

Communicable Diseases

WATCH



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FEATURE IN FOCUS

2024 Year in Review

Reported by Surveillance Division, Communicable Disease Branch, CHP

In this article, we highlight significant communicable diseases and outbreaks in Hong Kong in 2024.

Seasonal Influenza

Hong Kong experienced a prolonged influenza season that lasted for 28 weeks from January to July 2024, which was uncommon in the pre-COVID era. During this season, influenza A(H3) virus predominated initially, shifting to influenza A(H1) from April (Figure 1). Based on local and overseas experience, the prolongation of this influenza season could be attributed to a change in the circulating influenza virus strains.

The Centre for Health Protection (CHP) all along monitors the effectiveness of seasonal influenza vaccines (SIV). Data collected by CHP showed that the 2023/24 SIV was effective against influenza in the season.

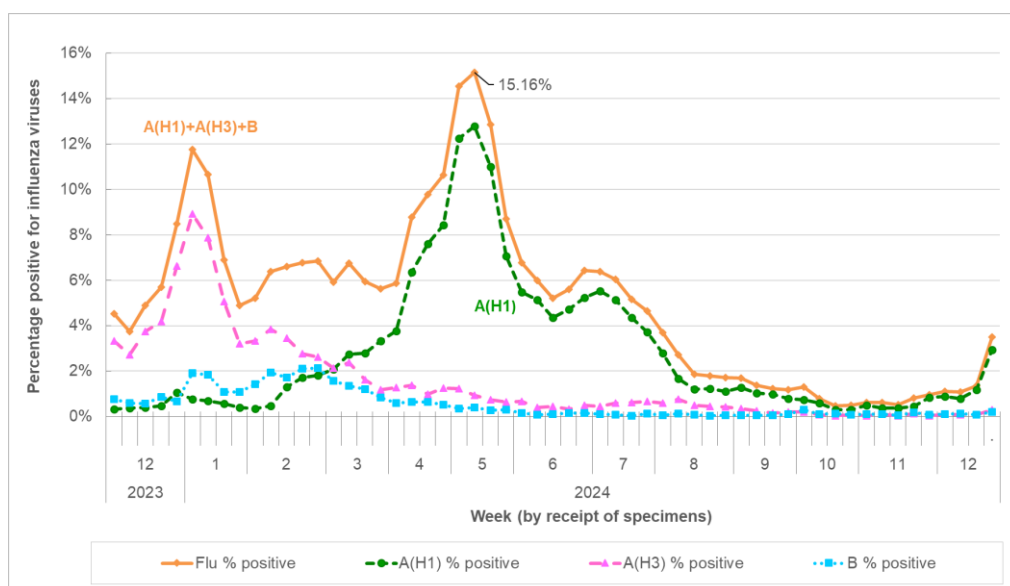


Figure 1 – Trend in percentage of respiratory specimens tested positive for influenza viruses.

For vaccine effectiveness against severe illness, a retrospective analysis revealed that among residents of residential care homes for the elderly who had not received SIV for this season, the rate of severe influenza illness was 2.2 times of that of vaccinated residents. For children aged 6 months to 17 years, the rate of influenza infection with serious complications or deaths among unvaccinated children was about 3.2 times of that of vaccinated, rising to 6.4 times in the 2 to 5-year age group.

In local primary care settings, sentinel private medical practitioners (PMPs) collected respiratory specimens and vaccination history from influenza-like illness patients during November 2023 to July 2024 to study the vaccine effectiveness (VE) of SIV. Analysis of the data showed that the overall VE against laboratory-confirmed influenza in out-patient settings was 60.7% against all influenza viruses, 51.4% against influenza A(H1), and 62.8% against influenza A(H3). These data demonstrated the protective effect of the 2023/24 SIV.

COVID-19

The activity of COVID-19 has followed a cyclical pattern since the society resumed normalcy in early 2023, with minor waves occurring about every four to six months throughout 2023 and 2024. For instance, COVID-19 activity showed an initial increase from early January 2024 with a positive laboratory detection rate of 6.8% among respiratory specimens, reaching a peak of 16.8% in early March before declining to a low level in June. A subsequent wave peaked at 9.06% between late July and early August, then declined and remained at low levels through December 2024 (Figure 2). Of note, the peaks have become less prominent

over time. These surges have been attributed to transitions in the dominant circulating SARS-CoV-2 variants locally. During these surges, the number of severe and fatal cases remained stable and low, ranging from 19 to 69 severe (including fatal) cases recorded per week.

