

COVID-19 & FLU EXPRESS



COVID-19 & Flu Express is a weekly report produced by Surveillance Division of the Communicable Disease Branch of the Centre for Health Protection. It monitors and summarizes the latest local and global COVID-19 and influenza activities.

Local Situation of COVID-19 Activity (as of May 10, 2023)

Reporting period: Apr 30 – May 6, 2023 (Week 18)

- The latest surveillance data showed that the activity of COVID-19 has increased in the past one week in Hong Kong.
- Members of the public are advised to maintain strict personal and environmental hygiene at all times for personal protection against COVID-19 infection and prevention of the spread of the disease in the community. For more details, please visit the COVID-19 information page (<https://www.chp.gov.hk/en/healthtopics/content/24/102466.html>).
- For the latest information on COVID-19 and prevention measures, please visit the thematic website of COVID-19 (<https://www.coronavirus.gov.hk/eng/index.html>).
- Members of the public are advised to take note of the latest recommendations on the use of COVID-19 vaccines in Hong Kong to protect themselves from serious outcomes of COVID-19. For more details, please visit (https://www.chp.gov.hk/files/pdf/consensus_interim_recommendations_on_the_use_of_covid19_vaccines_in_hong_kong_29mar.pdf).

Laboratory surveillance for COVID-19 cases

Positive nucleic acid test laboratory detections for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) virus

In week 18, the weekly number of newly recorded positive nucleic acid test laboratory detections for SARS-CoV-2 virus was 2,927 as compared to 2,400 in the preceding week. (Figure 1.1)

In the first 4 days of week 19 (May 7 – May 10), the daily number of newly recorded positive nucleic acid test laboratory detections for SARS-CoV-2 virus ranged from 413 to 583.

Since Jan 30, 2023, the cumulative number of positive nucleic acid test laboratory detections was 19,471 (as of May 10, 2023).

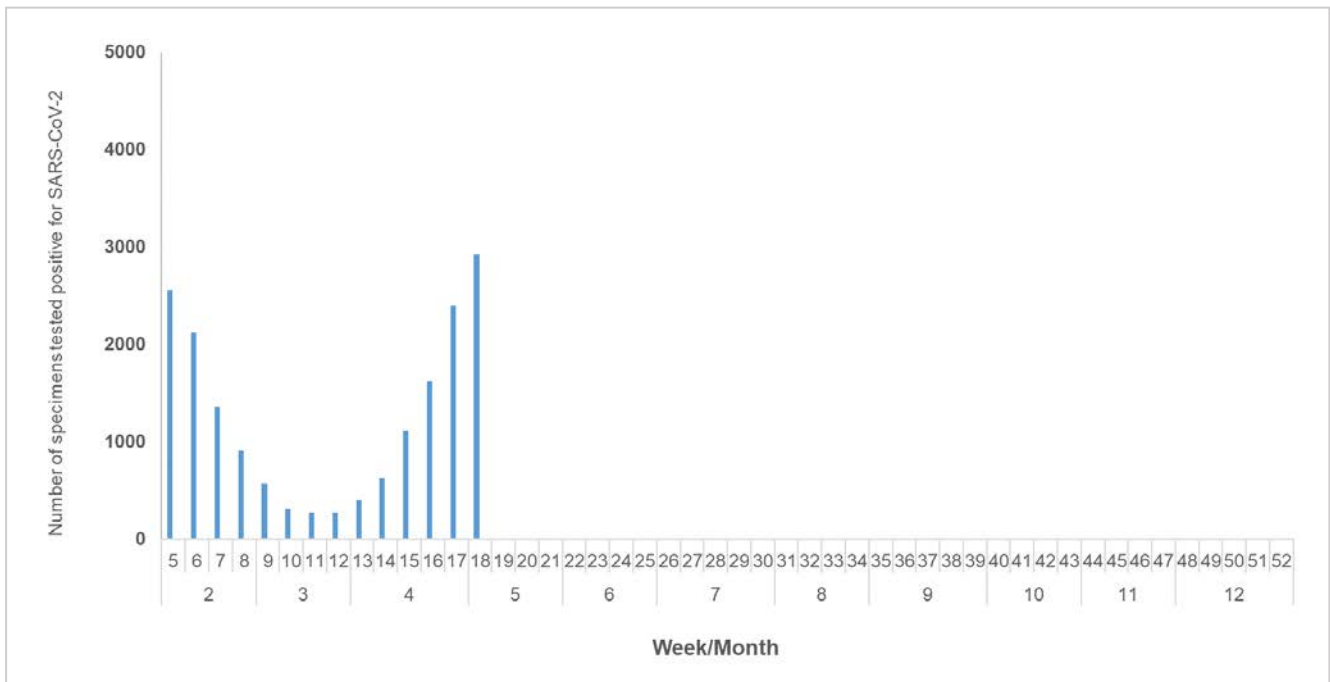


Figure 1.1 Weekly number of positive nucleic acid test laboratory detections for SARS-CoV-2 virus

Positive detection rate of specimens tested positive for SARS-CoV-2 virus at community testing centres/stations and the Public Health Laboratory Services Branch

Among the 1,583 specimens collected from community testing centres/stations (CTC) in week 18, 451 (28.49%[§]) were tested positive for SARS-CoV-2 virus. Among the 7,822 respiratory specimens received by the Public Health Laboratory Services Branch (PHLSB) in week 18, 2,315 (29.60%) were tested positive for SARS-CoV-2 virus. (Figure 1.2)

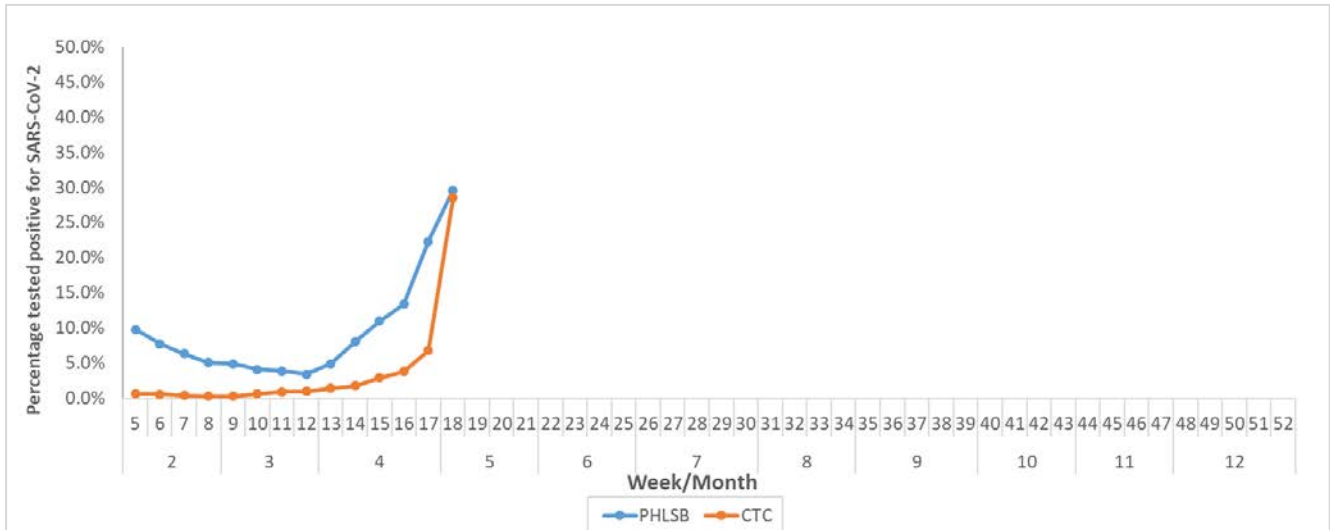


Figure 1.2 Percentage of specimens tested positive for SARS-CoV-2 virus at CTC and PHLSB

[§]Since April 29, 2023, pre-departure PCR testing was no longer required for travelling to some areas outside Hong Kong and it might result in the significant reduction in number of specimens collected from CTC. Interpretation of related trends and comparison with past data should be made with caution.

