

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. The mode of transmission is by inhalation of respiratory droplets or direct contact with respiratory tract secretions of infected persons.

A total of one case of Hib disease was reported in 2020, compared to four cases reported in 2019 (Figure 2.1). All cases reported in 2019 and 2020 were laboratory-confirmed with positive blood cultures, and all were indigenous (Table 2.1).

The age range among the four cases reported in 2019 was 10 weeks to 91 years, and all were male (Table 2.2). The case reported in 2020 was a 71-year-old female (Table 2.3). Among the three major ethnic groups, the Malays had the highest incidence rate in 2019 (Table 2.4). The case reported in 2020 was of Indian ethnicity (Table 2.5).

Figure 2.1
Weekly distribution of reported Hib cases, 2019-2020

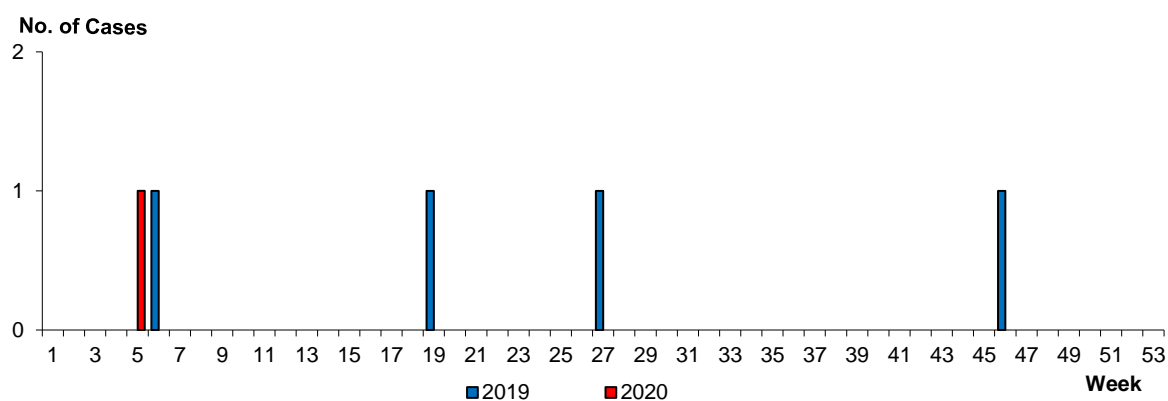


Table 2.1
Total number of notifications* received for Hib cases, 2016-2020

| Age group | 2016 | | 2017 | | 2018 | | 2019 | | 2020 | |
|--------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| | Local | Imported | Local | Imported | Local | Imported | Local | Imported | Local | Imported |
| 0-4 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 5-14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 15-24 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25-34 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 35-44 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 45-54 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 55-64 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 65+ | 0 | 0 | 3 | 0 | 1 | 0 | 2 | 0 | 1 | 0 |
| Total | 2 | 0 | 8 | 0 | 4 | 0 | 4 | 0 | 1 | 0 |

*Excluded tourists and foreigners seeking medical treatment in Singapore.

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Table 2.2
Age-sex distribution and age-specific resident incidence rate of reported Hib cases, 2019

| Age group | Number of notifications | | | | Incidence rate per 100,000 resident population* |
|--------------|-------------------------|----------|----------|------------|---|
| | Male | Female | Total | % | |
| 0-4 | 1 | 0 | 1 | 25 | 0.5 |
| 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 | 25 | 0 |
| 45-54 | 0 | 0 | 0 | 0 | 0 |
| 55-64 | 0 | 0 | 0 | 0 | 0 |
| 65+ | 2 | 0 | 2 | 50 | 0.3 |
| Total | 4 | 0 | 4 | 100 | - |

*Rates are based on 2019 estimated mid-year resident population.
(Source: Singapore Department of Statistics)

Table 2.3
Age-sex distribution and age-specific resident incidence rate of reported Hib cases, 2020

| Age group | Number of notifications | | | | 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 | 0 | 0 | 0 | 0 | 0 |
| 45-54 | 0 | 0 | 0 | 0 | 0 |
| 55-64 | 0 | 0 | 0 | 0 | 0 |
| 65+ | 0 | 1 | 1 | 100 | 0.2 |
| Total | 0 | 1 | 1 | 100 | - |

*Rates are based on 2020 estimated mid-year resident population.
(Source: Singapore Department of Statistics)

Table 2.4
Ethnic-sex distribution and ethnic-specific incidence rate of reported Hib cases, 2019

| | Male | Female | Total | % | Incidence rate per 100,000 population* |
|---------------------|----------|----------|----------|------------|--|
| Singapore residents | | | | | |
| Chinese | 2 | 0 | 2 | 50 | 0.1 |
| Malay | 1 | 0 | 1 | 25 | 0.2 |
| Indian | 0 | 0 | 0 | 0 | 0 |
| Others | 0 | 0 | 0 | 0 | 0 |
| Foreign residents | 1 | 0 | 1 | 25 | 0.1 |
| Total | 4 | 0 | 4 | 100 | 0.1 |

*Rates are based on 2019 estimated mid-year population.
(Source: Singapore Department of Statistics)

Table 2.5
Ethnic-sex distribution and ethnic-specific incidence rate of reported Hib cases, 2020

| | Male | Female | Total | % | Incidence rate per 100,000 population* |
|---------------------|----------|----------|----------|------------|--|
| Singapore residents | | | | | |
| Chinese | 0 | 0 | 0 | 0 | 0 |
| Malay | 0 | 0 | 0 | 0 | 0 |
| Indian | 0 | 1 | 1 | 100 | 0.3 |
| Others | 0 | 0 | 0 | 0 | 0 |
| Foreign residents | 0 | 0 | 0 | 0 | 0 |
| Total | 0 | 1 | 1 | 100 | 0.02 |

*Rates are based on 2020 estimated mid-year population.
(Source: Singapore Department of Statistics)

HAND, FOOT AND MOUTH DISEASE

Hand, foot and mouth disease (HFMD) is a common childhood viral disease that is mild and self-limiting. It is characterised by fever, mouth ulcers and rashes on the hands and the feet. The common causative agents for HFMD are the coxsackieviruses, echovirus, and enterovirus A71 (EV-A71). It can be transmitted from person to person through the respiratory or oral-faecal route.

HFMD was removed from the list of infectious diseases legally notifiable 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 a total of 5,070 attendances in polyclinics for HFMD in 2019. Almost all the attendances were by Singaporeans and Permanent Residents (99%). Persons below the age of 20 years represented 89.4% of attendances for HFMD (Table 2.6).

Amidst the COVID-19 pandemic in 2020, there were a total of 1,135 attendances in polyclinics for HFMD, lower than what was observed in 2019. 97.9% of the attendances were by Singaporeans and Permanent Residents. Persons below the age of 20 years represented 85.1% of attendances for HFMD (Table 2.7).

Table 2.6
Distribution of HFMD polyclinic attendances by sex, age group and nationality, 2019

| Age group | Singaporeans/PRs | | | Foreign residents | | | Total | % |
|--------------|------------------|--------------|--------------|-------------------|-----------|-----------|--------------|------------|
| | Male | Female | Total | Male | Female | Total | | |
| 0-9 | 2,127 | 1,844 | 3,971 | 25 | 14 | 39 | 4,010 | 79.1 |
| 10-19 | 285 | 236 | 521 | 1 | 2 | 3 | 524 | 10.3 |
| 20-29 | 99 | 100 | 199 | 5 | 1 | 6 | 205 | 4.0 |
| 30-39 | 99 | 97 | 196 | 3 | 2 | 5 | 201 | 4.0 |
| 40-49 | 44 | 34 | 78 | 0 | 0 | 0 | 78 | 1.5 |
| 50-59 | 18 | 15 | 33 | 0 | 0 | 0 | 33 | 0.7 |
| 60+ | 7 | 12 | 19 | 0 | 0 | 0 | 19 | 0.4 |
| Total | 2,679 | 2,338 | 5,017 | 34 | 19 | 53 | 5,070 | 100 |