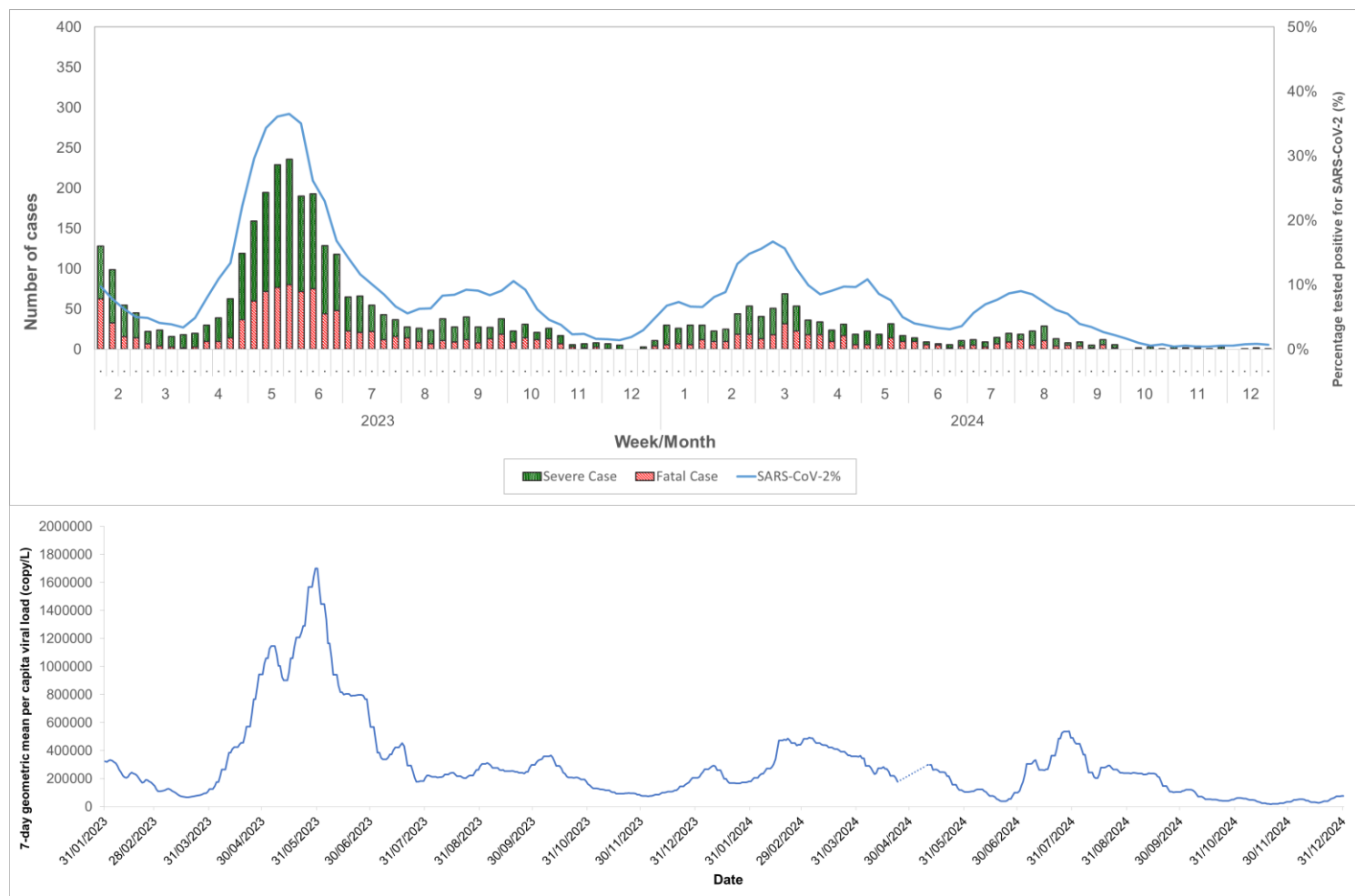


Figure 2 – Activity of COVID-19 in Hong Kong, 2023-2024.

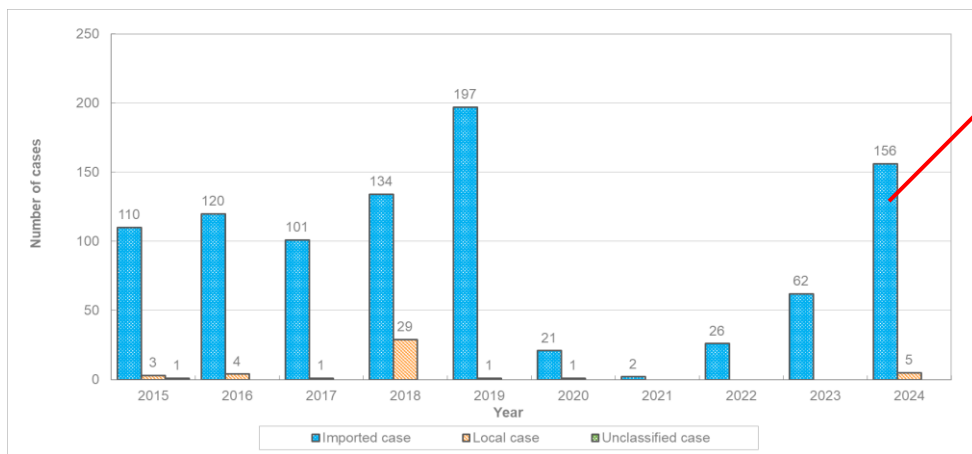
Dengue Fever

The CHP recorded 161 dengue fever (DF) cases (156 imported cases and five local cases) in 2024, compared to 62 cases (all imported) in 2023 (Figure 3). This significant increase is likely due to the surge in travel following the resumption of normalcy after the COVID-19 pandemic and ongoing outbreaks of DF in neighboring countries.

