DIPHTHERIA

Diphtheria is an infection caused by toxin-producing strains of *Corynebacterium diphtheriae* with two clinical forms, respiratory diphtheria and cutaneous diphtheria. The presentation of diphtheria depends on the site of involvement. Respiratory diphtheria is characterised by sore throat, fever, neck pain, cervical lymphadenopathy, and a thick greyish pseudomembrane on the tonsils. Cutaneous diphtheria may present with chronic, non-healing ulcers. Diphtheria primarily spreads from person to person through infectious respiratory particles when an infected person coughs or sneezes and can also spread via contact with contaminated surfaces as well as infected skin lesions.

There were no cases of respiratory diphtheria reported in both 2023 and 2024 in Singapore.

HAEMOPHILUS INFLUENZAE TYPE B DISEASE

Haemophilus influenzae type b (Hib) is a gram-negative coccobacillus bacterium that causes severe illnesses such as pneumonia, bacteraemia and meningitis. Hib primarily spreads from person to person through infectious respiratory particles when an infected person coughs or sneezes. It can also spread via contact with contaminated surfaces.

No cases of Hib disease were reported in 2024, while two cases were reported in 2023 (Figure 2.1). Both cases reported in 2023 were laboratory-confirmed with positive blood cultures. One was a local case, while the other one was imported (Table 2.1). The cases involved a 42-year-old male and a 69-year-old female (Table 2.2).

Figure 2.1
Weekly distribution of reported Hib cases, 2023-2024

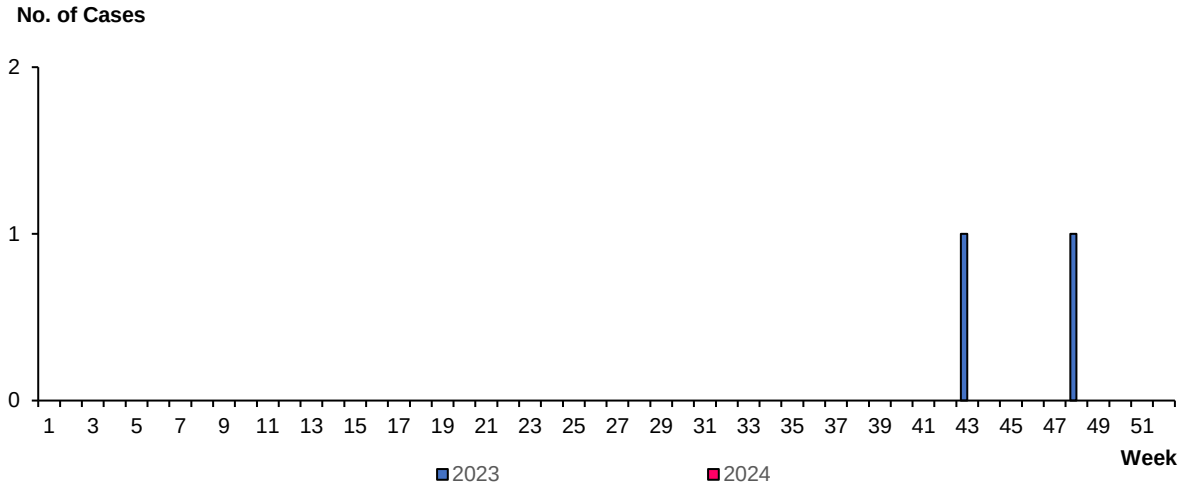


Table 2.1
Total number of reported Hib cases*, 2020-2024

Age group	2020		2021		2022		2023		2024	
	Local	Imported	Local	Imported	Local	Imported	Local	Imported	Local	Imported
0-4	0	0	0	0	0	0	0	0	0	0
5-14	0	0	0	0	0	0	0	0	0	0
15-24	0	0	0	0	1	0	0	0	0	0
25-34	0	0	0	0	0	0	0	0	0	0
35-44	0	0	0	0	1	0	1	0	0	0
45-54	0	0	0	0	0	0	0	0	0	0
55-64	0	0	0	0	0	0	0	0	0	0
65+	1	0	0	0	0	0	0	1	0	0
Total	**1**	**0**	**0**	**0**	**2**	**0**	**1**	**1**	**0**	**0**

*Excluded tourists and foreigners seeking medical treatment in Singapore.

Table 2.2
Age-sex distribution and age-specific resident incidence rate of reported Hib cases, 2023

Age group	Number of reported cases				Incidence rate per 100,000 resident population*
	Male	Female	Total	%	
0-4	0	0	0	0	0
5-14	0	0	0	0	0
15-24	0	0	0	0	0
25-34	0	0	0	0	0
35-44	1	0	1	50.0	0.2
45-54	0	0	0	0	0
55-64	0	0	0	0	0
65+	0	1	1	50.0	0.1
Total	**1**	**1**	**2**	**100**	**-**

*Rates are computed based on 2023 mid-year population obtained from the Singapore Department of Statistics.

Table 2.3
Ethnic-sex distribution and ethnic-specific incidence rate of reported Hib cases, 2023

Residential Status	Male	Female	Total	%	Incidence rate per 100,000 population*
Singapore residents					
Chinese	0	0	0	0	0
Malay	0	1	1	50.0	0.2
Indian	0	0	0	0	0
Others	1	0	1	50.0	0.7
Non-residents	0	0	0	0	0
Total	**1**	**1**	**2**	**100**	**0.0**

*Rates are computed based on 2023 mid-year population obtained from the Singapore Department of Statistics.

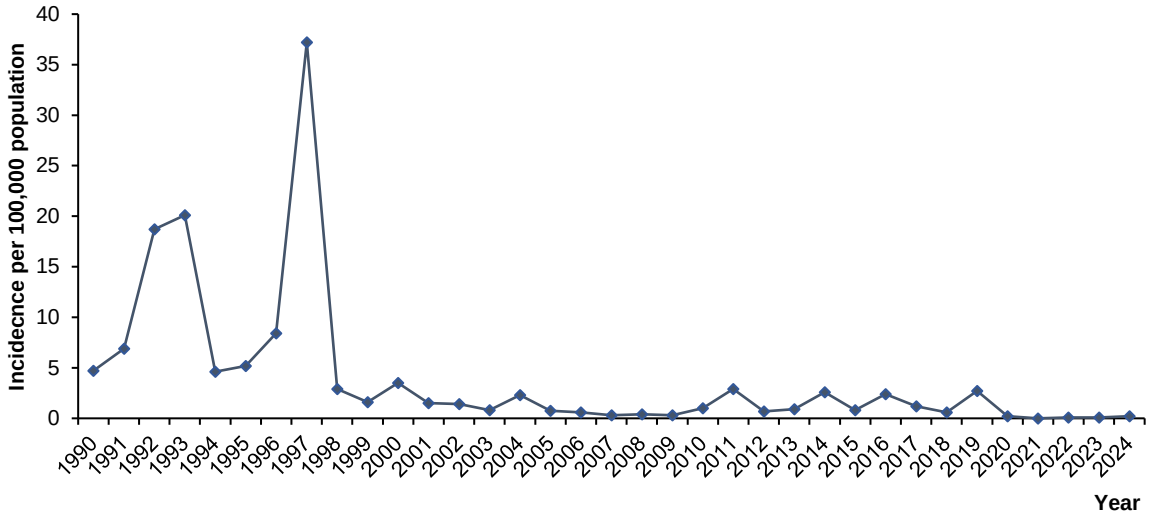
MEASLES

Measles is an acute, highly communicable viral disease caused by the measles virus, a member of the genus *Morbillivirus* of the family *Paramyxoviridae*. It is characterised by a fever, which is often accompanied by coryza (runny nose), cough and conjunctivitis (red watery eyes), followed shortly by a maculopapular rash. Measles primarily spreads from person to person through infectious respiratory particles when an infected person coughs or sneezes. It can also spread via contact with contaminated surfaces.

In Singapore, the number of reported measles cases has rapidly declined with the introduction of compulsory measles vaccination in August 1985. In 1992 and 1997, there was an increase in the number of reported cases (Figure 2.2). All age groups were affected and this led to the “catch-up” immunisation initiative that was implemented in July-November 1997, and the introduction of the two-dose MMR

vaccination regime in January 1998. The incidence of measles has remained at a low level since then.

Figure 2.2
Incidence of reported measles cases, 1990-2024



11 laboratory-confirmed cases of measles were reported in 2024, compared to eight cases in 2023 (Figure 2.3). Of the eight confirmed cases in 2023, six were local cases, one was an imported case and one was a tourist. Of the 11 confirmed cases in 2024, seven were local cases and four were imported cases (Table 2.4).

The resident incidence was similar across three age groups (25-34, 35-44 and 45-54) in 2023 (Table 2.5). In 2024, the resident incidence was highest in children less than one year of age (Table 2.6). Among the three major ethnic groups, Chinese had the highest incidence rate in 2023 (Table 2.7), while Malays had the highest incidence rate in 2024 (Table 2.8).

