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 Mar 19, 2025)

Reporting period: Mar 9, 2025 - Mar 15, 2025 (Week 11)

- The latest surveillance data showed that the overall local activity of COVID-19 is beginning to rise slightly, although still at a relatively low level.
- The Centre for Health Protection (CHP) has been closely monitoring the local prevalence of SAR-CoV-2 variants based on the World Health Organization (WHO)'s Tracking SAR-CoV-2 Variants list. The latest surveillance data showed that JN.1 is the most prevalent variant. At the same time, KP.2 and KP.3 are also detected in the sewage surveillance and human infection cases. However, the current information does not suggest JN.1 or KP.2 or KP.3 will cause a more severe disease than the previous prevalent XBB and its descendant lineages.
- 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. High risk people (e.g. persons with underlying medical conditions or persons who are immunocompromised) should adopt additional measures to protect themselves such as wearing mask properly when going to public places. For other details, please visit the COVID-19 information page (https://www.chp.gov.hk/en/healthtopics/content/24/102466.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. High-risk priority groups are recommended to receive a dose of COVID-19 vaccine at least six months since the last dose or infection, regardless of the number of doses received previously. For more details, please visit (https://www.chp.gov.hk/files/pdf/consensus interim recommendations on use of covid d19 vaccines in hong kong 17jul.pdf).
- 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).

Laboratory surveillance for COVID-19 cases

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

In week 11, the weekly number of newly recorded positive nucleic acid test laboratory detections for SARS-CoV-2 virus was 52 as compared to 41 in the preceding week. (Figure 1.1)

In the first 4 days of week 12 (Mar 16 – Mar 19), the daily number of newly recorded positive nucleic acid test laboratory detections for SARS-CoV-2 virus ranged from 10 to 15.

Since Jan 30, 2023, the cumulative number of positive nucleic acid test laboratory detections was 75,032 (as of Mar 19, 2025).

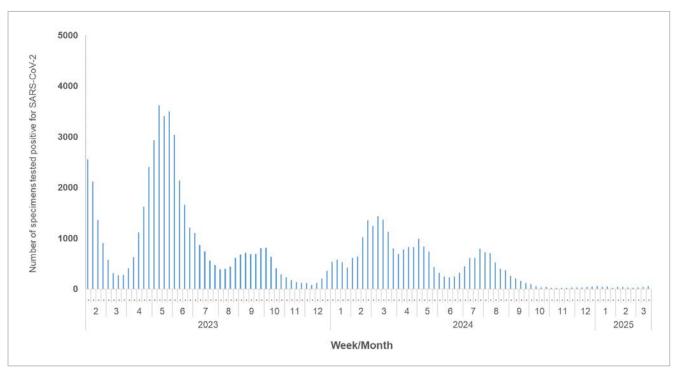


Figure 1.1 Weekly number of positive nucleic acid test laboratory detections for SARS-CoV-2 virus

Positive detection rate of specimens tested positive for SARS-CoV-2 virus at the Public Health Laboratory Services Branch, Centre for Health Protection

Among the 8,146 respiratory specimens received by the Public Health Laboratory Services Branch (PHLSB) in week 11, 95 (1.17%) were tested positive for SARS-CoV-2 virus as compared to 40 (0.49%) in the preceding week. (Figure 1.2)

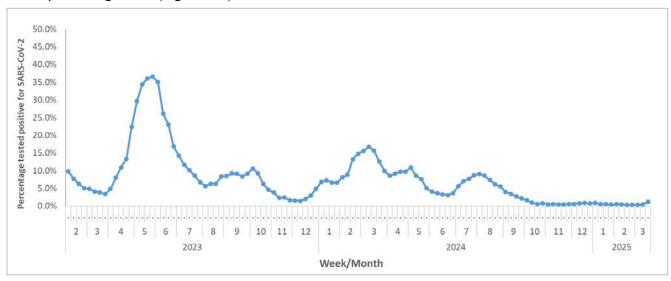


Figure 1.2 Percentage of specimens tested positive for SARS-CoV-2 virus at PHLSB

COVID-19 outbreak surveillance

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

In week 11, 0 COVID-19 outbreaks occurring in schools/institutions were recorded (affecting 0 persons), as compared to 0 outbreaks recorded in the previous week (affecting 0 persons). (Figure 1.3)

In the first 4 days of week 12 (Mar 16 – Mar 19), 1 COVID-19 outbreak occurring in schools/institutions was recorded (affecting 4 persons).

