衞生防護中心
Centre for Health Protection

Epidemiology of seasonal influenza in Hong Kong and use of seasonal influenza vaccines

Sep 2020

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Overview of seasonal influenza in HK

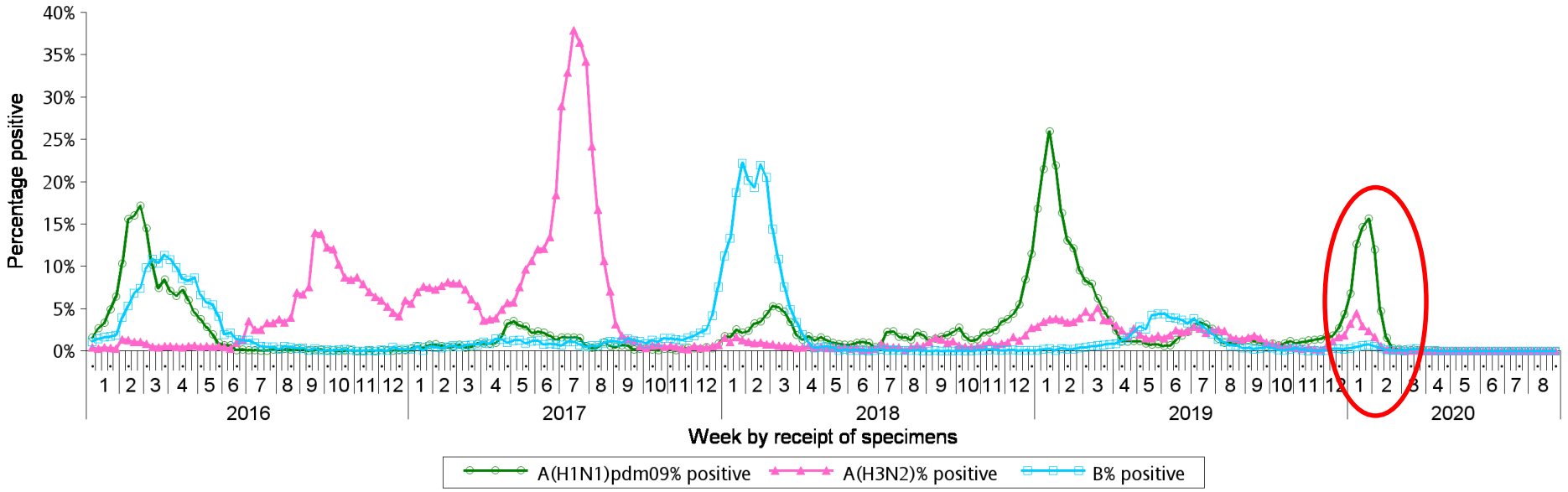
- Usually 2 influenza seasons each year
  - Main season: **winter season** occurring between Jan and Mar/Apr
    - Lasted for 12 - 16 weeks in past 5 years (except 7 weeks and 5 weeks in the atypical 2016/17 and 2019/20 winter seasons respectively)
  - Another **summer season** with variable timing (between Jun and Sep)
    - Lasted for 5 weeks in 2016 but 16 weeks in the atypical 2017 summer season
    - not occurred in some years (e.g. no summer season in 2018 - 2020)

2019/20 winter influenza season in HK

- Started in the second week of Jan this year
- Overall seasonal influenza activity increased above the baseline level and peaked in the last week of Jan
- Rapidly returned to baseline level in mid-Feb
- Lasted for 5 weeks, shorter than previous 2 seasons (12 weeks in 2017/18 winter and 14 weeks in 2018/19 winter seasons)

Laboratory surveillance

- Among the respiratory specimens received, the positive percentage of seasonal influenza viruses reached the peak of about 19% in late Jan (peak recorded during 2016–2019 ranged from 25.7% to 40.6%)
- The predominant virus was influenza A(H1) (accounting for about 80% of all influenza detections)



2019/20 winter influenza season in HK

- Mild season, reflected by rapid decrease in Feb
  - influenza detections
  - institutional influenza-like illness (ILI) outbreaks
  - influenza-associated hospitalisations
- Likely related to intensive prevention measure adopted by the whole community for COVID-19, such as hand hygiene, mask wearing, social distancing, etc.