The 161 cases involved 71 males and 90 females, with ages ranging from six to 86 years (median: 52 years). Their common presenting symptoms included fever (151, 93.8%), headache (93, 57.8%), myalgia (88, 54.7%), rash (70, 43.5%), arthralgia (34, 21.1%) and eye pain (30, 18.6%). Among them, 148 patients (91.9%) required hospitalisation. One fatal case was recorded, involving a Filipino with underlying illness who travelled to Hong Kong from the Philippines after onset of symptoms. The clinical diagnosis was dengue shock syndrome with multi-organ failure.

Among the 156 imported cases, nearly half (75, 48.1%) had travel history to Guangdong Province of Mainland China during the incubation period. The upsurge in imported cases from Guangdong during September – November correlated with the period of high DF activity in Guangdong. The places of infection of four imported cases remained inconclusive, as the patients had travelled to multiple countries during the incubation period.

In 2024, five local DF cases were recorded, including three sporadic cases and two epidemiologically linked cases. The three sporadic cases resided in Siu Sai Wan (April), Fanling (August) and Tai Wai (November), whereas the two epidemiologically linked local cases recorded in June resided in the same estate in Tin Shui Wai. For every local case, CHP conducted active case finding, while the Food and Environmental Hygiene Department carried out intensive and targeted anti-mosquito control measures in the affected areas. Territory-wide anti-mosquito measures were also strengthened by various government departments and organisations in response to detection of these local cases. Through the concerted efforts of different parties, no additional cases were identified by the end of the surveillance periods.



Country/ area of infection	Number of cases
Mainland China (Guangdong Province)	75
Southeast Asia	51
Others	26
Undetermined	4 (visited multiple countries during incubation period)
Total	156

Figure 3 – Annual DF notification in Hong Kong, 2015-2024.

Invasive Group B Streptococcus Infection Associated with Sequence Type 283 (ST283)

Enhanced surveillance for invasive Group B Streptococcus (GBS) cases conducted by the CHP and the Hospital Authority identified an upward trend in the number of invasive GBS cases since late August 2024, subsequent to the previous surge in August 2021. Genetic analysis confirmed that the outbreak was caused by the ST283 strain of GBS. Epidemiological investigations identified 131 ST283 cases from August to early October 2024. Their ages ranged from 29 to 97 years with a median of 69 years. Among them, 76% had underlying illnesses, and four died of invasive GBS infection. Further analysis revealed that handling raw freshwater fish was strongly associated with ST283 infection, with the risk of infection amongst exposed individuals about nine times (adjusted odds ratio = 9.2) of that amongst those without such exposure. Through rapid implementation of effective measures and the concerted efforts of the Government, including epidemiological investigation, environmental sampling, disinfection of relevant premises, stepping up of publicity and health education efforts, the trend of invasive GBS cases decreased stepwise after the peak in early September. By November, the number of GBS cases largely returned to pre-outbreak levels observed in early August (Figure 4).

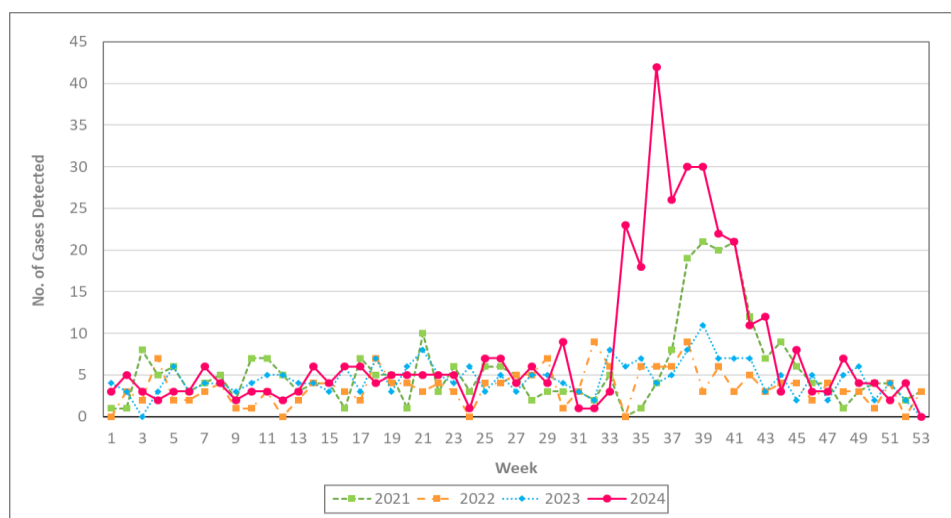


Figure 4 – Number of in-patients tested positive for GBS from sterile sites, 2021-2024 (As of December 31, 2024).

