Epidemiology on Seasonal Influenza and Pneumococcal Diseases and Updated Recommendations on Seasonal Influenza and Pneumococcal Vaccinations

Prof LAU Yu-lung
Chair Professor, Department of Paediatrics and Adolescent Medicine, LKS Faculty of Medicine, The University of Hong Kong

Member, Scientific Committee on Vaccine Preventable Diseases
Outline

• Seasonal influenza
  – Influenza activities in 2016/17 season
  – SCVPD recommendations for SIV 2017/18 season
  – Seasonal influenza vaccine

• Pneumococcal Diseases
  – Pneumococcal infections
  – SCVPD recommendations for PV 2017/18 season
  – Pneumococcal vaccine
Influenza activities in 2016/17 season
Overview of local influenza activity in 2017 (1)

- **Atypical** seasonality and intensity of influenza activity
  - Mild winter season but a severe summer season
- **Winter**
  - Local influenza activity increased between mid-Feb & early Apr (~7 weeks) with a small peak around late Feb / early Mar
  - Overall a mild season with modest increase in influenza activity
  - Shorter duration than previous winter seasons (16 weeks in 2015/16; 17 weeks in 2014/15)
  - A(H3N2) predominated throughout, B increasing slightly in later phase
Overview of local influenza activity in 2017 (2)

- Summer
  - Influenza activity increased again since early May, and exceeded baseline in mid-May
  - Started earlier than traditional summer seasons in past few years (starting between Jun & Sep)
  - Sharp increase in influenza activity from late Jun with a peak around mid-Jul
  - Also predominated by H3N2
  - Influenza activity much higher than 2017 winter
  - Similar situation in Guangdong and Macao
  - Influenza activity decreasing but still elevated above baseline (as of late Aug)
Overview of local influenza activity in 2017 (3)
Laboratory Surveillance

Figures as of 16 Aug 2017
SCVPD recommendations for SIV in 2017/18 season
SCVPD recommendations on priority groups for 2017/18 season

- Serious influenza infection can occur even in healthy individuals
- Seasonal influenza vaccines are safe and effective
- Seasonal influenza vaccination is recommended for personal protection against clinical influenza for all persons except those with known contraindications
Priority groups for influenza vaccination in 2017/18 season

- Pregnant women
- Elderly persons living in residential care homes
- Long-stay residents of institutions for persons with disabilities
- Persons aged 50 years or above
- Persons with chronic medical problems*
- Health care workers
- Children aged 6 months to 11 years
- Poultry workers
- Pig farmers and pig-slaughtering industry personnel
Chronic medical problems

People with chronic illnesses mainly refer to those who have:

- Chronic cardiovascular diseases (except hypertension without complication)
- Lung diseases
- Metabolic diseases
- Kidney diseases
- Obesity (BMI >= 30)
- Immunocompromised (with a weakened immune system due to disease such as HIV/AIDS or treatment such as cancer treatment)
- Children and adolescents (aged 6 months to 18 years) on long-term aspirin therapy
- 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 care for themselves
Rationale for recommendations

• **Pregnant women** are recommended to have the highest priority for vaccination

• Based on
  – Evidence of a substantial risk of severe disease in this group
  – Evidence that seasonal influenza vaccine is safe throughout pregnancy
  – Evidence that vaccine is effective in preventing influenza in the pregnant women and their young infants
Seasonal Influenza Vaccine
WHO recommendation on seasonal influenza vaccine composition in 2017/18 (Northern hemisphere)

- an A/Michigan/45/2015 (H1N1)pdm09-like virus
- an A/Hong Kong/4801/2014 (H3N2)-like virus
- a B/Brisbane/60/2008-like virus
- WHO also recommends that quadrivalent vaccines containing two influenza B viruses should contain the above three viruses and a B/Phuket/3073/2013-like virus
Registered seasonal influenza vaccine available in 2017/18 season

