67.48 deaths per million population in Hong Kong in the 2014/15 winter season, 2015/16 winter season and 2017 summer season among people aged 18 years or above respectively. Locally, a total of three GBS cases were recorded among persons who had received SIV (within the period of five days and six weeks after seasonal influenza vaccination) in the past five seasons (one case filed in 2012/13, 2013/14 and 2014/15 respectively).⁵ No case was recorded in the 2017/18 season. In Hong Kong, the number of GBS (all causes) admitted to public hospitals ranged from 51 to 88 cases per year between 2013 and 2017.⁶

23. For LAIV, the most common adverse reactions following LAIV administration are nasal congestion or runny nose in all ages, fever in children and sore throat in adults. The safety in pregnant women has not been established. Children aged below five years with recurrent wheezing / persons of any age with asthma may be at increased risk of wheezing following administration. As this is a live vaccine, there is potential for transmission of the vaccine viruses to immunocompromised individuals.

⁵ Causality assessment based on the WHO's classification (http://www.who.int/vaccine_safety/publications/gvs_aefi/en/) - the case in 2012/13: B2 (reviewing factors result in conflicting trends of consistency and inconsistency with causal association to immunization); both cases in 2013/14 and 2014/15: B1 (indeterminate; temporal relationship is consistent but there is insufficient definitive evidence for vaccine causing event)

⁶ <https://www.chp.gov.hk/en/features/26736.html>

Recommendations

24. The SCVPD made the following recommendations on seasonal influenza vaccination for the 2018/19 season in Hong Kong.

Vaccine Composition

25. The composition follows the recommendations by the WHO for the 2018/19 northern hemisphere influenza season. Recommended QIV to be used in the 2018/19 season (northern hemisphere winter) comprise an A/Michigan/45/2015 (H1N1)pdm09-like virus, an A/Singapore/INFIMH-16-0019/2016 (H3N2)-like virus, a B/Colorado/06/2017-like virus (B/Victoria/2/87 lineage), and a B/Phuket/3073/2013-like virus (B/Yamagata/16/88 lineage). The influenza B virus component of TIV for use in the 2018/19 season should be a B/Colorado/06/2017-like virus of the B/Victoria/2/87-lineage.

Vaccine Type

26. Both trivalent and quadrivalent IIVs are recommended for use in Hong Kong. Based on local laboratory data, trivalent SIV may potentially prevent majority of influenza burden in Hong Kong, while quadrivalent SIV may potentially offer additional protection against influenza B. Depending on individual brand, IIVs are recommended for use among people aged six months of age or older, including healthy people and those with chronic medical problems. The package inserts for individual products should always be referred to when deciding which vaccine to give.

27. The SCVPD noted that a type of LAIV (Flumist) has been registered in Hong Kong in April 2018. It can be used among non-pregnant and non-immunocompromised people 2-49 years of age. However, unlike IIVs, LAIV has not been used extensively in Hong Kong before. If healthcare providers choose to use LAIV, they should consider the contraindications and precautions (refer to paragraphs 30 and 33 below).

Dosage and Dosing Schedule

28. Given that SIV offer protection against clinical influenza and severe cases do occur in previously healthy persons, all members of the public except those with known contraindications should receive SIV annually for personal protection, which is in line with the recommendation by the WHO. Members of the public should only receive SIV once in the 2018/19 season, which are expected to offer protection for both winter and summer seasons.

29. Healthcare providers should follow the age-appropriate dosage of individual vaccines in the respective package inserts. A single dose of SIV is the standard regimen for persons aged nine years or above. Children below nine years, who have received one or more doses of SIV before are recommended to receive one dose of SIV in the 2018/19 season. Nevertheless, for vaccine-naive children aged below nine years, two doses of SIV with an interval of at least four weeks are required.

30. For individuals receiving LAIV, other live vaccines not administered on the same day should be administered at least four weeks apart, while inactivated and live vaccines may be administered simultaneously or at any interval between doses.

Vaccine Precautions

31. IIV is contraindicated for those with a history of severe hypersensitivity to any of the vaccine components or a previous dose of influenza vaccination. Individuals with mild egg allergy who are considering an influenza vaccination can be given SIV in primary care setting. Individuals with a history of anaphylaxis to egg should have SIV administered by health care professionals in appropriate medical facilities with capacity to recognise and manage severe allergic reactions.

32. A study has shown that there may be a small increased risk of febrile convulsions following concomitant administration of IIV and pneumococcal vaccine in young children in the United States, but the increased

risk was not observed during subsequent influenza season and the overall risk remains acceptable. Given the obvious benefit of on-time vaccination with the two vaccines, it is recommended that IIV and pneumococcal vaccine can be given concomitantly.