Measles

In the context of global resurgence of measles attributable to decline in vaccination coverage during the COVID-19 pandemic, there was a marked increase in measles cases in Hong Kong in 2024. Ten laboratory confirmed measles cases were recorded, exceeding the annual total during 2020 to 2023 (one to three cases per year) but remaining below 2018 and 2019 levels (Figure 5).

All the 10 cases (including six imported cases) recorded in the year were sporadic. Among them, six were adults (aged 22 to 57 years) and four were children aged three years or below. Regarding vaccination history, only two cases (20%) had received two doses of measles-containing vaccine (MCV), three had unknown vaccination status, and five were unvaccinated including two 11-month-old

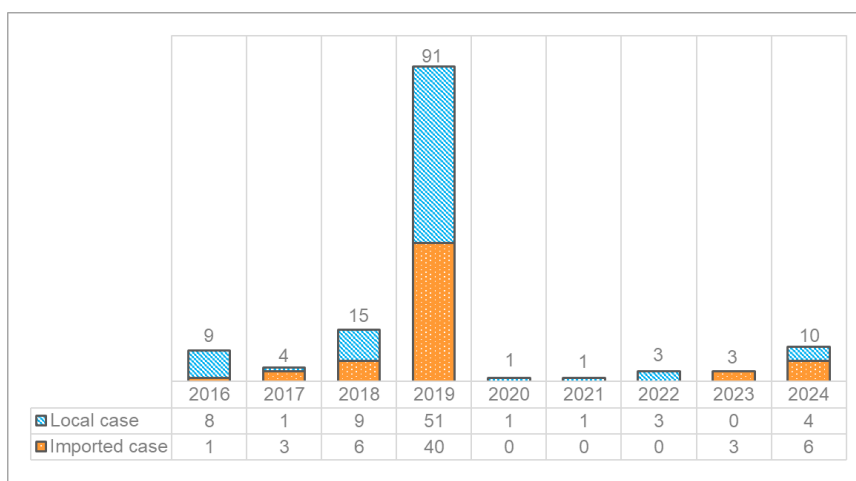


Figure 5 – Annual measles notification in Hong Kong since elimination declared in 2016.

infants not yet due for vaccination. Clinically, eight cases developed typical measles (80%) while two (20%) were modified measles with milder symptoms.

Despite the high levels of local population immunity and two-dose MCV coverage (95% or above), Hong Kong continues to face the risk of measles importations from countries where measles incidence is high or vaccine uptake remains suboptimal. In response to the global measles resurgence, CHP has stepped up risk communication measures for relevant stakeholders from January to May 2024, including dissemination of health messages through mass media, organisation of seminars targeting healthcare workers, as well as issuance of letters to doctors and press releases. An inter-departmental public health exercise code-named Kyanite was also held in June 2024 to test the preparedness of relevant government departments and organisations in response to a measles outbreak.

Pertussis

Following the usual cyclical pattern of pertussis, with the previous peak in 2018 and low incidence of pertussis during the COVID-19 period, pertussis activity increased in 2024 with 38 cases recorded in the year. The 38 cases comprised 23 males and 15 females, with ages ranging from two months to 80 years. Children under 18 years accounted for 26 cases (68%), of which six were infants aged below one year who had been vaccinated according to the schedule of the Hong Kong Childhood Immunisation Programme (HKCIP). Among the four cases involving infants aged below six months, mothers of two infants had received maternal pertussis vaccination during pregnancy. For the 20 cases affecting children aged between one and 17 years, except for an 11-year-old boy with unknown vaccination history, all had received at least three doses of pertussis vaccine. In contrast, among the 12 adults cases (aged 24 to 80 years), nine (75%) were either unvaccinated or had unknown vaccination status.

In terms of importation status, 30 cases were classified as local, six were imported (five from Mainland China, one from the United Kingdom) and two were of unknown place of infection. Except for a cluster involving two primary students in the same class (one being a cross-border student), all other cases were sporadic cases.

The increase in pertussis cases in 2024 might be attributed to an accumulation of susceptible individuals with reduced exposure to natural infection during the COVID-19 pandemic. In addition, data from the past two years showed a shift in the age distribution of the cases. In the pre-COVID-19 era, infants under six months who had not yet completed the primary series of pertussis vaccination accounted for about 40-50% of the cases while children aged six months to 17 years comprised only 10-20%. In contrast, during the recent two years, the proportion of cases involving children aged between 6 months to 17 years increased to about 55%, surpassing those among infants under six months (<10%) (Figure 6). This shift is largely due to a dramatic decrease in cases affecting infants under six months (four cases in 2024 compared with 26 and 42 cases recorded in 2018 to 2019 respectively) following the commencement of maternal pertussis vaccination in 2020.