Table 2.7
Distribution of HFMD polyclinic attendances by sex, age group and nationality, 2020

| Age group | Singaporeans/PRs | | | Foreign residents | | | Total | % |
|--------------|------------------|------------|--------------|-------------------|----------|-----------|--------------|------------|
| | Male | Female | Total | Male | Female | Total | | |
| 0-9 | 430 | 390 | 820 | 9 | 8 | 17 | 837 | 73.7 |
| 10-19 | 58 | 71 | 129 | 0 | 0 | 0 | 129 | 11.4 |
| 20-29 | 37 | 33 | 70 | 1 | 1 | 2 | 72 | 6.3 |
| 30-39 | 25 | 33 | 58 | 3 | 0 | 3 | 61 | 5.4 |
| 40-49 | 13 | 10 | 23 | 1 | 0 | 1 | 24 | 2.1 |
| 50-59 | 4 | 2 | 6 | 1 | 0 | 1 | 7 | 0.6 |
| 60+ | 3 | 2 | 5 | 0 | 0 | 0 | 5 | 0.4 |
| Total | 570 | 541 | 1,111 | 15 | 9 | 24 | 1,135 | 100 |

INFLUENZA

Influenza is an acute viral disease of the respiratory tract characterised by fever, sore throat, cough, coryza, headache and myalgia. It may be complicated by pneumonia, particularly in high risk patients such as those with pre-existing chronic lung disease. It is spread from person to person mainly through infectious respiratory droplets and secretions released during coughing and sneezing.

There are three main types – Type A, Type B and Type C. Influenza A(H1N1)pdm09, influenza A(H3N2)

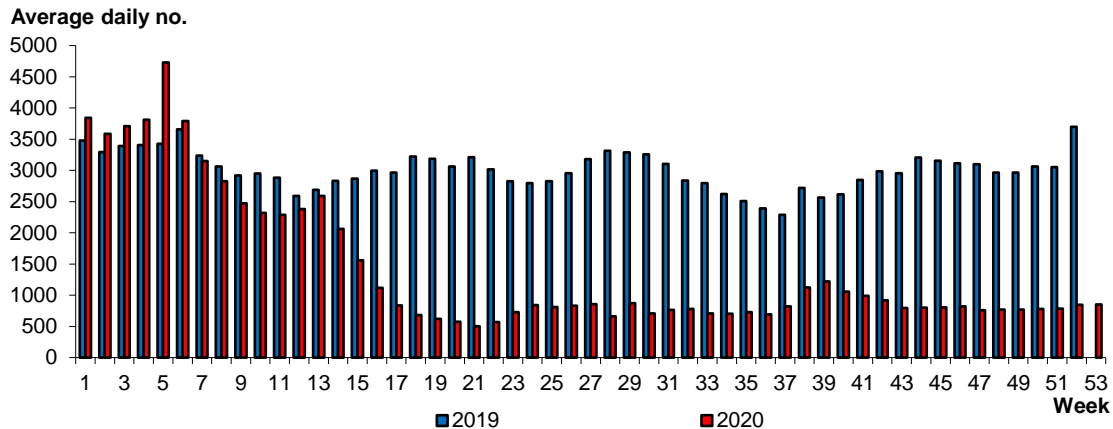
and influenza B are influenza viruses commonly circulating globally and in the community. Influenza C is associated with mild sporadic illness and occurs less frequently. Diagnosis is based on the clinical recognition of influenza-like illness with or without laboratory confirmation and strain characterisation.

In temperate and cold climates, influenza reaches peak incidence in winter. In contrast, tropical and subtropical areas may experience influenza epidemics twice a year or even throughout the year. Locally, influenza viruses circulate year-round with a bimodal increase in incidence observed in May–July and November–January.

The weekly attendance for acute respiratory infections (ARI) at polyclinics and public hospitals' emergency departments is routinely monitored as a proxy indicator for influenza activity (Note: ARI represents a mixture of respiratory illnesses and the proportion of influenza cases presenting with ARI varies with the level of influenza activity). The weekly number of admissions due to ARI at public hospitals is also monitored.

There were a total of 393,173 attendances at polyclinics for ARI in 2020, representing an decrease of 52.0% compared to 818,874 seen in 2019 (Figure 2.2). The sharp decline was observed to coincide with the initiation of Circuit Breaker measures (7 April to 1 June 2020) in Singapore to reduce COVID-19 transmission.

Figure 2.2
Weekly distribution of ARI attendances at polyclinics, 2019-2020



A total of 88,854 ARI cases were seen at the emergency departments (ED) of public hospitals in 2020, an increase of 16.8% compared to 76,067 cases reported in 2019. Of these 88,854 ARI cases reported in 2020, 6,878 cases were admitted as compared to 4,059 ARI admissions reported in 2019 (Figures 2.3 and 2.4).

Figure 2.3
Weekly polyclinics attendances, hospitals emergency departments attendances and admissions for acute respiratory infections, 2019

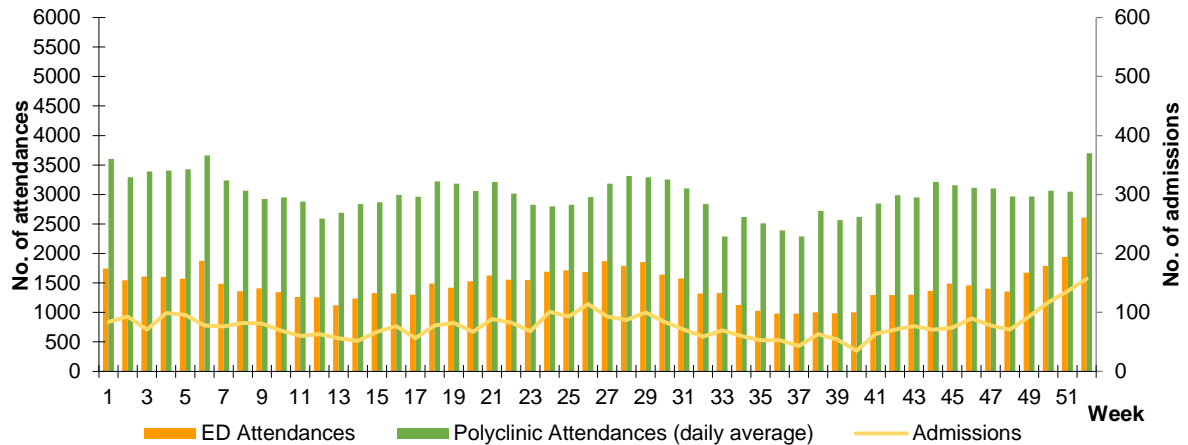
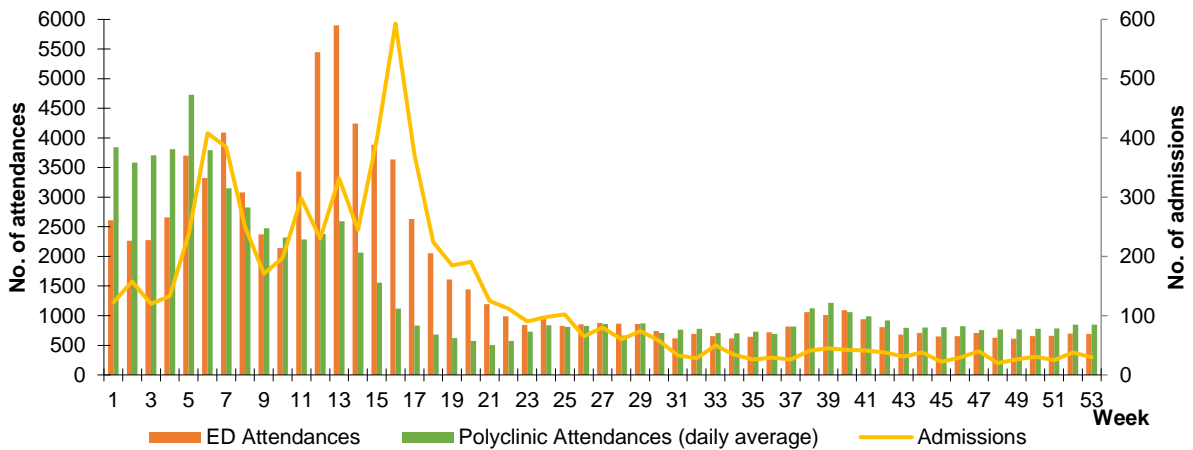


Figure 2.4
Weekly polyclinics attendances, hospitals emergency departments attendances and admissions for acute respiratory infections, 2020



Virological surveillance of influenza viruses is carried out on throat and/or nasopharyngeal specimens obtained from polyclinics, hospitals and sentinel GP clinics throughout the year. The typing, subtyping and isolation of influenza viruses is 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 for Reference and Research on Influenza in Melbourne, Australia.