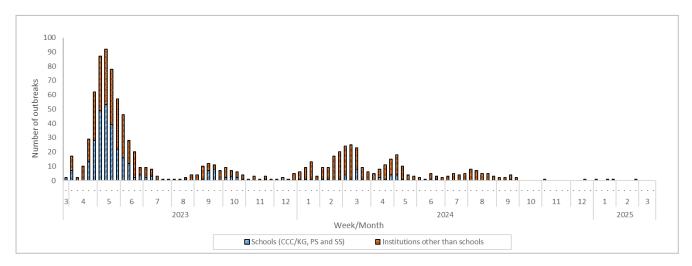


Figure 1.3 COVID-19 outbreaks in schools/institutions

Type of institutions	Week 10	Week 11	First 4 days of week 12 (Mar 16 – Mar 19)	
Child care centre/ kindergarten (CCC/KG)	0	0	0	
Primary school (PS)	0	0	0	
Secondary school (SS)	0	0	0	
Residential care home for the elderly	0	0	1	
Residential care home for persons with disabilities	0	0	0	
Others	0	0	0	
Total number of outbreaks	0	0	1	
Total number of persons affected	0	0	4	

Surveillance of severe and fatal COVID-19 cases

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

In week 11, the weekly number of severe COVID-19 cases including deaths with cause of death preliminarily assessed to be related to COVID-19 was 4 as compared to 3 in the preceding week. (Figure 1.4)

Since Jan 30, 2023, the cumulative number of fatal cases with cause of death preliminarily assessed to be related to COVID-19 was 1,401 (as of Mar 15, 2025).

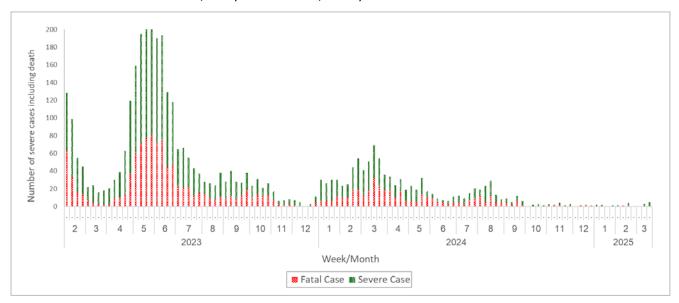


Figure 1.4 Weekly number of severe COVID-19 cases including deaths

Note: Severe and fatal cases are recorded according to their initial reporting dates.

Sewage surveillance of SARS-CoV-2 virus

In week 11, the 7-day geometric mean per capita viral load of SARS-CoV-2 virus from sewage surveillance was around 85,000 copy/L as compared to around 62,000 copy/L in the preceding week. (Figure 1.5)

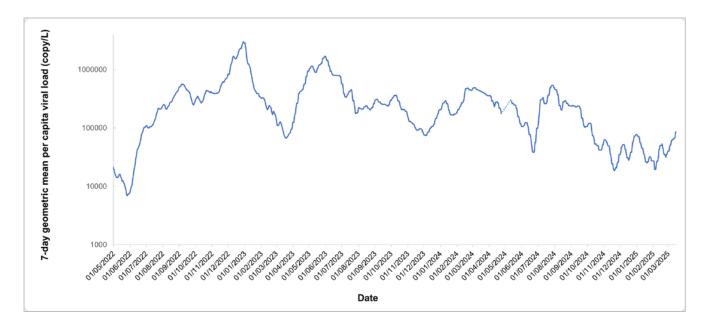


Figure 1.5 7-day geometric mean per capita viral load of SARS-CoV-2 virus from sewage surveillance since May 1, 2022

Note: The dotted line refers to the temporary sewage sampling suspension for a safety review by the Drainage Services Department.

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

In week 11, the average consultation rate for COVID-19 among sentinel general out-patient clinics (GOPC) and sentinel private medical practitioner clinics were 2.0 (Figure 1.6) and 1.5 (Figure 1.7) COVID-19 cases per 1,000 consultations, respectively.