Figure 2.3
Weekly distribution of reported measles cases, 2023-2024

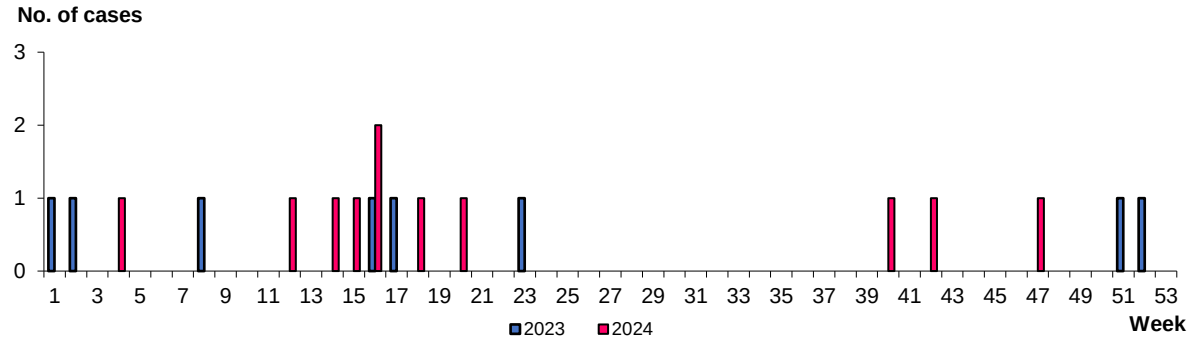


Table 2.4
Total number of reported measles cases*, 2020-2024

Age group	2020		2021		2022		2023		2024	
	Local	Imported	Local	Imported	Local	Imported	Local	Imported	Local	Imported
< 6 mths	1	0	0	0	0	0	0	0	1	0
6 mths-< 1yr	0	0	0	0	1	1	0	0	3	0
1-4	3	0	0	0	1	0	1	0	0	0
5-9	0	0	0	0	0	0	0	0	0	0
10-14	0	0	0	0	0	0	0	0	0	0
15-24	1	0	0	0	0	0	0	0	0	0
25-34	4	1	0	0	0	0	1	0	1	0
35-44	1	0	0	0	1	0	1	1	1	4
45-54	0	0	0	0	0	0	3	0	1	0
55+	0	0	0	0	0	0	0	0	0	0
Total	**10**	**1**	**0**	**0**	**3**	**1**	**6**	**1**	**7**	**4**

*Excluded tourists and foreigners seeking medical treatment in Singapore.

Table 2.5
Age-sex distribution and age-specific resident incidence rate of reported measles cases^, 2023

Age group	Number of reported cases				Incidence rate per 100,000 resident population*
	Male	Female	Total	%	
< 6 mths	0	0	0	0	0
6 mths-< 1yr	0	0	0	0	0
1-4	0	1	1	14.3	0
5-9	0	0	0	0	0
10-14	0	0	0	0	0
15-24	0	0	0	0	0
25-34	1	0	1	14.3	0.2
35-44	2	0	2	28.6	0.2
45-54	2	1	3	42.9	0.2
55+	0	0	0	0	0
Total	**5**	**2**	**7**	**100⁺**	**-**

^Excluded one tourist in Singapore.
*Rates are computed based on 2023 mid-year population obtained from the Singapore Department of Statistics.
⁺Figures may not add to 100% due to rounding.

Table 2.6
Age-sex distribution and age-specific resident incidence rate of reported measles cases, 2024

Age group	Number of reported cases				Incidence rate per 100,000 resident population*
	Male	Female	Total	%	
< 6 mths	1	0	1	9.1	7.3
6 mths-< 1yr	2	1	3	27.3	19.3
1-4	0	0	0	0	0
5-9	0	0	0	0	0
10-14	0	0	0	0	0
15-24	0	0	0	0	0
25-34	1	0	1	9.1	0
35-44	1	4	5	45.5	0.2
45-54	1	0	1	9.1	0
55+	0	0	0	0	0
Total	**6**	**5**	**11**	**100⁺**	**-**

*Rates are computed based on 2024 mid-year population obtained from the Singapore Department of Statistics.
⁺Figures may not add to 100% due to rounding.

Table 2.7
Ethnic-sex distribution and ethnic-specific incidence rate of reported measles cases^, 2023

Residential Status	Male	Female	Total	%	Incidence rate per 100,000 population*
Singapore residents					
Chinese	3	0	3	42.9	0.1
Malay	0	0	0	0	0
Indian	0	0	0	0	0
Others	0	0	0	0	0
Non-residents	2	2	4	57.1	0.2
Total	**5**	**2**	**7**	**100**	**0.1**

^Excluded one tourist in Singapore.
*Rates are computed based on 2023 mid-year population obtained from the Singapore Department of Statistics.

Table 2.8
Ethnic-sex distribution and ethnic-specific incidence rate of reported measles cases, 2024

Residential Status	Male	Female	Total	%	Incidence rate per 100,000 population*
Singapore residents					
Chinese	2	1	3	27.3	0.1
Malay	1	1	2	18.2	0.4
Indian	0	0	0	0	0
Others	0	0	0	0	0
Non-residents	3	3	6	54.5	0.3
Total	**6**	**5**	**11**	**100**	**0.2**

*Rates are computed based on 2024 mid-year population obtained from the Singapore Department of Statistics.

MENINGOCOCCAL DISEASE

Meningococcal disease is an acute bacterial disease caused by *Neisseria meningitidis,* with serogroups A, B, C, W-135, and Y accounting for most cases. It can lead to serious illnesses such as meningitis and meningococcaemia. Meningococcal meningitis is characterised by the sudden onset of fever, severe headache, nausea, vomiting and neck stiffness. Meningococcaemia is a severe bloodstream infection characterised by a petechial rash, shock, disseminated intravascular coagulation and multiorgan failure, and can rapidly progress to sepsis and death. Meningococcal disease primarily spreads from person to person through infectious respiratory particles when an infected person coughs or sneezes. It can also spread via contact with contaminated surfaces.

Four cases of meningococcal disease were reported in 2024, compared to three cases reported in 2023 (Table 2.9). Of the three confirmed cases in 2023, two were local cases and one was an imported case in a foreigner seeking medical treatment. Of the four confirmed cases reported in 2024, two were local cases and two were imported cases (Table 2.9).

All cases in 2023 and 2024 were laboratory-confirmed with blood or cerebrospinal fluid which tested positive via culture or Polymerase Chain Reaction (PCR). The resident incidence rate was highest in the 25-34 years age group in 2023 (Table 2.10) and in the 0-4 years age group in 2024 (Table 2.11). Serogroup B was implicated in two cases in 2023 (Table 2.12) and two cases in 2024 (Table 2.13).

Table 2.9
Total number of reported meningococcal disease cases*, 2020-2024

Age group	2020		2021		2022		2023		2024	
	Local	Imported	Local	Imported	Local	Imported	Local	Imported	Local	Imported
0-4	0	0	1	0	2	0	0	0	0	1
5-14	0	0	0	0	0	0	0	0	0	0
15-24	1	0	0	0	0	0	0	0	1	0
25-34	3	0	1	0	0	0	2	0	0	0
35-44	1	0	0	0	0	0	0	0	0	0
45-54	0	0	0	0	1	0	0	0	0	0
55-64	1	0	0	0	0	0	0	0	0	1
65+	1	0	0	0	0	0	0	0	1	0
Total	**7**	**0**	**2**	**0**	**3**	**0**	**2**	**0**	**2**	**2**

*Excluded tourists and foreigners seeking medical treatment in Singapore.

Table 2.10
Age-sex distribution and age-specific resident incidence rate of reported meningococcal disease cases^, 2023

Age group	Number of reported cases				Incidence rate per 100,000 resident population*
	Male	Female	Total	%	
0-4	0	0	0	0	0
5-14	0	0	0	0	0
15-24	0	0	0	0	0
25-34	2	0	2	100	0.2
35-44	0	0	0	0	0
45-54	0	0	0	0	0
55-64	0	0	0	0	0
65+	0	0	0	0	0
Total	**2**	**0**	**2**	**100**	**-**

^Excluded one foreigner seeking medical treatment in Singapore.
*Rates are computed based on 2023 mid-year population obtained from the Singapore Department of Statistics.

Table 2.11
Age-sex distribution and age-specific resident incidence rate of reported meningococcal disease cases, 2024

Age group	Number of reported cases				Incidence rate per 100,000 resident population*
	Male	Female	Total	%	
0-4	0	1	1	25.0	0.6
5-14	0	0	0	0	0
15-24	1	0	1	25.0	0.2
25-34	0	0	0	0	0
35-44	0	0	0	0	0
45-54	0	0	0	0	0
55-64	0	1	1	25.0	0.2
65+	1	0	1	25.0	0.1
Total	**2**	**2**	**4**	**100**	**-**

*Rates are computed based on 2024 mid-year population obtained from the Singapore Department of Statistics.

Table 2.12
Epidemiological data of two reported meningococcal disease cases^, 2023

Case particulars			Causative agent	Status
Sex	Age	Ethnic group		
M	27 years	Chinese	*Neisseria meningitidis* Grp B	Demised
M	27 years	Others	*Neisseria meningitidis* Grp B	Demised

^Excluded one foreigner seeking medical treatment in Singapore.

Table 2.13
Epidemiological data of four reported meningococcal disease cases, 2024

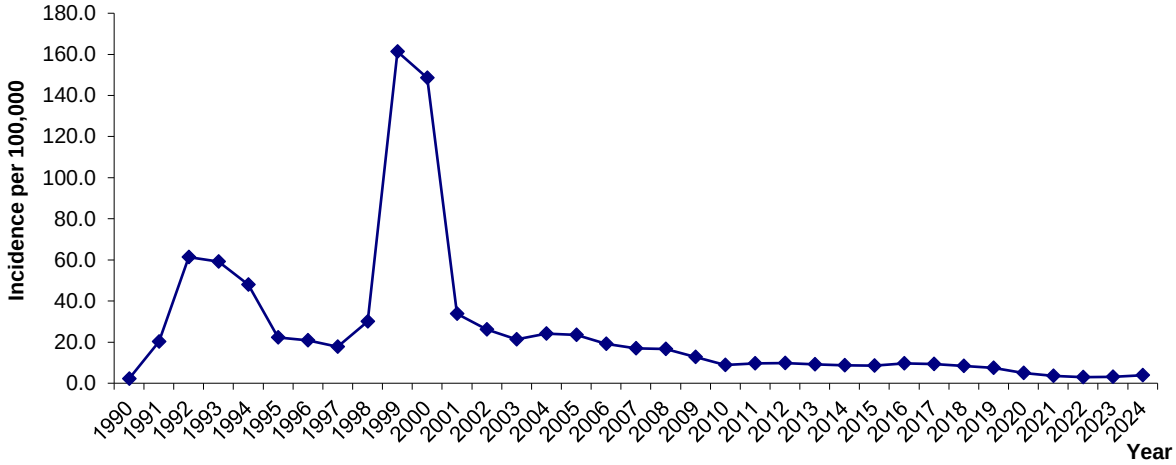
Case particulars			Causative agent	Status
Sex	Age	Ethnic group		
F	1 year	Chinese	*Neisseria meningitidis* Grp B	Recovered
F	60 years	Malay	*Neisseria meningitidis* Grp B	Recovered
M	19 years	Chinese	*Neisseria meningitidis* Grp Y	Recovered
M	73 years	Indian	*Neisseria meningitidis* (Non-groupable)	Recovered

MUMPS

Mumps is an acute viral disease caused by the mumps virus, a member of the genus *Paramyxovirus*. It is characterised by fever, swelling and tenderness of one or more salivary glands. Complications include orchitis, meningitis and deafness. Mumps primarily spreads from person to person through infectious respiratory particles when an infected person coughs or sneezes. It can also spread via contact with contaminated surfaces.