33. LAIV is a live vaccine and is generally contraindicated in the following conditions, taking reference from recommendations of the United States, United Kingdom and Canada:

- (a) History of severe allergic reaction to any vaccine component or after previous dose of any influenza vaccine;
- (b) Concomitant aspirin or salicylate-containing therapy in children and adolescents;
- (c) Children aged 2 through 4 years who have received a diagnosis of asthma or whose parents or caregivers report that a health care provider has told them during the preceding 12 months that their child had wheezing or asthma or whose medical record indicates a wheezing episode has occurred during the preceding 12 months⁷;
- (d) Children and adults who are immunocompromised due to any cause;
- (e) Close contacts and caregivers of severely immunosuppressed persons who require a protected environment;
- (f) Pregnancy; and
- (g) Receipt of influenza antiviral medication within previous 48 hours.

Priority Groups

34. People who are in the priority groups are generally at increased risk of severe influenza or transmitting influenza to those at high risk. Therefore, they shall have higher priority for seasonal influenza vaccination. These priority groups have been determined based on a range of scientific considerations taking

⁷ The United Kingdom recommends that vaccination with LAIV should be deferred in children with wheezing/ increased use of bronchodilator in past 72 hours. If their condition has not improved after a further 72 hours, these children should be offered an IIV, while Canada recommends that individuals with severe asthma or those with medically attended wheezing in the 7 days prior to vaccination should not use LAIV.

into account local disease burden and international experience.

35. The priority groups recommended in the 2017/18 season will continue to be included as priority groups for influenza vaccination in the 2018/19 season. Recommendations on the priority groups for seasonal influenza vaccination are summarised below:

- (a) Pregnant Women: Pregnant women are recommended to have the highest priority for vaccination. Seasonal influenza vaccination is recommended for all pregnant women for benefits in terms of reduced acute respiratory infection for both mothers and infants, and reduction of cardiopulmonary complications and the associated hospitalisations in pregnant women. IIV is considered safe by the WHO for use at any gestational age of pregnancy and there is no evidence indicating that inactivated influenza vaccine is teratogenic even when given during the first trimester. LAIV should not be used in pregnant women.
- (b) Elderly Persons Living in Residential Care Homes: Seasonal influenza vaccination is recommended for elderly persons living in residential care homes for reducing the risk of complications from influenza including hospitalisation and pneumonia in influenza outbreaks.
- (c) Long-stay Residents of Institutions for Persons with Disability: Seasonal influenza vaccination is recommended for long-stay residents of institutions for the mentally and physically disabled for reducing influenza related hospitalisation during influenza outbreaks. The disability of the residents hinders them from undertaking adequate hygiene measures in an institutional environment which favours the transmission of influenza.
- (d) Persons Aged 50 Years or Above: Seasonal influenza vaccination is recommended for elderly persons aged 65 years or above because of their high risk of complications and excess hospital admissions and death from influenza. Persons aged 50-64 years are also recommended for influenza vaccination because local influenza epidemiology showed that people

aged 50–64 years, irrespective of chronic medical problems, were having a higher risk of influenza-related ICU admission and death during seasons predominated by influenza A (H1N1)pdm09.

- (e) Persons with Chronic Medical Problems: Seasonal influenza vaccination is recommended for persons aged six months or above having chronic cardiovascular (except hypertension without complication), lung, metabolic or kidney disease, obesity (body mass index 30 or above)⁸, who are immunocompromised⁹, children and adolescents (aged six months to 18 years) on long-term aspirin therapy, and those with chronic neurological condition that can compromise respiratory function or the handling of respiratory secretions or that can increase the risk for aspiration or those who lack the ability to take care for themselves. Seasonal influenza vaccination is recommended in view of their increased risk of complications and death associated with influenza infection. LAIV should not be used in immunocompromised persons.

- (f) Health Care Workers: Seasonal influenza vaccination is recommended for health care workers to reduce morbidity and hence reduce absenteeism among health care workers related to respiratory infections. It is also recommended in order to reduce the risk of transmitting influenza to patients who are at high risk of complications and mortality from influenza.

- (g) Children Aged Six Months to 11 Years: Seasonal influenza vaccination is recommended for children six months to 11 years for reducing influenza related complications such as excess hospitalisations or deaths. Studies in overseas have shown that vaccinating young school children may potentially reduce school absenteeism and influenza transmission in the community.

⁸ Obesity is considered as an independent risk factor for influenza complication and thus people with BMI 30 or above are included for seasonal influenza vaccination.

⁹ People who are immunocompromised refer to those with a weakened immune system due to disease (such as HIV/AIDS) or treatment (such as cancer treatment).

- (h) Poultry Workers: Seasonal influenza vaccination is recommended for poultry workers and persons involved in slaughtering of animals potentially infected with highly pathogenic avian influenza virus for minimising the risk of re-assortment and eventual emergence of a novel influenza virus with pandemic potential through preventing concomitant infections by the human influenza and avian influenza viruses in humans.

- (i) Pig Farmers and Pig-slaughtering Industry Personnel: Pig farmers and pig-slaughtering industry personnel are recommended to receive SIV to prevent emergence of new influenza A virus in either human or pig hosts.

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