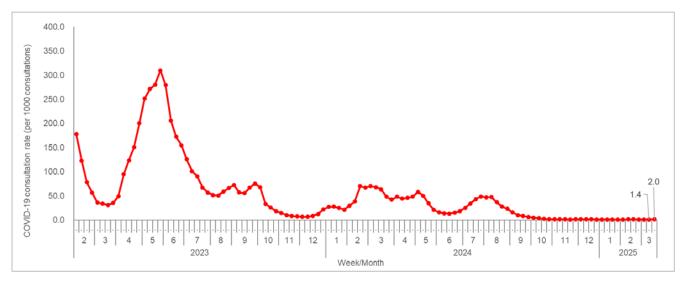


Figure 1.6 Average consultation rate of COVID-19 cases in GOPC

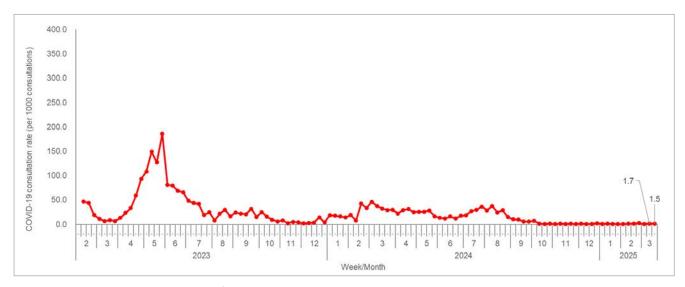


Figure 1.7 Average consultation rate of COVID-19 cases in private medical practitioner clinics

Surveillance on SARS-CoV-2 variants

CHP conducts surveillance on SARS-CoV-2 variants from sewage samples. The latest surveillance data (as of Mar 19, 2025) showed that JN.1 and its descendant lineages remained the most prevalent variant, comprising 62% of all characterised specimens, where 60.2% belongs to the descendant strain KP.3. (Figure 1.8)

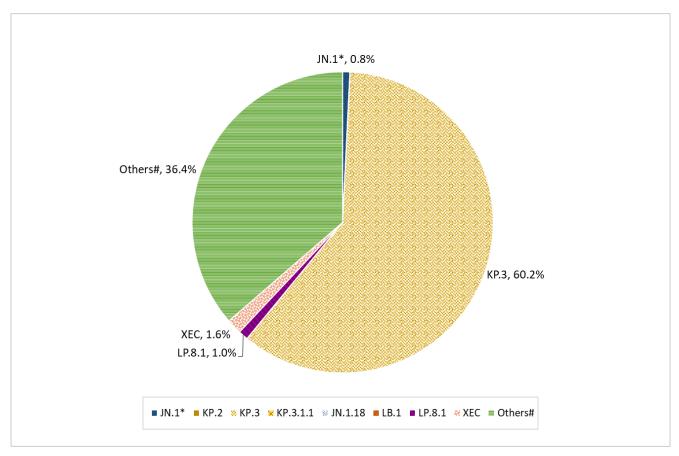


Figure 1.8 Estimated proportion of variants among sewage samples

Note: JN.1.18, KP.2, KP.3, KP.3.1.1, LB.1, LP.8.1 and XEC are the descendant lineages of JN.1

^{*}Including JN.1 and its descendant lineages, except those individually specified elsewhere in the table

[&]quot;Those SARS-CoV-2 variants not classified as variants of interest (VOIs)/ variants under monitoring (VUMs) by WHO at the time of reporting

CHP also conducted genetic characterisation on 2 specimens obtained from reported severe and fatal cases of COVID-19 between Feb 12 and Feb 25, 2025. The result showed that all specimens belonged to JN.1. (Figure 1.9)

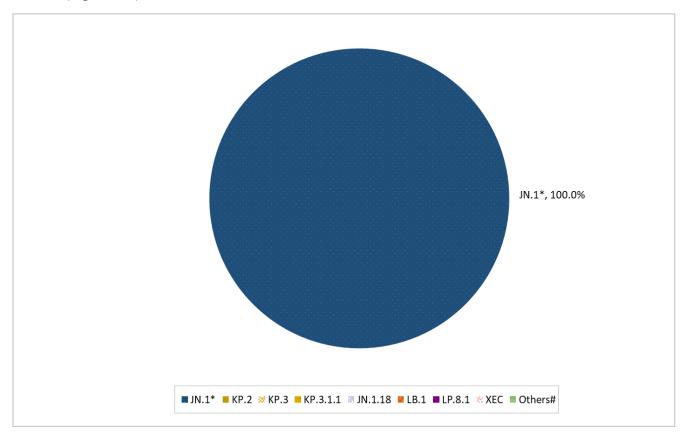


Figure 1.9 Proportion of variants among specimens obtained from reported severe and death cases for COVID-19
*Including JN.1 and its descendant lineages, except those individually specified elsewhere in the table

Besides, CHP conducted genetic characterisation for the specimens obtained from some non-severe cases of COVID-19 between Feb 26 and Mar 11, 2025. The results showed that JN.1 and its descendant lineages remained the most prevalent variant, comprising 100% of all characterised specimens, of which 9.7% belonged to the descendant lineage KP.3.

[#]Those SARS-CoV-2 variants not classified as VOIs/VUMs by WHO at the time of reporting

Global situation of COVID-19 activity

- Globally, as of Mar 2, 2025, there have been 777,594,331 confirmed cases of COVID-19, including 7,089,989 deaths, reported to WHO.
- According to WHO COVID-19 epidemiological update last published on Mar 17, 2025,
 - Over 147,000 new cases and more than 4,500 new deaths were reported in the last 28 days (Jan 6 to Feb 2, 2025) globally.
 - ◆ The highest numbers of new 28-day cases were reported from Russia, Greece, Italy, the UK, and Malaysia. The highest numbers of new 28-day deaths were reported from the USA, Brazil, Sweden, Russia, Greece, and Italy.
 - ◆ 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.
 - ◆ Currently, WHO is monitoring one VOI, which is JN.1, and seven VUMs, which are JN.1.18, KP.2, KP.3, KP.3.1.1, LB.1, LP.8.1 and XEC.
 - ◆ Between Jan 27 and Feb 2, 2025, the prevalence of JN.1 was 16.3%, showed a small increase from a prevalence of 14.1% between Jan 6 and Jan 12, 2025. The risk evaluation for JN.1 published on Apr 15, 2024 suggests an overall low public health risk at the global level based on available evidence. The prevalence of two VUMs showed an increasing trend, including LP.8.1 (8.0% to 13.9%) and LB.1 (0.2% to 1.2%) while the rest had their prevalence in decreasing trends or remained stable, including XEC (45.8% to 42.7%), KP.3.1.1 (23.9% to 20.3%), KP.3 (4.8% to 4.0%), KP.2 (0.8% to 0.5%) and JN.1.18 (0.1% to 0.0%).

Sources:

- 1. WHO COVID-19 dashboard, accessed on Mar 20, 2025
- 2. Tracking SARS-CoV-2 variants
- 3. World Health Organization COVID-19 epidemiological update

Local Situation of Influenza Activity (as of Mar 19, 2025)

Reporting period: Mar 9 - 15, 2025 (Week 11)

- The latest surveillance data showed that the local influenza activity continued to decrease.
- 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.
- 2024/25 Seasonal Influenza Vaccination Programmes, including the Seasonal Influenza Vaccination School Outreach Programme and the Residential Care Home Vaccination Programme (RVP), has been launched on September 26, 2024. The public may visit the CHP's Vaccination Schemes page for more details of the vaccination programmes (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 seasonal influenza and its prevention, please visit the Centre for Health Protection's Seasonal Influenza page
 - (http://www.chp.gov.hk/en/view content/14843.html).

Influenza-like-illness surveillance among sentinel general out-patient clinics and sentinel private medical practitioner clinics, 2021-25

In week 11, the average consultation rate for influenza-like illness (ILI) among sentinel general outpatient clinics (GOPC) was 5.6 ILI cases per 1,000 consultations, which was lower than 6.2 recorded in the previous week (Figure 2.1, left). The average consultation rate for ILI among sentinel private medical practitioner (PMP) clinics was 47.3 ILI cases per 1,000 consultations, which was higher than 44.3 recorded in the previous week (Figure 2.1, right).

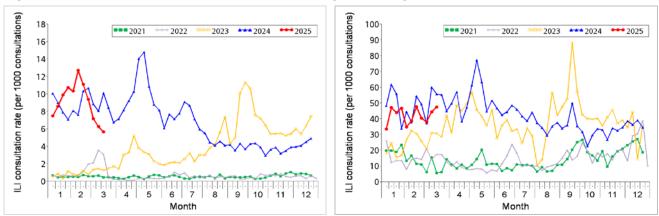


Figure 2.1 ILI consultation rates at sentinel GOPC (left) and PMP clinics (right), 2021-25

Laboratory surveillance, 2021-25

Among the 8,891 respiratory specimens* received in week 11, 229 (2.58%) were tested positive for seasonal influenza A or B viruses. Among the subtyped influenza detections, there were 146 (69%) influenza A(H1), 16 (8%) influenza A(H3) and 49 (23%) influenza B viruses. The positive percentage (2.58%) was below the baseline threshold of 4.94% but was lower than 3.67% recorded in the previous week (Figure 2.2).

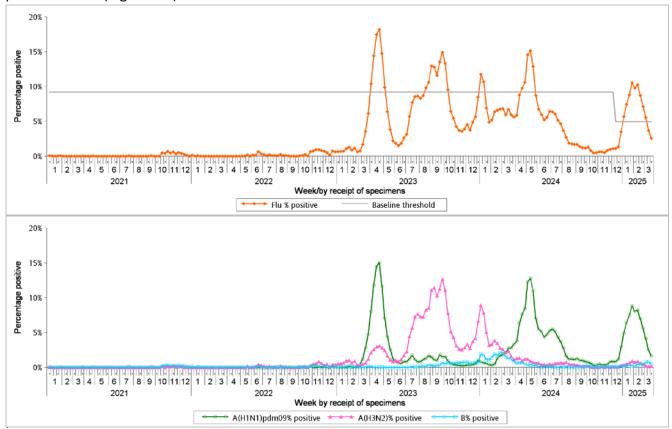


Figure 2.2 Percentage of respiratory specimens tested positive for influenza viruses, 2021-25 (upper: overall positive percentage, lower: positive percentage by subtypes)

[Notes: The Centre for Health Protection (CHP) of the Department of Health closely monitors the local seasonal influenza activity through a series of surveillance systems. Among them, the CHP sets threshold levels for two important influenza indicators, including the positive percentage of influenza detections among respiratory specimens and the admission rate of patients diagnosed with influenza in public hospitals. These threshold levels are calculated statistically based on data collected for both indicators in the past years during non-season periods. Using these thresholds, the CHP assesses the current local situation of seasonal influenza with higher accuracy and determines whether Hong Kong enters influenza season. The CHP annually reviews and analyses the latest surveillance data, and updates these threshold levels where appropriate. The sensitivity of the surveillance system is enhanced with the updated thresholds of positive percentage of influenza detection and admission rate of higher coherence.]

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

- Public Health Laboratory Services Branch, Centre for Health Protection tests influenza virus isolates obtained from cell culture for antiviral susceptibility.
- In January 2025, 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/10/641/695/7088.html
- Low detection rates of oseltamivir (Tamiflu) resistant influenza A and B viruses from latest surveillance data of overseas countries (less than 5%).
- CHP will continue laboratory surveillance on oseltamivir (Tamiflu) resistance of influenza viruses to monitor the trend.

^{*} Including 8,146 specimens received by Public Health Laboratory Services Branch, Centre for Health Protection and 745 specimens received by the Hospital Authority

Influenza-like illness outbreak surveillance, 2021-25

In week 11, 13 ILI outbreaks occurring in schools/institutions were recorded (affecting 54 persons), as compared to 11 outbreaks recorded in the previous week (affecting 66 persons)(Figure 2.3). The overall number was at the low intensity level currently (Figure 2.4*). In the first 4 days of week 12 (Mar 16 to 19), 8 ILI outbreaks in schools/institutions were recorded (affecting 27 persons).

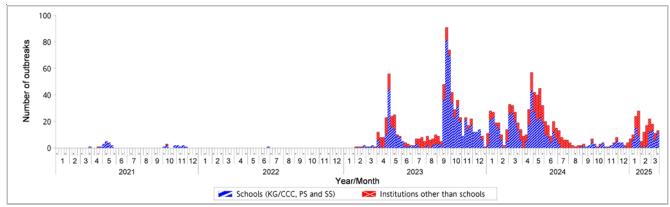
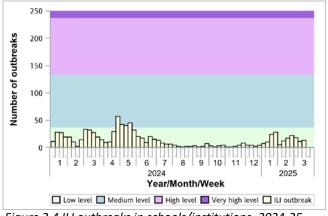
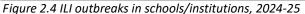


Figure 2.3 ILI outbreaks in schools/institutions, 2021-25

Type of institutions	Week 10	Week 11	First 4 days of week 12 (Mar 16 – 19)
Child care centre/ kindergarten (CCC/KG)	0	1	0
Primary school (PS)	4	5	7
Secondary school (SS)	2	5	0
Residential care home for the elderly	3	1	1
Residential care home for persons with disabilities	2	1	0
Others	0	0	0
Total number of outbreaks	11	13	8
Total number of persons affected	66	54	27

In comparison, 725, 344 and 184 outbreaks were recorded in the same duration of surveillance (9 complete weeks) in the 2018/19 winter, 2023 summer and 2023/24 seasons respectively, as compared with 147 outbreaks in the current season (Figure 2.5).





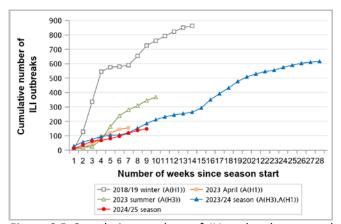


Figure 2.5 Cumulative numbers of ILI outbreaks reported during major influenza seasons, 2019 and 2023–25

Note: The predominating virus was shown in bracket.

^{*} Various intensity levels applicable for this year were calculated with the moving epidemic method (MEM). 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, 2021-25

In week 11, the overall admission rate in public hospitals with principal diagnosis of influenza was 0.12 (per 10,000 population) as compared to 0.24 recorded in the previous week (Figure 2.6). It was below the baseline threshold of 0.27 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 0.46, 0.40, 0.14, 0.05, 0.03 and 0.23 cases (per 10,000 people in the age group) respectively, as compared to 0.88, 0.37, 0.31, 0.08, 0.13 and 0.49 cases in the previous week (Figure 2.6).

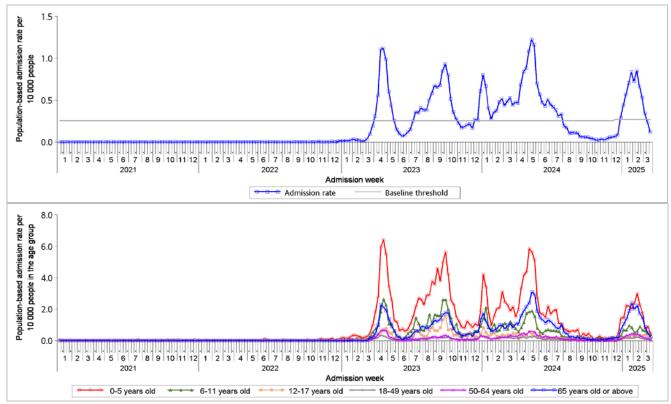


Figure 2.6 Influenza-associated hospital admission rates, 2021-25 (upper: overall rate, lower: rates by age groups)

[Notes: The Centre for Health Protection (CHP) of the Department of Health closely monitors the local seasonal influenza activity through a series of surveillance systems. Among them, the CHP sets threshold levels for two important influenza indicators, including the positive percentage of influenza detections among respiratory specimens and the admission rate of patients diagnosed with influenza in public hospitals. These threshold levels are calculated statistically based on data collected for both indicators in the past years during non-season periods. Using these thresholds, the CHP assesses the current local situation of seasonal influenza with higher accuracy and determines whether Hong Kong enters influenza season. The CHP annually reviews and analyses the latest surveillance data, and updates these threshold levels where appropriate. The sensitivity of the surveillance system is enhanced with the updated thresholds of positive percentage of influenza detection and admission rate of higher coherence.]

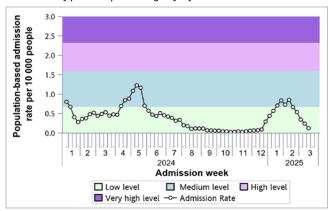


Figure 2.7 Influenza-associated hospital admission rates, 2024-25

*Various intensity levels applicable for this year were calculated with the moving epidemic method (MEM). 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, 2021-25#

In week 11, the rate of the ILI syndrome group in the accident and emergency departments (AEDs) was 136.5 (per 1,000 coded cases), which was higher than the rate of 130.2 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.

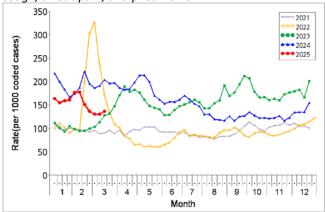


Figure 2.8 Rate of ILI syndrome group in AEDs, 2021-25

Fever surveillance at sentinel residential care homes for the elderly, 2021-25

In week 11, 0.08% of residents in the sentinel residential care homes for the elderly (RCHEs) had fever (38°C or above), compared to 0.08% recorded in the previous week (Figure 2.10).

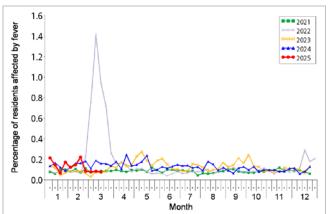


Figure 2.10 Percentage of residents with fever at sentinel RCHEs, 2021-25

Fever surveillance at sentinel child care centres/ kindergartens, 2021-25

In week 11, 0.99% of children in the sentinel child care centres / kindergartens (CCCs/KGs) had fever (38°C or above) as compared to 0.79% recorded in the previous week (Figure 2.9).

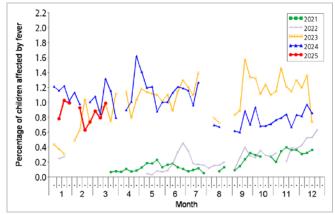


Figure 2.9 Percentage of children with fever at sentinel CCCs/KGs, 2021-25

Influenza-like illness surveillance among sentinel Chinese medicine practitioners, 2021-25

In week 11, the average consultation rate for ILI among Chinese medicine practitioners (CMPs) was 1.13 ILI cases per 1,000 consultations as compared to 0.63 recorded in the previous week (Figure 2.11).

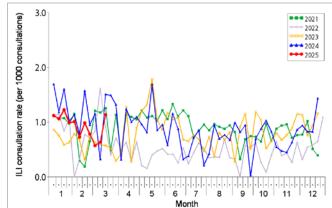


Figure 2.11 ILI consultation rate at sentinel CMPs, 2021-25

Surveillance of severe influenza cases

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

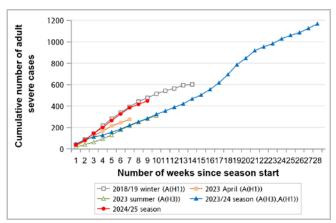
<u>Surveillance for intensive care unit (ICU) admission/death with laboratory confirmation of influenza among adult patients (Aged 18 years or above)</u>

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 11, 23 adult cases of ICU admission/death with laboratory confirmation of influenza were recorded, in which 21 of them were fatal. Among the 23 adult cases, 15 were not known to have received the 2024/25 seasonal influenza vaccine (SIV). In the first 4 days of week 12 (Mar 16 − 19), 7 cases were recorded, in which 5 of them were fatal.

Week	Influenza type					
	A(H1)	A(H3)	A (pending subtype)	В	A and B	С
Week 11	17	1	4	1	0	0
First 4 days of week 12 (Mar 16 – 19)	6	0	1	0	0	0

• In comparison, 476, 281 and 284 adult cases were recorded in the same duration of surveillance (first 9 weeks) in the 2018/19 winter, 2023 summer and 2023/24 seasons respectively, as compared with 447 cases in the current season (Figure 2.12, left). The corresponding figures for deaths were 271, 187 and 177 in the above seasons, as compared with 295 deaths in the current season (Figure 2.12, right).



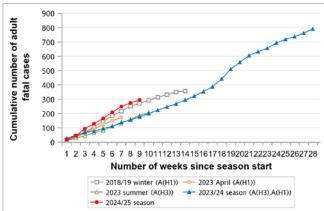


Figure 2.12 Cumulative numbers of adult severe influenza cases reported during major influenza seasons, 2019 and 2023–25 (left: ICU admission/death cases; right: deaths)

Note: The predominating virus was shown in bracket.

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

- In week 11 and the first 4 days of week 12 (Mar 16 − 19), there were no cases of severe paediatric influenza-associated complication/death.
- In 2025, 10 paediatric cases of influenza-associated complication were reported, in which none of them were fatal. 7 cases had infections with influenza A(H1), 1 case had infection with influenza A(H3), and 2 cases had infection with influenza B. Seven cases did not receive the 2024/25 SIV.
- In comparison, 21, 14 and 9 paediatric cases of influenza-associated complication/death were recorded in the same duration of surveillance (first 9 weeks) in the 2018/19 winter, 2023 summer and 2023/24 seasons respectively, as compared with 10 cases in the current season (Figure 2.13, left). The corresponding figures for deaths were 1, 1 and 0 in the above seasons, as compared with 0 deaths in current season (Figure 2.13, right).