<table>
<thead>
<tr>
<th>Vaccine type</th>
<th>Route of administration</th>
<th>Certificate holder</th>
<th>Name of vaccine</th>
<th>Available in 2017/18 influenza season (as of 22 May 2017)</th>
<th>Dosage and dosing schedule*</th>
<th>Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trivalent</td>
<td>Intramuscular</td>
<td>Sanofi-Aventis Hong Kong Limited</td>
<td>Vaxigrip Purified Flu Vaccine^</td>
<td>Yes</td>
<td>6-35 months: 0.25ml, 1 dose*</td>
<td>Age 6 months or above without contraindications</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Vaxigrip Paediatric Use Flu Vaccine^&lt;sup&gt;2&lt;/sup&gt;</td>
<td>No</td>
<td>(Adimflu-S Influenza HA Vaccine are licensed for use in 1 year of age and over)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Vaxigrip Influenza Vaccine (Multidose)^</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>GlaxoSmithKline Ltd.</td>
<td>Fluarix Vaccine (W.H.O. Composition)^</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Novartis Pharmaceuticals (HK) Ltd.</td>
<td>Agrippal SI Vaccine Pre-filled Syr Inj.^</td>
<td>To be confirmed</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Abbott Lab Ltd.</td>
<td>Fluid Vaccine Pre-filled Syr Inj.^</td>
<td>To be confirmed</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hua Tai Pharmaceuticals Co. Ltd.</td>
<td>Influenza Vaccine (Split Virion), Inactivated (Shanghai Inst)^</td>
<td>No</td>
<td>3-8 years: 0.5ml, 1 dose*</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Influenza Vaccine (Split Virion), Inactivated (Paediatric Use) (Shanghai Inst)^&lt;sup&gt;3&lt;/sup&gt;</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Global Commonwealth Life Science (Holdings) Ltd.</td>
<td>Adimflu-S Influenza HA Vaccine (Split Virion) 0.5ml Pre-filled Syringe^&lt;sup&gt;4&lt;/sup&gt;</td>
<td>No</td>
<td>9 years or above: 0.5ml, 1 dose</td>
<td>(Fluad is licensed for use in 65 years of age and over)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sinovac Biotech (Hong Kong) Ltd.</td>
<td>Anflu Inactivated Influenza Vaccine (Split Virion) 0.5ml/dose</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Anflu Inactivated Influenza Vaccine (Split Virion) 0.25ml Pre-filled Syringe</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Anflu Inactivated Influenza Vaccine (Split Virion) 0.5ml Pre-filled Syringe</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Luen Cheong Hong Ltd.</td>
<td>Fluavax Vaccine^</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quadrivalent</td>
<td>Intramuscular</td>
<td>Sanofi-Aventis Hong Kong Limited</td>
<td>FluQuadri Quadrivalent Influenza Vaccine (Pediatic for 6-35 months of age)</td>
<td>Yes</td>
<td>6-35 months: 0.25ml, 1 dose*</td>
<td>Age 6 months or above without contraindications</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>FluQuadri Quadrivalent Influenza Vaccine (For 3 years of age and older)</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>GlaxoSmithKline Ltd.</td>
<td>Fluarix Tetra Northern Hemisphere Vaccine Suspension for Injection</td>
<td>Yes</td>
<td>3-8 years: 0.5ml, 1 dose*</td>
<td>Age 3 years or above without contraindications</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Fluarix Tetra Northern Hemisphere Vaccine Suspension for Injection</td>
<td>Yes</td>
<td>9 years or above: 0.5ml, 1 dose</td>
<td></td>
</tr>
</tbody>
</table>

* The vaccine can also be administered subcutaneously should these be contraindication for intramuscular administration.
* For details on dosage and dosage schedule for individual vaccine, please refer to package insert.
* 2 doses for first time vaccination with interval 4 weeks.
* Licensed for use in children from 6 months to 35 months.
* Children below 9 years who have properly received one or more doses of seasonal influenza vaccine in or before 2016/17 season should receive one dose in 2017/18 season.
Choice of vaccine

- Both trivalent and quadrivalent inactivated influenza vaccines are recommended for use in Hong Kong.