The 4-weekly moving average of the proportion of samples from patients in polyclinics and sentinel GP clinics with influenza-like illness (ILI) which were positive for influenza viruses in 2019 and 2020 are shown in Figures 2.5 and 2.6 respectively.

Figure 2.5
Virological surveillance of influenza A and B, 2019

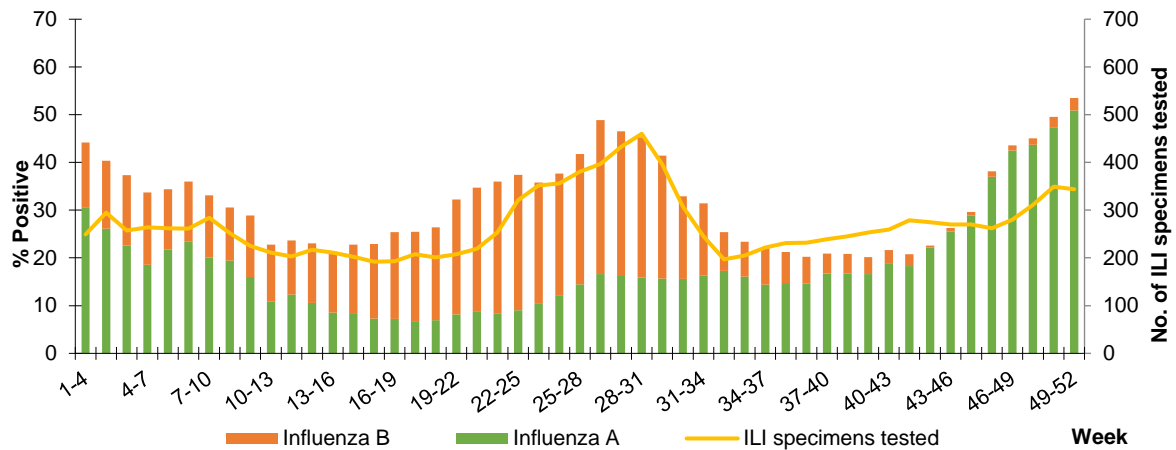
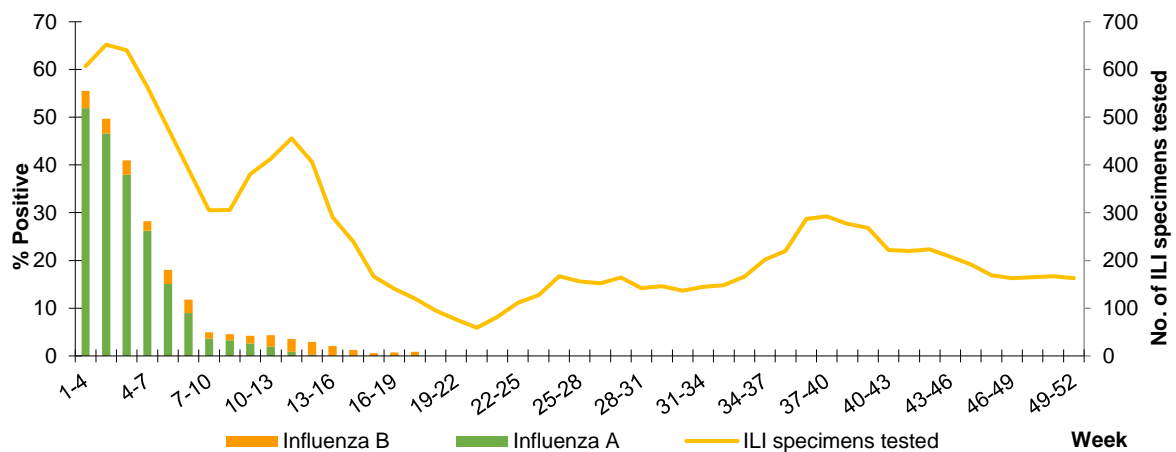


Figure 2.6
Virological surveillance of influenza A and B, 2020



In 2019, 34.6% of all ILI samples tested positive for influenza viruses. Of the positive samples, 60.4% tested positive for influenza A viruses, of which 65.0% were of the influenza A(H1N1)pdm09 subtype. Influenza A(H1N1)pdm09, influenza A(H3N2) and influenza B co-circulate in Singapore, with influenza A being the dominant subtype for most of the year (Figure 2.7).

In 2019, all influenza A(H1N1)pdm09 viruses analysed by sequencing fell within phylogenetic clade 6B.1A and were antigenically related to vaccine strains, A/Michigan/45/2014 and A/Brisbane/02/2018. Majority of influenza A(H3N2) viruses fell within the major phylogenetic clade 3C.2a, with most falling within subclade 3C.2a1b. All viruses evaluated by haemagglutination inhibition remained antigenically related to A/Switzerland/8060/2017 (SH 2019 vaccine strain). Among the circulating Influenza B viruses, B/Victoria/2/87-lineage predominated throughout the year. Previously circulating B/Brisbane/60/2008-like (clade V1A) and B/Colorado/06/2017-like (clade V1A-2DEL) viruses were completely replaced with B/Washington/02/2019-like viruses (clade V1A-3DEL). In 2019, more than 500 clinical specimens positive for Influenza A or B viruses were analysed by sequencing. No known mutations conferring resistance to neuraminidase inhibitors were detected.

In 2020, 13.5% of all ILI samples tested positive for influenza viruses. Of the positive samples, 89.0% tested positive for influenza A viruses, of which 82.6% were of the influenza A(H1N1)pdm09 subtype. Influenza A(H1N1)pdm09, influenza A(H3N2) and influenza B co-circulate in Singapore, with influenza A being the dominant subtype for most of the year (Figure 2.8). There were no positive influenza samples recorded from E-Week 18 onwards in 2020. Analyses by sequencing were not performed for specimens in 2020.

Figure 2.7
Influenza typing results, 2019

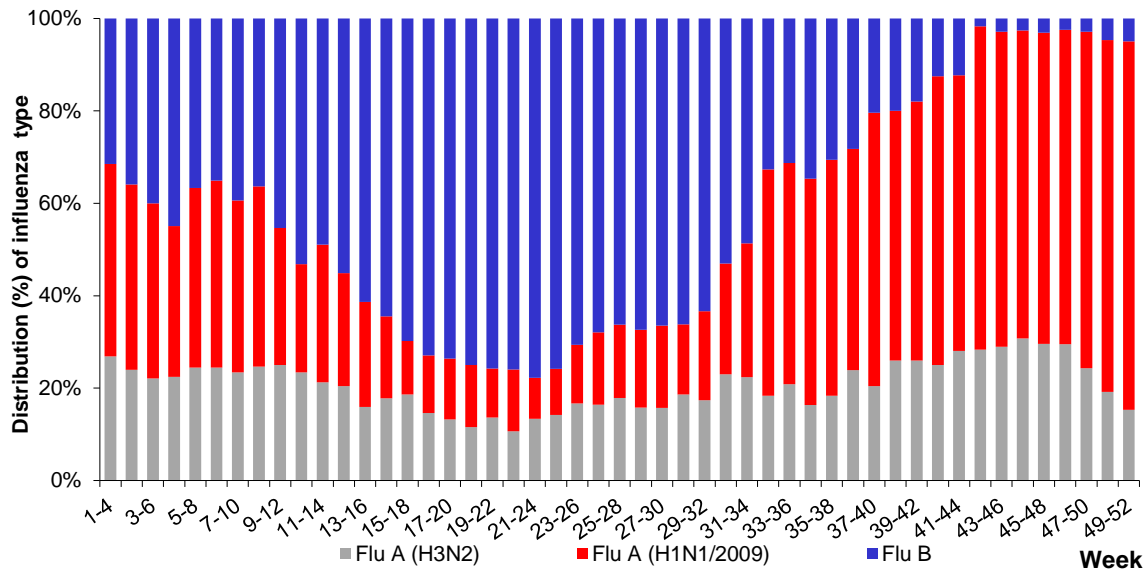
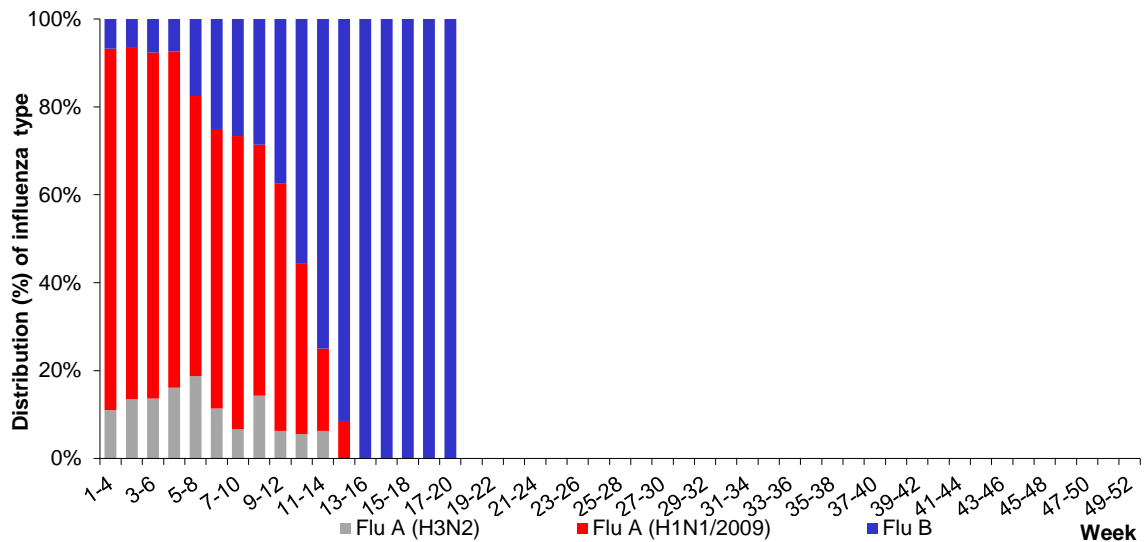


Figure 2.8
Influenza typing results, 2020

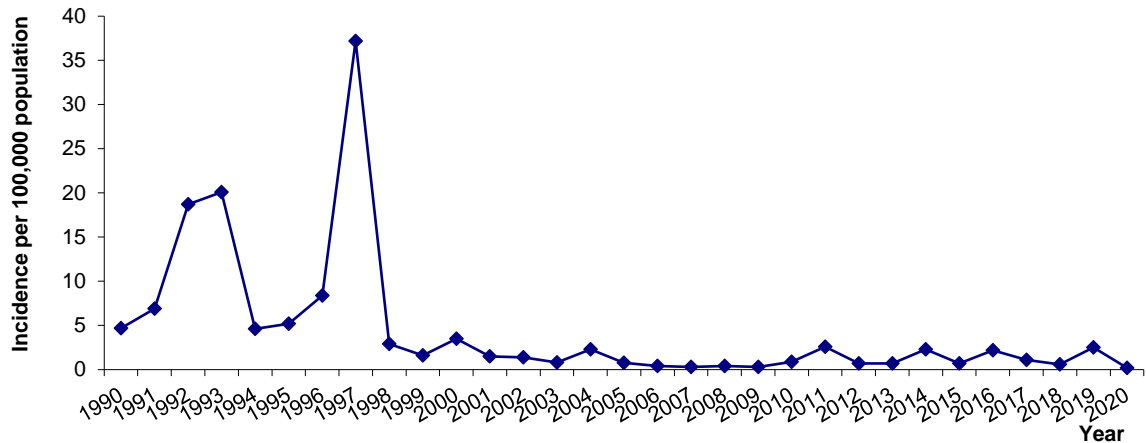


MEASLES

Measles is an acute, highly communicable viral disease caused by the measles virus, a member of the genus *Morbillivirus* of the family *Paramyxoviridae*. In measles, a maculopapular rash follows shortly after a fever, and is often accompanied by coryza, cough and conjunctivitis. The mode of transmission is airborne by droplet spread, or direct contact with the nasal or throat secretions of an infected person.

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 2.9). All age groups were affected and as a result, the “catch-up” immunisation initiative was implemented in July-November 1997 and the two-dose MMR vaccination regime was implemented in January 1998. The incidence of measles has remained at a low level since then.

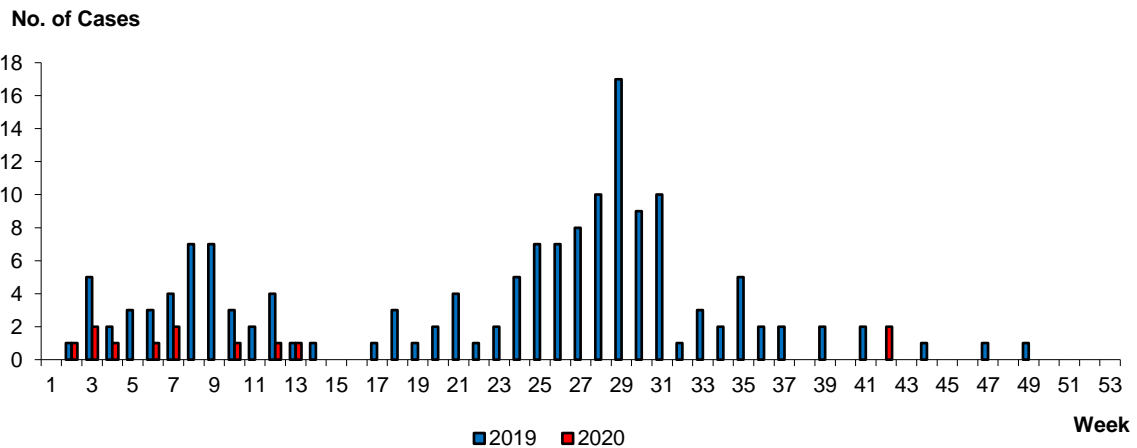
Figure 2.9
Incidence of reported measles cases, 1990-2020



A total of 12 laboratory confirmed cases of measles were reported in 2020, compared to 152 cases reported in 2019 (Figure 2.10). Of the 152 confirmed cases in 2019, 119 were indigenous cases, 26 were imported cases and the remaining cases included six tourists and one foreigner seeking medical treatment in Singapore. Of the 12 confirmed cases in 2020, 10 were indigenous cases, one was an imported case and the remaining case involved a tourist in Singapore (Table 2.8).

The resident incidence was highest in children between six months and less than one year of age in 2019 (Table 2.9), and in children less than six months of age in 2020 (Table 2.10). Among the three major ethnic groups, Malays had the highest incidence rate, followed by Chinese and Indians in 2019 (Table 2.11), while Malays and Chinese had the highest incidence rate in 2020 (Table 2.12).

Figure 2.10
Weekly distribution of reported measles cases, 2019-2020



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Table 2.8
Total number of notifications* received for measles, 2016-2020

| Age group | 2016 | | 2017 | | 2018 | | 2019 | | 2020 | |
|--------------|------------|----------|-----------|----------|-----------|----------|------------|-----------|-----------|----------|
| | Local | Imported | Local | Imported | Local | Imported | Local | Imported | Local | Imported |
| < 6 mths | 10 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 |
| 6 mths-< 1yr | 33 | 2 | 10 | 0 | 4 | 2 | 9 | 4 | 0 | 0 |
| 1-4 | 27 | 3 | 7 | 1 | 4 | 0 | 7 | 3 | 3 | 0 |
| 5-9 | 11 | 0 | 3 | 0 | 0 | 0 | 3 | 2 | 0 | 0 |
| 10-14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 15-24 | 1 | 0 | 4 | 1 | 0 | 1 | 8 | 2 | 1 | 0 |
| 25-34 | 16 | 1 | 11 | 1 | 5 | 2 | 41 | 4 | 4 | 1 |
| 35-44 | 17 | 2 | 10 | 5 | 11 | 0 | 30 | 9 | 1 | 0 |
| 45-54 | 3 | 0 | 4 | 0 | 0 | 0 | 9 | 1 | 0 | 0 |
| 55+ | 0 | 0 | 1 | 0 | 1 | 0 | 11 | 0 | 0 | 0 |
| Total | 118 | 8 | 51 | 8 | 26 | 6 | 119 | 26 | 10 | 1 |

*Excluded tourists and foreigners seeking medical treatment in Singapore.

Table 2.9
Age-sex distribution and age-specific resident incidence rate of reported measles cases[^], 2019

| Age group | Number of notifications | | | | Incidence rate per 100,000 resident population* |
|--------------|-------------------------|-----------|------------|------------|---|
| | Male | Female | Total | % | |
| < 6 mths | 1 | 1 | 2 | 1.4 | 5.4 |
| 6 mths-< 1yr | 7 | 6 | 13 | 9.0 | 59.3 |
| 1-4 | 6 | 4 | 10 | 6.9 | 6.1 |
| 5-9 | 1 | 4 | 5 | 3.4 | 1.5 |
| 10-14 | 0 | 0 | 0 | 0 | 0 |
| 15-24 | 4 | 6 | 10 | 6.9 | 0.8 |
| 25-34 | 29 | 16 | 45 | 31.0 | 1.0 |
| 35-44 | 23 | 16 | 39 | 26.9 | 3.3 |
| 45-54 | 6 | 4 | 10 | 6.9 | 1.6 |
| 55+ | 4 | 7 | 11 | 7.6 | 0.9 |
| Total | 81 | 64 | 145 | 100 | - |

[^]Excluded six tourists and one foreigner seeking medical treatment in Singapore.

*Rates are based on 2019 estimated mid-year population.

(Source: Singapore Department of Statistics)

Table 2.10
Age-sex distribution and age-specific resident incidence rate of reported measles cases[^], 2020

| Age group | Number of notifications | | | | Incidence rate per 100,000 resident population* |
|--------------|-------------------------|----------|-----------|------------|---|
| | Male | Female | Total | % | |
| < 6 mths | 0 | 1 | 1 | 9.1 | 5.5 |
| 6 mths-< 1yr | 0 | 0 | 0 | 0 | 0 |
| 1-4 | 2 | 1 | 3 | 27.3 | 2.0 |
| 5-9 | 0 | 0 | 0 | 0 | 0 |
| 10-14 | 0 | 0 | 0 | 0 | 0 |
| 15-24 | 0 | 1 | 1 | 9.1 | 0.2 |
| 25-34 | 3 | 2 | 5 | 45.5 | 0.2 |
| 35-44 | 1 | 0 | 1 | 9.1 | 0 |
| 45-54 | 0 | 0 | 0 | 0 | 0 |
| 55+ | 0 | 0 | 0 | 0 | 0 |
| Total | 6 | 5 | 11 | 100 | - |

[^]Excluded one tourist in Singapore.

*Rates are based on 2020 estimated mid-year population.

(Source: Singapore Department of Statistics)

Table 2.11
Ethnic-sex distribution and ethnic-specific incidence rate of reported measles cases[^], 2019

| | Male | Female | Total | % | Incidence rate per 100,000 population* |
|---------------------|-----------|-----------|------------|------------|--|
| Singapore residents | | | | | |
| Chinese | 27 | 24 | 51 | 35.2 | 1.7 |
| Malay | 3 | 7 | 10 | 6.9 | 1.8 |
| Indian | 4 | 1 | 5 | 3.4 | 1.4 |
| Others | 4 | 5 | 9 | 6.2 | 7.0 |
| Foreign residents | 43 | 27 | 70 | 48.3 | 4.2 |
| Total | 81 | 64 | 145 | 100 | 2.5 |

[^]Excluded six tourists and one foreigner seeking medical treatment in Singapore

*Rates are based on 2019 estimated mid-year population.

(Source: Singapore Department of Statistics)

Table 2.12
Ethnic-sex distribution and ethnic-specific incidence rate of reported measles cases[^], 2020

| | Male | Female | Total | % | Incidence rate per 100,000 population* |
|---------------------|----------|----------|-----------|------------|--|
| Singapore residents | | | | | |
| Chinese | 2 | 3 | 5 | 45.5 | 0.2 |
| Malay | 1 | 0 | 1 | 9.1 | 0.2 |
| Indian | 0 | 0 | 0 | 0 | 0 |
| Others | 0 | 0 | 0 | 0 | 0 |
| Foreign residents | 3 | 2 | 5 | 45.5 | 0.3 |
| Total | 6 | 5 | 11 | 100 | 0.2 |

[^]Excluded one tourist in Singapore

*Rates are based on 2020 estimated mid-year population.

(Source: Singapore Department of Statistics)

MENINGOCOCCAL INFECTION

Meningococcal meningitis is an acute bacterial disease characterised by a sudden onset of fever, intense headache, nausea, vomiting and a stiff neck. It is often accompanied by a petechial rash, and can progress to sepsis and death. The causative agent is *Neisseria meningitidis*, with serotype groups A, B, C, Y, W-135, X and Z accounting for most disease cases. The mode of transmission is via direct contact, including respiratory droplets from nose and throat of infected persons.

A total of seven cases of meningococcal infection were reported in 2020, compared to eight cases reported in 2019 (Table 2.13). All confirmed cases in 2019 and 2020 were indigenous cases (Table 2.13).

All cases in 2019 and 2020 were laboratory-confirmed with culture-positive or PCR-positive blood or cerebrospinal fluid. The resident incidence rate was highest in the 0-4 years age group in 2019 (Table 2.14) and in the 25-34 years age group in 2020 (Table 2.15). Serotype B was implicated in four cases in 2019 (Table 2.16) and two cases in 2020 (Table 2.17).

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Table 2.13
Total number of notifications* received for meningococcal infection, 2016-2020

| Age group | 2016 | | 2017 | | 2018 | | 2019 | | 2020 | |
|--------------|----------|----------|-----------|----------|----------|----------|----------|----------|----------|----------|
| | Local | Imported | Local | Imported | Local | Imported | Local | Imported | Local | Imported |
| 0-4 | 0 | 0 | 1 | 1 | 3 | 0 | 2 | 0 | 0 | 0 |
| 5-14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 15-24 | 2 | 0 | 4 | 0 | 2 | 0 | 0 | 0 | 1 | 0 |
| 25-34 | 1 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 3 | 0 |
| 35-44 | 0 | 1 | 1 | 0 | 1 | 0 | 3 | 0 | 1 | 0 |
| 45-54 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 55-64 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 65+ | 0 | 1 | 2 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| Total | 3 | 2 | 11 | 1 | 8 | 0 | 8 | 0 | 7 | 0 |

*Excluded tourists and foreigners seeking medical treatment in Singapore.

Table 2.14
Age-sex distribution and age-specific resident incidence rate of reported meningococcal infection cases, 2019

| Age group | Number of notifications | | | | Incidence rate per 100,000 resident population* |
|--------------|-------------------------|----------|----------|------------|---|
| | Male | Female | Total | % | |
| 0-4 | 2 | 0 | 2 | 25 | 1.1 |
| 5-14 | 0 | 0 | 0 | 0 | 0 |
| 15-24 | 0 | 0 | 0 | 0 | 0 |
| 25-34 | 1 | 1 | 2 | 25 | 0.2 |
| 35-44 | 3 | 0 | 3 | 37.5 | 0.3 |
| 45-54 | 0 | 0 | 0 | 0 | 0 |
| 55-64 | 0 | 0 | 0 | 0 | 0 |
| 65+ | 1 | 0 | 1 | 12.5 | 0.2 |
| Total | 7 | 1 | 8 | 100 | - |

*Rates are based on 2019 estimated mid-year resident population.
(Source: Singapore Department of Statistics)

Table 2.15
Age-sex distribution and age-specific resident incidence rate of reported meningococcal infection cases, 2020

| Age group | Number of notifications | | | | 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 | 1 | 0 | 1 | 14.3 | 0.2 |
| 25-34 | 3 | 0 | 3 | 42.9 | 0.3 |
| 35-44 | 1 | 0 | 1 | 14.3 | 0.2 |
| 45-54 | 0 | 0 | 0 | 0 | 0 |
| 55-64 | 0 | 1 | 1 | 14.3 | 0.2 |
| 65+ | 0 | 1 | 1 | 14.3 | 0.2 |
| Total | 5 | 2 | 7 | 100 | - |

*Rates are based on 2020 estimated mid-year resident population.
(Source: Singapore Department of Statistics)

Table 2.16
Epidemiological data of eight reported meningococcal infection cases, 2019

| Case particulars | | | Causative agent | Status |
|------------------|-----------|--------------|---|-----------|
| Sex | Age | Ethnic group | | |
| M | 85 years | Chinese | <i>Neisseria meningitidis</i> Grp Y | Recovered |
| M | 25 years | Indian | <i>Neisseria meningitidis</i> Grp B | Recovered |
| M | 40 years | Others | <i>Neisseria meningitidis</i> Grp W135 | Recovered |
| M | 36 years | Others | <i>Neisseria meningitidis</i> Grp B | Recovered |
| M | 43 years | Malay | <i>Neisseria meningitidis</i> Grp B | Recovered |
| M | 10 months | Malay | <i>Neisseria meningitidis</i> Grp B | Recovered |
| M | 3 years | Malay | <i>Neisseria meningitidis</i> (ungrouped) | Recovered |
| F | 25 years | Chinese | <i>Neisseria meningitidis</i> Grp Y | Recovered |

Table 2.17
Epidemiological data of seven reported meningococcal infection cases, 2020

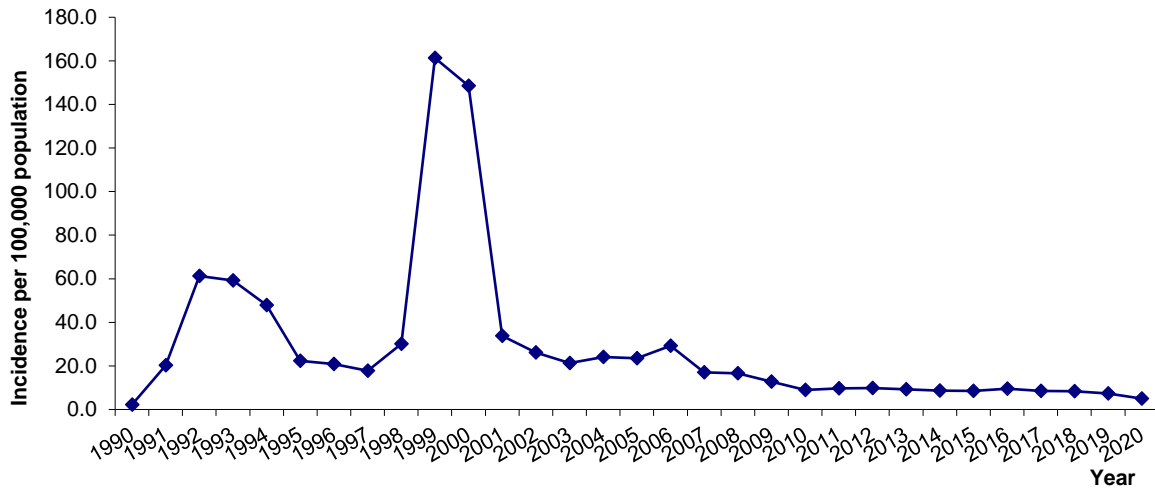
| Case particulars | | | Causative agent | Status |
|------------------|----------|--------------|---|-----------|
| Sex | Age | Ethnic group | | |
| M | 28 years | Malay | <i>Neisseria meningitidis</i> (ungrouped) | Recovered |
| F | 55 years | Indian | <i>Neisseria meningitidis</i> Grp B | Recovered |
| M | 20 years | Others | <i>Neisseria meningitidis</i> Grp Y | Demised |
| M | 33 years | Indian | <i>Neisseria meningitidis</i> (ungrouped) | Recovered |
| M | 40 years | Indian | <i>Neisseria meningitidis</i> (ungrouped) | Demised |
| M | 27 years | Others | <i>Neisseria meningitidis</i> (ungrouped) | Recovered |
| F | 67 years | Malay | <i>Neisseria meningitidis</i> Grp B | Recovered |

MUMPS

Mumps or infectious parotitis is an acute viral disease characterised by fever, swelling and tenderness of one or more salivary glands. Complications include orchitis, meningitis and deafness. The mumps virus, a member of the genus *Paramyxovirus*, is antigenically related to the parainfluenza viruses. The mode of transmission is airborne spread via infected respiratory droplets or by direct contact with the saliva of an infected person.

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 2.11).

Figure 2.11
Incidence of reported mumps cases, 1990-2020



A total of 285 cases of mumps were reported in 2020, as compared to 422 cases in 2019 (Figure 2.12). The resident incidence rate was highest in the 0-4 years age group in 2019 (Table 2.18), and in the 5-14 years age group in 2020 (Table 2.19). Among the three major ethnic groups, Malays had the highest incidence rate, followed by Chinese and Indians in 2019 and 2020 (Tables 2.20 and 2.21).

Figure 2.12
Weekly distribution of reported mumps cases, 2019-2020

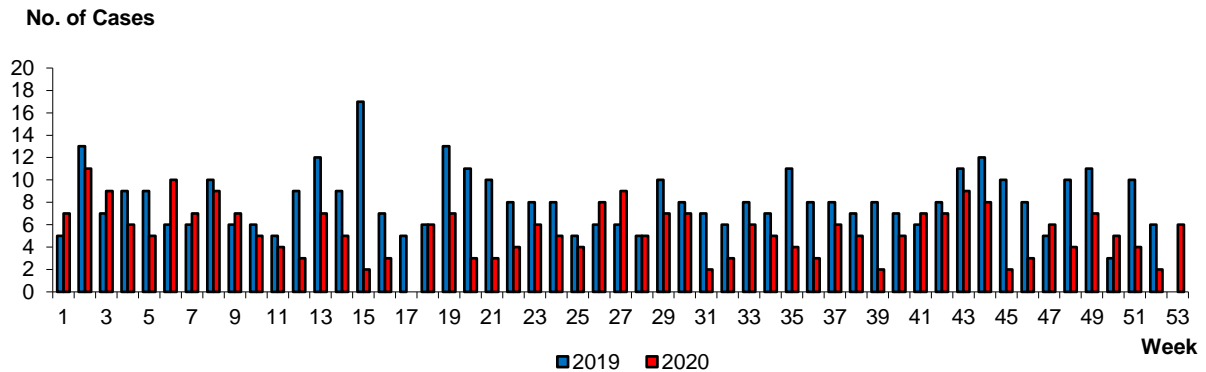


Table 2.18
Age-sex distribution and age-specific resident incidence rate of reported mumps cases[^], 2019

| Age group | Number of notifications | | | | Incidence rate per 100,000 resident population* |
|--------------|-------------------------|------------|------------|------------|---|
| | Male | Female | Total | % | |
| 0-4 | 37 | 19 | 56 | 13.3 | 22.7 |
| 5-14 | 55 | 35 | 90 | 21.4 | 18.2 |
| 15-24 | 6 | 19 | 25 | 5.9 | 3.8 |
| 25-34 | 47 | 34 | 81 | 19.2 | 6.0 |
| 35-44 | 35 | 29 | 64 | 15.2 | 7.5 |
| 45-54 | 29 | 24 | 53 | 12.6 | 6.4 |
| 55-64 | 18 | 23 | 41 | 9.8 | 7.0 |
| 65+ | 5 | 6 | 11 | 2.6 | 1.9 |
| Total | 232 | 189 | 421 | 100 | - |

[^]Excluded one tourist in Singapore.

*Rates are based on 2019 estimated mid-year population.
(Source: Singapore Department of Statistics)

Table 2.19
Age-sex distribution and age-specific resident incidence rate of reported mumps cases, 2020

| Age group | Number of notifications | | | | Incidence rate per 100,000 resident population* |
|--------------|-------------------------|------------|------------|------------|---|
| | Male | Female | Total | % | |
| 0-4 | 7 | 9 | 16 | 5.6 | 8.2 |
| 5-14 | 33 | 17 | 50 | 17.6 | 11.6 |
| 15-24 | 13 | 12 | 25 | 8.8 | 3.3 |
| 25-34 | 25 | 29 | 54 | 18.9 | 5.0 |
| 35-44 | 23 | 25 | 48 | 16.9 | 4.3 |
| 45-54 | 18 | 20 | 38 | 13.3 | 5.6 |
| 55-64 | 19 | 13 | 32 | 11.2 | 5.4 |
| 65+ | 10 | 12 | 22 | 7.7 | 3.6 |
| Total | 148 | 137 | 285 | 100 | - |

*Rates are based on 2020 estimated mid-year population.
(Source: Singapore Department of Statistics)

Table 2.20
Ethnic-sex distribution and ethnic-specific incidence rate of reported mumps cases[^], 2019

| | Male | Female | Total | % | Incidence rate per 100,000 population* |
|---------------------|------------|------------|------------|------------|--|
| Singapore residents | | | | | |
| Chinese | 120 | 99 | 219 | 52.0 | 7.3 |
| Malay | 23 | 31 | 54 | 12.8 | 10.0 |
| Indian | 6 | 4 | 10 | 2.4 | 2.8 |
| Others | 13 | 9 | 22 | 5.2 | 17.0 |
| Foreign residents | 70 | 46 | 116 | 27.6 | 6.9 |
| Total | 232 | 189 | 421 | 100 | 7.4 |

[^]Excluded one tourist in Singapore.
*Rates are based on 2019 estimated mid-year population.
(Source: Singapore Department of Statistics)

Table 2.21
Ethnic-sex distribution and ethnic-specific incidence rate of reported mumps cases, 2020

| | Male | Female | Total | % | Incidence rate per 100,000 population* |
|---------------------|------------|------------|------------|------------|--|
| Singapore residents | | | | | |
| Chinese | 79 | 81 | 160 | 56.1 | 5.3 |
| Malay | 23 | 13 | 36 | 12.6 | 6.6 |
| Indian | 7 | 7 | 14 | 4.9 | 3.9 |
| Others | 4 | 6 | 10 | 3.5 | 7.7 |
| Foreign residents | 35 | 30 | 65 | 22.8 | 4.0 |
| Total | 148 | 137 | 285 | 100 | 5.0 |

*Rates are based on 2020 estimated mid-year population.
(Source: 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. The mode of transmission is via respiratory droplets or direct contact with the nasal or throat secretions of an infected person.

A total of 10 laboratory confirmed cases of pertussis were reported in 2020, compared to 62 reported in 2019 (Figure 2.13). Of the 62 confirmed cases reported in 2019, 59 were indigenous cases and three were imported, while all 10 confirmed cases in 2020 were indigenous cases (Table 2.22).

The highest resident incidence rate was observed in children below the age of one year in 2019 and

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2020 (Tables 2.23 and 2.24). Among the three major ethnic groups, Malays had the highest incidence rate, followed by Indians and Chinese in 2019 and 2020 (Tables 2.25 and 2.26). No pertussis death was reported in 2019 and 2020.

Figure 2.13
Weekly distribution of reported pertussis cases, 2019-2020

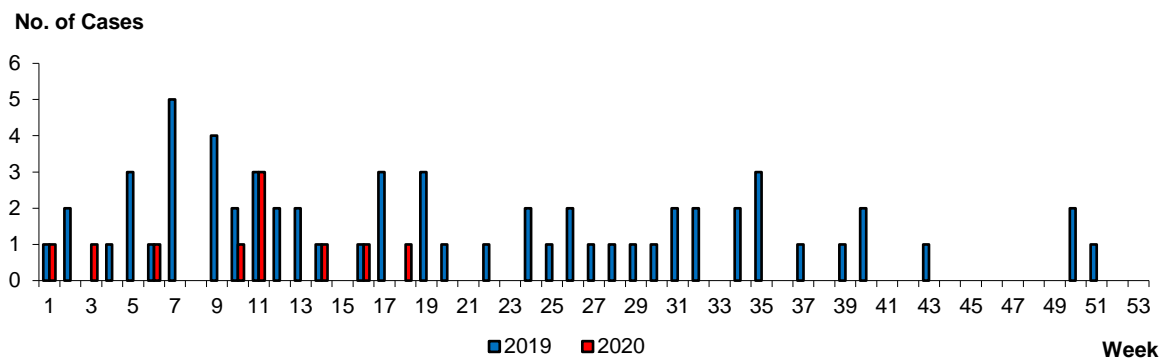


Table 2.22
Total number of notifications* received for pertussis, 2016-2020

| Age group | 2016 | | 2017 | | 2018 | | 2019 | | 2020 | |
|--------------|-----------|----------|-----------|----------|------------|----------|-----------|----------|-----------|----------|
| | Local | Imported | Local | Imported | Local | Imported | Local | Imported | Local | Imported |
| 0-4 | 44 | 2 | 41 | 0 | 54 | 1 | 26 | 1 | 2 | 0 |
| 5-14 | 7 | 0 | 1 | 0 | 4 | 0 | 10 | 1 | 0 | 0 |
| 15-24 | 21 | 0 | 16 | 0 | 16 | 0 | 0 | 0 | 0 | 0 |
| 25-34 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 35-44 | 0 | 1 | 2 | 0 | 6 | 0 | 1 | 1 | 2 | 0 |
| 45-54 | 2 | 1 | 4 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 55-64 | 2 | 0 | 4 | 0 | 6 | 0 | 10 | 0 | 3 | 0 |
| 65+ | 3 | 1 | 8 | 0 | 17 | 0 | 11 | 0 | 3 | 0 |
| Total | 80 | 5 | 76 | 0 | 105 | 1 | 59 | 3 | 10 | 0 |

*Excluded tourists and foreigners seeking medical treatment in Singapore.

Table 2.23
Age-sex distribution and age-specific resident incidence rate of reported pertussis cases, 2019

| Age group | Number of notifications | | | | Incidence rate per 100,000 resident population* |
|--------------|-------------------------|-----------|-----------|------------|---|
| | Male | Female | Total | % | |
| 0-<1yr | 13 | 6 | 19 | 30.6 | 48.6 |
| 1-4 | 5 | 3 | 8 | 12.9 | 3.4 |
| 5-14 | 2 | 9 | 11 | 17.7 | 2.2 |
| 15-24 | 0 | 0 | 0 | 0 | 0 |
| 25-34 | 1 | 0 | 1 | 1.6 | 0.2 |
| 35-44 | 1 | 1 | 2 | 3.3 | 0.2 |
| 45-54 | 0 | 0 | 0 | 0 | 0 |
| 55-64 | 5 | 5 | 10 | 16.1 | 1.7 |
| 65+ | 5 | 6 | 11 | 17.7 | 1.9 |
| Total | 32 | 30 | 62 | 100 | - |

*Rates are based on 2019 estimated mid-year population.
(Source: Singapore Department of Statistics)

Table 2.24
Age-sex distribution and age-specific resident incidence rate of reported pertussis cases, 2020

| Age group | Number of notifications | | | | Incidence rate per 100,000 resident population* |
|--------------|-------------------------|----------|-----------|------------|---|
| | Male | Female | Total | % | |
| 0-<1yr | 2 | 0 | 2 | 20 | 5.5 |
| 1-4 | 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 | 1 | 2 | 20 | 0.3 |
| 45-54 | 0 | 0 | 0 | 0 | 0 |
| 55-64 | 3 | 0 | 3 | 30 | 0.5 |
| 65+ | 1 | 2 | 3 | 30 | 0.5 |
| Total | 7 | 3 | 10 | 100 | - |

*Rates are based on 2020 estimated mid-year population.
(Source: Singapore Department of Statistics)

Table 2.25
Ethnic-sex distribution and ethnic-specific incidence rate of reported pertussis cases, 2019

| | Male | Female | Total | % | Incidence rate per 100,000 population* |
|---------------------|-----------|-----------|-----------|------------|--|
| Singapore residents | | | | | |
| Chinese | 14 | 16 | 30 | 48.4 | 1.0 |
| Malay | 13 | 6 | 19 | 30.6 | 3.5 |
| Indian | 0 | 4 | 4 | 6.5 | 1.1 |
| Others | 1 | 1 | 2 | 3.2 | 1.5 |
| Foreign residents | 4 | 3 | 7 | 11.3 | 0.4 |
| Total | 32 | 30 | 62 | 100 | 1.1 |

*Rates are based on 2019 estimated mid-year population.

Table 2.26
Ethnic-sex distribution and ethnic-specific incidence rate of reported pertussis cases, 2020

| | Male | Female | Total | % | Incidence rate per 100,000 population* |
|---------------------|----------|----------|-----------|------------|--|
| Singapore residents | | | | | |
| Chinese | 5 | 1 | 6 | 60 | 0.2 |
| Malay | 1 | 1 | 2 | 20 | 0.4 |
| Indian | 0 | 1 | 1 | 10 | 0.3 |
| Others | 1 | 0 | 1 | 10 | 0.8 |
| Foreign residents | 0 | 0 | 0 | 0 | 0 |
| Total | 7 | 3 | 10 | 100 | 0.2 |

*Rates are based on 2020 estimated mid-year population.

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*. The mode of transmission is by droplets or close contact with the nasopharyngeal secretions of an infected person.

A total of 43 laboratory confirmed cases of invasive pneumococcal infection were reported in 2020, compared to 134 laboratory confirmed cases reported in 2019 (Figure 2.14). Of the 134 confirmed cases reported in 2019, 122 were indigenous cases, eight were imported cases, and four were tourists or foreigners seeking medical treatment. Of the 43 confirmed cases reported in 2020, 40 were indigenous cases, two were imported cases, and one was a tourist (Table 2.27).

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The resident incidence rate was highest in the 65 years and above age group in 2019 and 2020 (Tables 2.28 and 2.29). Among the three major ethnic groups, Malays had the highest incidence rate in 2019 (Table 2.30), while Indians had the highest incidence rate in 2020 (Table 2.31).

78 cases of the 134 laboratory confirmed cases (58.2%) were serotyped in 2019; while 32 cases of the 43 laboratory confirmed cases (74.4%) were serotyped in 2020. Among children, the predominant pneumococcal type was Type 19A in 2019, while Pneumococcal Group 11, Group 15 and Type 19A were detected in 2020 (Table 2.32). Among adults, Type 3 was the predominant pneumococcal type in 2019, while Type 3 and Type 23A were the predominant types in 2020 (Table 2.33).

Figure 2.14
Weekly distribution of reported invasive pneumococcal disease cases, 2019-2020

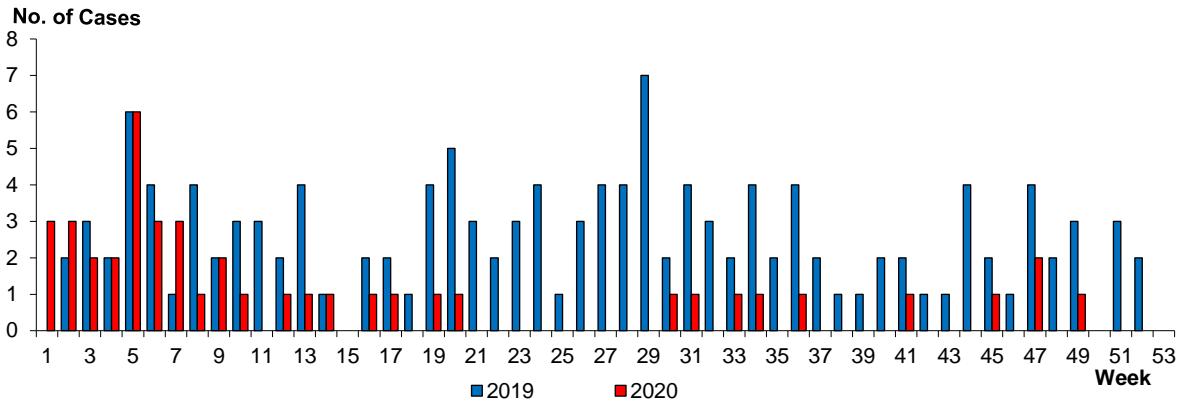


Table 2.27
Total number of notifications* received for invasive pneumococcal disease cases, 2016-2020

| Age group | 2016 | | 2017 | | 2018 | | 2019 | | 2020 | |
|--------------|------------|----------|------------|----------|------------|----------|------------|----------|-----------|----------|
| | Local | Imported | Local | Imported | Local | Imported | Local | Imported | Local | Imported |
| 0-4 | 7 | 2 | 9 | 0 | 9 | 0 | 5 | 0 | 2 | 0 |
| 5-14 | 10 | 0 | 1 | 0 | 6 | 0 | 1 | 0 | 2 | 0 |
| 15-24 | 2 | 0 | 2 | 0 | 3 | 0 | 2 | 1 | 0 | 0 |
| 25-34 | 10 | 1 | 4 | 0 | 5 | 0 | 12 | 0 | 3 | 0 |
| 35-44 | 13 | 1 | 10 | 0 | 10 | 0 | 12 | 0 | 3 | 1 |
| 45-54 | 12 | 1 | 17 | 2 | 10 | 2 | 15 | 3 | 11 | 0 |
| 55-64 | 30 | 0 | 43 | 1 | 23 | 0 | 23 | 2 | 7 | 0 |
| 65+ | 41 | 1 | 63 | 4 | 61 | 1 | 52 | 2 | 12 | 1 |
| Total | 125 | 6 | 149 | 7 | 127 | 3 | 122 | 8 | 40 | 2 |

*Excluded tourists and foreigners seeking medical treatment in Singapore.

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Table 2.28
Age-sex distribution and age-specific resident incidence rate of reported invasive pneumococcal disease cases[^], 2019

| Age group | Number of notifications | | | | Incidence rate per 100,000 resident population* |
|--------------|-------------------------|-----------|------------|------------|---|
| | Male | Female | Total | % | |
| 0-4 | 2 | 3 | 5 | 3.9 | 1.6 |
| 5-14 | 1 | 0 | 1 | 0.8 | 0.2 |
| 15-24 | 2 | 1 | 3 | 2.3 | 0.2 |
| 25-34 | 7 | 5 | 12 | 9.2 | 1.4 |
| 35-44 | 8 | 4 | 12 | 9.2 | 1.7 |
| 45-54 | 10 | 8 | 18 | 13.9 | 2.4 |
| 55-64 | 17 | 8 | 25 | 19.2 | 4.1 |
| 65+ | 34 | 20 | 54 | 41.5 | 9.1 |
| Total | 81 | 49 | 130 | 100 | - |

[^]Excluded four tourists and foreigners seeking medical treatment in Singapore.

*Rates are based on 2019 estimated mid-year resident population.

(Source: Singapore Department of Statistics)

Table 2.29
Age-sex distribution and age-specific resident incidence rate of reported invasive pneumococcal disease cases[^], 2020

| Age group | Number of notifications | | | | Incidence rate per 100,000 resident population* |
|--------------|-------------------------|-----------|-----------|------------|---|
| | Male | Female | Total | % | |
| 0-4 | 2 | 0 | 2 | 4.8 | 1.1 |
| 5-14 | 1 | 1 | 2 | 4.8 | 0.5 |
| 15-24 | 0 | 0 | 0 | 0 | 0 |
| 25-34 | 1 | 2 | 3 | 7.1 | 0.3 |
| 35-44 | 3 | 1 | 4 | 9.5 | 0.3 |
| 45-54 | 9 | 2 | 11 | 26.2 | 1.6 |
| 55-64 | 6 | 1 | 7 | 16.6 | 1.2 |
| 65+ | 7 | 6 | 13 | 31 | 2.1 |
| Total | 29 | 13 | 42 | 100 | - |

[^]Excluded one tourist in Singapore.

*Rates are based on 2020 estimated mid-year resident population.

(Source: Singapore Department of Statistics)

Table 2.30
Ethnic-sex distribution and ethnic-specific incidence rate of reported invasive pneumococcal disease cases[^], 2019

| | Male | Female | Total | % | Incidence rate per 100,000 population* |
|---------------------|-----------|-----------|------------|------------|--|
| Singapore residents | | | | | |
| Chinese | 41 | 24 | 65 | 50 | 2.2 |
| