



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

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Overview of seasonal influenza in HK

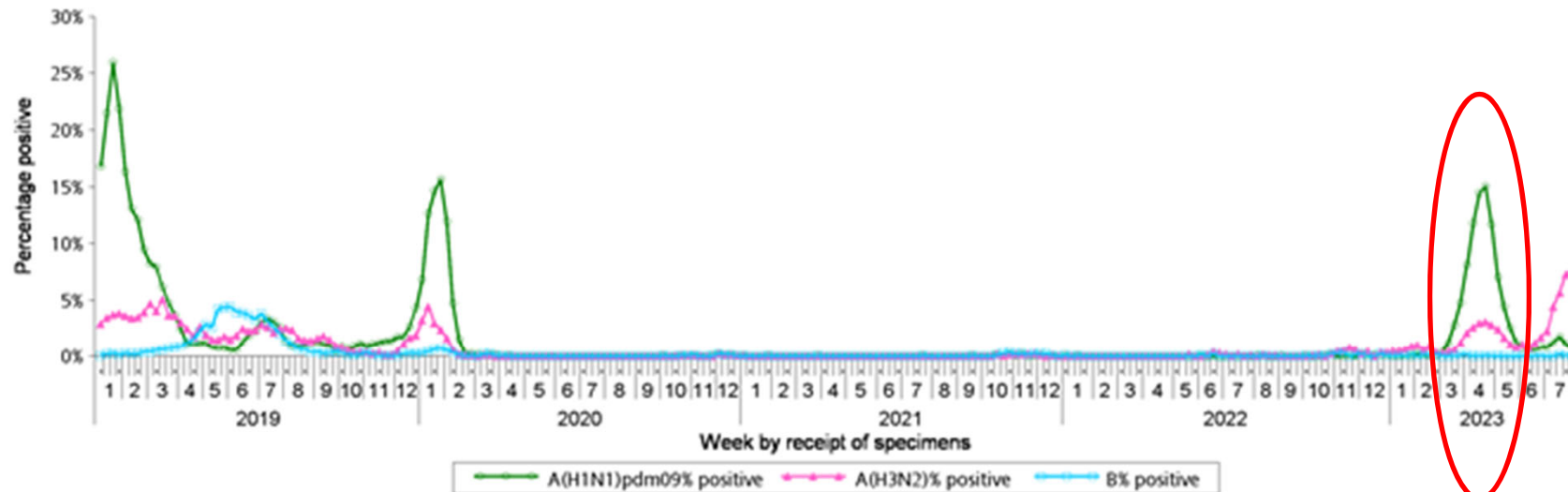
- Usually 2 influenza seasons each year
 - Main season: **winter season** occurring between Jan and Mar/Apr
 - Lasted for 12 – 17 weeks in pre-COVID-19 years (but 7 weeks in the atypical 2016/17 winter season)
 - Another **summer season** with variable timing (between Jun and Sep)
 - Lasted for 5 – 8 weeks in pre-COVID-19 years (except 16 weeks in the atypical 2017 summer season)
 - Not occurred in some years (e.g. no summer season in 2018 & 2019)

2023 April influenza season in HK

- Started in early April with overall seasonal influenza activity increasing rapidly since early April
- Started to decrease gradually after reaching the peak in late April and returned to baseline in late May
- Lasted for 7 weeks
- Young children aged 0-5, children aged 6-11 and elderly aged ≥ 65 were mostly affected
 - Majority of ILI outbreaks were in primary school and residential care homes for the elderly
 - Hospitalisation rate in public hospitals was the highest in young children aged < 6 years

Laboratory surveillance

- Among the respiratory specimens received, the positive percentage of seasonal influenza viruses peaked at 18.2% in late Apr
- The predominant virus was influenza A(H1) (accounting for 80% of all influenza detections)



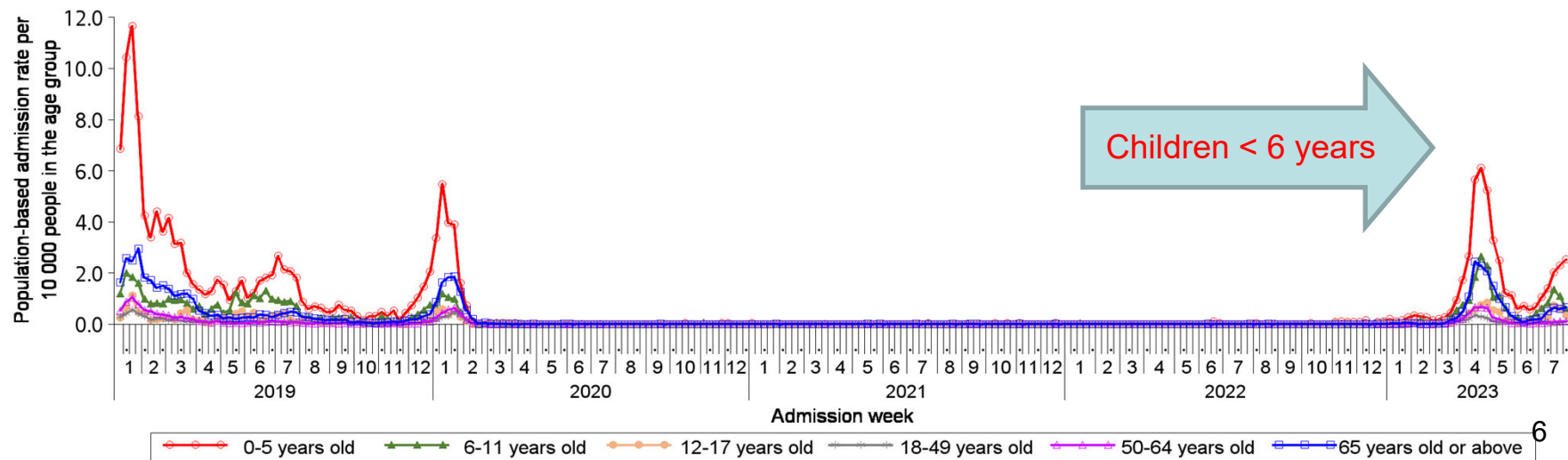
ILI outbreaks in schools/institutions

- 157 ILI outbreaks were recorded in this season
- ILI outbreaks peaked in late Apr (59 outbreaks)

Type of schools/institutions	No. of outbreaks (% among all outbreaks)	Total no. of schools/institutions in HK	Percentage of schools/institutions affected
KGs/CCCs	16 (10%)	1,581	1%
Primary schools	61 (39%)	593	10%
Secondary schools	19 (12%)	510	4%
RCHEs	34 (22%)	821	4%
RCHDs	19 (12%)	339	6%
Others	8 (5%)	--	--
Total	157	--	--

Influenza-associated admission rates in public hospitals

- Peaked in the week ending Apr 22 (1.14 per 10,000 population) [within the range of 1.50 to 1.91 recorded in major seasons during 2017-2019]
- Peak weekly admission rates in this season by age groups: highest among young children 0-5 years (6.03 per 10,000 population), followed by children 6-11 years (2.65) & elderly ≥ 65 years (2.44)



Adult influenza cases who required ICU admission or died

- Total 274 cases (including 172 deaths) in this season
- Most (73% of cases and 87% of deaths) affected elderly ≥ 65 years ;
- About 84% had pre-existing chronic diseases
- Only 94 (34%) were known to have received 2022/23 seasonal influenza vaccine (SIV)

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	24 (8.8%)	7.8	5 (2.9%)	1.6
50 - 64	50 (18.2%)	27.6	18 (10.5%)	9.9
≥ 65	200 (73.0%)	130.8	149 (86.6%)	97.5
Total	274	42.8	172	26.9

Paediatric influenza-associated severe complications/deaths

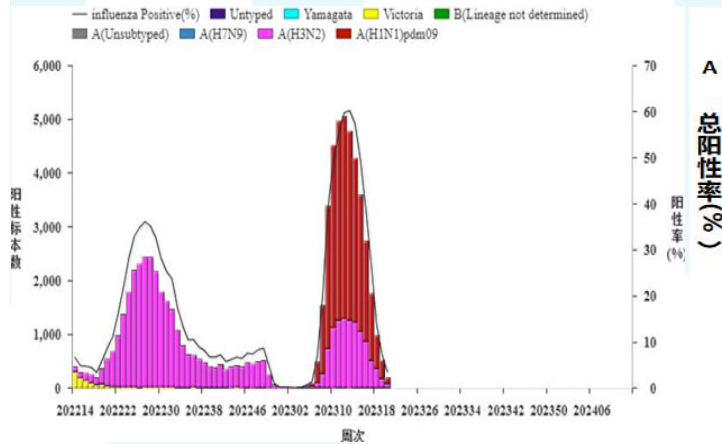
- 3 cases (including 2 deaths) were recorded in this season
- Age range: 1 year – 17 years (median: 13 years)
- 1 (33%) had pre-existing chronic diseases
- All did not receive the 2022/23 SIV

Age group	No. of cases (death among the cases)	Cumulative incidence (per million population)
0 - 5	1 (0)	3.8
6 - 11	0 (0)	0.0
12 - 17	2 (2)	6.1

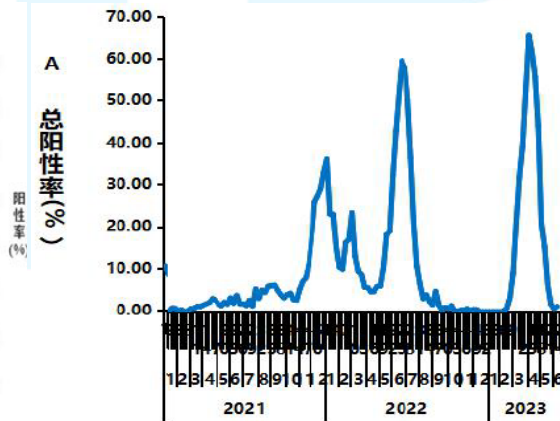
Summary of 2023 April Influenza Season

- Short and mild, started few months later than usual winter influenza seasons
- Predominated by influenza A (H1) virus, which also predominated in the Mainland, Guangdong and Macao within the same period

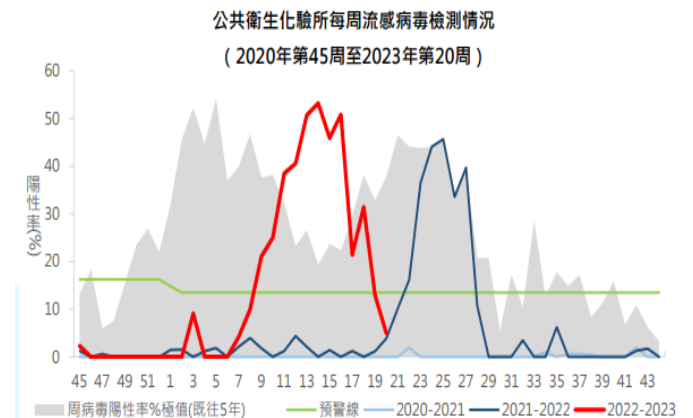
Southern China



Guangdong

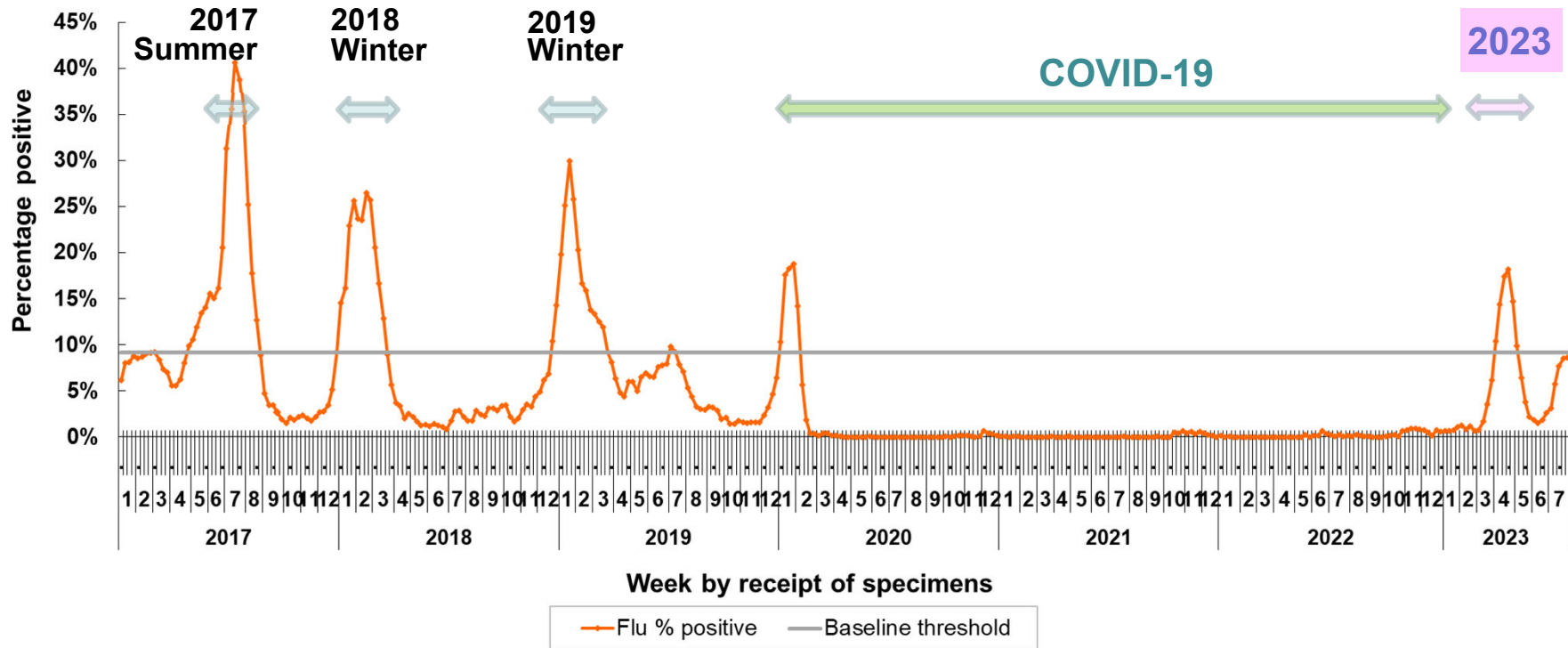


Macao



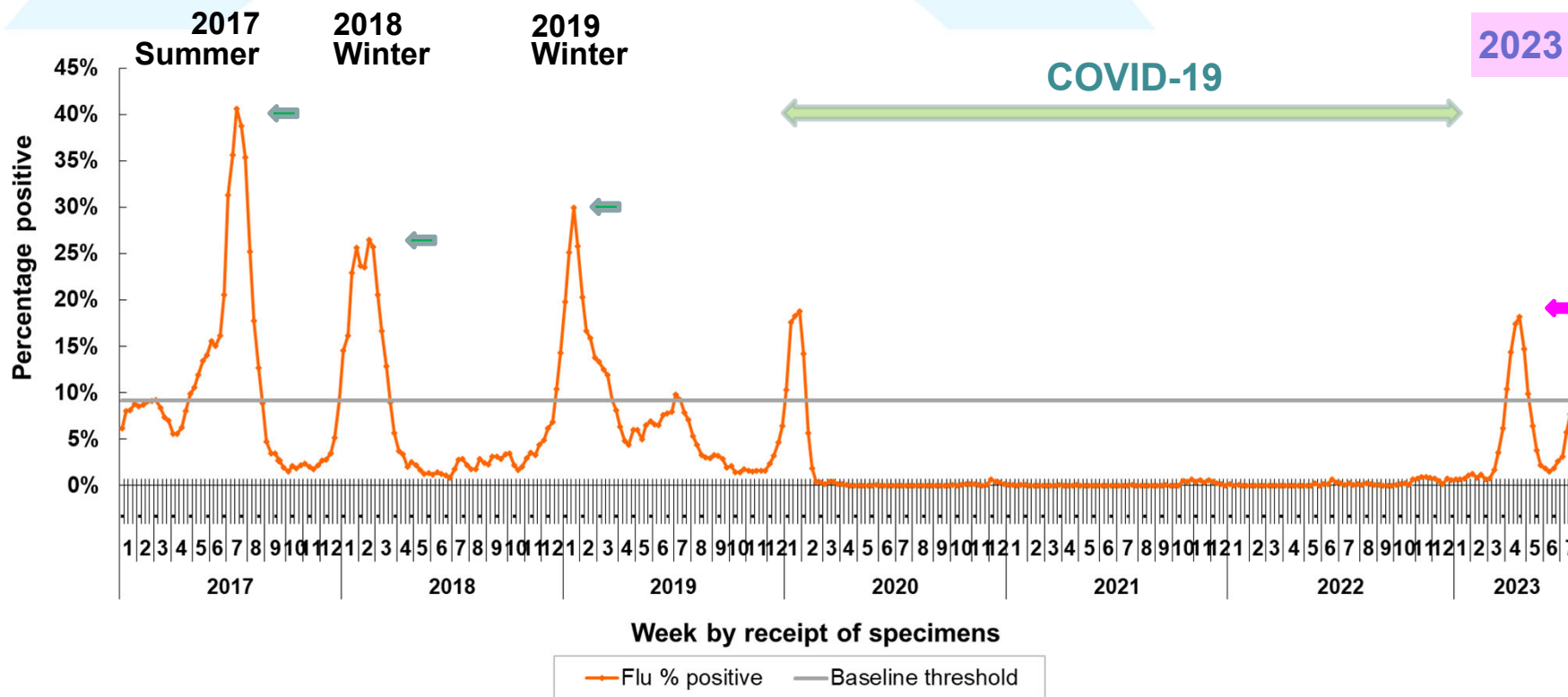
Comparison of 2023 April Influenza Season in Hong Kong with pre-COVID-19 years (2017 - 2019)

Timing and Duration of Seasons



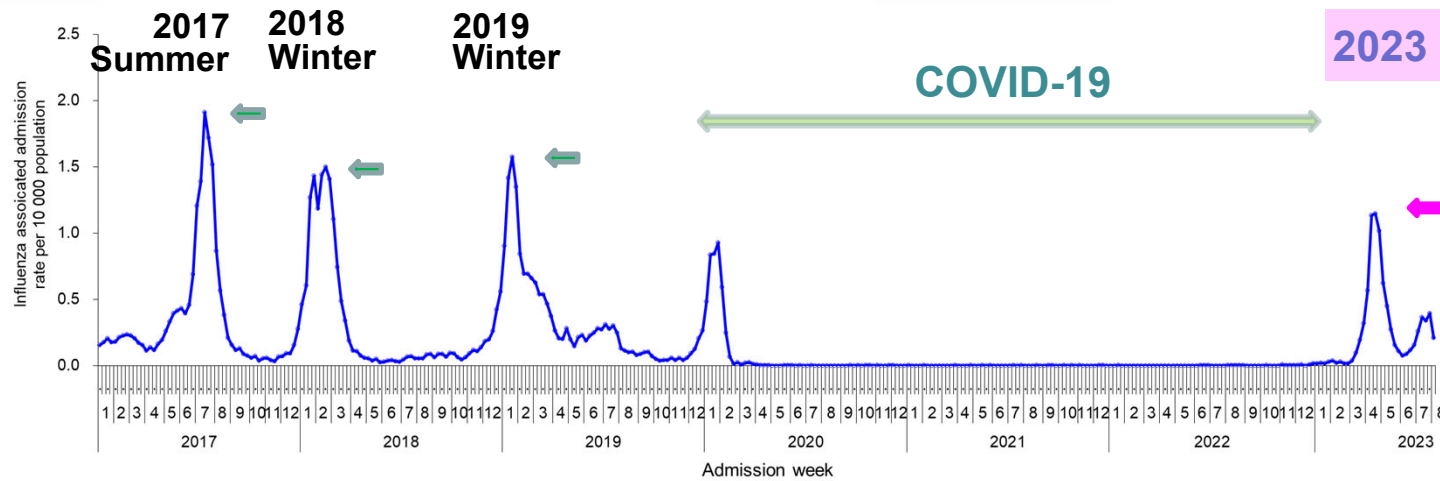
Aspect	2017 - 2019	2023	Compare
Timing	Jan – Mar/Apr (except 2017 summer season)	Apr to May	Later
Duration	12 – 17 weeks	7 weeks	Shorter

Peak of influenza detection



Aspect	2017 - 2019	2023	Compare
Flu detection (peak)	26.5% – 40.6%	18.2%	Lower

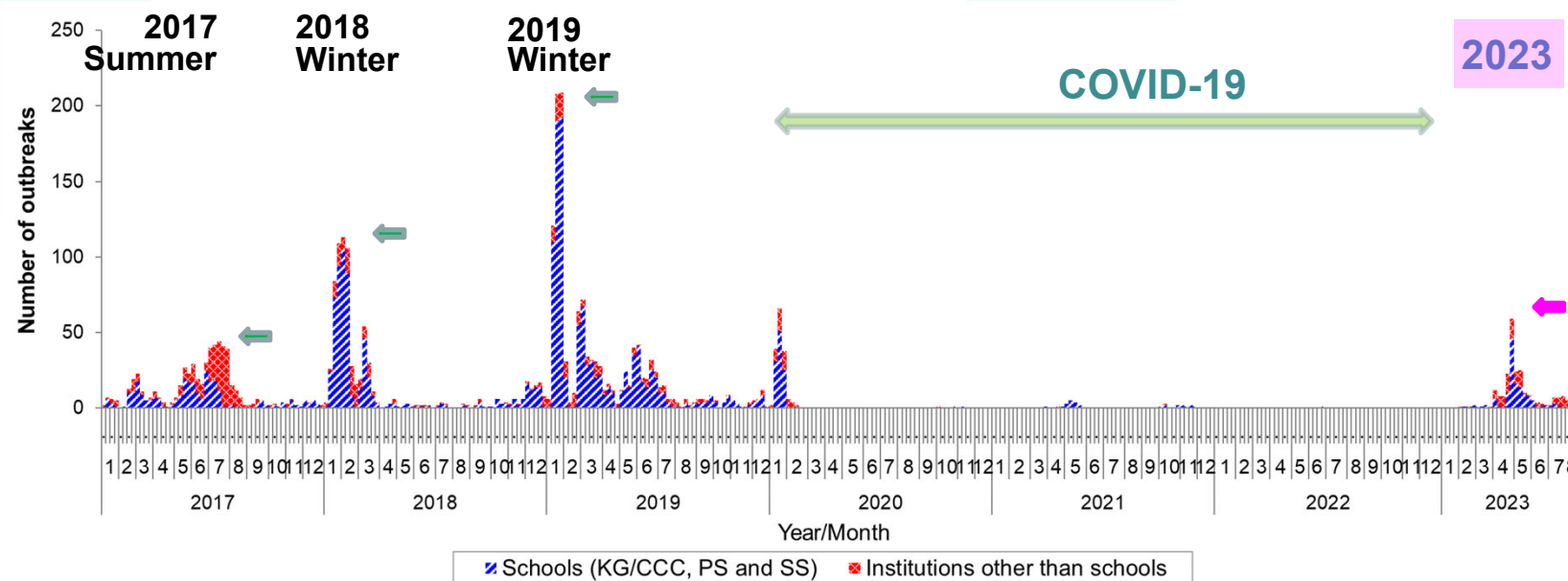
Weekly influenza-associated admission rates in HA hospitals



Season (predominating virus)	Peak admission rate (per 10,000 population) recorded						
	0-5	6-11	12-17	18-49	50-64	≥65	All ages
2023 (H1)	6.03	2.65	0.85	0.35	0.67	2.44	1.14
2018/19 winter (H1)	11.66	2.00	1.14	0.57	1.04	2.96	1.58
2017/18 winter (B)	9.03	3.69	1.50	0.36	0.86	4.05	1.50
2017 summer (H3)	9.09	1.65	0.61	0.31	0.87	6.39	1.91

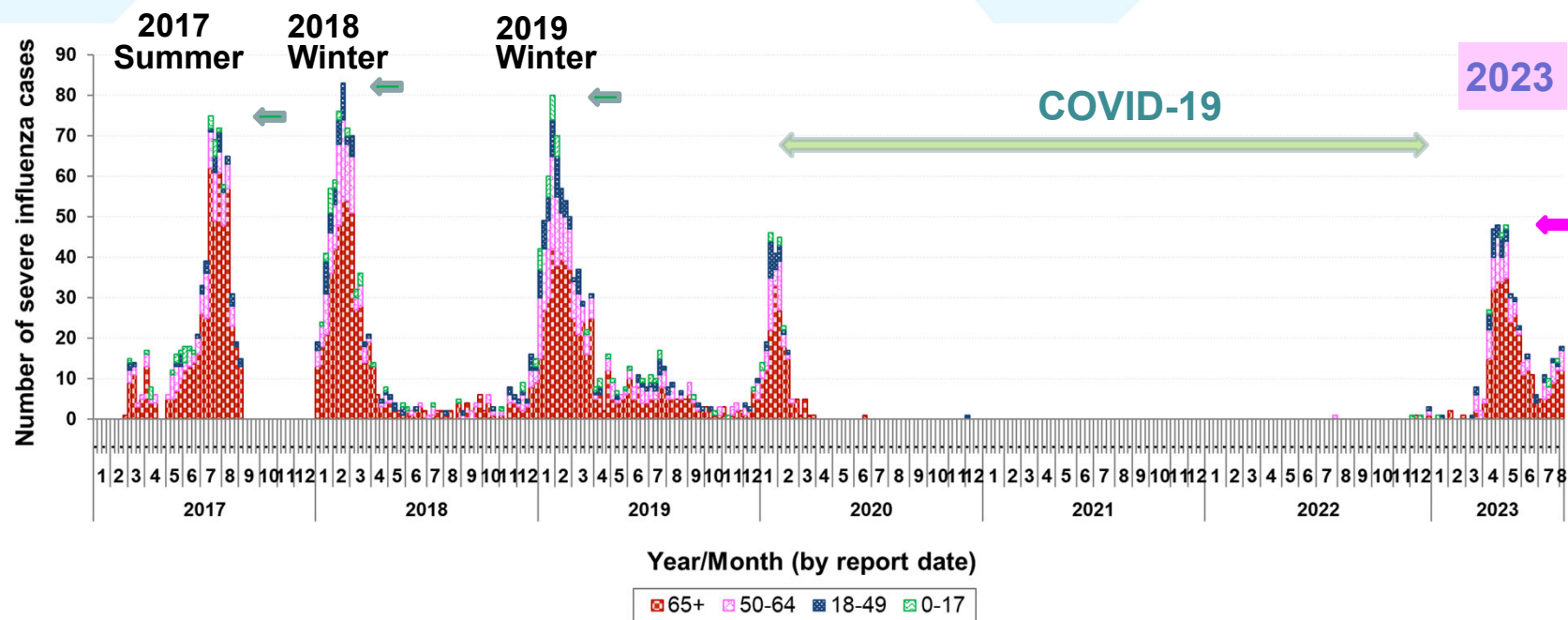
- 2023 overall peak rate lower than previous 3 years
- 2023: 0-5, 6-11, ≥65 mostly affected
- Age-specific rates within historical ranges
- 2023 rates lower than 2018/19 season (both predominated by A(H1))

Institutional ILI outbreaks



Aspect	2017 - 2019	2023	Compare
ILI outbreaks	2017: 44 in peak week 2018: 113 in peak week 2019: 209 in peak week	59 in peak week	Less than previous 2 winter seasons
Cumulative ILI outbreaks	~ 400 – 860	157	Less

Severe influenza cases



Aspect	2017 - 2019	2023	Compare
Severe/fatal cases	~80 cases in peak week	48 cases in peak week	Less

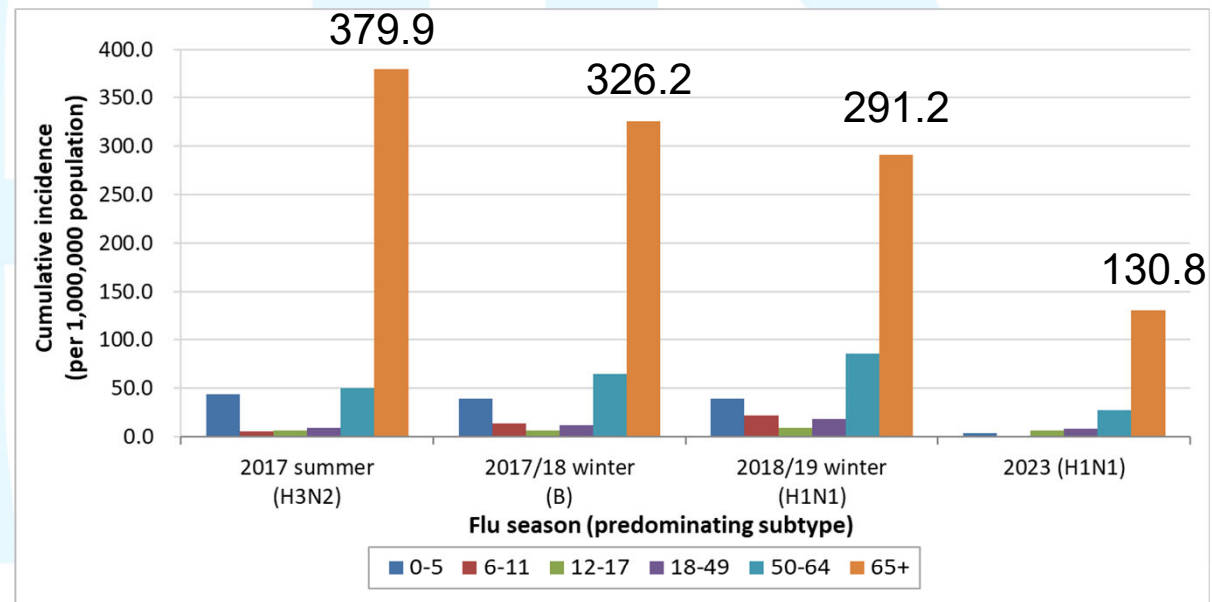
Severe influenza cases (cumulative)

Year	Season	Adult cases	Adult deaths	Paed cases	Paed deaths	All cases	All deaths
2023*	April	274	172	3	2	277	174
2017	Summer	582	430	19	3	601	433
2017/18	Winter	570	382	20	2	590	384
2018/19	Winter	601	356	24	1	625	357

Aspect	2017 - 2019	2023	Compare
Severe/fatal cases (cumulative)	690 – 625 cases	277 cases	Less

Cumulative incidence rates of severe cases (age-specific)

- Much higher in elders than other age groups
- Second high was 50 - 64 years, usually followed by young children 0 – 5 years in previous seasons



Aspect	2017 - 2019	2023	Compare
Cumulative incidence in elders	291.2 – 379.9	130.8	Lower

Complications of severe paediatric influenza cases

Complications	2017 – 2019		2023	
	No. of cases including deaths (%)	No. of deaths (%)	No. of cases including deaths (%)	No. of deaths (%)
Neurological complications (encephalitis, encephalopathy, etc.)	38 (60%)	5 (83%)	1 (33%)	0
Severe pneumonia	19 (30%)	0	1 (33%)	1 (50%)
Shock	10 (16%)	1 (17%)	2 (67%)	2 (100%)
Sepsis	0	0	1 (33%)	1 (50%)
Myocarditis	2 (3%)	0	0	0
Total	63	6	3	2

Summary

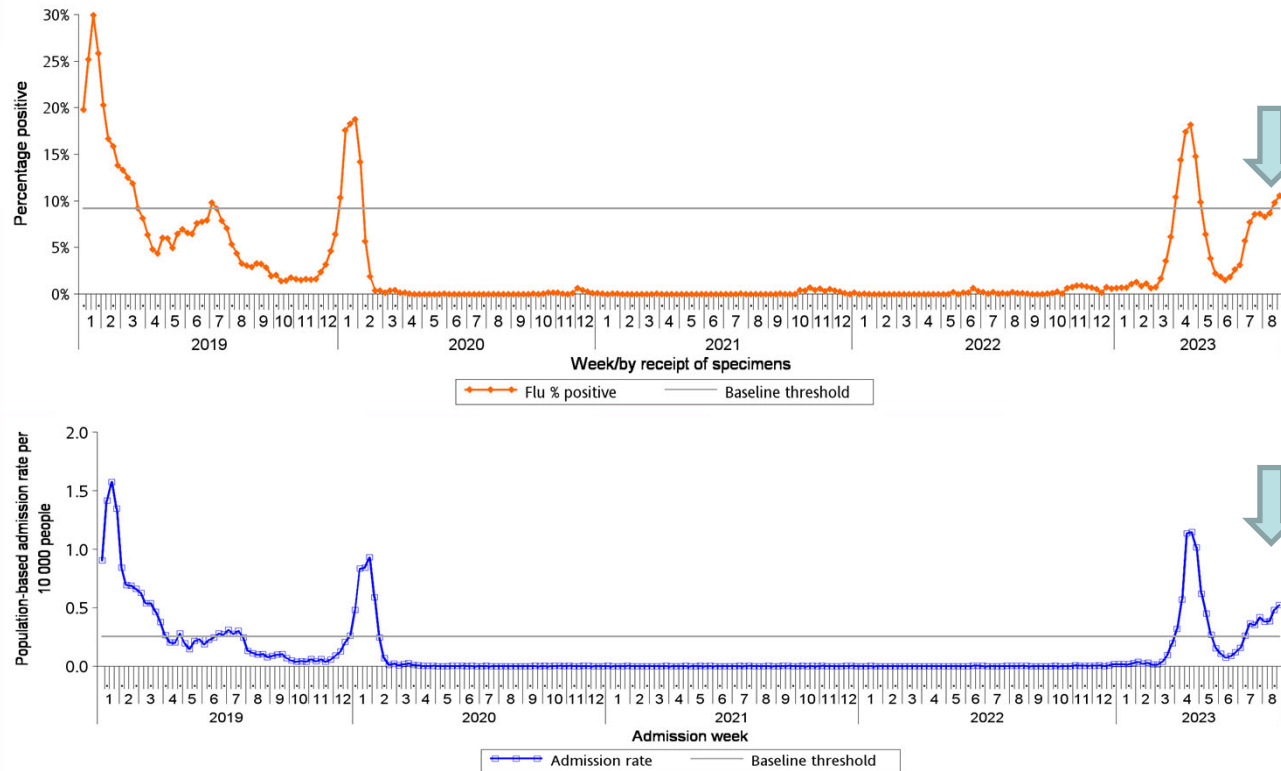
- Significant disease burden of seasonal influenza during influenza seasons in terms of institutional outbreaks, hospitalisations and mortality, esp. among elderly and young children
- H1N1 tend to affect children more whereas H3N2 tends to affect elderly
- The majority of severe cases did not receive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

2023 Summer Influenza Season

2023 Summer Influenza Season

- Announced entering summer flu season on 24 August
- Influenza activity has increased since July, exceeded the seasonal epidemic threshold in the week ending 19 August 2023 as reflected by influenza detection and influenza-associated hospitalization
- Influenza activity continued to increase in recent weeks
- CHP will continue to closely monitor the situation

Flu detection & Hospitalisation



- Increasing positive percentage of influenza detection, reaching 10.57% in the last week of August
- Influenza A(H3) viruses predominating
- Increasing weekly admission rate (0.52 per 10,000 population in the last week of August)

Seasonal Influenza Vaccine (SIV)

Recommendation on seasonal influenza vaccine composition in 2023/24 (Northern hemisphere)

	Egg-based	Cell-based / Recombinant-based
H1	A/Victoria/4897/2022 (H1N1)pdm09-like virus	A/Wisconsin/67/2022 (H1N1)pdm09-like virus
H3	A/Darwin/9/2021(H3N2)-like virus	A/Darwin/6/2021 (H3N2)-like virus
B/Victoria	B/Austria/1359417/2021(B/Victoria lineage)-like virus	
B/Yamagata*	B/Phuket/3073/2013 (B/Yamagata lineage)-like virus.	

*Included in quadrivalent SIV only but not in trivalent SIV.