Laboratory surveillance on genetic characterisation for COVID-19 cases

PHLSB of the Centre for Health Protection (CHP) conducts genetic characterisation on a sample of specimens positive for SARS-CoV-2 as well as reported severe and death cases for COVID-19. Between May 4 and May 10, 2023, XBB and its descendant lineages comprised 44.7% of all characterised specimens during the period, an increase from 33.1% in Week 15. (Figure 1.3 & 1.4)

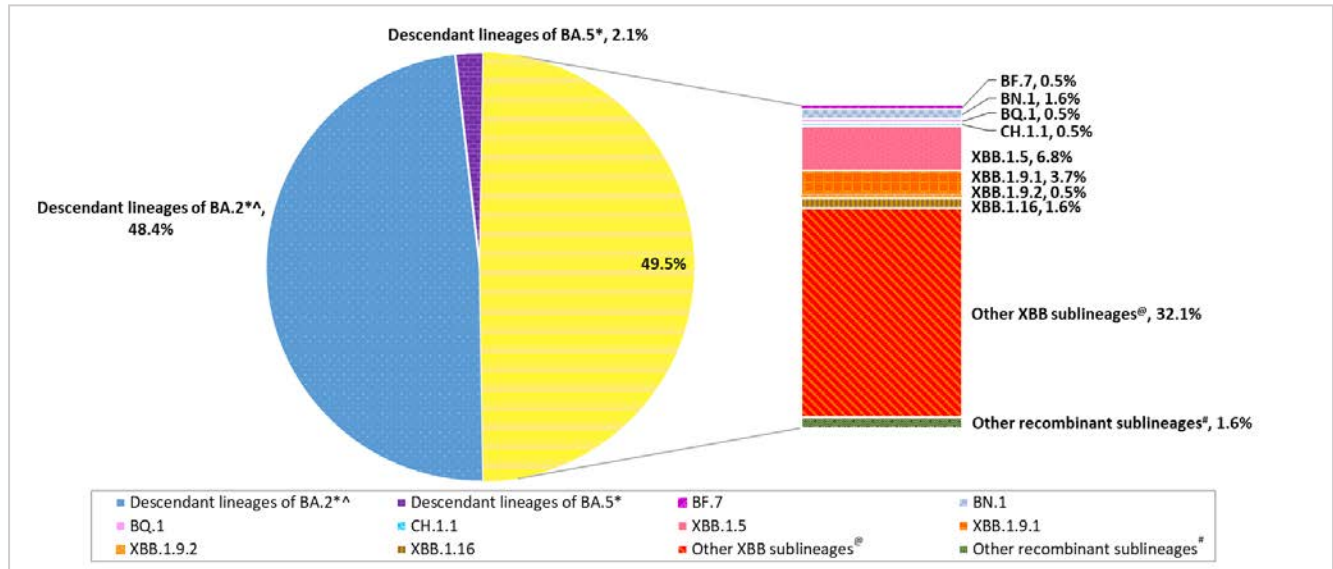


Figure 1.3 Proportion of variants among specimens tested positive for SARS-CoV-2 virus by PHLSB

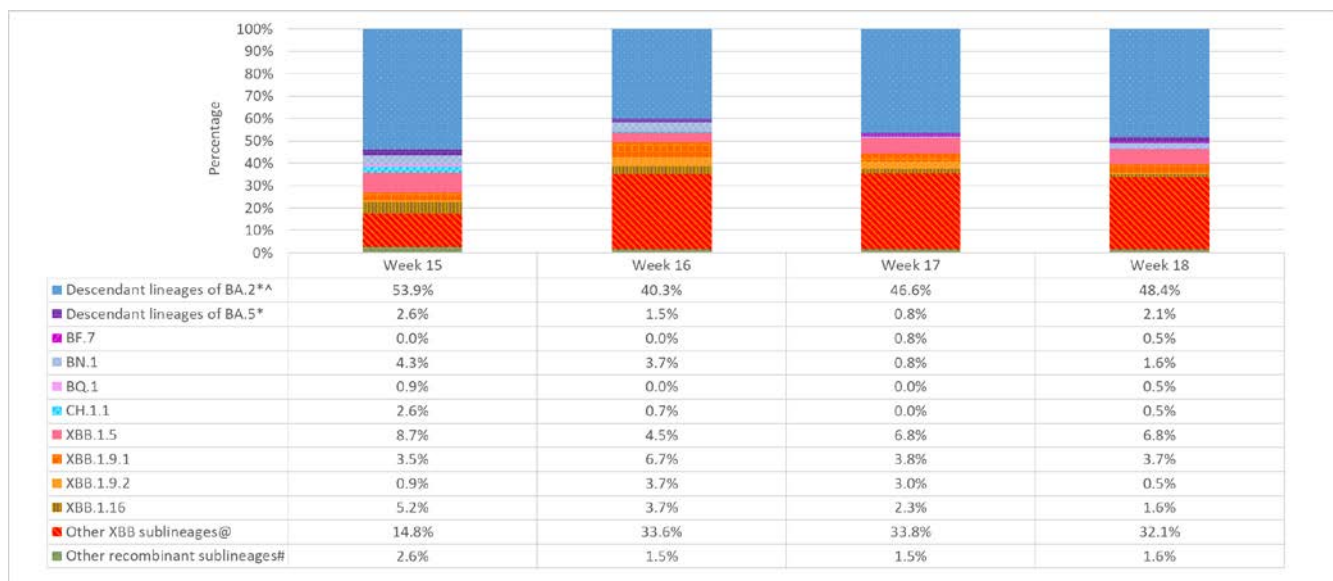


Figure 1.4 Proportion of variants among specimens tested positive for SARS-CoV-2 virus by PHLSB in the past 4 weeks

* Excluding BF.7, CH.1.1, XBB, XBF and their descendant lineages

^ Among them, some were confirmed to be BA.2.75 sublineages other than CH.1.1.

Including XAY, XBF and XBL

@Include some XBB specimens pending its descendant lineage information

COVID-19 outbreak surveillance

In week 18, 80 COVID-19 outbreaks occurring in schools/institutions were recorded (affecting 448 persons), as compared to 58 outbreaks recorded in the previous week (affecting 359 persons). (Figure 1.5)

In the first 4 days of week 19 (May 7 – May 10), 45 COVID-19 outbreaks occurring in schools/institutions were recorded (affecting 215 persons).

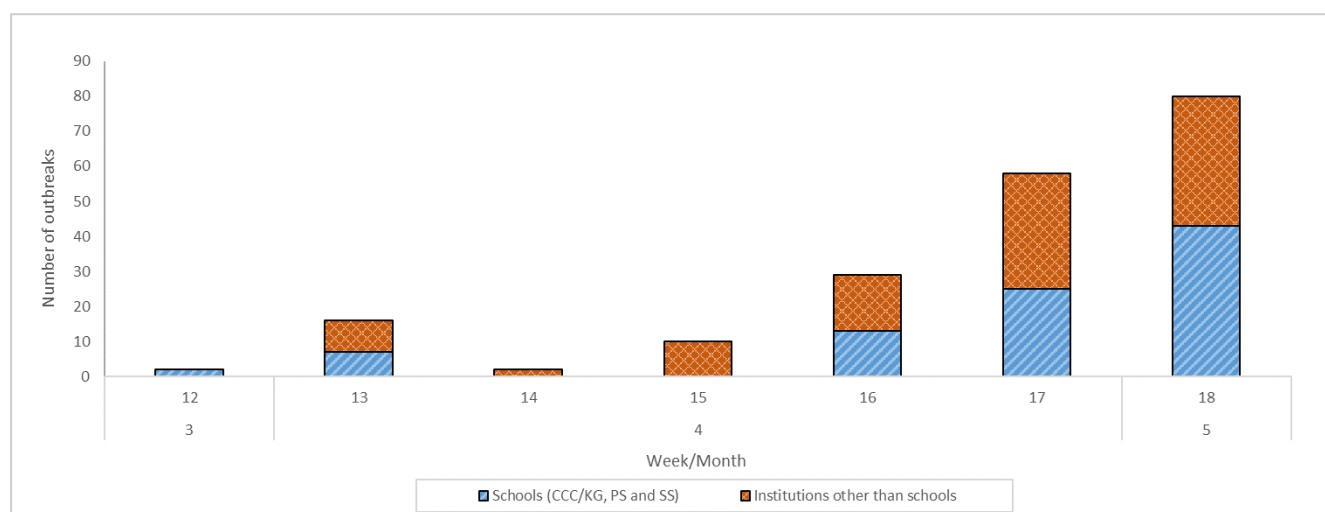


Figure 1.5 COVID-19 outbreaks in schools/institutions

Type of institutions	Week 17	Week 18	First 4 days of Week 19 (May 7 – May 10)
Child care centre/ kindergarten (CCC/KG)	0	1	0
Primary school (PS)	9	17	8
Secondary school (SS)	16	25	17
Residential care home for the elderly	16	24	12
Residential care home for persons with disabilities	9	10	5
Others	8	3	3
<i>Total number of outbreaks</i>	58	80	45
<i>Total number of persons affected</i>	359	448	215

Surveillance of severe and fatal COVID-19 cases

(Note: The data reported are provisional figures and subject to further revision.)

In week 18, the weekly number of severe COVID-19 cases including deaths with cause of death preliminarily assessed to be related to COVID-19 was 159 as compared to 119 in the preceding week. (Figure 1.6)

In the first 4 days of week 19 (May 7 – May 10), 94 severe COVID-19 cases including deaths with cause of death preliminarily assessed to be related to COVID-19.

Since Jan 30, 2023, the cumulative number of fatal cases with cause of death preliminarily assessed to be related to COVID-19 was 283 (as of May 10, 2023).

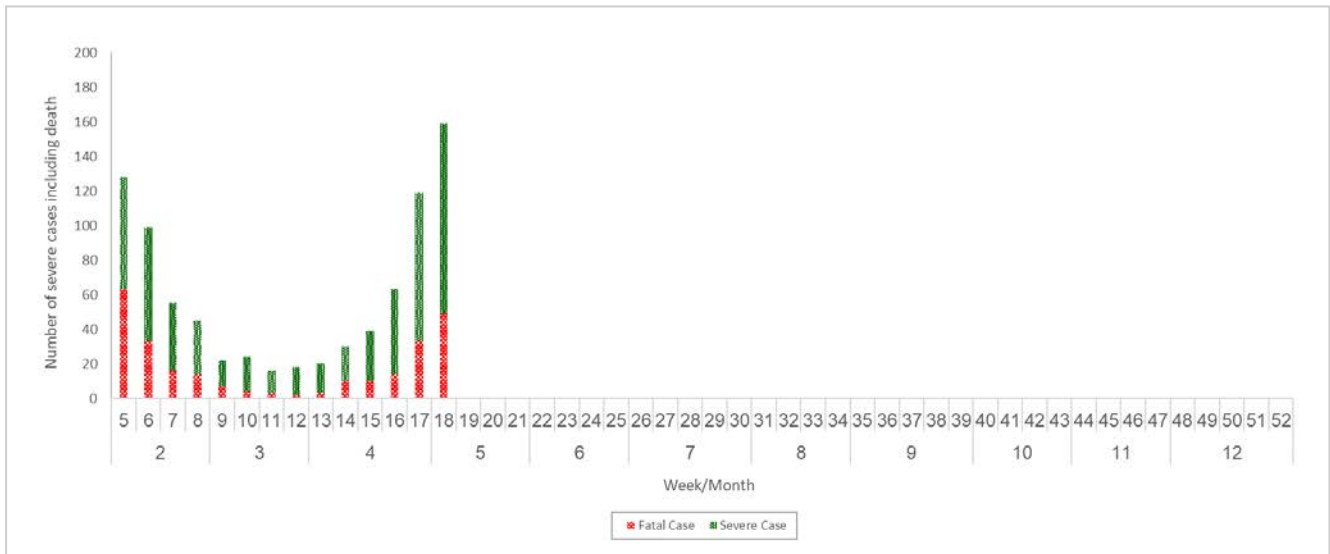


Figure 1.6 Weekly number of severe COVID-19 cases including deaths

Sewage surveillance of SARS-CoV-2 virus

In week 18, the 7-day geometric mean per capita viral load of SARS-CoV-2 virus from sewage surveillance was around 1,147,000 copy/L as compared to around 943,000 copy/L in the preceding week. (Figure 1.7)

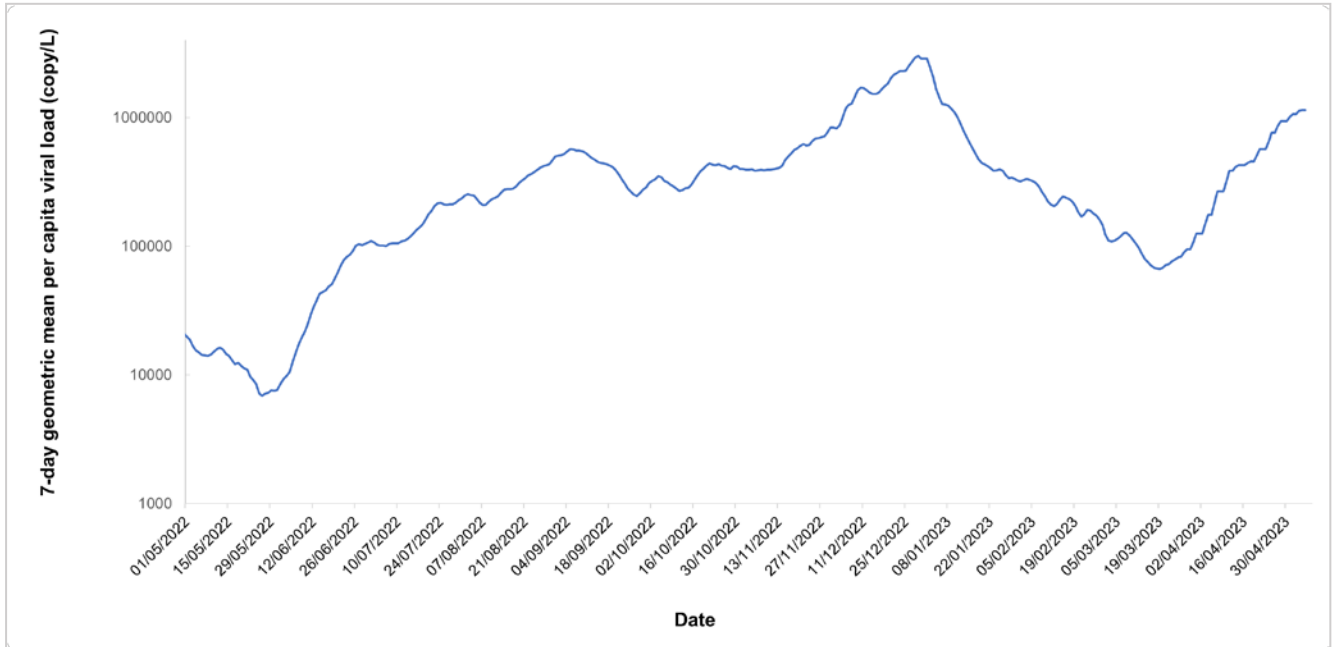


Figure 1.7 7-day geometric mean per capita viral load of SARS-CoV-2 virus from sewage surveillance since May 1, 2022

COVID-19 surveillance among sentinel general out-patient clinics and sentinel private medical practitioner clinics

In week 18, the average consultation rate for COVID-19 among sentinel general out-patient clinics (GOPC) and sentinel private medical practitioner clinics were 251.8 (Figure 1.8) and 108.6 (Figure 1.9) COVID-19 cases per 1,000 consultations, respectively.

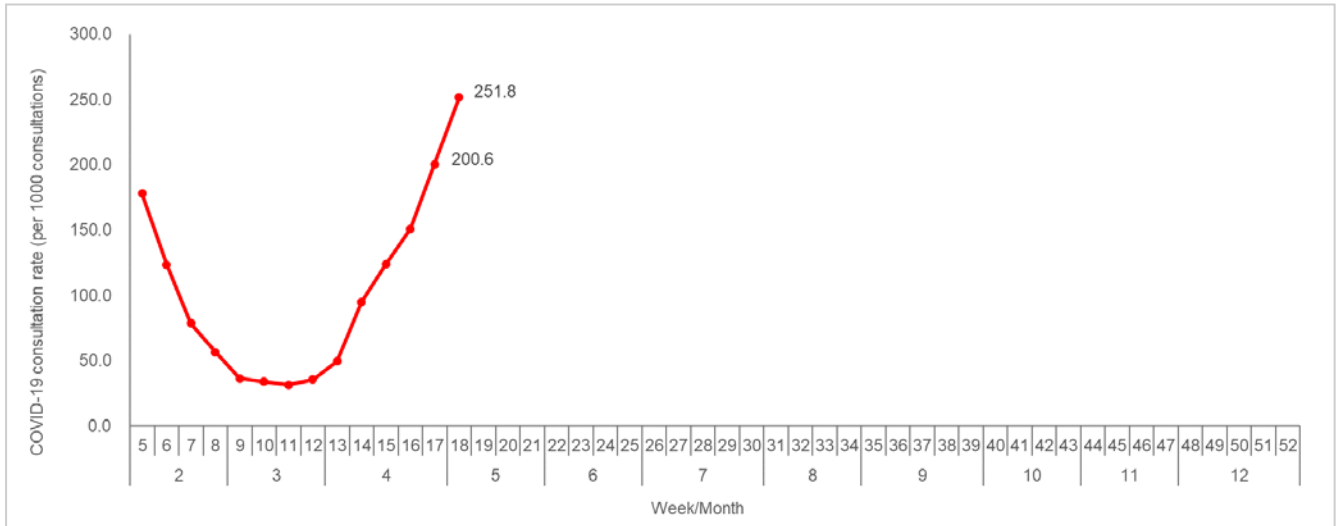


Figure 1.8 Average consultation rate of COVID-19 cases in GOPC

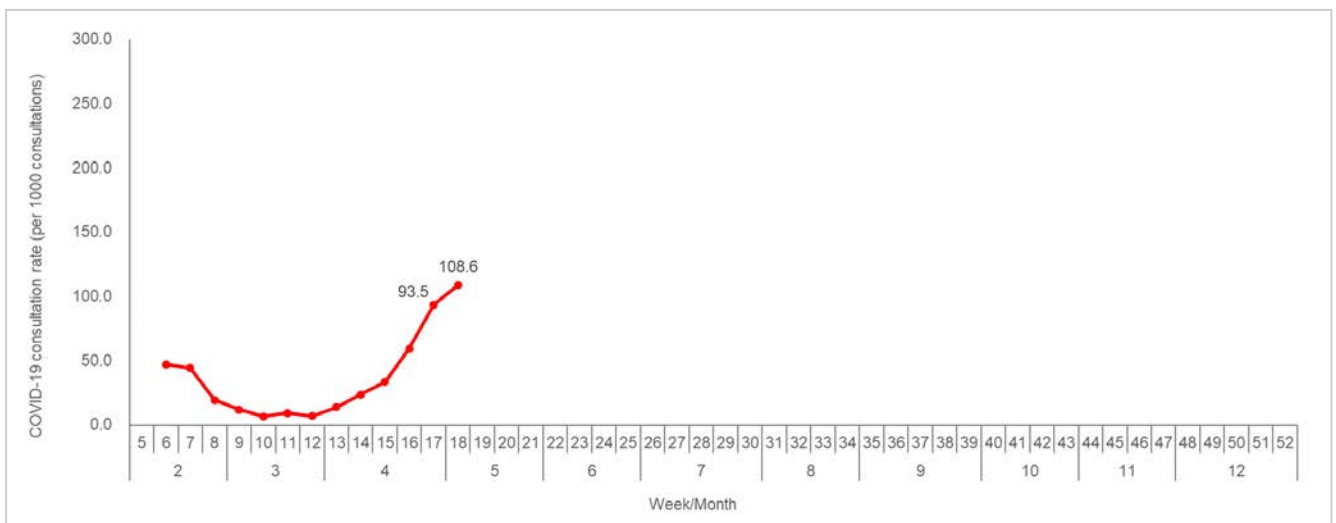


Figure 1.9 Average consultation rate of COVID-19 cases in private medical practitioner clinics

Global situation of COVID-19 activity

- According to the World Health Organization (WHO), as of Apr 30, 2023, over 765 million confirmed cases and over 6.9 million deaths have been reported globally. Nearly 2.8 million new cases and over 17,000 deaths were reported in the last 28 days (Apr 3 to Apr 30, 2023) globally, a decrease of 17% and 30%, respectively, compared to the previous 28 days (Mar 6 to Apr 2, 2023).
- The highest numbers of new 28-day cases were reported from the United States of America (USA), Korea, Japan, India and France. The highest numbers of new 28-day deaths were reported from the USA, Brazil, Russia, France and Iran.
- WHO commented that current trends in reported COVID-19 cases were underestimates of the true number due to the reduction in testing and delays in reporting in many countries. Therefore, related data should be interpreted with caution.
- WHO has updated its tracking system and working definitions for variants of SARS-CoV-2. From Mar 15 2023, the tracking system classifies Omicron sublineages as variants under monitoring (VUMs), variants of interest (VOIs), or variant of concern (VOCs). Currently WHO is monitoring two VOIs, which are XBB.1.5 and XBB.1.16, and seven VUMs, which are BA.2.75, BQ.1, CH.1.1, XBB, XBB.1.9.1, XBB.1.9.2 and XBF.
- Between Apr 10 to Apr 16, 2023, the prevalence of XBB.1.5 was 46.7%, a decrease from 49.3% between Mar 13 to Mar 19, 2023. Meanwhile, the prevalence of XBB.1.16 increased from 2.0% to 5.7%. Among the VUMs, the prevalence of three showed increasing trends, including XBB (8.1% to 16.4%), XBB.1.9.1 (6.9% to 10.7%) and XBB.1.9.2 (1.8% to 2.8%) while others presented declining trends during the same period.

Sources:

Information will be extracted from the following sources when updates are available: [World Health Organization Weekly epidemiological update on COVID-19](#)

Local Situation of Influenza Activity (as of May 10, 2023)

Reporting period: Apr 30 – May 6, 2023 (Week 18)

- Hong Kong has entered influenza season. The overall activity of local seasonal influenza remained active as indicated by local surveillance data.
- Influenza can cause serious illnesses in high-risk individuals and even healthy persons. Given that seasonal influenza vaccines are safe and effective, all persons aged 6 months or above except those with known contraindications are recommended to receive influenza vaccine to protect themselves against seasonal influenza and its complications, as well as related hospitalisations and deaths.
- As Hong Kong continues to face the challenge of COVID-19 pandemic, influenza viruses and SARS-CoV-2 virus may both spread at the same time. To protect the healthcare system from being overwhelmed, getting influenza vaccination is therefore important. Seasonal Influenza Vaccination School Outreach and the Residential Care Home Vaccination Programme were launched on September 29, 2022, whereas the Vaccination Subsidy Scheme (VSS) and the Government Vaccination Programme (GVP) began on October 6, 2022. For details, please refer to the webpage (<https://www.chp.gov.hk/en/features/17980.html>).
- Apart from getting influenza vaccination, members of the public should always maintain good personal and environmental hygiene.
- For the latest information on influenza and prevention measures, please visit the Centre for Health Protection's pages below for more information:
 - The influenza page (http://www.chp.gov.hk/en/view_content/14843.html)
 - Webpage on Personal Hygiene (<https://www.chp.gov.hk/en/healthtopics/content/460/19899.html>)
 - Video on "Prevent diseases · Maintain good hygiene" (<https://www.youtube.com/watch?v=sJFekuVWJ-s>)
- The current influenza surveillance data should be interpreted with caution as the ongoing COVID-19 pandemic has influenced the monitoring systems.

Influenza-like-illness surveillance among sentinel general out-patient clinics and sentinel private medical practitioner clinics, 2019-23

In week 18, the average consultation rate for influenza-like illness (ILI) among sentinel general outpatient clinics (GOPC) was 3.8 ILI cases per 1,000 consultations, which was lower than 5.2 recorded in the previous week (Figure 2.1, left). The average consultation rate for ILI among sentinel private medical practitioner (PMP) clinics was 56.8 ILI cases per 1,000 consultations, which was higher than 49.3 recorded in the previous week (Figure 2.1, right).

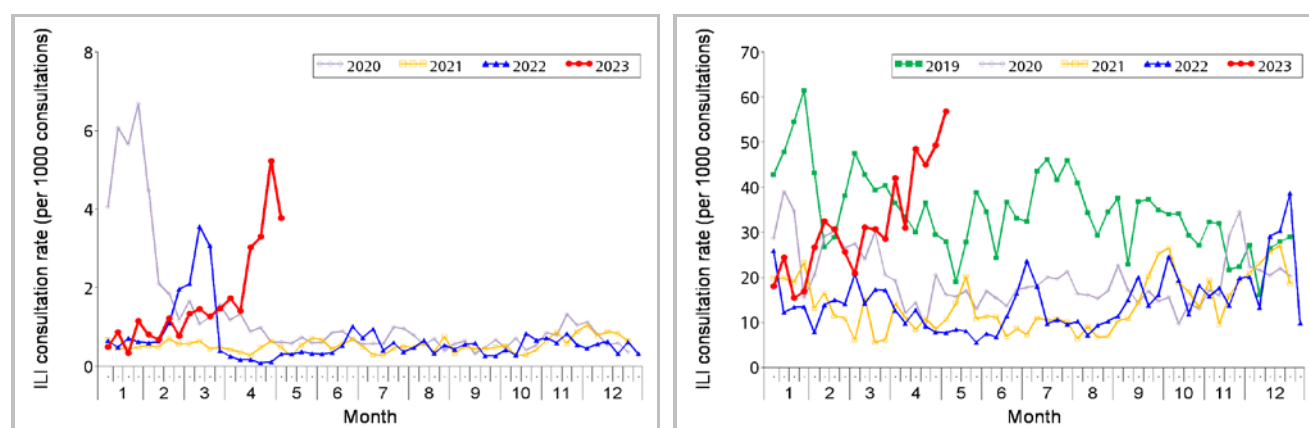


Figure 2.1 ILI consultation rates at sentinel GOPC (2020-23) (left) and PMP clinics (2019-23) (right)

Note: The CHP has started to use electronic data on diagnosis coding of patients of the Hospital Authority's GOPC for sentinel surveillance since January 2020, replacing manual data collection in the past.