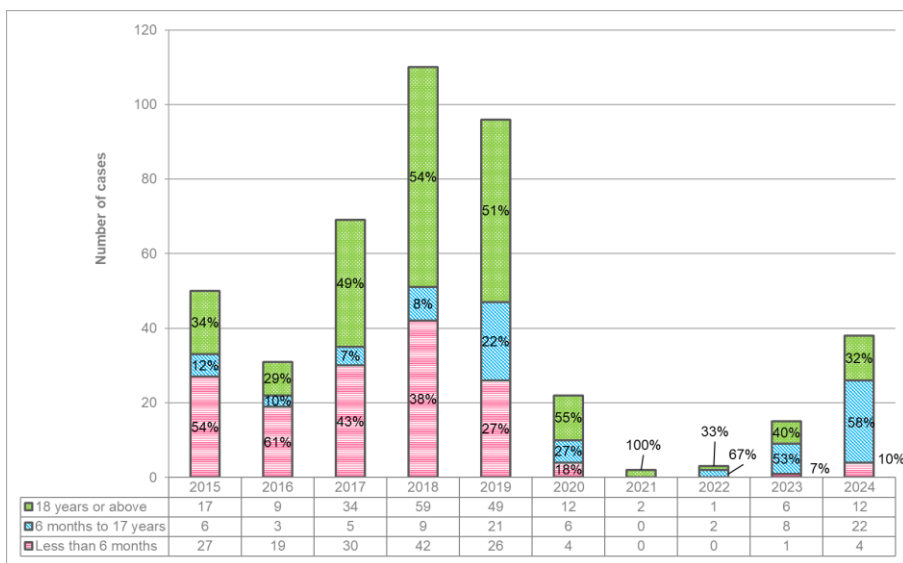


Figure 6 – Annual pertussis notification in Hong Kong by year and age groups, 2015-2024.

B virus infection

The CHP recorded the first human case of B virus infection in Hong Kong on April 3, 2024. The affected patient was a 37-year-old man with good past health. He was injured by wild monkeys while having contact with them in Kam Shan Country Park in late February 2024. The patient was admitted to a hospital due to fever and confusion on March 21, 2024 and required intensive care. His cerebrospinal fluid specimen was tested positive for B virus, and the clinical diagnosis was B virus encephalitis. The patient developed shock on June 17, 2024 and passed away the day after.

Following the confirmation of the first human case of B virus infection in Hong Kong, the CHP issued a press release to alert the public, and enhanced surveillance by adding B virus infection to the list of “Other communicable diseases of topical public health concern” since April 5, 2024. Relevant case definition and reporting criteria were disseminated to medical practitioners via letter to doctors. The CHP also strengthened related risk communication with health information made available on the CHP website and social media.

Sewage surveillance for COVID-19 in Hong Kong – past, present and future

Reported by Dr Shirley TSANG, Scientific Officer, Dr Dawin LO, Senior Medical Officer, Respiratory Disease Section, Surveillance Division, Communicable Disease Branch, CHP

Background

Sewage surveillance has been used as a public health tool to track the spread of infectious diseases for several decades. Back in the 1940s, epidemiologists in the United States utilised wastewater to track and contain polio outbreaks¹. Although the development of polymerase chain reaction (PCR) in the 1980s enabled detection and quantification of pathogens in even relatively small volumes of specimens, the substantial investment required to set up the necessary infrastructure limited its widespread adoption. However, the emergence of COVID-19 changed the whole scene. Worldwide, sewage surveillance has proven effective in monitoring disease activity, complementing the shortcomings of traditional clinically based surveillance indicators. This article provides an update on the latest status of Hong Kong’s territory-wide sewage surveillance programme for infectious diseases.

The past: Applying sewage surveillance during the COVID-19 containment phase

During the COVID-19 pandemic, the Environmental Protection Department (EPD) initiated and launched the territory-wide sewage surveillance programme in collaboration with the University of Hong Kong. It is an interdepartmental project comprising the Department of Health (DH), the EPD and the Drainage Services Department (DSD). Under the programme, sewage samples were collected from residential sites throughout Hong Kong for detecting SARS-CoV-2 virus and measuring viral concentrations in a non-intrusive way, covering about 80% of Hong Kong’s population during the fifth wave in 2022.

Statistical models were established using the collected sewage data and human data. It was found that sewage surveillance could predict the number of new cases in real-time two to four days ahead, providing timely information for formulating anti-epidemic strategies and measures. During the containment phase of the pandemic, sewage surveillance was also used as a contact tracing tool for active case finding to stop ongoing spread of the virus. Whenever SARS-CoV-2 virus was detected, upstream tracing according to the sewerage network was carried out to trace the origin down to individual buildings. This allowed targeted “Restriction-Testing Declaration” operations to be arranged to identify and isolate human cases. Over 26 500 confirmed cases (a majority of whom being asymptomatic) were successfully identified for timely public health management².