The incidence of mumps in Singapore increased five-fold between 1998 and 1999, from 1,183 cases to 6,384 cases. Children below 15 years of age were the most affected age group. This increase was due to the low protective efficacy of vaccines containing the Rubini strain, which had been used between the years 1993-1995. Following this resurgence, a more efficacious vaccine replaced the Rubini strain-containing vaccine. Since then, the annual incidence of mumps has declined rapidly and remained low since 2010 (Figure 2.4).

Figure 2.4
Incidence of reported mumps cases, 1990-2024



233 cases of mumps were reported in 2024, as compared to 182 cases in 2023 (Figure 2.5).

The resident incidence rate was highest in the 0-4 years age group in 2023 (Table 2.14) and the 5-14 years age group in 2024 (Table 2.15). Among the three major ethnic groups, Malays had the highest incidence rate in 2023 (Table 2.16) while Indians had the highest incidence rate in 2024 (Table 2.17).

Figure 2.5
Weekly distribution of reported mumps cases, 2023-2024

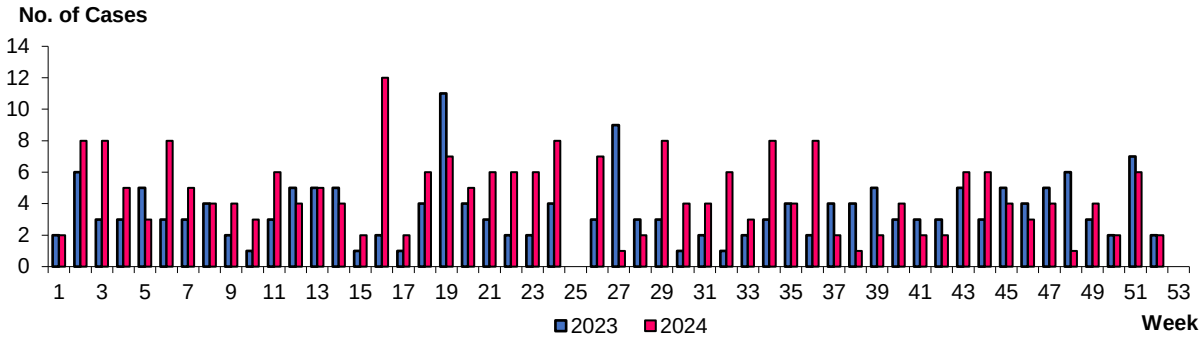


Table 2.14
Age-sex distribution and age-specific resident incidence rate of reported mumps cases^, 2023

Age group	Number of reported cases				Incidence rate per 100,000 resident population*
	Male	Female	Total	%	
0-4	18	6	24	13.4	12.6
5-14	18	19	37	20.7	8.6
15-24	13	2	15	8.4	2.3
25-34	17	8	25	14.0	2.0
35-44	13	16	29	16.2	3.4
45-54	15	14	29	16.2	3.5
55-64	7	6	13	7.3	2.2
65+	4	3	7	3.9	1.0
Total	**105**	**74**	**179**	**100⁺**	**-**

^Excluded three tourists in Singapore.
*Rates are computed based on 2023 mid-year population obtained from the Singapore Department of Statistics.
⁺Figures may not add to 100% due to rounding.

Table 2.15
Age-sex distribution and age-specific resident incidence rate of reported mumps cases^, 2024

Age group	Number of reported cases				Incidence rate per 100,000 resident population*
	Male	Female	Total	%	
0-4	4	5	9	4.0	4.7
5-14	28	14	42	18.5	8.4
15-24	11	4	15	6.6	1.4
25-34	24	12	36	15.9	2.7
35-44	39	17	56	24.7	3.5
45-54	22	15	37	16.3	3.9
55-64	8	10	18	7.9	2.7
65+	6	8	14	6.2	1.9
Total	**142**	**85**	**227**	**100⁺**	**-**

^Excluded six tourists in Singapore.
*Rates are computed based on 2024 mid-year population obtained from the Singapore Department of Statistics.
⁺Figures may not add to 100% due to rounding.

Table 2.16
Ethnic-sex distribution and ethnic-specific incidence rate of reported mumps cases^, 2023

Residential Status	Male	Female	Total	%	Incidence rate per 100,000 population*
Singapore residents					
Chinese	47	43	90	50.3	2.9
Malay	19	14	33	18.4	5.9
Indian	6	2	8	4.5	2.1
Others	5	5	10	5.6	7.1
Non-residents	28	10	38	21.2	2.1
Total	**105**	**74**	**179**	**100**	**3.0**

^Excluded three tourists in Singapore.
*Rates are computed based on 2023 mid-year population obtained from the Singapore Department of Statistics.

Table 2.17
Ethnic-sex distribution and ethnic-specific incidence rate of reported mumps cases^, 2024

Residential Status	Male	Female	Total	%	Incidence rate per 100,000 population*
Singapore residents					
Chinese	51	46	97	42.7	3.1
Malay	12	8	20	8.8	3.5
Indian	9	5	14	6.2	3.7
Others	4	5	9	4.0	6.2
Non-residents	66	21	87	38.3	4.7
Total	**142**	**85**	**227**	**100**	**3.8**

^Excluded six tourists in Singapore.
*Rates are computed based on 2024 mid-year population obtained from the Singapore Department of Statistics.

PERTUSSIS

Pertussis is an acute bacterial infection of the respiratory tract caused by *Bordetella pertussis.* It classically presents with paroxysms of cough and a whooping sound on inspiration. In infants, the infection may be severe with respiratory distress, apnoea and seizures. Pertussis primarily spreads from person to person through infectious respiratory particles when an infected person coughs or sneezes. It can also spread via contact with contaminated surfaces.

123 laboratory-confirmed cases of pertussis were reported in 2024, compared to 20 cases reported in 2023 (Figure 2.6). Of the 20 cases reported in 2023, 15 were local cases, three were imported cases, one was a tourist, and one was a foreigner seeking medical treatment in Singapore. Of the 123 cases reported in 2024, 110 were local cases, 11 were imported cases, one was a tourist, and one was a foreigner seeking medical treatment in Singapore (Table 2.18).

The resident incidence rate was highest in children aged between one and four years in 2023 (Table 2.19), and in children below the age of one year in 2024 (Table 2.20). Among the three major ethnic groups, Malays had the highest incidence rate in both 2023 and 2024 (Tables 2.21 and 2.22).

No pertussis deaths were reported in 2023 and 2024.

Figure 2.6
Weekly distribution of reported pertussis cases, 2023-2024

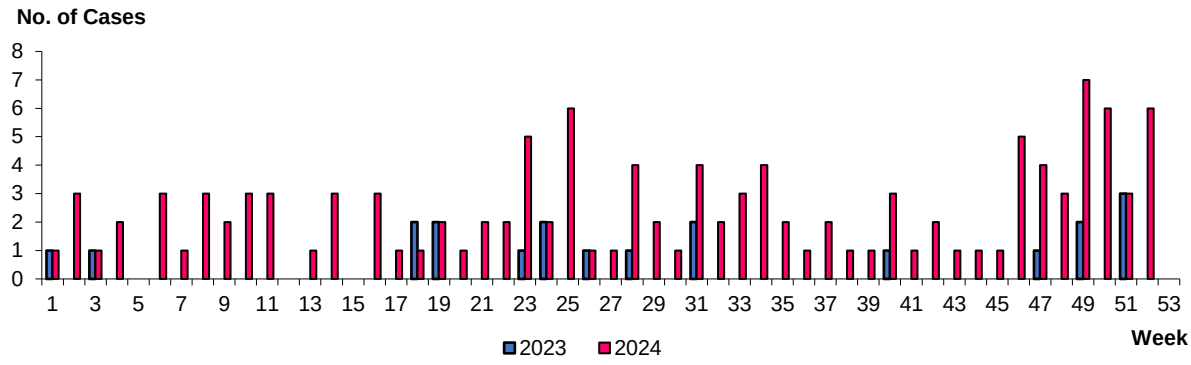


Table 2.18
Total number of reported pertussis cases*, 2020-2024

Age group	2020		2021		2022		2023		2024	
	Local	Imported	Local	Imported	Local	Imported	Local	Imported	Local	Imported
0-4	2	0	0	0	1	0	1	0	7	2
5-14	0	0	0	0	0	0	1	0	26	5
15-24	0	0	0	0	0	0	3	0	4	1
25-34	0	0	0	0	0	0	4	0	12	1
35-44	2	0	0	0	0	0	2	0	11	0
45-54	0	0	0	0	0	0	1	1	9	0
55-64	3	0	0	0	0	0	1	1	6	0
65+	3	0	0	0	0	0	2	1	35	2
Total	**10**	**0**	**0**	**0**	**1**	**0**	**15**	**3**	**110**	**11**

*Excluded tourists and foreigners seeking medical treatment in Singapore.

Table 2.19
Age-sex distribution and age-specific resident incidence rate of reported pertussis cases^, 2023

Age group	Number of reported cases				Incidence rate per 100,000 resident population*
	Male	Female	Total	%	
0-<1yr	0	0	0	0	0
1-4	1	0	1	5.6	0.7
5-14	1	0	1	5.6	0.2
15-24	2	1	3	16.7	0.2
25-34	4	0	4	22.2	0
35-44	2	0	2	11.1	0
45-54	2	0	2	11.1	0.3
55-64	2	0	2	11.1	0.3
65+	2	1	3	16.7	0.4
Total	**16**	**2**	**18**	**100⁺**	**-**

^Excluded one tourist and one foreigner seeking medical treatment in Singapore.
*Rates are computed based on 2023 mid-year population obtained from the Singapore Department of Statistics.
⁺Figures may not add to 100% due to rounding.

Table 2.20
Age-sex distribution and age-specific resident incidence rate of reported pertussis cases^, 2024

Age group	Number of reported cases				Incidence rate per 100,000 resident population*
	Male	Female	Total	%	
0-<1yr	2	2	4	3.3	13.7
1-4	2	3	5	4.1	1.4
5-14	18	13	31	25.6	3.9
15-24	3	2	5	4.1	0.5
25-34	10	3	13	10.7	0.5
35-44	10	1	11	9.1	0.3
45-54	6	3	9	7.4	1.0
55-64	4	2	6	5.0	0.8
65+	15	22	37	30.6	4.6
Total	**70**	**51**	**121**	**100⁺**	**-**

^Excluded one tourist and one foreigner seeking medical treatment in Singapore.
*Rates are computed based on 2024 mid-year population obtained from the Singapore Department of Statistics.
⁺Figures may not add to 100% due to rounding.

Table 2.21
Ethnic-sex distribution and ethnic-specific incidence rate of reported pertussis cases^, 2023

Residential Status	Male	Female	Total	%	Incidence rate per 100,000 population*
Singapore residents					
Chinese	4	0	4	22.2	0.1
Malay	2	0	2	11.1	0.4
Indian	0	0	0	0	0
Others	2	2	4	22.2	2.8
Non-residents	8	0	8	44.4	0.5
Total	**16**	**2**	**18**	**100⁺**	**0.3**

^Excluded one tourist and one foreigner seeking medical treatment in Singapore.
*Rates are computed based on 2023 mid-year population obtained from the Singapore Department of Statistics.
⁺Figures may not add to 100% due to rounding.

Table 2.22
Ethnic-sex distribution and ethnic-specific incidence rate of reported pertussis cases^, 2024

Residential Status	Male	Female	Total	%	Incidence rate per 100,000 population*
Singapore residents					
Chinese	23	23	46	38.0	1.5
Malay	11	7	18	14.9	3.2
Indian	0	3	3	2.5	0.8
Others	3	5	8	6.6	5.6
Non-residents	33	13	46	38.0	2.5
Total	**70**	**51**	**121**	**100**	**2.0**

^Excluded one tourist and one foreigner seeking medical treatment in Singapore.
*Rates are computed based on 2024 mid-year population obtained from the Singapore Department of Statistics.

PNEUMOCOCCAL DISEASE (INVASIVE)

Invasive pneumococcal disease (IPD) is an acute life-threatening infection of the brain or blood stream caused by the bacteria *Streptococcus pneumoniae*. IPD usually requires frequent or prolonged close contact. It primarily spreads from person to person through infectious respiratory particles when an infected person coughs or sneezes. It can also spread via contact with contaminated surfaces.

122 laboratory-confirmed cases of invasive pneumococcal infection were reported in 2024, compared

to 142 laboratory-confirmed cases reported in 2023 (Figure 2.7). Of the 142 cases reported in 2023, 126 were local cases, 15 were imported cases, and one was a tourist. Of the 122 cases reported in 2024, 108 were local cases, 11 were imported cases, two were tourists and one was a foreigner seeking medical treatment in Singapore (Table 2.23).

The resident incidence rate was highest in the 65 years and above age group in both 2023 and 2024 (Tables 2.24 and 2.25). Among the three major ethnic groups, Malays had the highest incidence rate in 2023 (Table 2.26), and Malays and Indians both had the highest incidence rate in 2024 (Table 2.27).

130 cases (92.2%^) were serotyped in 2023 while 112 cases (94.1%^) were serotyped in 2024. Among children (≤ 16 years old), the predominant pneumococcal type was 19A in 2023, while Pneumococcal Type 3 and Type 19A were both the predominant types detected in 2024 (Table 2.28). Among adults, Pneumococcal Type 3 was more commonly detected in both 2023 and 2024 (Table 2.29).

^Excluding tourists and foreigners seeking medical treatment in Singapore.

Figure 2.7
Weekly distribution of reported invasive pneumococcal disease cases, 2023-2024

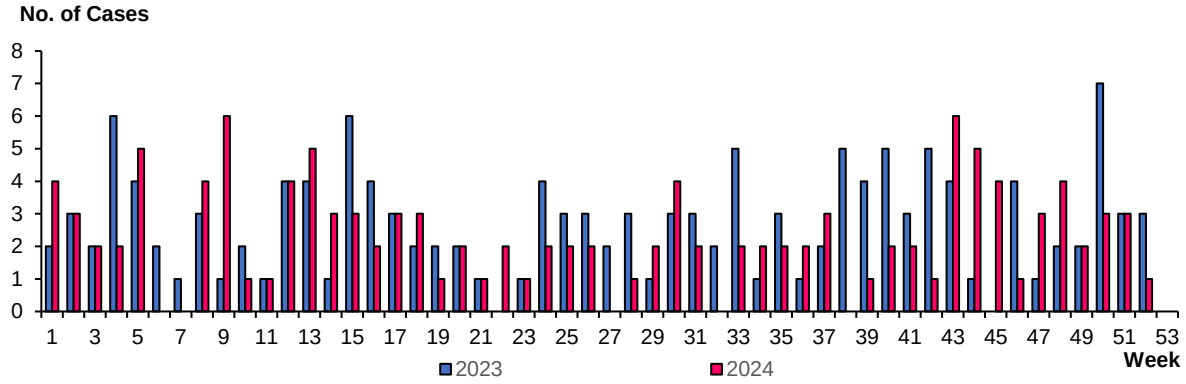


Table 2.23
Total number of reported invasive pneumococcal disease cases*, 2020-2024

Age group	2020		2021		2022		2023		2024	
	Local	Imported	Local	Imported	Local	Imported	Local	Imported	Local	Imported
0-4	2	0	1	0	4	1	4	0	5	0
5-14	2	0	0	0	3	0	3	1	7	0
15-24	0	0	0	0	0	0	1	1	2	1
25-34	3	0	2	0	7	2	9	1	7	1
35-44	3	1	3	0	3	0	13	3	6	1
45-54	11	0	4	0	9	0	16	1	14	2
55-64	7	0	5	0	11	0	29	5	18	1
65+	12	1	16	0	20	1	51	3	49	5
Total	**40**	**2**	**31**	**0**	**57**	**4**	**126**	**15**	**108**	**11**

*Excluded tourists and foreigners seeking medical treatment in Singapore.

Table 2.24
Age-sex distribution and age-specific resident incidence rate of reported invasive pneumococcal disease cases^, 2023

Age group	Number of reported cases				Incidence rate per 100,000 resident population*
	Male	Female	Total	%	
0-4	2	2	4	2.8	2.3
5-14	2	2	4	2.8	0.5
15-24	2	0	2	1.4	0.2
25-34	7	3	10	7.1	1.0
35-44	11	5	16	11.3	1.6
45-54	15	2	17	12.1	2.3
55-64	26	8	34	24.1	5.7
65+	33	21	54	38.3	7.4
Total	**98**	**43**	**141**	**100⁺**	**-**

^Excluded one tourist in Singapore.
*Rates are computed based on 2023 mid-year population obtained from the Singapore Department of Statistics.
⁺Figures may not add to 100% due to rounding.

Table 2.25
Age-sex distribution and age-specific resident incidence rate of reported invasive pneumococcal disease cases^, 2024

Age group	Number of reported cases				Incidence rate per 100,000 resident population*
	Male	Female	Total	%	
0-4	2	3	5	4.2	1.8
5-14	5	2	7	5.9	1.2
15-24	3	0	3	2.5	0.7
25-34	5	3	8	6.7	1.2
35-44	4	3	7	5.9	1.0
45-54	11	5	16	13.4	2.1
55-64	13	6	19	16.0	3.0
65+	36	18	54	45.4	6.9
Total	**79**	**40**	**119**	**100**	**-**

^Excluded two tourists and one foreigner seeking medical treatment in Singapore.
*Rates are computed based on 2024 mid-year population obtained from the Singapore Department of Statistics.

Table 2.26
Ethnic-sex distribution and ethnic-specific incidence rate of reported invasive pneumococcal disease cases^, 2023

Residential Status	Male	Female	Total	%	Incidence rate per 100,000 population*
Singapore residents					
Chinese	53	22	75	53.2	2.4
Malay	17	14	31	22.0	5.5
Indian	11	4	15	10.6	4.0
Others	2	1	3	2.1	2.1
Non-residents	15	2	17	12.1	1.0
Total	**98**	**43**	**141**	**100**	**2.4**

^Excluded one tourist in Singapore.
*Rates are computed based on 2023 mid-year population obtained from the Singapore Department of Statistics.

Table 2.27
Ethnic-sex distribution and ethnic-specific incidence rate of reported invasive pneumococcal disease cases^, 2024

Residential Status	Male	Female	Total	%	Incidence rate per 100,000 population*
Singapore residents					
Chinese	42	21	63	52.9	2.0
Malay	18	6	24	20.2	4.2
Indian	8	8	16	13.4	4.2
Others	3	1	4	3.4	2.8
Non-residents	8	4	12	10.1	0.6
Total	**79**	**40**	**119**	**100**	**2.0**

^Excluded two tourists and one foreigner seeking medical treatment in Singapore.
*Rates are computed based on 2024 mid-year population obtained from the Singapore Department of Statistics.

Table 2.28
Distribution of pneumococcal serotypes among children cases (≤ 16 years old), 2023 and 2024

Pneumococcal Type/ Group	2023	2024
	Number of isolates (n = 8) (%)	Number of isolates (n = 12) (%*)
Type 3 §	0 (0)	3 (25.0)
Type 6B +§	0 (0)	1 (8.3)
Group 11	0 (0)	1 (8.3)
Type 14 +§	1 (12.5)	0 (0)
Group 15	2 (25.0)	0 (0)
Type 15B	0 (0)	1 (8.3)
Type 15C	1 (12.5)	0 (0)
Type 19A §	3 (37.5)	3 (25.0)
Type 19F +§	0 (0)	1 (8.3)
Type 23B	0 (0)	1 (8.3)
Non-groupable	1 (12.5)	1 (8.3)

+ Serotype included in PCV7.
§ Serotype included in PCV13.
*Figures may not add to 100% due to rounding.

Table 2.29
Distribution of pneumococcal serotypes among adult cases, 2023 and 2024

Pneumococcal Type/ Group	2023	2024
	Number of isolates (n = 122) (%*)	Number of isolates (n = 100) (%)
Type 3 [§]	19 (15.6)	13 (13.0)
Type 4 [+§]	3 (2.5)	1 (1.0)
Type 5 [§]	0 (0)	2 (2.0)
Type 6A [§]	2 (1.6)	2 (2.0)
Type 6B [+§]	3 (2.5)	3 (3.0)
Type 6C	0 (0)	5 (5.0)
Type 7F [§]	3 (2.5)	2 (2.0)
Type 8	2 (1.6)	4 (4.0)
Type 9V [+§]	3 (2.5)	0 (0)
Group 10	1 (0.8)	0 (0)
Group 11	2 (1.6)	3 (3.0)
Group 12	3 (2.5)	2 (2.0)
Type 14 [+§]	3 (2.5)	3 (3.0)
Type 15A	5 (4.1)	5 (5.0)
Type 15B	1 (0.8)	5 (5.0)
Type 15C	0 (0)	4 (4.0)
Type 15F	1 (0.8)	1 (1.0)
Type 18C [+§]	0 (0)	1 (1.0)
Type 19A [§]	14 (11.5)	3 (3.0)
Type 19F [+§]	4 (3.3)	5 (5.0)
Group 20	0 (0)	1 (1.0)
Type 22F	10 (8.2)	3 (3.0)
Type 23A	11 (9.0)	7 (7.0)
Type 23B	2 (1.6)	3 (3.0)
Type 23F [+§]	10 (8.2)	4 (4.0)
Group 33	1 (0.8)	2 (2.0)
Non-groupable	19 (15.6)	16 (16.0)

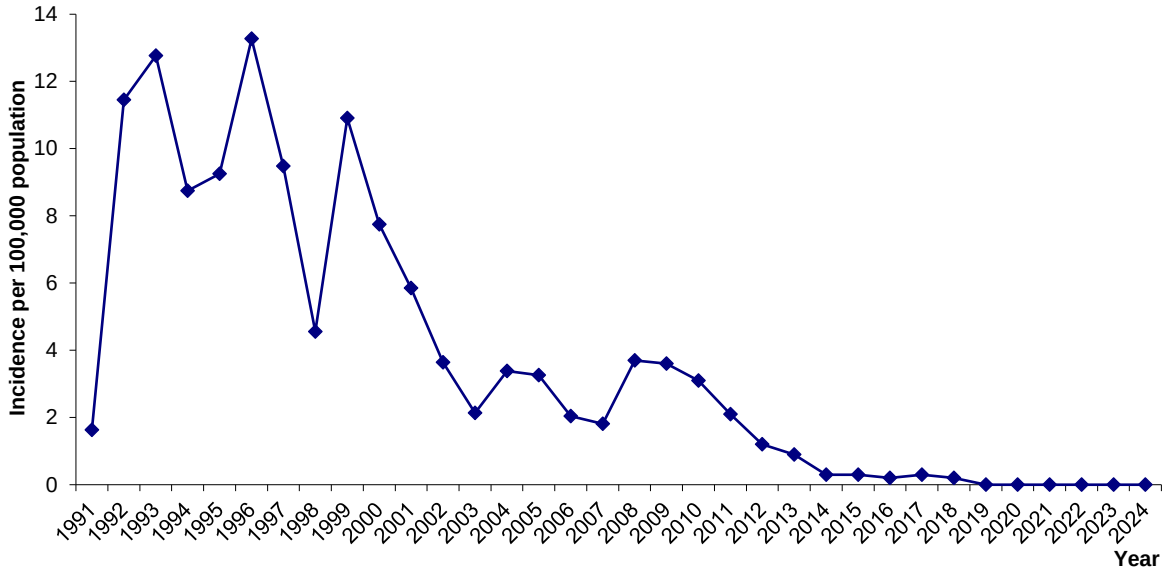
[+] Serotype included in PCV7.
[§] Serotype included in PCV13.
*Figures may not add to 100% due to rounding.

RUBELLA

Rubella, also known as German measles, is an acute viral disease caused by the rubella virus, a member of the genus *Rubivirus* from the *Togaviridae* family. It is characterised by febrile illness with a diffuse punctate and maculopapular rash sometimes resembling that of measles or scarlet fever. Infection in unvaccinated pregnant women may cause miscarriage, stillbirth, or serious birth defects in the developing baby. Rubella primarily spreads from person to person through infectious respiratory particles when an infected person coughs or sneezes. It can also spread via contact with contaminated surfaces.

Rubella incidence fluctuated during 1991-1999, then declined from 1999 to 2024 (Figure 2.8).

Figure 2.8
Incidence of reported rubella cases, 1991-2024



There were no laboratory-confirmed cases of rubella or cases of Congenital Rubella Syndrome (CRS) reported in 2023 and 2024 (Table 2.30).

Table 2.30
Total number of reported rubella cases*, 2020-2024

Age group	2020		2021		2022		2023		2024	
	Local	Imported	Local	Imported	Local	Imported	Local	Imported	Local	Imported
< 6 mths	0	0	0	0	0	0	0	0	0	0
6 mths-< 1yr										
1-4	0	0	0	0	0	0	0	0	0	0
5-9	0	0	0	0	0	0	0	0	0	0
10-14	0	0	0	0	0	0	0	0	0	0
15-24	0	0	0	0	0	0	0	0	0	0
25-34	0	0	0	0	0	0	0	0	0	0
35-44	0	1	0	0	0	0	0	0	0	0
45-54	0	0	0	0	0	0	0	0	0	0
55+	0	0	0	0	0	0	0	0	0	0
Total	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

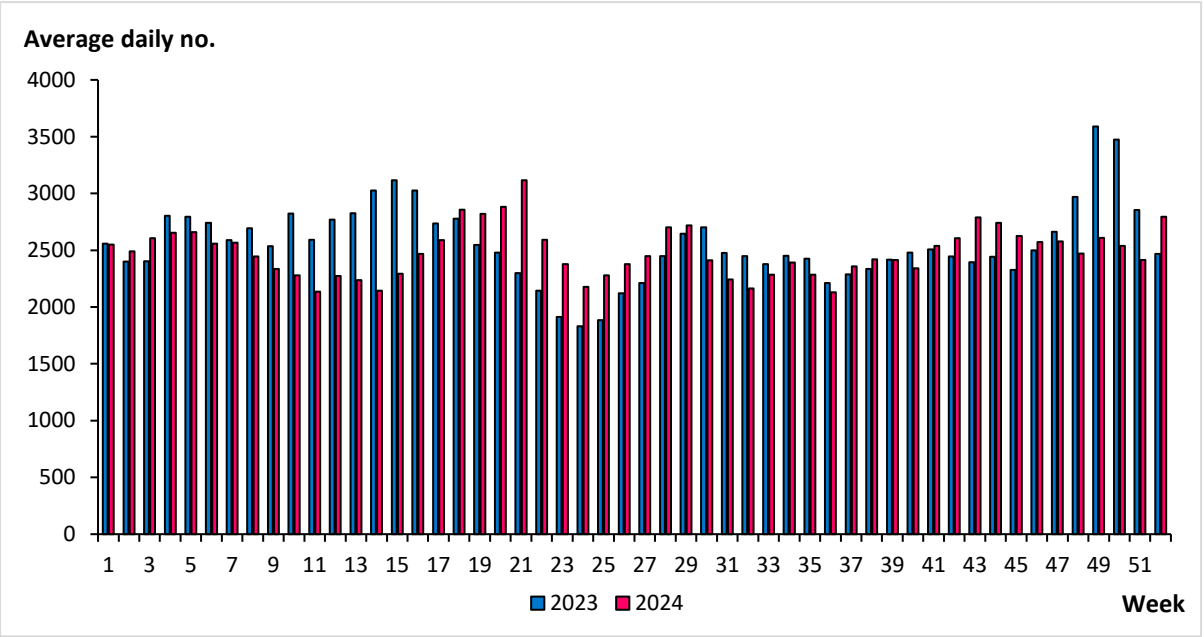
*Excluded tourists and foreigners seeking medical treatment in Singapore.

ACUTE RESPIRATORY INFECTION (ARI)

Acute respiratory infections (ARIs) are commonly caused by viruses and bacteria, such as the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and influenza. These infections typically present with symptoms such as fever, cough, sore throat and runny nose. ARIs primarily spread from person to person through infectious respiratory particles when an infected person coughs or sneezes. ARIs can also spread via contact with contaminated surfaces.

Weekly attendances for ARI at polyclinics are routinely monitored. There were 681,921 attendances at polyclinics for ARI in 2024, which was comparable to the 701,867 attendances recorded in 2023 (Figure 2.9).

Figure 2.9
Weekly distribution of ARI attendances at polyclinics, 2023-2024



Prior to the COVID-19 pandemic, a sentinel surveillance programme for Influenza-Like Illness (ILI) was established at selected polyclinics and General Practitioner (GP) clinics. In May 2022, the surveillance programme was expanded to the National Surveillance Programme for ARI with broader case definitions to include ARI cases, beyond ILI.

Under the National Surveillance Programme for ARI, patients presenting with ARI or ILI symptoms at the participating sites are randomly selected for PCR testing. Testing is performed by the National Public Health Laboratory (NPHL) for a range of commonly circulating respiratory pathogens, including SARS-CoV-2 and influenza.

COVID-19

COVID-19 is a common respiratory disease caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). COVID-19 primarily spreads from person to person through infectious respiratory particles when an infected person coughs or sneezes. It can also spread via contact with contaminated surfaces. The signs and symptoms of COVID-19 infection range from mild respiratory symptoms to severe illnesses such as pneumonia. Severity of symptoms may change with new COVID-19 variants and can vary depending on prior vaccination status and past COVID-19 infection. Infection is mild in the majority of persons and up to one in three infected persons are asymptomatic. Common symptoms of COVID-19 include fever, chills, sore throat, cough, nasal congestion, runny nose, headache, loss of taste or smell, fatigue, muscle aches, nausea or vomiting and diarrhoea. In severe cases, COVID-19 can lead to complications such as pneumonia (lung infection), shortness of breath and chest pain. Severe cases should seek immediate medical attention. Risk factors for severe disease or complications include persons who are partially vaccinated or unvaccinated against COVID-19, persons aged 60 years and above, pregnant women and persons with weakened immune systems.

From 1 March 2024, national COVID-19 surveillance was integrated into the National Surveillance Programme for ARI, and mandatory COVID-19 case notifications were no longer required under the Infectious Diseases Act. Accordingly, data on COVID-19 notifications will only be reported up to 2023 in this annual report.

There were 155,958 COVID-19 cases (including both laboratory-confirmed and healthcare-administered Antigen Rapid Test-positive cases) reported in 2023, of whom 92% were local cases. Most cases were aged 65 years old and above.

Table 2.31
Total number of reported COVID-19 cases, 2023

Age group	2023	
	Local	Imported
0-4	4,319	241
5-14	6,649	479
15-24	11,012	971
25-34	21,986	2,740
35-44	21,227	2,493
45-54	17,901	2,062
55-64	19,344	1,872
65+	40,624	2,038
Total	**143,062**	**12,896**

Table 2.32
Age-sex distribution and age-specific resident incidence rate of reported COVID-19 cases, 2023

Age group	Number of reported cases					Incidence rate per 100,000 resident population per year*
	Male	Female	Unknown[#]	Total	%	
0-4	2,186	2,013	361	4,560	2.9	2,601.7
5-14	3,575	3,505	48	7,128	4.6	1,753.8
15-24	6,041	5,818	124	11,983	7.7	2,731.8
25-34	11,220	13,297	209	24,726	15.9	4,110.6
35-44	11,129	12,377	214	23,720	15.2	3,887.2
45-54	9,161	10,664	138	19,963	12.8	3,300.3
55-64	9,911	11,156	149	21,216	13.6	3,569.0
65+	19,682	22,716	264	42,662	27.4	5,943.1
Total	**72,905**	**81,546**	**1,507**	**155,958**	**100[+]**	**3,758.7**

[#]Sex information for some cases is unknown.
*Rates are computed based on 2023 mid-year population obtained from the Singapore Department of Statistics.
[+]Figures may not add to 100% due to rounding.

Table 2.33
Ethnic-sex distribution and ethnic-specific incidence rate of reported COVID-19 cases, 2023

Residential Status	Male	Female	Unknown[#]	Total	%	Incidence rate per 100,000 population per year*
Singapore residents						
Chinese	46,586	53,695	185	100,466	64.4	3,270.0
Malay	8,473	9,441	76	17,990	11.5	3,204.9
Indian	4,882	5,210	34	10,126	6.5	2,701.3
Others	1,376	1,890	36	3,302	2.1	2,346.0
Non-residents	11,588	11,310	1,176	24,074	15.4	1,361.3
Total	**72,905**	**81,546**	**1,507**	**155,958**	**100[+]**	**2,635.5**

[#]Sex information for some cases is unknown.
*Rates are computed based on 2023 mid-year population obtained from the Singapore Department of Statistics.
[+]Figures may not add to 100% due to rounding.

Based on data from the National Surveillance Programme for ARI, the weekly positivity rate for COVID-19 among ARI samples in the community in 2023 and 2024 are shown in Figures 2.10 and 2.11 respectively.

Figure 2.10
Weekly positive rate of COVID-19, 2023

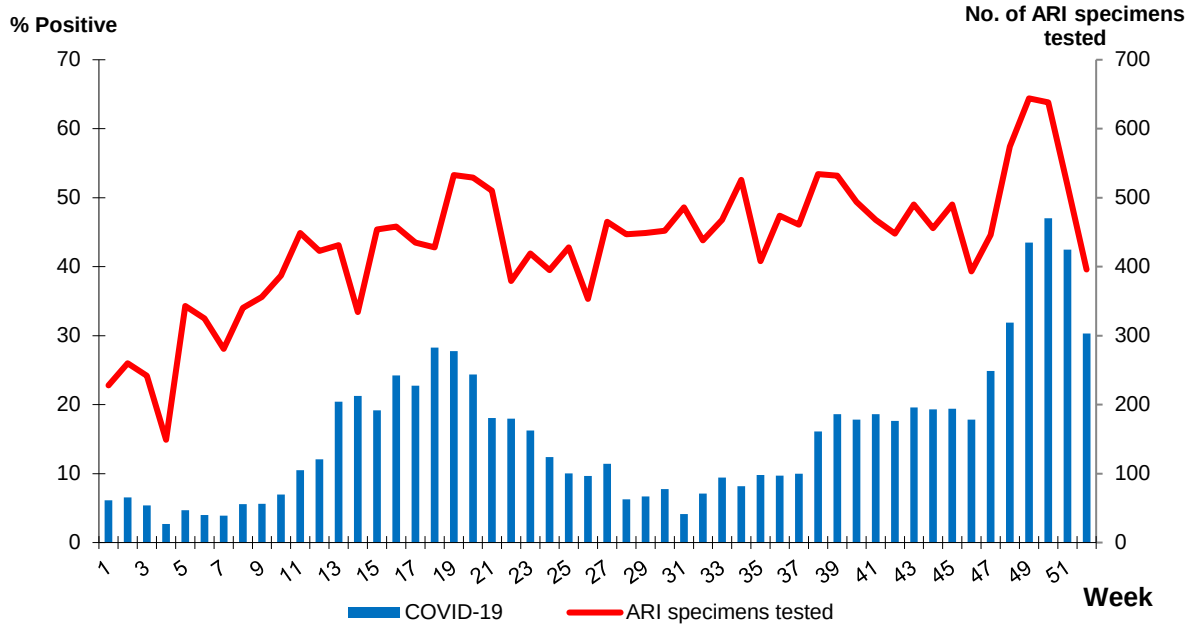
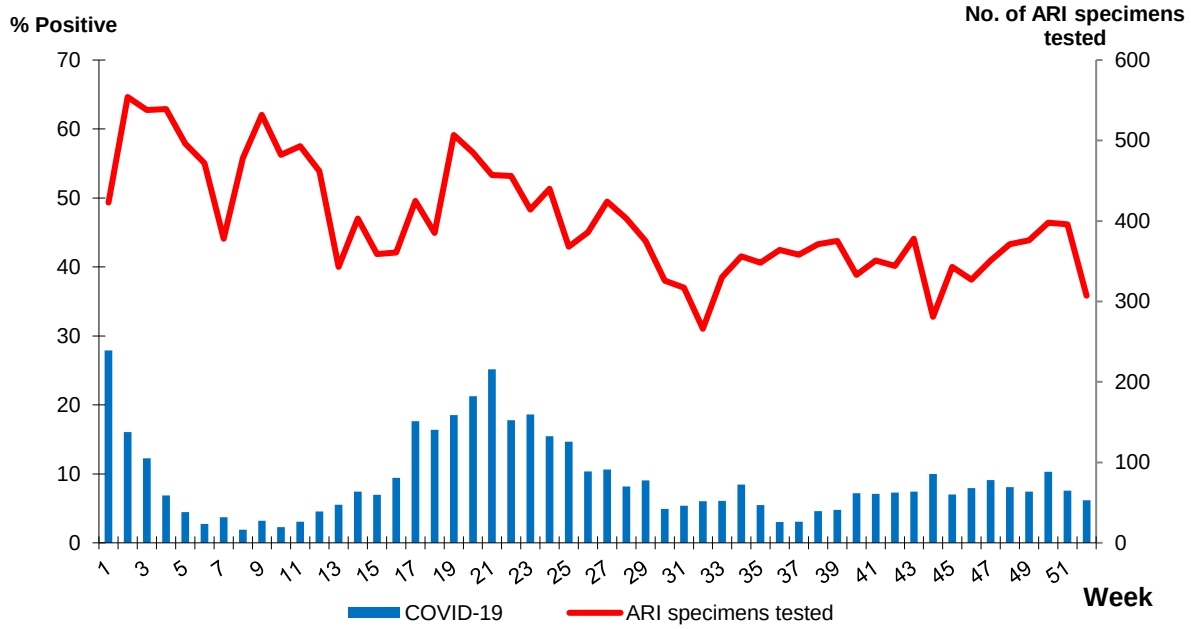


Figure 2.11
Weekly positive rate of COVID-19, 2024



INFLUENZA

Influenza, commonly known as the flu, is an acute respiratory infection caused by influenza viruses. Influenza primarily spreads from person to person through infectious respiratory particles when an infected person coughs or sneezes. It can also spread via contact with contaminated surfaces. Clinical manifestations of influenza infections range from mild illnesses (e.g. upper respiratory tract infection) to severe illnesses (e.g. infection of the lungs). Common symptoms include fever, chills, runny nose, headache, cough, sore throat, muscle aches, general malaise and fatigue. Gastrointestinal symptoms, such as nausea, vomiting, or diarrhoea are more commonly seen in children. In severe cases, influenza can result in pneumonia (lung infection), hospitalisation or even death, especially in populations at higher risk of developing severe disease.

There are three main types of influenza viruses – Type A, Type B and Type C. Influenza A(H1N1) pdm09, influenza A(H3N2) and influenza B are influenza viruses commonly circulating globally and in the community. Influenza C is associated with mild sporadic illness and occurs less frequently.

In temperate climates, influenza reaches peak incidence in winter. In tropical and subtropical climates, including Singapore, influenza circulation patterns are more complex and less distinct than those observed in temperate regions. In Singapore, influenza viruses typically circulate year-round with a bimodal increase in incidence observed in May–August and December–March.

Virological surveillance of influenza viruses is carried out on throat and/or nasopharyngeal specimens obtained from the National Surveillance Programme for ARI and hospitals throughout the year. The typing, subtyping and isolation of influenza viruses are carried out at the National Public Health Laboratory (NPHL) and at designated hospital laboratories. Further genetic analysis and antigenic characterisation of selected samples is also done by NPHL and the WHO Collaborating Centre (CC) for Reference and Research on Influenza in Melbourne, Australia.

The weekly positivity rate for influenza among ILI samples in the community in 2023 and 2024 are shown in Figures 2.12 and 2.13 respectively.

Figure 2.12
Weekly positive rate of influenza A and B viruses, 2023

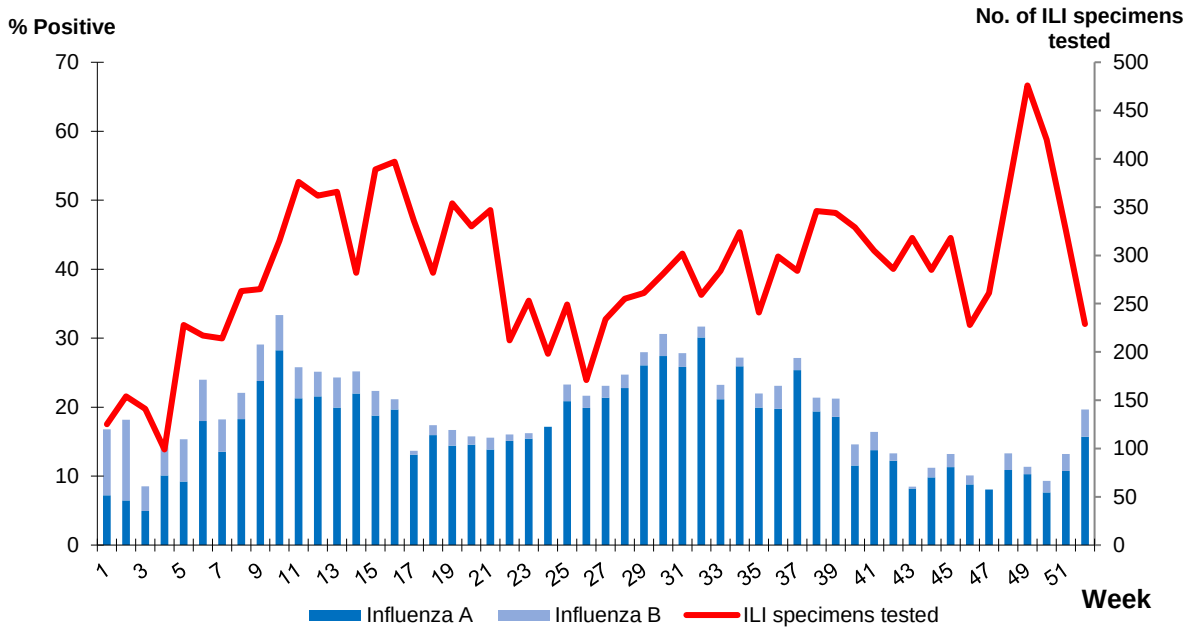
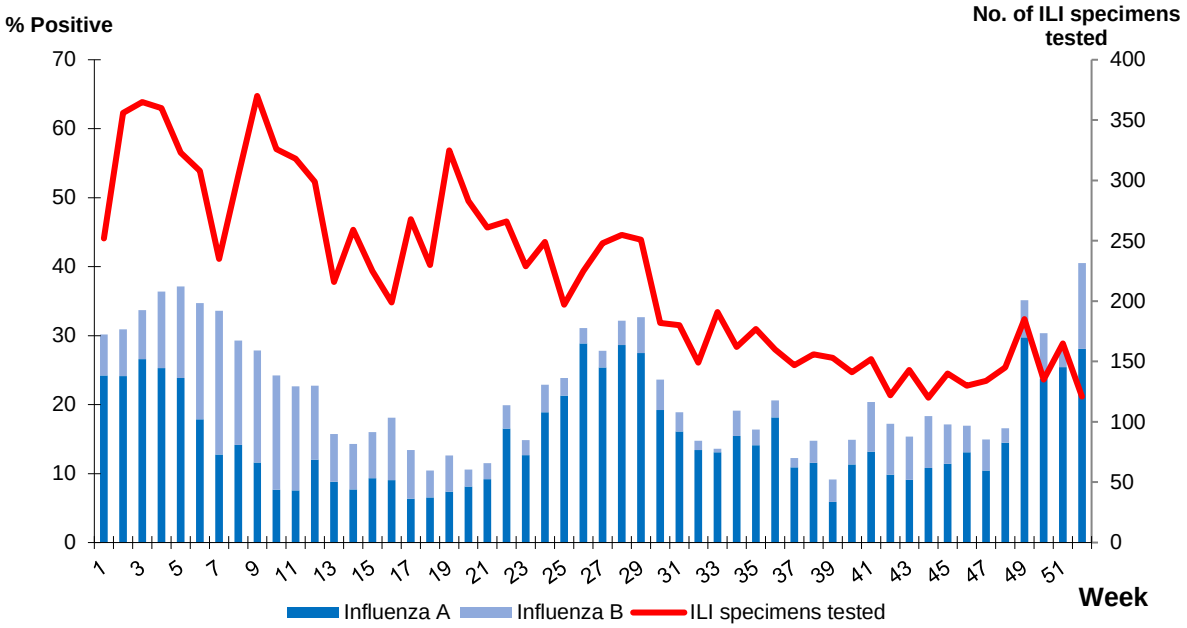


Figure 2.13
Weekly positive rate of influenza A and B viruses, 2024

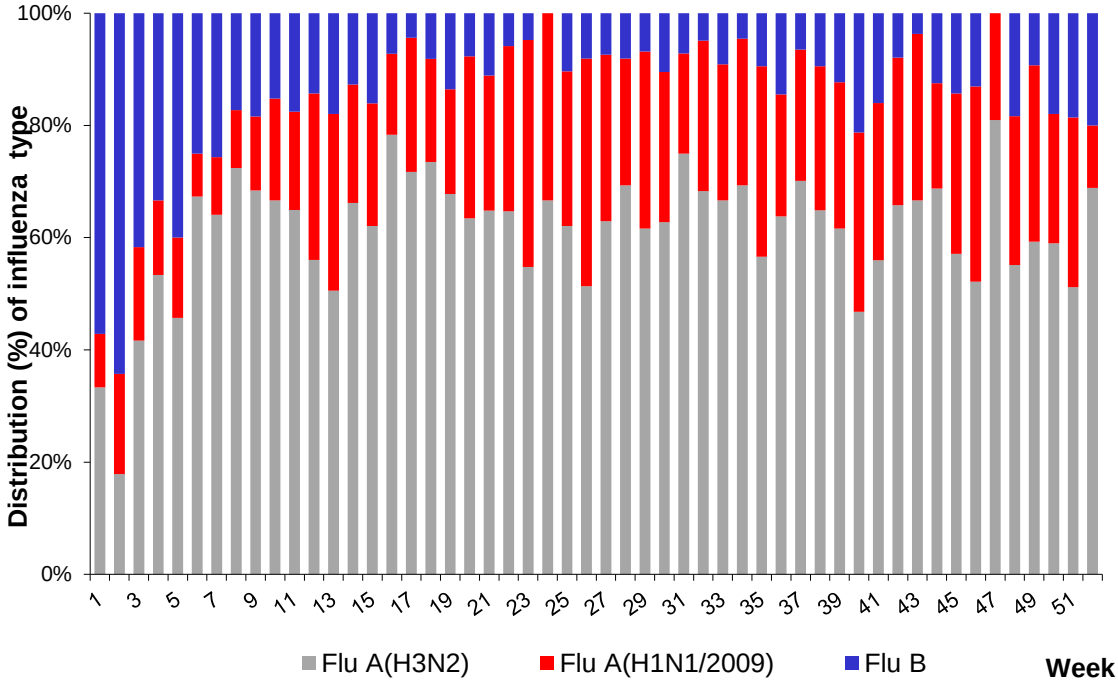


The weekly influenza typing distribution results in 2023 and 2024 are shown in Figures 2.14 and 2.15 respectively. The percentage of ILI samples testing positive for influenza viruses was 19.4% in 2023 and 22.9% in 2024. Influenza A(H1N1)pdm09, influenza A(H3N2) and influenza B co-circulated in Singapore, with influenza A being the dominant type in both years. Among positive samples in 2023, 86.9% tested positive for influenza A viruses, of which 72.6% were of A(H3N2) subtype (Figure 2.14). Among positive samples in 2024, 69.1% tested positive for influenza A viruses, of which 54.0% were of A(H3N2) subtype (Figure 2.15).

A total of 730 and 758 clinical and surveillance specimens were sequenced by NPHL in 2023 and 2024, respectively. For both years, A(H1N1)pdm09 viruses predominantly belonged to phylogenetic clade 6B.1A.5a.2a, with a minority in clade 6B.1A.5a.2a.1. While A(H3N2) viruses were distributed across multiple subclades of 3C.2a1b.2a.2 in 2023, they primarily consolidated in subclade 3C.2a1b.2a.2a.3a.1 in 2024. All circulating type B viruses belonged to the Victoria lineage falling in clade V1A.3a.2, with no Yamagata-lineage type B viruses detected. Genetic analysis identified the oseltamivir resistance-associated H275Y mutation in one case with A(H1N1)pdm09 in2023 and two cases in 2024.

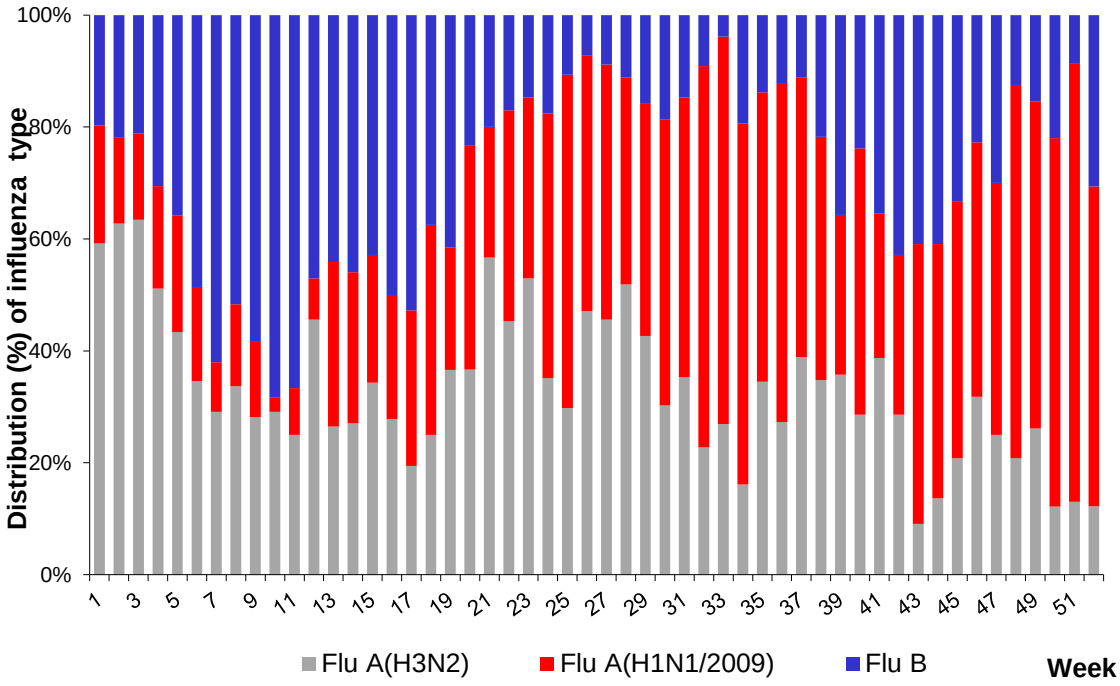
Phenotypic antiviral susceptibility testing was performed on 155 and 189 isolates collected in 2023 and 2024, respectively, at the WHO Collaborating Centre in Melbourne. In 2023, one A(H1N1)pdm09 isolate demonstrated highly reduced inhibition to oseltamivir and peramivir, consistent with the H275Y mutation identified by genetic analysis. An additional isolate exhibited reduced inhibition to both zanamivir and peramivir. In 2024, no antiviral resistance was detected among the tested isolates; however, the two A(H1N1)pdm09 specimens carrying the H275Y mutation identified by sequencing were not included in the phenotypic testing panel.

Figure 2.14
Weekly influenza typing distribution, 2023^



^Please note that the proportion of influenza types/subtypes in the current chart differs from positivity as different denominators are used for the calculations. For the proportion in this chart, the number of unique influenza types/subtypes detected (in positive samples) is used as the denominator rather than the total number of ILI samples.

Figure 2.15
Weekly influenza typing distribution, 2024^



^Please note that the proportion of influenza types/subtypes in the current chart differs from positivity as different denominators are used for the calculations. For the proportion in this chart, the number of unique influenza types/subtypes detected (in positive samples) is used as the denominator rather than the total number of ILI samples.

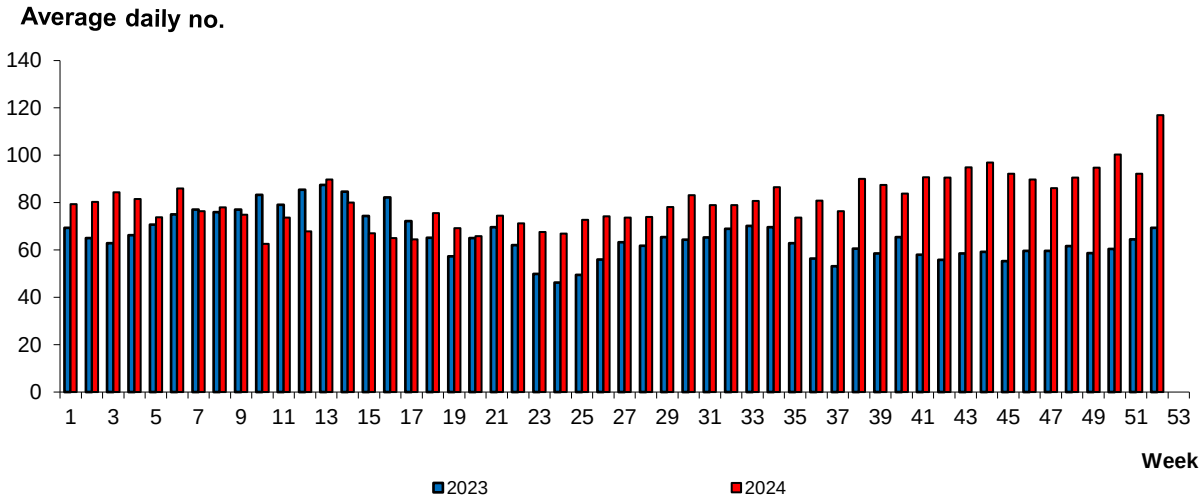
CONJUNCTIVITIS

Conjunctivitis, commonly known as "pink eye," is an inflammation of the conjunctiva - the thin, clear tissue that covers the white part of the eye and the inner surface of the eyelid. Conjunctivitis can be either infectious or non-infectious in nature; infectious conjunctivitis is usually due to viral or bacterial infections, while non-infectious conjunctivitis is usually due to an allergy.

Both bacterial and viral conjunctivitis are highly contagious and are primarily spread from person to person through direct contact with discharge from the eye of an infected person, or through infectious respiratory particles when an infected person coughs or sneezes. They can also spread via contact with contaminated surfaces.

There were 22,046 attendances in polyclinics for conjunctivitis in 2024, compared to 18,013 attendances in 2023 (Figure 2.16).

Figure 2.16
Weekly distribution of reported conjunctivitis cases, 2023-2024



CHICKENPOX

Chickenpox, also known as varicella, is a highly contagious disease caused by the varicella-zoster virus (VZV). Chickenpox is endemic in Singapore and can affect all ages. It is characterised by an itchy rash which progresses to become blisters, accompanied by fever and fatigue. Chickenpox primarily spreads from person to person through infectious respiratory particles when an infected person coughs or sneezes. It can also be transmitted via direct contact with fluid from blisters or contact with contaminated surfaces.

There were 1,674 attendances in polyclinics for chickenpox in 2024, compared to 1,438 attendances in 2023. Persons below the age of 20 years represented 55.5% of attendances for chickenpox in 2024, compared to 57.5% of attendances in 2023 (Tables 2.34 and 2.35).

Table 2.34
Distribution of varicella (chickenpox) polyclinic attendances by sex, age group and nationality, 2023

Age group	Singapore residents			Non-residents			Total	%
	Male	Female	Total	Male	Female	Total		
0-9	255	214	469	6	3	9	478	33.2
10-19	190	154	344	2	3	5	349	24.3
20-29	86	62	148	16	8	24	172	12.0
30-39	39	28	67	14	7	21	88	6.1
40-49	48	35	83	3	5	8	91	6.3
50-59	47	42	89	2	0	2	91	6.3
60+	91	78	169	0	0	0	169	11.8
Total	**756**	**613**	**1,369**	**43**	**26**	**69**	**1,438**	**100**

Table 2.35
Distribution of varicella (chickenpox) polyclinic attendances by sex, age group and nationality, 2024

Age group	Singapore residents			Non-residents			Total	%
	Male	Female	Total	Male	Female	Total		
0-9	262	237	499	6	5	11	510	30.5
10-19	224	190	414	2	2	4	418	25.0
20-29	82	91	173	15	12	27	200	11.9
30-39	66	45	111	13	6	19	130	7.8
40-49	55	56	111	4	2	6	117	7.0
50-59	50	49	99	1	0	1	100	6.0
60+	107	89	196	2	1	3	199	11.9
Total	**846**	**757**	**1,603**	**43**	**28**	**71**	**1,674**	**100[+]**

[+]Figures may not add to 100% due to rounding.

HAND, FOOT AND MOUTH DISEASE

Hand, foot and mouth disease (HFMD) is a common mild and self-limiting childhood viral disease caused by the coxsackieviruses, echovirus, and enterovirus A71. It is characterised by fever, mouth ulcers and rashes or small blisters on the hands and feet. HFMD spreads via the faecal-oral route, direct contact with respiratory secretions, saliva or vesicular fluid from rash or indirectly via contaminated surfaces.

HFMD was removed from the list of legally notifiable diseases under the Infectious Diseases Act (IDA) with effect from 31 January 2019. The weekly attendance for HFMD at polyclinics is now routinely monitored as a proxy indicator for HFMD activity in the community.

There were 7,899 attendances in polyclinics for HFMD in 2024, compared to 5,366 attendances in 2023. Persons below the age of 20 years represented 89.5% of attendances for HFMD in 2024, compared to 88.6% of attendances in 2023 (Tables 2.36 and 2.37).

Table 2.36
Distribution of HFMD polyclinic attendances by sex, age group and nationality, 2023

Age group	Singapore residents			Non-residents			Total	%
	Male	Female	Total	Male	Female	Total		
0-9	2,354	1,906	4,260	37	28	65	4,325	80.6
10-19	255	170	425	2	1	3	428	8.0
20-29	110	99	209	2	0	2	211	3.9
30-39	122	116	238	1	1	2	240	4.5
40-49	72	25	97	2	0	2	99	1.8
50-59	19	21	40	0	0	0	40	0.7
60+	11	12	23	0	0	0	23	0.4
Total	**2,943**	**2,349**	**5,292**	**44**	**30**	**74**	**5,366**	**100[+]**

[+]Figures may not add to 100% due to rounding.

Table 2.37
Distribution of HFMD polyclinic attendances by sex, age group and nationality, 2024

Age group	Singapore residents			Non-residents			Total	%
	Male	Female	Total	Male	Female	Total		
0-9	3,333	2,782	6,115	31	33	64	6,179	78.2
10-19	526	353	879	7	3	10	889	11.3
20-29	194	156	350	2	3	5	355	4.5
30-39	138	130	268	5	4	9	277	3.5
40-49	78	49	127	0	1	1	128	1.6
50-59	24	29	53	0	0	0	53	0.7
60+	10	8	18	0	0	0	18	0.2
Total	**4,303**	**3,507**	**7,810**	**45**	**44**	**89**	**7,899**	**100**