- Trivalent influenza vaccine may potentially prevent majority of influenza burden in Hong Kong, while quadrivalent influenza vaccine may potentially offer additional protection against influenza B.
Dosage and dosing schedule

• TIV and QIV
  – 6 – 35 months: TIV - Half the adult dose; QIV - Paediatric version
  – 36 months or above: adult dose

• One dose is adequate for
  – Persons 9 years or above
  – Children below 9 years, who have properly received one or more doses of seasonal influenza vaccine in or before 2015/16 season

• 2-dose regimen separated by at least 28 days is recommended for vaccine naïve children below 9 years
Uploaded recommendations on CHP website

Centre for Health Protection
Department of Health
The Government of the Hong Kong Special Administrative Region

General Public | Health Professionals | Institutions & Schools | Business & Workplace

Home > Scientific Advisory Structure > Scientific Committees (SCs) > Scientific Committee on Vaccine Preventable Diseases

Scientific Committee on Vaccine Preventable Diseases

Vaccination offers the best hope for protecting population health against challenges posed by infectious diseases, through strengthening of the human defense systems. The Scientific Committee on Vaccine Preventable Diseases is set up to provide science-based advice on vaccine use at the population level.

Chairman
Dr. CHOW Chun Bong, B.B.S, JP

Members
Dr. CHAN Man Chung, JP
Dr. SUSAN CHIU Shui Seng
Dr. CHU Chung Ming, M.H.
Dr. Daniel CHU Cheung Shing
Prof. Benjamin John COWLING
Dr. Yvonne LAM Chau Kuen
Prof. LAU Yu Ling
Prof. Nelson LEE Lai Shun
Dr. LEUNG Chi Chiu
Dr. Janice LO Yee Chi, JP
Dr. MAK Sin Pong, B.B.S
Dr. Owen TSANG Tak Yin
Prof. Patrick WOO Chiu Yat
Dr. Betty YOUNG Wan Yin

Scope of Advice
1. To advise the Controller, CHPS on scientific basis of the public health actions aimed at protecting the community from vaccine-preventable diseases; and
2. To review and develop strategies for public health management of vaccine-preventable infections and their risk factors in the light of changing epidemiology and advances in medical science.

Papers Discussed / Recommendations
- Recommendations on Seasonal Influenza Vaccination for the 2017/18 Season (June 2017)
- Scientific Committee on Vaccine Preventable Diseases and Scientific Committee on Vector borne Diseases Updated Recommendation on Japanese Encephalitis Vaccination (November 2016)
- Consensus Statement on the use of Human Papilloma Virus (HPV) Vaccine in prevention of cervical cancer (September 2016)
- Updated Recommendations on the Use of Pneumococcal Vaccines for High-risk Individuals (July 2016)
- Recommendations on Seasonal Influenza Vaccination for the 2016/17 Season (June 2016)
- Recommendations on Seasonal Influenza Vaccination for the 2015/16 Season (July 2015)
- Updated Recommendations on the Use of Pneumococcal Vaccines for High-risk Individuals (December 2014)
- Recommendations on Seasonal Influenza Vaccination for the 2014/15 Season (July 2014)

Protect yourself from seasonal influenza

Influenza Vaccination Helps
Pneumococcal Infections

• Pneumococcal infections
  – a wide range of diseases caused by the bacterium Streptococcus pneumoniae (or more commonly referred as pneumococcus).

• Streptococcus pneumoniae (pneumococcus)
  – a common cause of mild illnesses such as sinus or middle ear infections
  – may also cause severe or even life-threatening invasive pneumococcal diseases (IPD) such as bacteremic pneumonia, sepsis, and meningitis
  – outcomes for IPD are usually more severe among young children and elderly persons.
Pneumococcal Infections

- **Streptococcus pneumoniae (cont’)**
  - causative agent of pneumococcal infections
  - a Gram-positive bacterium encapsulated with polysaccharides
  - The difference in the composition of capsular polysaccharides constitutes to at least 90 different serotypes of pneumococci identified thus far

- **Pneumococci**
  - carried on human bodies
  - present in the upper respiratory tracts even in some healthy carriers.
  - transmitted via spread of droplet, direct oral contact or indirect contact with articles soiled with respiratory discharges
Invasive pneumococcal diseases

- Invasive pneumococcal diseases (IPD)
  - sepsis, meningitis, bacteraemic pneumonia
  - caused by Streptococcus pneumoniae
  - can occur in persons of any age but the risk is substantially higher for elders

- Incidence for elders aged 65 or above: 4.5 to 10 per 100,000 (50 – 112 new cases per year)

- In Hong Kong, the annual incidence of IPD ranged from 1.7 to 2.9 per 100,000 from 2007 to 2016. The incidence is higher in children younger than 5 years of age and adults 65 years of age and older
SCVPD recommendations for PV in 2017/18 season
Recommendations of SCVPD

- In December 2015, the Scientific Committee on Vaccine Preventable Diseases (SCVPD) updated recommendation of pneumococcal vaccination for individuals aged 2 years or above.