The present: Utilisation of sewage surveillance after resumption of normalcy

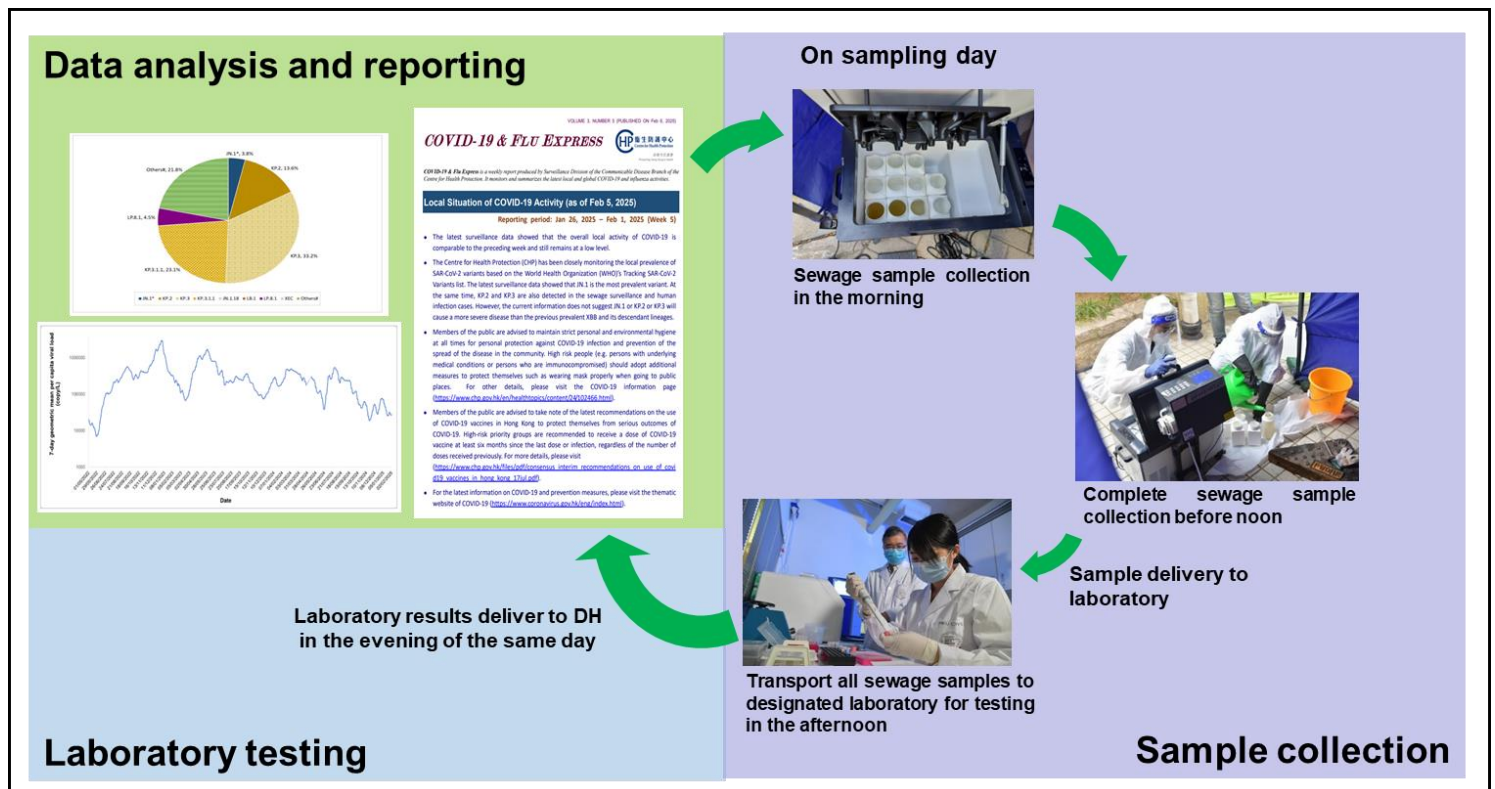


Figure 1 – Present workflow of sewage surveillance.

Following resumption of normalcy of the community from the COVID-19 pandemic, COVID-19 is now managed as an upper respiratory tract infection in a manner similar to other respiratory viruses such as seasonal influenza. As such, the role of sewage

surveillance has shifted from active case finding to routine surveillance of COVID-19 disease activity in the community. Moreover, collected samples are also used for variant testing, covering those classified by the World Health Organization as variants of interest (VOIs) and variants under monitoring (VUMs), on biweekly basis to monitor the prevalence of different SARS-CoV-2 variants circulating in the community. Figure 1 shows the current workflow of sewage surveillance.

The change in objective of sewage surveillance for COVID-19 provided room for reorientation of service implementation in a more cost-effective manner. In this connection, the Centre for Health Protection (CHP) conducted a retrospective review of the sewage surveillance data recorded from April 2023 to March 2024, using models to simulate different combinations of sampling sites and compile the 7-day geometric mean per capita viral load of SARS-CoV-2 virus from sewage. We correlated the estimates with corresponding values deduced from the original sampling strategy of using 120 manholes and clinical surveillance indicators.