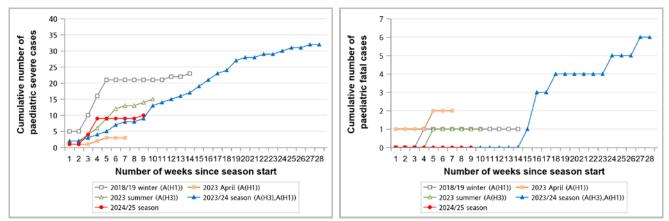


Figure 2.13 Cumulative numbers of cases of paediatric influenza-associated complication/death reported during major influenza seasons, 2019 and 2023–25 (left: complication/death cases; right: deaths)

Note: The predominating virus was shown in bracket.

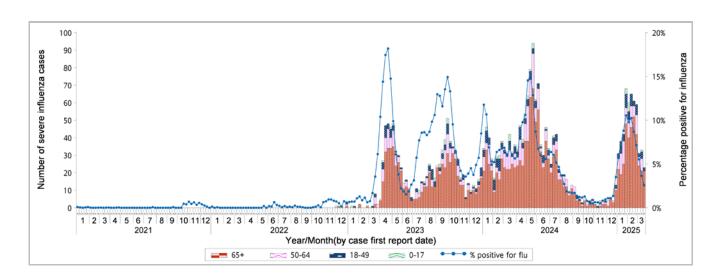


Figure 2.14 Weekly number of severe influenza cases by age groups, 2021-25 (the percentage positive for influenza viruses in Figure 2.2 is also shown in this graph)

Global Situation of Influenza Activity

In the Northern hemisphere, influenza activities in many countries in Europe, America and Asia remained elevated. In the Southern Hemisphere, influenza activity was low in general (data up to Mar 2, 2025).

- In the United States (week ending Mar 8, 2025), the national influenza activity remained elevated but decreased for four consecutive weeks. This season is classified as a high severity season overall. The percentage of specimens tested positive for influenza decreased to 16.1% from the peak of 31.7%. Influenza A(H1N1)pdm09 and A(H3N2) viruses were co-circulating.
- In Canada (week ending Mar 8, 2025), indicators of influenza activity decreased. Influenza positivity decreased to 24.0%, but was higher than the threshold of 5%. Laboratory detections are predominantly influenza A and among subtyped influenza A detections, influenza A(H1N1) is predominant (71%).
- In the United Kingdom (week ending Mar 9, 2025), influenza activity overall decreased across most indicators and was at low activity levels. Influenza positivity in England decreased to 9.5% as compared with 11.6% in preceding week. Influenza A and B viruses were co-circulating.
- In Europe (week ending Mar 9, 2025), 2024/2025 seasonal influenza epidemic started in early December last year. Influenza positivity from sentinel specimens was 35% as compared to 37% in preceding week, which was higher than 10% epidemic threshold. Influenza A(H1N1)pdm09, A(H3N2) and influenza B viruses were co-circulating.
- In Mainland China (week ending Mar 9, 2025), influenza activity reached high levels in early 2025, and then the percentage of specimens tested positive for influenza in southern and northern provinces continued to decrease to 13.3% and 6.0% in week 10 respectively. Influenza A(H1N1)pdm09 viruses were predominating in this season.
- In Taiwan (week ending Mar 15, 2025), influenza epidemic persisted. The number of ILI consultation was on a decreasing trend. The predominating circulating viruses in the community were influenza A(H1N1).
- In Japan (week ending Mar 9, 2025), influenza activity continued to decrease from its peak in the last week of 2024. In week 10, the average number of reported ILI cases per sentinel site was 2.02, as compared to 1.89 in preceding week, and was still above the baseline level of 1.00. Most of the influenza detections were influenza A(H1N1)pdm09 viruses.
- In South Korea (week ending Mar 8, 2025), the weekly ILI rate continued to decrease. The rate in week 9 and 10 was 9.1 and 8.0 per 1,000 out-patient visits respectively, which was below the seasonal epidemic threshold of 8.6. Influenza A(H1N1)pdm09, A(H3N2) and B viruses were co-circulating.

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, European Centre for Disease Prevention and Control (ECDC) and WHO Regional Office for Europe (WHO Euro), Chinese National Influenza Center, Taiwan Centers for Disease Control and Japan Ministry of Health and Korean Disease Control and Prevention Agency.