<table>
<thead>
<tr>
<th>Without high-risk conditions</th>
<th>Aged 2 to 64 years</th>
<th>Aged 65 years or above</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not recommended</td>
<td>Either a single dose of PCV13 or a single dose of 23vPPV</td>
<td></td>
</tr>
</tbody>
</table>

| Individuals with high-risk conditions who have not received any pneumococcal vaccines | One dose of PCV13 followed by one dose of 23vPPV 1 year after the previous PCV13 vaccination^ |

| Individuals with high-risk conditions who have received 23vPPV | Single dose of PCV13 1 year after previous 23vPPV vaccination |

| Individuals with high-risk conditions who have received PCV13 | Single dose of 23vPPV 1 year after previous PCV13 vaccination |
Recommendations of SCVPD

High-risk conditions include the following:

(a) History of invasive pneumococcal disease

(b) Immunocompromised states:
   - Asplenia, HIV/AIDS, primary immunodeficiency
   - Immunodeficiencies related to malignancy and transplantation
   - Immunodeficiencies related to use of immunosuppressive drugs / systemic steroid

(c) Chronic disease:
   - Chronic cardiac, pulmonary, liver or renal disease
   - Diabetes mellitus or CSF leakage

(d) With cochlear implants

(Essential hypertension per se is not considered as a high risk condition)
Recommendations of SCVPD

• For individuals who have not received any pneumococcal vaccines, it is recommended to receive PCV13 before 23vPPV for better immune response.

• Those who previously received 23vPPV are recommended to receive PCV13 one year later to avoid hypo-responsiveness to the vaccine antigens.
Recommendations of SCVPD

• Besides pneumococcal vaccination, individuals (except those with known contraindications) should also receive seasonal influenza vaccine.

• The clinical efficacy for dual vaccination in elderly in preventing hospitalisation and death associated with respiratory, cardiovascular and cerebrovascular disease has been proven in local study.
Pneumococcal Vaccine
Pneumococcal vaccines

- 2 types of pneumococcal vaccines available in the market
  - 23-valent pneumococcal polysaccharide vaccine (23vPPV)
  - Pneumococcal conjugate vaccines (PCV)

- Immunogenicity studies on PCV13 and 23vPPV showed that PCV13 elicited non-inferior or better immune response for serotypes commonly covered by both vaccines. However, it is worth noting that 23vPPV contains 11 additional serotypes and theoretically offers extra protection.

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>4</th>
<th>9V</th>
<th>6B</th>
<th>14</th>
<th>18C</th>
<th>19F</th>
<th>23F</th>
<th>1</th>
<th>5</th>
<th>7F</th>
<th>3</th>
<th>6A</th>
<th>19A</th>
<th>2</th>
<th>8</th>
<th>9N</th>
<th>10A</th>
<th>11A</th>
<th>12F</th>
<th>15B</th>
<th>17F</th>
<th>20</th>
<th>22F</th>
<th>33F</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCV13</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23vPPV</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Registered PCV13 and 23vPPV available in 2017/18 season

<table>
<thead>
<tr>
<th>Vaccine Type</th>
<th>Route of administration</th>
<th>Certificate holder</th>
<th>Name of vaccine</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCV13</td>
<td>Intramuscular</td>
<td>PFIZER CORPORATION HONG KONG LIMITED</td>
<td>Prevenar 13</td>
</tr>
<tr>
<td>23vPPV</td>
<td>Intramuscular/subcutaneous</td>
<td>MERCK SHARP &amp; DOHME (ASIA) LTD</td>
<td>Pneumovax 23</td>
</tr>
</tbody>
</table>
Uploaded recommendations on CHP website

Scientific Committee on Vaccine Preventable Diseases

Vaccination offers the best hope for protecting population health against challenges posed by infectious diseases, through strengthening of the human defense systems. The Scientific Committee on Vaccine Preventable Diseases is set up to provide science-based advice on vaccine use at the population level.