The review showed that reducing the number of sampling sites from 120 (one to 12 in each of the 18 administrative districts in Hong Kong) to 18 manholes (one in each district) could significantly reduce the operating costs by nearly 80%, while maintaining a strong correlation (correlation coefficient = 0.96, $p < 0.001$) with findings deduced from the original sampling strategy and clinical surveillance indicators. Based on the findings from the review, sewage samples have been collected from 18 manholes weekly for viral load testing to monitor local COVID-19 activity. Relevant results are presented in Figure 2. Based on the observed trends during April 2024 to December 2024, the 7-day geometric mean per capita viral load of the SARS-CoV-2 virus from sewage surveillance exhibited a strong correlation with the weekly percentage of human respiratory specimens tested positive for SARS-CoV-2 virus (correlation coefficient = 0.83, $p < 0.001$).

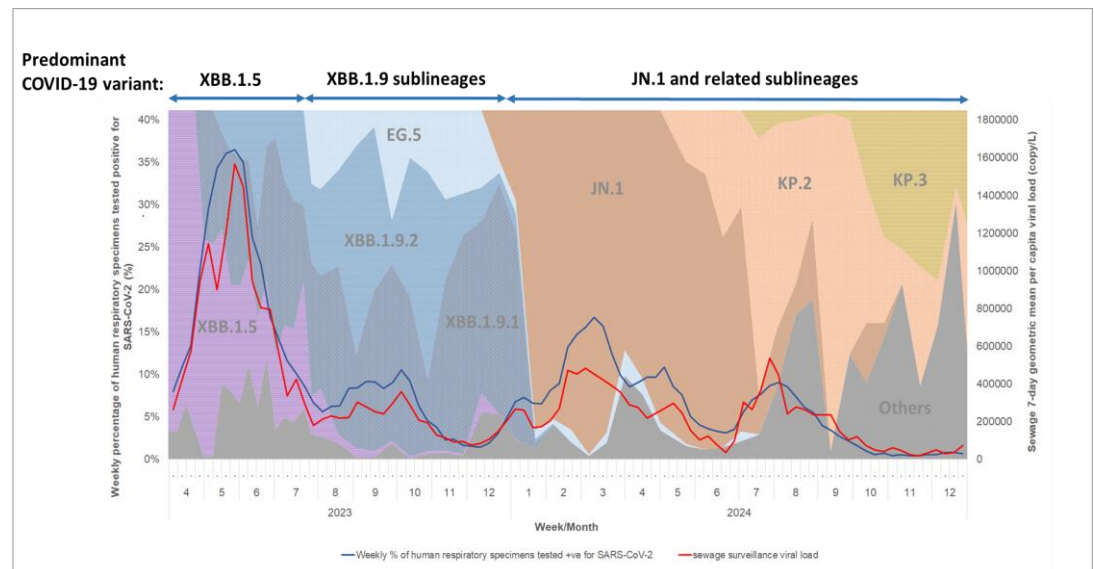


Figure 2 – 7-day geometric mean per capita viral load of SARS-CoV-2 virus from sewage surveillance and distribution of COVID-19 variants deduced from sewage surveillance, April 2023 to December 2024.

The future: Strengthening capacity to combat communicable diseases

Building on the successful experience from COVID-19, the CHP is exploring wider use of sewage surveillance for other diseases of public health significance. For instance, riding on the prevailing optimised sampling strategy, a pilot project has kick-started since October 2024 to monitor seasonal influenza activity from sewage samples. The CHP will analyse the sewage surveillance data collected in the current influenza season and assess the correlation with human surveillance data for seasonal influenza, so as to determine whether sewage surveillance on seasonal influenza could provide complementary information (e.g. early signals) to enhance the existing surveillance system on seasonal influenza.

Moreover, to strengthen the preparedness for combating emerging infectious diseases in the future, the CHP has been collaborating with the EPD and DSD to conduct a comprehensive manhole survey of the sewerage network in Hong Kong to delineate the catchment areas. This will enhance the efficiency of active case finding during war time scenarios. In the long run, the CHP will continue to enhance the sewage surveillance programme based on the latest scientific developments and innovations in the field.

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Characteristics and risk factors associated with COVID-19 reinfection in Hong Kong: a retrospective cohort study¹

Dr Wenhua LIN, Dr KH KUNG, Mr Jason CHAN, Dr Albert AU, Dr SK CHUANG, Communicable Disease Branch, CHP

The Centre for Health Protection (CHP) of the Department of Health (DH) conducted a retrospective cohort analysis of over three million confirmed COVID-19 cases in Hong Kong to investigate risk factors associated with COVID-19 reinfection. The findings were recently published in *Epidemiology and Infection*. The study covered COVID-19 cases recorded by the CHP during January 8, 2020 and January 29, 2023. The analysis revealed that 3.32% of the cases were reinfections, with females, persons with chronic diseases, and residents of residential care homes (RCHs) showing a higher risk. The median time between the initial infection and reinfection was 282 days, with most reinfections occurring within one year.