Laboratory surveillance, 2019-23

Among the 8,682 respiratory specimens* received in week 18, 855 (9.85%) were tested positive for seasonal influenza A or B viruses. Among the subtyped influenza detections, there were 609 (74%) influenza A(H1), 212 (26%) influenza A(H3) and 3 (0%) influenza B viruses. The positive percentage (9.85%) was above the baseline threshold of 9.21% but was lower than 14.76% recorded in the previous week (Figure 2.2).

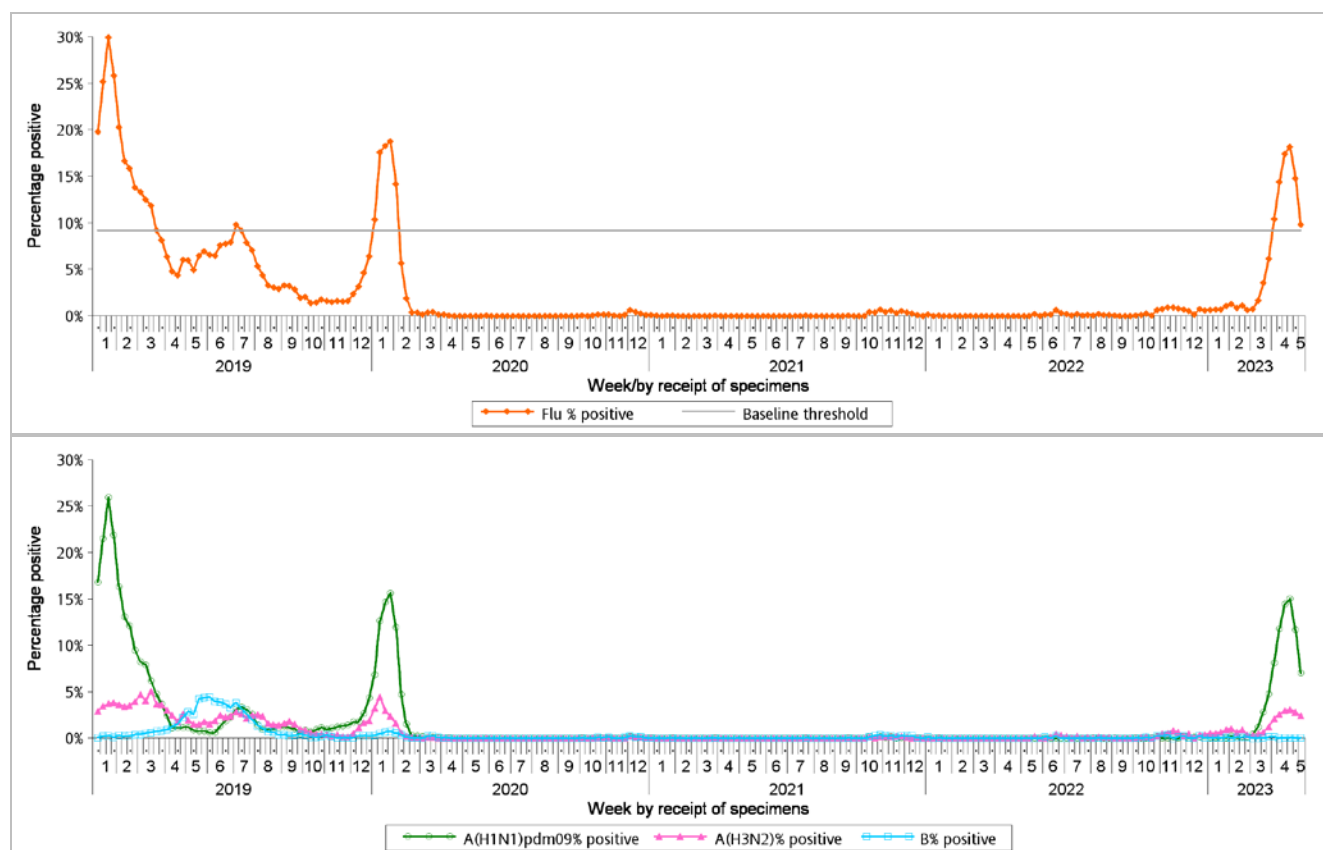


Figure 2.2 Percentage of respiratory specimens tested positive for influenza viruses, 2019-23 (upper: overall positive percentage, lower: positive percentage by subtypes)

[Note: The baseline threshold is 1.96 standard deviation above the average weekly positive percentage during non-season periods from 2014 week 49 to 2019 week 48.]

Remarks: Some specimens may contain vaccine strains from people with recent history of receiving live-attenuated influenza vaccine

Surveillance of oseltamivir resistant influenza A and B viruses

- In February 2023, there were no new reports of oseltamivir (Tamiflu) resistant influenza A and B viruses.
- For the results of previous months, please refer to the following webpage:
<https://www.chp.gov.hk/en/statistics/data/10/641/695/7035.html>

* Including 7,822 specimens received by Public Health Laboratory Services Branch, Centre for Health Protection and 860 specimens received by the Hospital Authority

Influenza-like illness outbreak surveillance, 2019-23

In week 18, 24 ILI outbreaks occurring in schools/institutions were recorded (affecting 111 persons), as compared to 59 outbreaks recorded in the previous week (affecting 342 persons) (Figure 2.3). The overall number was at the low intensity level currently (Figure 2.4*). In the first 4 days of week 19 (May 7 to 10), 16 ILI outbreaks occurring in schools/institutions were recorded (affecting 71 persons). Since the start of 2023 influenza season in week 14, 138 outbreaks were recorded (as of May 10).

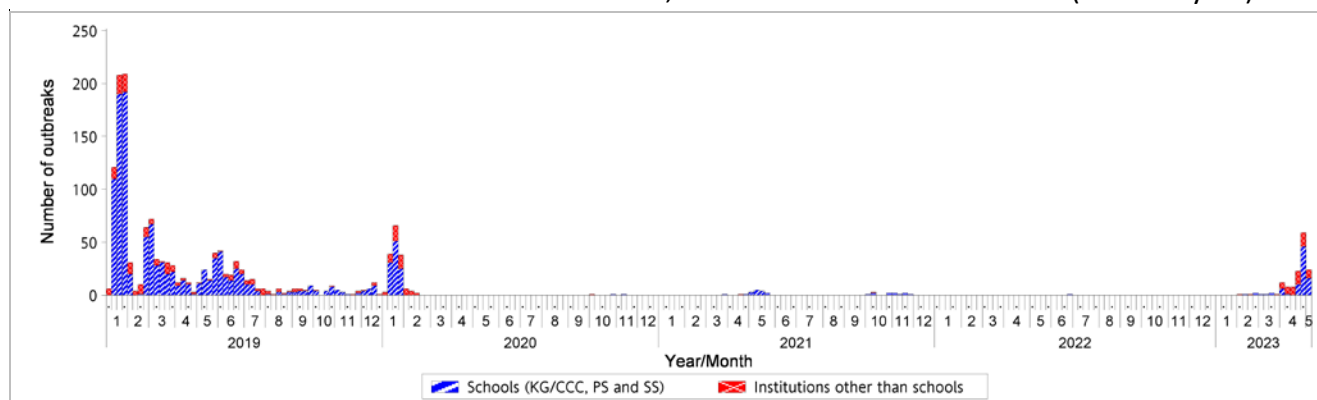


Figure 2.3 ILI outbreaks in schools/institutions, 2019-23

Type of institutions	Week 17	Week 18	Cumulative number of outbreaks since week 14 (as of May 10)
Child care centre/ kindergarten (CCC/KG)	6	4	14
Primary school (PS)	30	9	51
Secondary school (SS)	10	3	18
Residential care home for the elderly	7	7	29
Residential care home for persons with disabilities	4	0	18
Others	2	1	8
<i>Total number of outbreaks</i>	59	24	138
<i>Total number of persons affected</i>	342	111	773

In comparison, 120, 112, 438 and 575 outbreaks were recorded in the same duration of surveillance (5 complete weeks) in the 2015/16 winter, 2017 summer, 2017/18 winter and 2018/19 winter seasons respectively, as compared with 122 outbreaks in the current season (Figure 2.5).

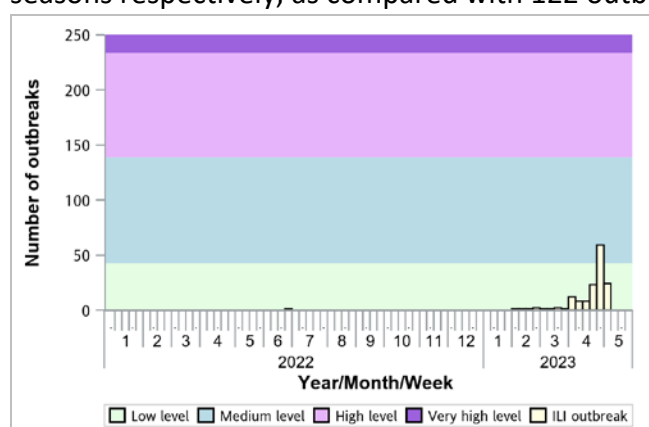


Figure 2.4 ILI outbreaks in schools/institutions, 2022-23

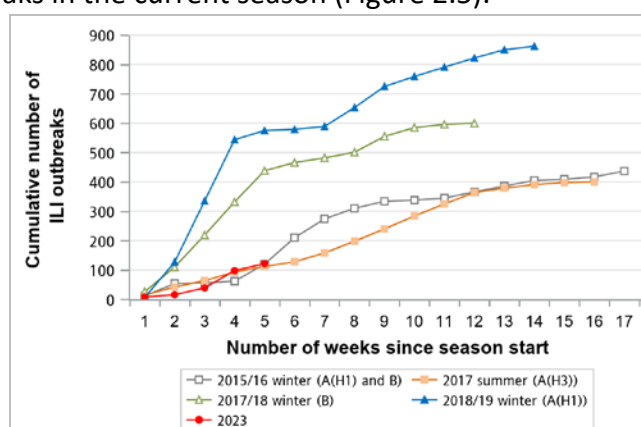


Figure 2.5 Cumulative numbers of ILI outbreaks reported during major influenza seasons, 2015/16–2023

Note: The predominating virus was shown in bracket.

* Various intensity levels applicable for this year were calculated with the moving epidemic method (MEM) based on the relevant historical data recorded from 2010 week 49 to 2019 week 48. For details, please refer to this webpage:

https://www.chp.gov.hk/files/pdf/explanatory_note_for_flux_mem_eng.pdf

Influenza-associated hospital admission rates in public hospitals based on discharge coding, 2019-23

In week 18, the overall admission rate in public hospitals with principal diagnosis of influenza was 0.52 (per 10,000 population) as compared to 0.96 recorded in the previous week (Figure 2.6). It was above the baseline threshold of 0.25 and at the low intensity level (Figure 2.7*). The influenza-associated admission rates for persons aged 0-5 years, 6-11 years, 12-17 years, 18-49 years, 50-64 years and 65 years or above were 3.24, 1.04, 0.52, 0.12, 0.21 and 1.11 cases (per 10,000 people in the age group) respectively, as compared to 5.05, 2.19, 0.82, 0.23, 0.61 and 1.86 cases in the previous week (Figure 2.6).

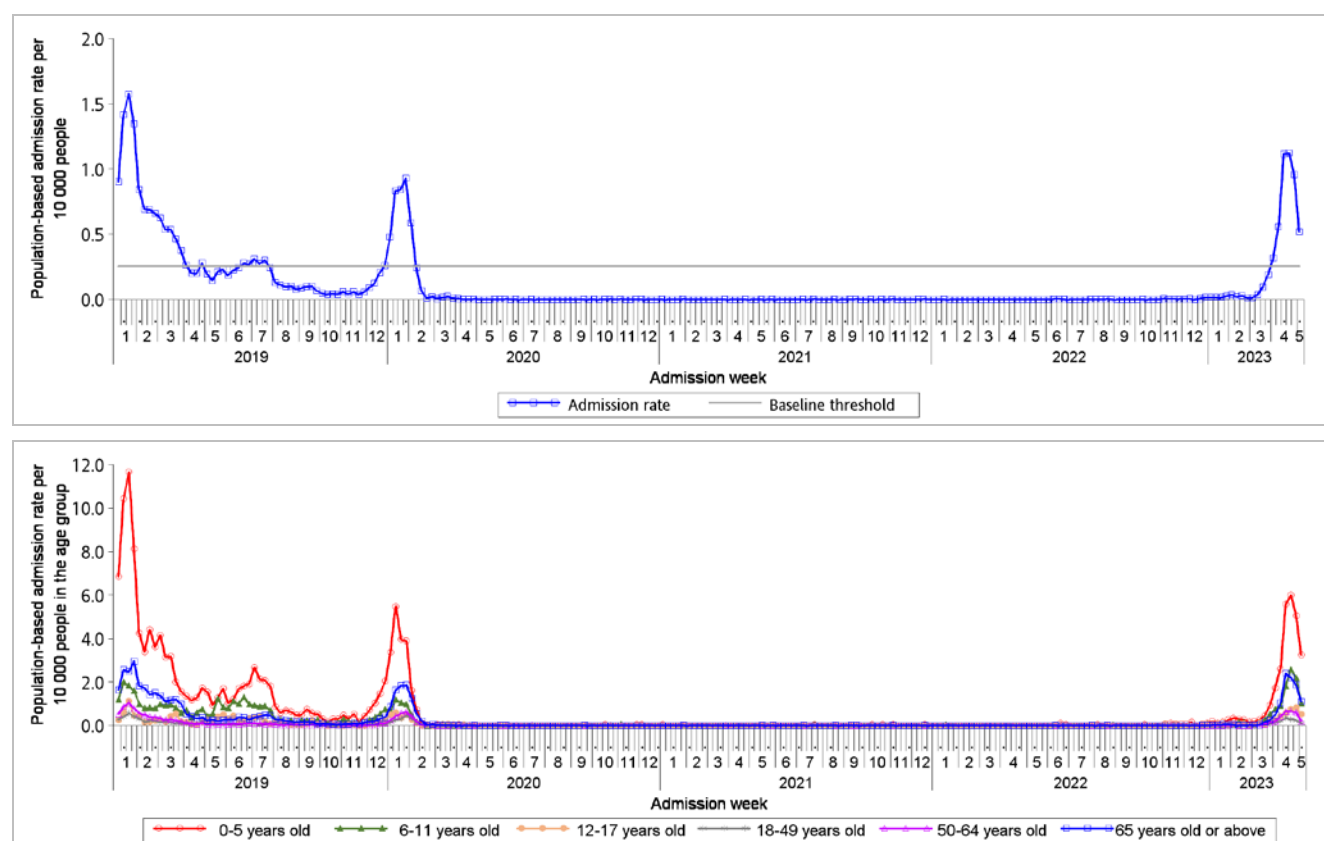


Figure 2.6 Influenza-associated hospital admission rates, 2019-23 (upper: overall rate, lower: rates by age groups)

[Note: The baseline threshold is 1.96 standard deviation above the average weekly admission rate during non-season periods from 2014 week 49 to 2019 week 48.]

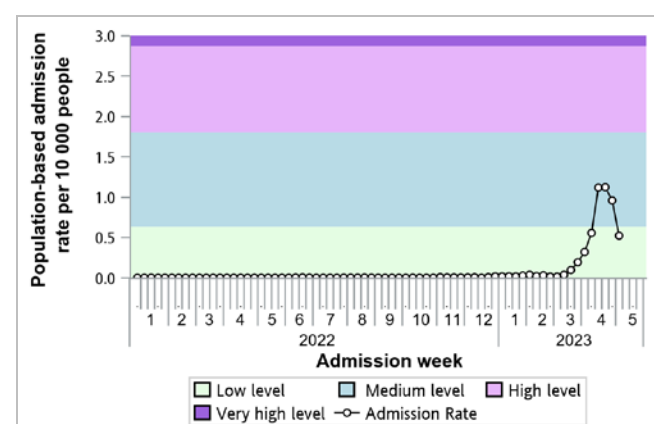


Figure 2.7 Influenza-associated hospital admission rates, 2022-23

*Various intensity levels applicable for this year were calculated with the moving epidemic method (MEM) based on the relevant historical data recorded from 2010 week 49 to 2019 week 48. For details, please refer to this webpage: https://www.chp.gov.hk/files/pdf/explanatory_note_for_flux_mem_eng.pdf

Rate of ILI syndrome group in accident and emergency departments, 2019-23[#]

In week 18, the rate of the ILI syndrome group in the accident and emergency departments (AEDs) was 176.6 (per 1,000 coded cases), which was lower than the rate of 182.8 in the previous week (Figure 2.8).

#Note: This syndrome group includes codes related to ILI such as influenza, upper respiratory tract infection, fever, cough, throat pain, and pneumonia.