Chairman
Dr. CHOW Chun Bong, B.B.S, JP

Members
Dr. CHAN Man Chung, JP
Dr. SUSAN CHIU Shui Seng
Dr. CHU Cheng Ming, M.H.
Dr. Daniel CHIU Cheung Shing
Prof. Benjamin John COWLING
Dr. Yonnie LAM Chau Kuen
Prof. LAU Yu Ling
Prof. Nelson LEE Lai Shun
Dr. LEUNG Chi Chiu
Dr. Janice LO Yee Chiq, JP
Dr. MAK Sin Ting, B.B.S
Dr. Owen TSANG Tak Yin
Prof. Patrick WOO Chiu Yat
Dr. Betty YOUNG Wan Yin

Scope of Advice
1. To advise the Controller, CHP on scientific basis of the public health actions aimed at protecting the community from vaccine-preventable diseases; and
2. To review and develop strategies for public health management of vaccine-preventable infections and their risk factors in the light of changing epidemiology and advances in medical science.

Papers Discussions / Recommendations
- Recommendations on Seasonal Influenza Vaccination for the 2017/18 Season (June 2017)
- Statement on Hepatitis A Vaccination and men who have sex with men (June 2017)
- Scientific Committee on Vaccine Preventable Diseases and Scientific Committee on Vector-borne Diseases Updated Recommendation on Japanese Encephalitis Vaccination (November 2016)
- Updated Recommendations on the Use of Human Papilloma Virus (HPV) Vaccination in Prevention of Gynaecological Cancer (September 2016)
- Updated Recommendations on the Use of Pneumococcal Vaccines for High-risk Individuals (May 2016)
- Recommendations on Seasonal Influenza Vaccination for the 2015/16 Season (July 2015)
- Updated Recommendations on the Use of Pneumococcal Vaccines for High-risk Individuals (December 2014)
- Recommendations on Seasonal Influenza Vaccination for the 2014/15 Season (July 2014)

FAQs on SIV
FAQ on SIV (1)

I enjoy good health all along. Should I receive 2017/18 seasonal influenza vaccine?

Answer:

- Seasonal influenza vaccination is one of the effective means to prevent seasonal influenza and its complications
- Severe cases can occur even in healthy persons
- All members of the public aged 6 months or above, except those with known contraindications, should receive seasonal influenza vaccine for personal protection
- SIV is also recommended to HCW to reduce the risk of transmitting influenza to patients who are at high risk of complications and mortality from influenza
I am afraid that yearly vaccinated with SIV would decrease my body immunity. Is it necessary to get vaccinated against seasonal influenza every year?

Answer

- The circulating seasonal influenza strains may change from time to time, the seasonal influenza vaccine composition is updated every year to enhance protection.
- The immunity built up in a vaccinated person in the prior season will decrease over time and may become too low to provide protection in next season.
- In addition, the vaccine compositions of 2017/18 seasonal influenza vaccine are different from those in 2016/17.
FAQ on SIV (3)

I still got flu-like illness after vaccination last year. How much protection does the seasonal influenza vaccine provide?

Answer:

- When the vaccine strains closely match the circulating influenza viruses, efficacy of inactivated influenza vaccine in individuals younger than 65 years of age typically range from 70% to 90%.
- For prevention against influenza, vaccinated individuals should maintain good personal and environmental hygiene practices, balanced diet, regular exercise, adequate rest, and no smoking.
FAQ on SIV (4)

Is seasonal influenza vaccine safe? I am afraid of the side effects? Would it give rise to Guillain-Barré syndrome?

Answer:
- Inactivated seasonal influenza vaccine is very safe.
- Usually well tolerated apart from occasional soreness, redness or swelling at the injection site.
- Some recipients may experience fever, muscle pain, and tiredness beginning 6 to 12 hours after vaccination and lasting up to two days.
- Influenza vaccination may be rarely followed by serious adverse events, e.g. severe allergic reaction (anaphylaxis) (9 per 10 million doses distributed).
- Guillain-Barré syndrome (GBS) (1 to 2 case per million vaccinees), the causal relationship of influenza vaccination with GBS is not established.
Thank you