WHO Recommended composition of influenza virus vaccines for use in the 2023- 2024 northern hemisphere influenza season. 24 February 2023. <https://www.who.int/publications/m/item/recommended-composition-of-influenza-virus-vaccines-for-use-in-the-2023-2024-northern-hemisphere-influenza-season>

Compositions of the SIVs recommended by WHO

Type		2022/23 Northern		2023 Southern		2023/24 Northern	
		Egg-based	Cell-based / Recombinant-based	Egg-based	Cell-based / Recombinant-based	Egg-based	Cell-based / Recombinant-based
Tri-valent SIV	H1	A/Victoria/2570/2019 (H1N1)pdm09-like virus	A/Wisconsin/588/2019 (H1N1)pdm09-like virus	A/Sydney/5/2021 (H1N1)pdm09-like virus		A/Victoria/4897/2022 (H1N1)pdm09-like virus	A/Wisconsin/67/2022 (H1N1)pdm09-like virus
	H3	A/Darwin/9/2021 (H3N2)-like virus	A/Darwin/6/2021 (H3N2)-like virus	A/Darwin/9/2021 (H3N2)-like virus	A/Darwin/6/2021 (H3N2)-like virus	A/Darwin/9/2021 (H3N2)-like virus	A/Darwin/6/2021 (H3N2)-like virus
	B	B/Austria/1359417/2021 (B/Victoria lineage)-like virus					
Additional component in quadrivalent SIV		B/Phuket/3073/2013-like (B/Yamagata lineage) virus					

Seasonal influenza vaccines available in HK in 2023/24 season

Quadrivalent inactivated influenza vaccine (all egg-based)

- Vaxigriptetra Vaccine 0.5ml (aged six months or above)
- Vaxigriptetra Quadrivalent Influenza 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 six months or above)

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

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

Recombinant influenza vaccine (recombinant-based)

- Flublok Quadrivalent Influenza Vaccine solution for injection 0.5ml (pre-filled syringe without needle) (adults aged 18 or above)

Recommendations on influenza vaccination in 2023/24 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. Health care workers*
 2. Elderly persons living in residential care homes
 3. Pregnant women
 4. Long-stay residents of institutions for persons with disability
 5. Persons aged 50 years or above
 6. Persons with chronic medical problems
 7. Children and adolescents aged 6 months to **under 18 years (secondary school students/adolescents aged 12-17 years added as temporary cohort since 2022-23 season)**
 8. Poultry workers
 9. Pig farmers and pig-slaughtering industry personnel

Types of SIVs recommended to be used in HK

- IIV, LAIV and RIV are recommended
- For IIVs, quadrivalent IIV is preferred to trivalent IIV due to the additional protection against one more lineage of influenza B offered by quadrivalent IIV. Depending on individual brand, IIVs are recommended for use among people aged six months of age or older
- For LAIV which is a quadrivalent SIV, it can be used for people 2-49 years of age except those who are pregnant, immunocompromised or with other contraindications
- RIV is recommended for use in individuals of 18 years or above
 - A review of existing studies suggested that, in older age group, **RIV may be potentially more effective than standard-dose IIV**
 - Both IIV and RIV are recommended for use in the residential care home setting. **When available, RIV which may offer improved protection against influenza illness in older adults is preferred for older adults living in residential care homes**

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 (a chicken protein), but the manufacturing process involves repeated purification and the ovalbumin content is very little
- 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 ≥ 9 years
- Children below 9 years:
 - vaccine-naïve: 2 doses of SIV with an interval of at least 4 weeks
 - who have received one or more doses of SIV before: 1 dose
- For IIV and RIV, other 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
- SIV can be co-administered with COVID-19 vaccine on the same visit under informed consent. The same principle would also apply to similar settings including residential care homes

Estimates of Vaccine Effectiveness of SIV at Primary Care Setting in HK



The effect of seasonal influenza vaccine on medically-attended influenza and non-influenza respiratory viruses infections at primary care level, Hong Kong SAR, 2017/18 to 2019/20

Yung-wai Chan*, Miu-ling Wong, Fong-yuen Kwok, Albert Ka-Wing Au, Emily Chi-mei Leung, Shuk-kwan Chuang

Communicable Disease Branch, Centre for Health Protection, Department of Health, Hong Kong Special Administrative Region

- Specimens of 1059 and 467 ILI patients submitted to CHP by sentinel PMPs in 2018/19 and 2019/20 seasons respectively were included to estimate the corresponding SIV VE on influenza A/B using the test-negative case control design.
- SIV was moderately effective against medically-attended ILI caused by influenza A/B in both 2018/19 and 2019/20 winter seasons (53.2% (95%CI 36.7–65.5) and 41.8% (95%CI 6.3–64.1), respectively).
- VE against the main circulating subtype, influenza A(H1), was higher for the 2018/19 season (57.2% (95%CI 39.8–69.9), compared to 34.6% (95%CI 9.6–61.4) in the 2019/20 season).

Interim estimates for 2022/23 season in overseas countries

- In the Northern Hemisphere, influenza A(H3N2) predominated in the 2022-23 winter season.
- Interim early season estimates in primary care setting in overseas countries showed influenza vaccination offered moderate protection against A(H3N2).

Country/Region	VE against A(H3N2) (95% CI)
United States	60% (25 to 79)
Canada	54% (38 to 66)
Europe	44% (32 to 54)
United Kingdom	Age 2-17: 68% (43 to 82); 18-64: 25% (-28 to 56); ≥65: 39% (14 to 56)

Proportion of schools with ILI outbreaks in 2018/19 winter influenza season

School type	Without outreach vaccination	With outreach vaccination
KGs/CCCs (n=1,063)	394 / 879 (44.8%)	51 / 184* (27.7%) ↓ 38%
Primary schools (n=587)	66 / 184 (35.9%)	76 / 403* (18.9%) ↓ 47%

* Note: Schools having outbreaks within 2 weeks after outreach vaccination are not counted (1 KG/CCC & 1 primary school). One primary school with outreach SIV for staff only was also not counted.

Thank you