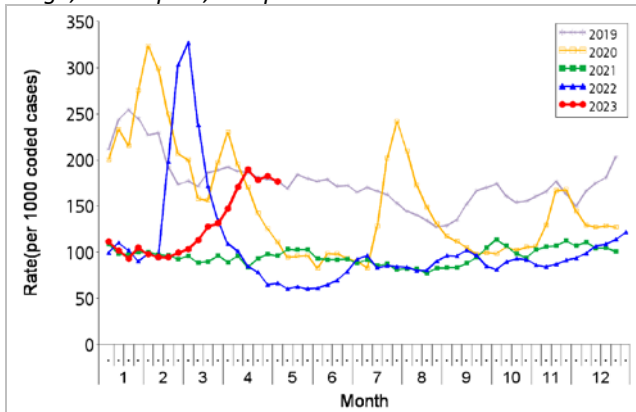


Figure 2.8 Rate of ILI syndrome group in AEDs, 2019-23

Fever surveillance at sentinel child care centres/ kindergartens, 2019-23

In week 18, 1.18% of children in the sentinel child care centres / kindergartens (CCCs/KGs) had fever (38°C or above) as compared to 1.04% recorded in the previous week (Figure 2.9).

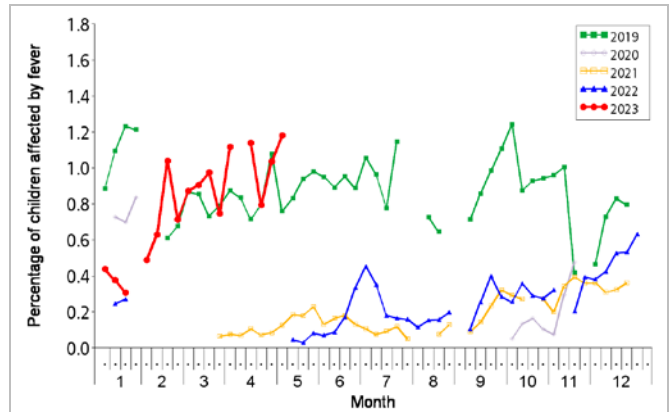


Figure 2.9 Percentage of children with fever at sentinel CCCs/KGs, 2019-23

Fever surveillance at sentinel residential care homes for the elderly, 2019-23

In week 18, 0.23% of residents in the sentinel residential care homes for the elderly (RCHEs) had fever (38°C or above), compared to 0.14% recorded in the previous week (Figure 2.10).

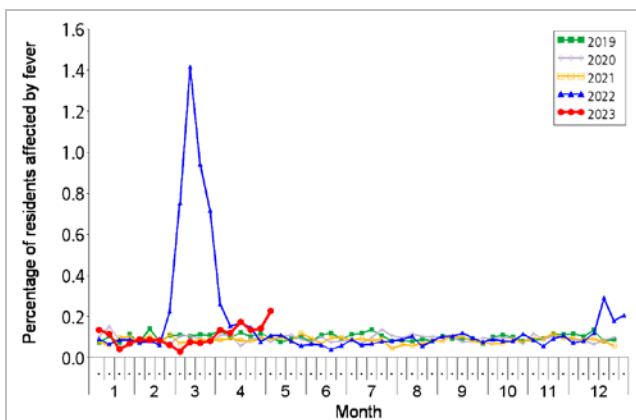


Figure 2.10 Percentage of residents with fever at sentinel RCHEs, 2019-23

Influenza-like illness surveillance among sentinel Chinese medicine practitioners, 2019-23

In week 18, the average consultation rate for ILI among Chinese medicine practitioners (CMPs) was 1.21 ILI cases per 1,000 consultations as compared to 0.88 recorded in the previous week (Figure 2.11).

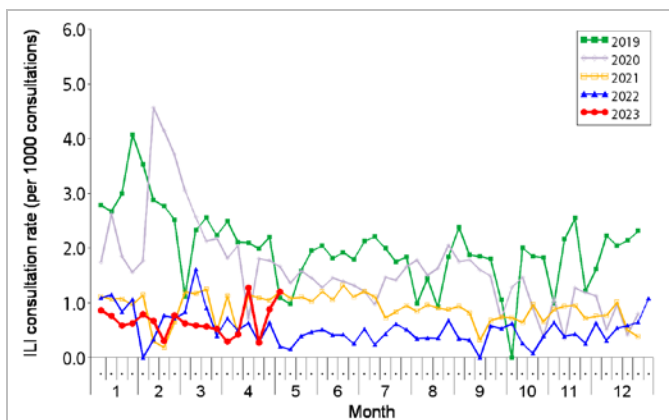


Figure 2.11 ILI consultation rate at sentinel CMPs, 2019-23

Surveillance of severe influenza cases

(Note: The data reported are provisional figures and subject to further revision.)

Surveillance for intensive care unit (ICU) admission/death with laboratory confirmation of influenza among adult patients (Aged 18 years or above)

Since 2018, the Centre for Health Protection (CHP) has collaborated with the Hospital Authority and private hospitals to monitor ICU admissions and deaths with laboratory confirmation of influenza among adult patients regularly. For surveillance purpose, the cases refer to laboratory-confirmed influenza patients who required ICU admission or died within the same admission of influenza infection. Their causes of ICU admission or death may be due to other acute medical conditions or underlying diseases.

- In week 18, 48 adult cases of ICU admission/death with laboratory confirmation of influenza were recorded, in which 28 of them were fatal. Among the 48 adult cases, 13 were known to have received the 2022/23 seasonal influenza vaccine (SIV). In the first 4 days of week 19 (May 7 – 10), 18 cases were recorded, in which 14 of them were fatal.

Week	Influenza type			
	A(H1)	A(H3)	B	A (pending subtype)
Week 18	30	7	0	11
First 4 days of week 19 (May 7 – 10)	9	3	0	6

- Since the start of 2023 influenza season in week 14, 234 adult cases of ICU admission/death with laboratory confirmation of influenza were recorded, in which 132 of them were fatal (as of May 10). Among them, 174 patients had influenza A(H1) infection, 27 patients with influenza A(H3) and 33 patients with influenza A (pending subtype).
- In comparison, 176, 72, 244 and 280 adult cases were recorded in the same duration of surveillance (5 complete weeks) in the 2015/16 winter, 2017 summer, 2017/18 winter and 2018/19 winter seasons respectively, as compared with 216 cases in the current season (Figure 2.12, left). The corresponding figures for deaths were 67, 54, 151, 144 in the above seasons, as compared with 118 deaths in the current season (Figure 2.12, right).

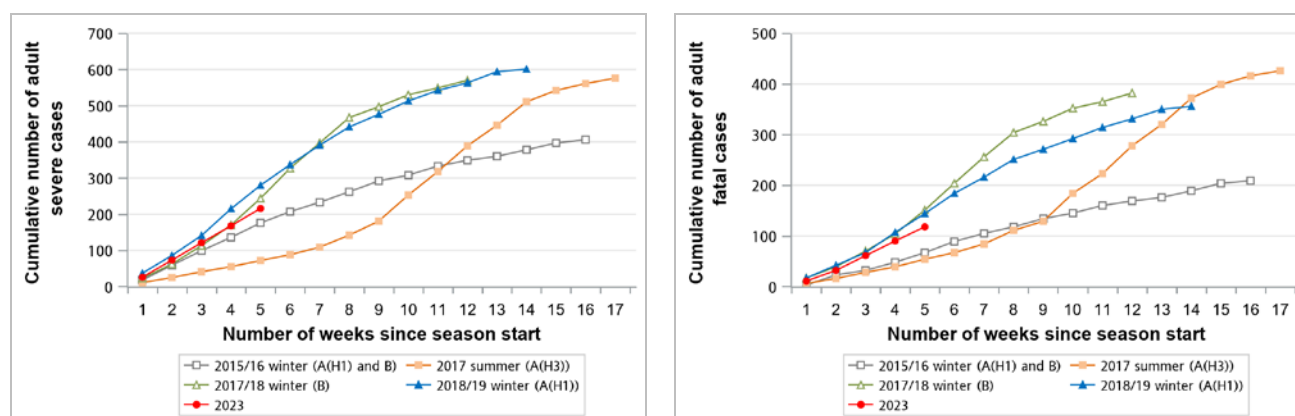


Figure 2.12 Cumulative numbers of adult severe influenza cases reported during major influenza seasons, 2015/16–2023 (left: ICU admission/death cases; right: deaths)

Note: The predominating virus was shown in bracket.

Surveillance of severe paediatric influenza-associated complication/death (Aged below 18 years)

- In week 18 and the first 4 days of week 19 (May 7 – 10), there was 1 case of severe paediatric influenza-associated complication/death.

Reporting week	Age	Sex	Complication	Fatal case?	Influenza subtype	History of receiving influenza vaccine for this season
18	13 years	Female	Sepsis and shock	Yes	Influenza A(H3)	No

- Since the start of 2023 influenza season in week 14, 3 paediatric cases of influenza-associated complication/death were reported, in which 2 of them were fatal (as of May 10). Among the 3 cases, 2 cases had infection with influenza A(H1) and 1 case had infection with influenza A(H3). None of them received the 2022/23 SIV. In 2023, 4 paediatric cases of influenza-associated complication/death were recorded, in which 3 of them were fatal (as of May 10).
- In comparison, 10, 9, 13 and 21 paediatric cases of influenza-associated complication/death were recorded in the same duration of surveillance (5 complete weeks) in the 2015/16 winter, 2017 summer, 2017/18 winter and 2018/19 winter seasons respectively, as compared with 3 cases in the current season (Figure 2.13, left). The corresponding figures for deaths were 2, 2, 2 and 1 in the above seasons, as compared with 2 deaths in current season (Figure 2.13, right).