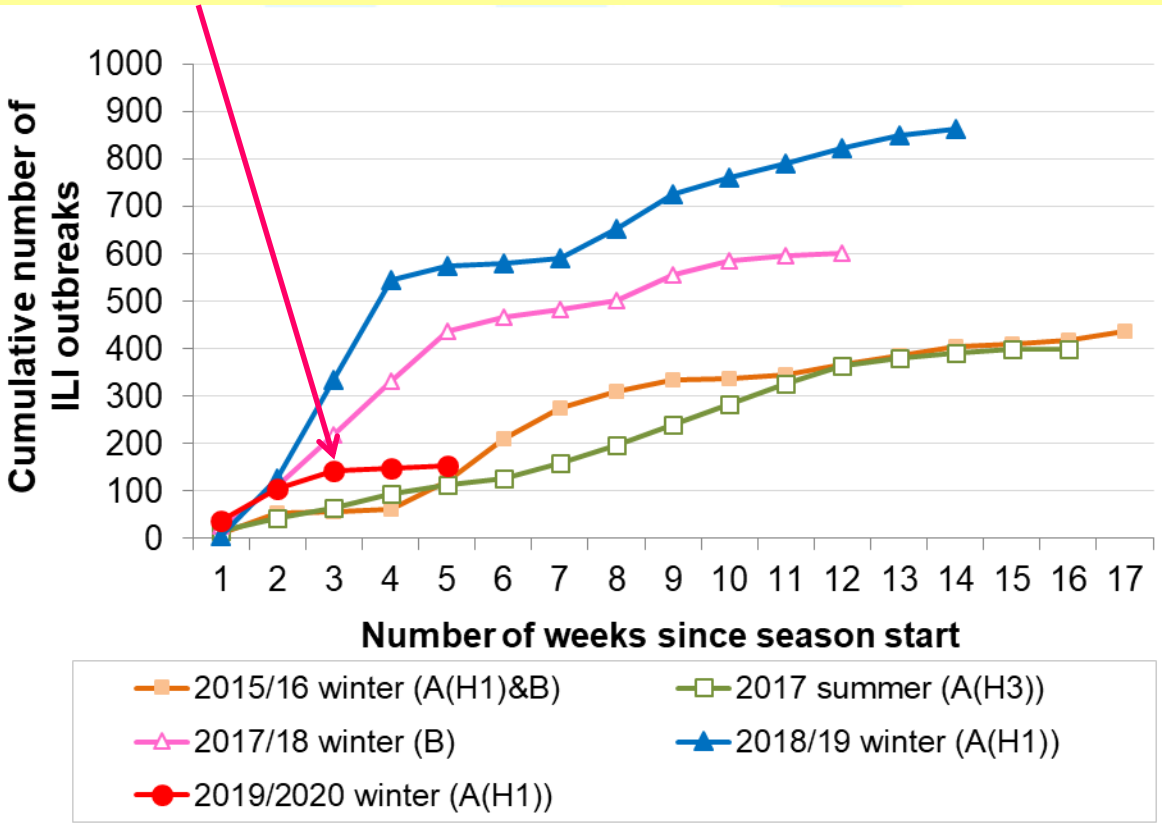
ILI outbreaks in schools/institutions

- Number of ILI outbreaks increased in mid to late Jan (39 - 65 outbreaks per week)
- 153 ILI outbreaks were recorded in this season, which was lower than 600 and 863 outbreaks in previous 2 winter seasons

Type of schools/institutions	No. of outbreaks (% among all outbreaks)	Total no. of schools/ institutions in HK	Percentage of schools/ institutions affected
KGs/CCCs	**61 (39.9%)**	1,079	5.7%
Primary schools	38 (24.8%)	587	6.5%
Secondary schools	9 (5.9%)	521	1.7%
RCHEs	21 (13.7%)	758	2.8%
RCHDs	15 (9.8%)	331	4.5%
Others	9 (5.9%)	--	--
Total	153	--	--

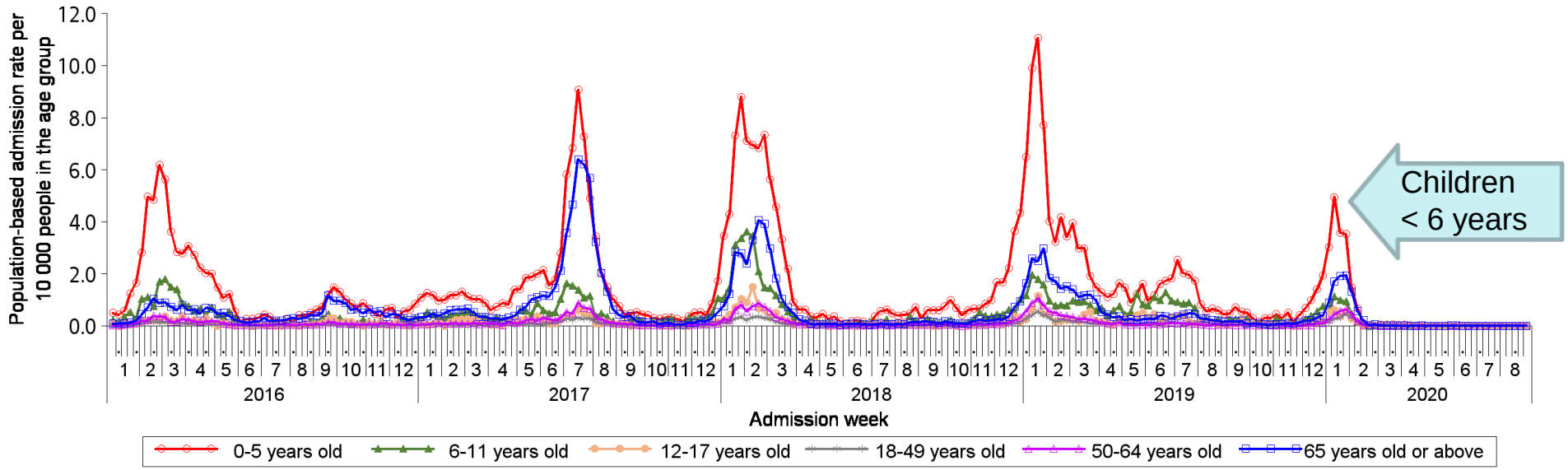
Cumulative numbers of reported ILI outbreaks

2019/20 winter: Start of Lunar New Year holiday on 25 Jan (at the end of the 3rd week) and continued school suspension afterwards



Influenza-associated admission rates in public hospitals

- Peaked in the week ending Jan 25 (0.93 per 10,000 population) [within the range of 0.67 to 1.91 recorded in major seasons during 2016-2019]
- Peak weekly admission rates in this season by age groups: highest among young children 0-5 years (4.95 per 10,000 population), followed by elderly ≥65 years (1.94) & children 6-11 years (1.13)



Adult influenza cases who required ICU admission or died

- Total 169 cases (including 103 deaths) in this season
- Most (66%) affected elderly ≥65 years；about 78% had pre-existing chronic diseases
- Only 42 (25%) were known to have received 2019/20 seasonal influenza vaccine (SIV)
- About 22% were aged 50-64 years, higher than H3N2-predominant seasons (e.g. 15% in 2017 summer) and B-predominant seasons (e.g. 20% in 2017/18 winter)

Age group	All cases including deaths		Deaths among the cases	
	No. of cases (%)	Cumulative incidence (per million population)	No. of deaths (%)	Cumulative mortality (per million population)
18 - 49	20 (11.8%)	6.0	3 (2.9%)	0.9
50 - 64	37 (21.9%)	20.5	17 (16.5%)	9.4
≥65	112 (66.3%)	84.7	83 (80.6%)	62.8
Total	169	26.1	103	15.9

Paediatric influenza-associated severe complications/deaths

- 5 cases (including no deaths) were recorded in this season
- Age range: 26 months – 8 years (median: 5 years)
- 1 (20%) had pre-existing chronic diseases
- 4 (80%) did not received the 2019/20 SIV

Age group	No. of cases (death among the cases)	Cumulative incidence (per million population)
0 – 5	3 (0)	8.9 (0)
6 - 11	2 (0)	5.4 (0)
12 - 17	0 (0)	0 (0)

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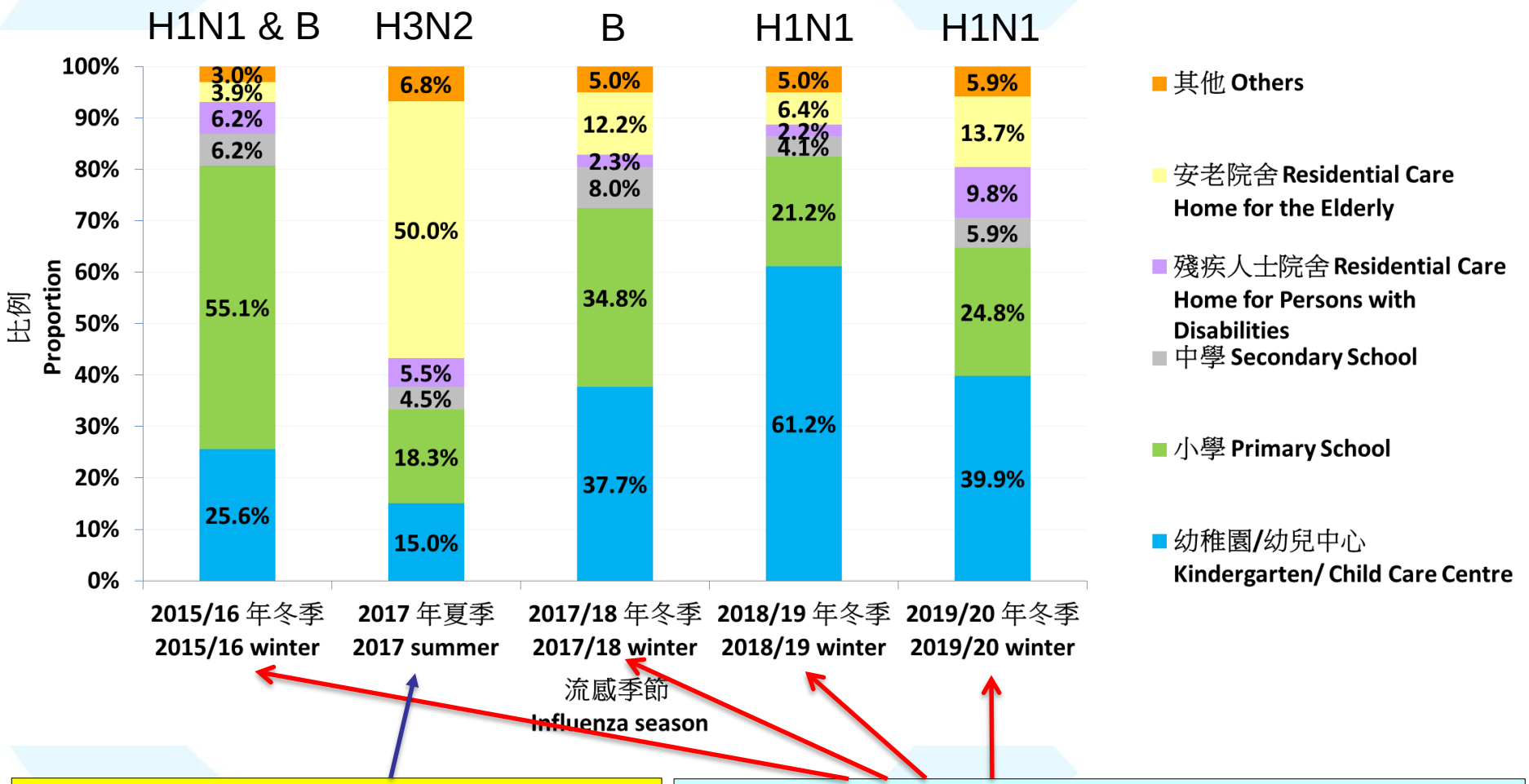
Distribution of ILI outbreaks by types of institutions

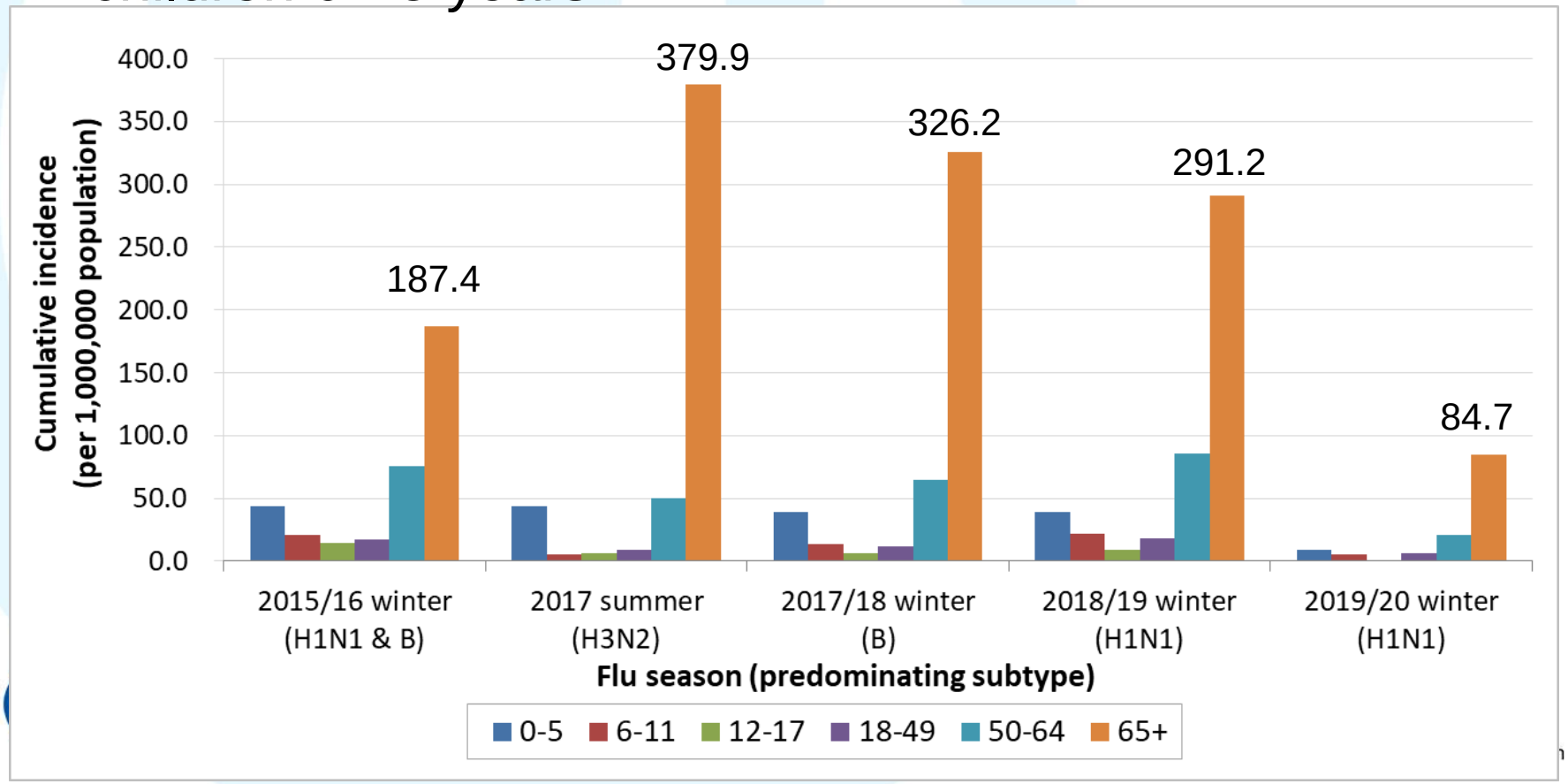


Most outbreaks occurred in RCHEs during 2017 summer seasons predominated by **A(H3N2)**

Most outbreaks occurred in schools during 2015/16, 2017/18, 2018/19 and 2019/20 winter seasons predominated by **A(H1N1)** or **B**

Cumulative incidence rates of severe cases (per million population)

- Much higher in elderly than other age groups
- Second high was 50 - 64 years, followed by young children 0 - 5 years



Surveillance of adult influenza cases who required ICU admission or died

Season (predominating virus)	No. of weeks	No. of severe cases including deaths	No. of deaths
2019/20 winter (H1)	5	169	103
2018/19 winter (H1)	14	601	356
2017/18 winter (B)	12	570	382
2017 summer (H3)	16	582	430
2015/16 winter (H1&B)	17	409	211

- 169 – 601 adult severe cases per season (103 - 430 deaths)
- About 79% had pre-existing chronic medical diseases
- Only about 28% were known to have received SIV for the respective seasons

Surveillance of severe paediatric influenza cases (2016 – 2020)

Season (predominating virus)	No. of weeks	No. of cases including deaths	No. of deaths
2019/20 winter (H1)	5	**5**	**0**
2018/19 winter (H1)	14	**24**	**1**
2017/18 winter (B)	12	**20**	**2**
2017 summer (H3)	16	**19**	**3**
2015/16 winter (H1/B)	17	**27**	**3**

- 5 – 27 cases per season (0 – 3 deaths)
- About 29% had pre-existing chronic medical diseases
- Only 14% were known to have received SIV for the respective seasons

Seasonal Influenza Vaccine (SIV)

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Recommendation on SIV composition in 2020/21 (Northern hemisphere)

Only **egg-based quadrivalent** SIV will be available in Hong Kong

	Egg-based	**Cell-based / Recombinant-based**
H1	A/Guangdong-Maonan/SWL1536/2019 (H1N1)pdm09-like virus	A/Hawaii/70/2019 (H1N1)pdm09-like virus
H3	A/Hong Kong/2671/2019 (H3N2)-like virus	A/Hong Kong/45/2019 (H3N2)-like virus
B/Victoria	B/Washington/02/2019 (B/Victoria lineage)-like virus	
B/Yamagata*	B/Phuket/3073/2013 (B/Yamagata lineage)-like virus.	

*To be included in quadrivalent SIV only but not in trivalent SIV

Compositions of the SIVs recommended by WHO

Type		2018/19 Northern	2019 Southern	2019/20 Northern	2020 Southern	2020/21 Northern	
						Egg-based	Cell-based / Recombinant-based
Trivalent SIV	**H1**	A/Michigan/45/2015 (H1N1)pdm09-like virus		A/Brisbane/02/2018 (H1N1)pdm09-like virus		A/Guangdong-Maonan/SWL1536/2019 (H1N1)pdm09-like virus	A/Hawaii/70/2019 (H1N1)pdm09-like virus
	H3	A/Singapore/INFIMH-16-0019/2016 (H3N2)-like virus	A/Switzerland/8060/2017 (H3N2)-like virus	A/Kansas/14/2017 (H3N2)-like virus	A/South Australia/34/2019 (H3N2)-like virus	A/Hong Kong/2671/2019 (H3N2)-like virus	A/Hong Kong/45/2019 (H3N2)-like virus
	B	B/Colorado/06/2017-like (B/Victoria/2/87 lineage) virus			B/Washington/02/2019-like (B/Victoria lineage) virus		
Additional component in quadrivalent SIV		B/Phuket/3073/2013-like (B/Yamagata lineage) virus					

Recommendations on influenza vaccination in 2020/21 season

- **All members of the public** aged 6 months or above except those with known contraindications should receive SIV annually for personal protection
- 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 SIV
  1. Pregnant women
  2. Residents of Residential Care Homes (such as RCHE or RCHD)
  3. Persons aged 50 years or above
  4. Persons with chronic medical problems
  5. Health care workers
  6. Children aged 6 months to 11 years
  7. Poultry workers
  8. Pig farmers and pig-slaughtering industry personnel

Seasonal influenza vaccines available in HK in 2020/21 season

(Information from Drug Office, DH)

Quadrivalent inactivated influenza vaccine (all egg-based)

- Vaxigriptetra Vaccine 0.5ml (aged six months or above)
- Fluarix Tetra Northern Hemisphere Vaccine Suspension for Injection (aged six months or above)
- Influvac Tetra Vaccine Suspension for Injection (Northern Hemisphere) (aged three years or above)

Live Attenuated Influenza Vaccine (LAIV) (egg-based)

- Flumist Quadrivalent Influenza Intranasal Vaccine (aged 2 - 49 years)

Types of SIVs recommended to be used in HK

- **Both** IIV and LAIV are recommended
- For IIVs, depending on individual brand, most IIVs are given via the intramuscular route and recommended for use among people aged six months of age or above except those with known contraindications
- For LAIV, it can be used for people aged 2-49 years except those who are pregnant, immunocompromised or with other contraindications

Contraindications

- All SIV: history of severe hypersensitivity to any of the vaccine components or a previous dose of SIV
- Additional contraindications for LAIV:
  - Concomitant aspirin or salicylate-containing therapy in children and adolescents;
  - Children 2 years through 4 years who have asthma or who have had a history of wheezing in the past 12 month;
  - Children and adults who are immunocompromised due to any cause;
  - Close contacts and caregivers of severely immunosuppressed persons who require a protected environment;
  - Pregnancy; and
  - Receipt of influenza antiviral medication within previous 48 hours

About egg allergy (both IIV & LAIV)

- SIV contains ovalbumin (an egg protein), but the vaccine manufacturing process involves repeated purification and the ovalbumin content is very low
- Even people who are allergic to eggs are generally safe to receive vaccination
  - Individuals with mild egg allergy can receive 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

Dosing schedule and vaccination interval

- A single dose of SIV is the standard regimen for persons aged ≥9 years
- Children below 9 years of age:
  - who have received one or more doses of SIV before: 1 dose
  - who have not received any SIV before: 2 doses of SIV with an interval of at least 4 weeks

- Inactivated and live vaccines may be administered simultaneously or at any interval between doses
- For individuals receiving LAIV, other live vaccines not administered on the same day should be administered at least 4 weeks apart

ILI outbreaks among schools with or without outreach vaccination

Proportion of schools with ILI outbreaks in 2019/20 winter influenza season

School type	Without outreach vaccination	With outreach vaccination
KGs/CCCs (n=1,079)	21 / 324 (6.5%)	37 / 755* (4.9%) ↓24%
Primary schools (n=587)	6 / 48 (12.5%)	31 / 539 (5.8%) ↓54%

* Note: One KG/CCC having outbreaks within 21 days after outreach vaccination are not counted.

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Summary

- Significant disease burden of seasonal influenza during influenza seasons in terms of institutional outbreaks, hospitalisations and mortality, esp. among elderly and young children
- H3N2 tends to affect elderly while H1N1 tends to affect children more
- The majority of severe cases did not receive SIV
- Promoting SIV is the most effective means for mitigating the disease burden of seasonal influenza

Thank you