Furthermore, Cox regression analysis indicated that females had a 12% increased risk for reinfection (Hazard Ratio [HR] = 1.12), those with chronic diseases had an 18% increased risk (HR = 1.18), and residents of RCHs had an almost sevenfold risk (HR = 6.78) compared to others. Conversely, receiving additional vaccinations after the primary infection was found to be protective, reducing the risk of reinfection by 20% (HR = 0.80).

The study was the first report on the situation of COVID-19 reinfection based on the most comprehensive population-based dataset recorded in Hong Kong. It highlights the importance of vaccination and suggests further research into both the risk factors and protective measures against reinfection to inform targeted interventions.

Change in Public Knowledge, Attitude and Practice on Antibiotic Use After a Territory-Wide Health Promotion Campaign in Hong Kong²

Dr Edmond MA, Mr Enoch HSU, Ms Tracy CHOW, Dr KO Lok-sum, Ms LAU Kar-ye, Dr Billy HO, Infection Control Branch, CHP

The CHP conducted telephone surveys among Hong Kong residents aged 15 years or above to evaluate the impact of a territory-wide health promotion campaign aimed at improving public knowledge, attitudes, and practices regarding antibiotic use in Hong Kong. A subgroup analysis by age groups was conducted to assess changes in public understanding and behaviours related to antibiotics before and after the publicity campaign in November 2023. The findings were published in *Journal of Infectious Diseases & Therapy*.

A total of 1 083 residents were interviewed in the 2023 survey, with response rate of 50.1%. The findings indicated a significant improvement in the knowledge that cold and flu do not need antibiotic treatment (with correct responses increasing from 49.7% to 83.3%, $p < 0.001$) after the campaign. Those who knew that antibiotics are not needed for flu were less likely to ask for antibiotics during consultations (2.7% vs. 11.4%, $p < 0.01$). A large proportion (62.8% to 89.6%) did follow the infection control practices such as hand hygiene, disinfecting and covering all wounds while taking antibiotics. Besides, there was an improvement in wearing mask (rising from 72.3% in 2022 to 77.3% in 2023, $p < 0.001$). Elderly respondents had lower health literacy on antimicrobial resistance. The study suggests that health promotion initiatives can effectively enhance public knowledge and influence behaviours regarding antibiotic use. The results provide useful information to develop future health promotion strategies to combat antibiotic resistance.

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² Ma E, Hsu E, Chow T, Ko LS, Lau KY, et al. (2024) Change in Public Knowledge, Attitude and Practice on Antibiotic use After a Territory-Wide Health Promotion Campaign in Hong Kong. *J Infect Dis Ther* 12:604. DOI: 10.4172/2332-0877.1000604.

NEWS IN BRIEF

Two sporadic cases of psittacosis

The Centre for Health Protection (CHP) of the Department of Health (DH) recorded two sporadic cases of psittacosis on February 6 and 19, 2025 respectively.

The first case involved a 43-year-old woman with good past health residing in Sai Kung. She presented with fever, cough and shortness of breath on January 18, and was admitted to a private hospital on January 24. Chest X-ray showed right lower zone consolidation and bronchoalveolar lavage was tested positive for *Chlamydia psittaci* DNA. Her condition improved with antibiotic treatment and she was discharged on February 3. She had no travel history during incubation period. She did not keep any birds at home, but reported the presence of pigeons and their droppings outside her living room. The case was referred to Agriculture, Fisheries and Conservation Department and Food and Environmental Hygiene Department for follow-up.

The second case involved an 80-year-old man with good past health residing in Kwai Tsing. He had travelled to Shenzhen from January 27 to February 2, 2025. He developed fever, cough and generalised weakness on February 13, and was admitted to a public hospital on February 15. Chest X-ray showed consolidative changes over right middle and lower zones, and endotracheal aspirate was tested positive for *Chlamydia psittaci* DNA. He succumbed on February 22 despite treatment. He did not keep any birds, but had contact with two parrots in his family's home in Mainland. The case was referred to the Mainland authority for follow-up.

All home contacts of both cases were asymptomatic.

Two local sporadic cases of listeriosis

The CHP recorded two local sporadic cases of listeriosis on January 28 and 29, 2025 respectively.

The first case involved a 33-year-old pregnant woman with underlying illness residing in Sai Kung. She presented with fever, diarrhoea and headache on January 18 at second trimester of gestation. She was admitted to a public hospital on January 20 and was found to have miscarriage on January 21. Placental swab grew *Listeria monocytogenes*. She was treated with antibiotics. Her condition was stable and she was discharged on February 6. She had no recent travel. She recalled consumption of pre-packed and ready-to-eat fruits, salad and cheese during the incubation period. Food items collected during home visit were tested negative for *Listeria monocytogenes*. Her household contacts remained asymptomatic.

The second case involved a 27-year-old man with underlying illness residing in Tai Po. He presented with fever, cough and diarrhoea on January 25 and was admitted to a public hospital on January 27. His blood collected on January 27 grew *Listeria monocytogenes*. He was treated with antibiotics and his current condition was stable. He had no travel history and there was no known high-risk exposure during the incubation period. His household contacts remained asymptomatic.