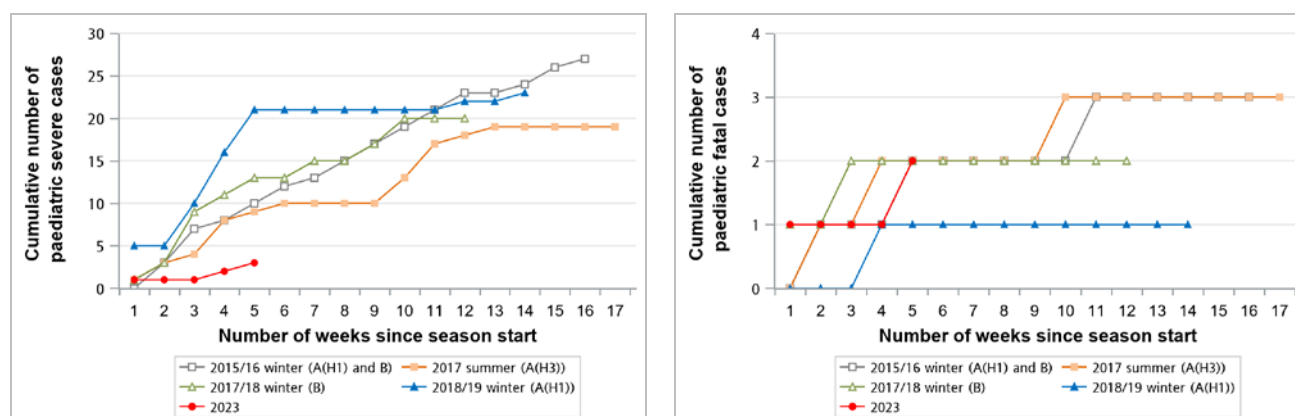


Figure 2.13 Cumulative numbers of cases of paediatric influenza-associated complication/death reported during major influenza seasons, 2015/16–2023 (left: complication/death cases; right: deaths)

Note: The predominating virus was shown in bracket.

Severe influenza cases of all ages

- Since the start of current influenza season in week 14, 237 severe influenza cases among all ages have been reported, including 134 deaths (as of May 10).

Age group	Cumulative number of cases (death)
0-5	1 (0)
6-11	0 (0)
12-17	2 (2)
18-49	23 (5)
50-64	46 (13)
>=65	165 (114)

- Among the adult fatal cases with available clinical information, about 91% had chronic diseases.
- Among patients with laboratory confirmation of influenza admitted to public hospitals in this season (from Apr 2 to May 10, 2023), 2.5% of admitted cases died during the same episode of admission. So far, it was within the historical range between 1.9% (2015/16 winter season) and 3.3% (2015 summer season).

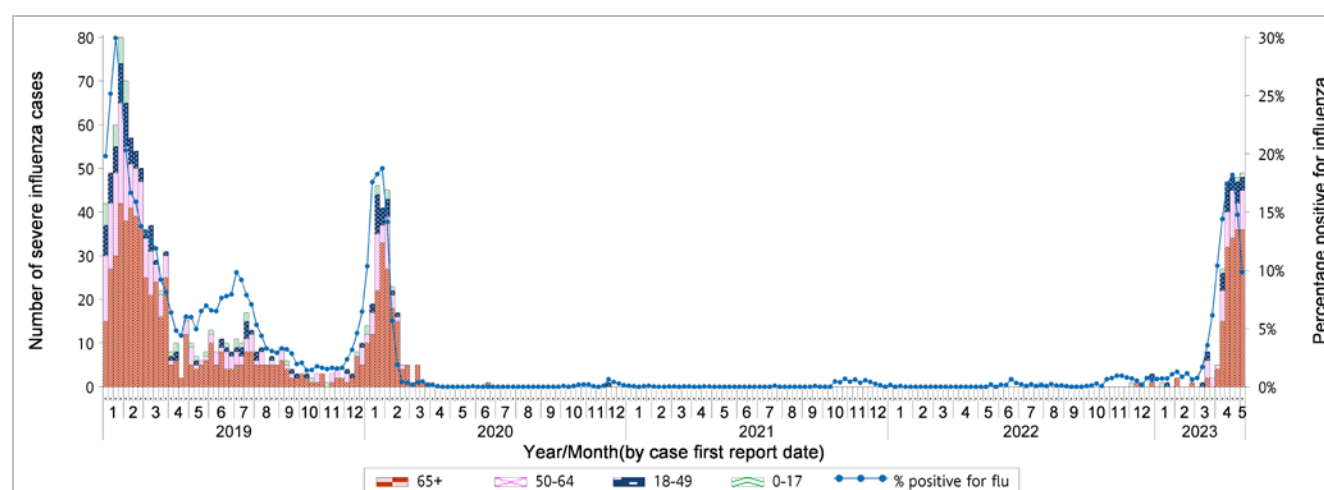


Figure 2.14 Weekly number of severe influenza cases by age groups, 2019-23 (the percentage positive for influenza viruses in Figure 2 is also shown in this graph)

Global Situation of Influenza Activity

Globally, influenza detections decreased further due to decreased detections in the northern hemisphere, while some countries in the southern hemisphere reported increased influenza detections in recent weeks. In the temperate zone of the southern hemisphere, influenza activity remained low.

- In the United States (week ending Apr 29, 2023), influenza activity remained low nationally. The percentage of specimens tested positive for influenza remained low (1.0%). The percentage of out-patient visits for ILI was 2.0%, which was below the national baseline of 2.5%.
- In Canada (week ending Apr 29, 2023), influenza activity has been stable and remained at inter-seasonal levels. The weekly percentage of tests positive for influenza was 2.2%, as compared to 2.3% in the preceding week.
- In the United Kingdom (week ending Apr 30, 2023), influenza activity remained low. Influenza positivity remained low and stable at 1.0%. The weekly ILI consultation rates in England, Wales, Scotland and Northern Ireland remained within baseline activity levels.
- In Europe (week ending Apr 30, 2023), the percentage of sentinel specimens tested positive for influenza decreased to 7% from 9% in the preceding week, which was below the epidemic threshold of 10%. In week 17, both influenza A and B viruses were detected in sentinel and non-sentinel surveillance, with influenza B viruses predominating in both systems.
- In Mainland China (week ending Apr 30, 2023), influenza surveillance data showed that the percentage of specimens tested positive for influenza in the northern and southern provinces continued to decrease. Majority of the influenza detections in the northern and southern provinces were influenza A(H1N1)pdm09 viruses, and co-circulation of influenza A(H1N1)pdm09 and influenza A(H3N2) viruses were observed.
- In Taiwan (week ending Apr 29, 2023), influenza activity has been increasing. Majority of the influenza detections in the recent 4 weeks were influenza A(H3N2) viruses and the proportion of influenza A(H1N1) virus detections slightly increased.
- In Japan (week ending Apr 30, 2023), the average number of reported ILI cases per sentinel site decreased to 2.24 from 2.51 in the preceding week, which was above the baseline level of 1.00. Influenza A(H3) viruses were predominating.
- In Korea (week ending Apr 29, 2023), the weekly ILI rate remained elevated. The rate in week 17 was 23.0 per 1,000 out-patient visits, which was higher than 19.9 in the preceding week. In week 17, 30 out of 356 respiratory specimens (8.4%) were tested positive for influenza (including 22 influenza A(H3N2), 5 influenza A(H1N1)pdm09 and 3 influenza B viruses).
- In Singapore (week ending Apr 29, 2023), the daily number of consultations for acute respiratory infection decreased. The overall positivity rate for influenza among ILI samples in the community was 20.5% in the past 4 weeks. Majority of the influenza detections in March were influenza A(H3N2) viruses (61.3%), followed by influenza A(H1N1) (22.3%) and influenza B viruses (16.2%).

Sources:

Information have been extracted from the following sources when updates are available: [World Health Organization](#), [United States Centers for Disease Control and Prevention](#), [Public Health Agency of Canada](#), [UK Health Security Agency](#), [Joint European Centre for Disease Prevention and Control-World Health Organization/Flu News Europe](#), [Chinese National Influenza Center](#), [Taiwan Centers for Disease Control](#), [Japan Ministry of Health, Labour and Welfare](#), [Korean Centers for Disease Control and Prevention](#) and [Singapore Ministry of Health](#).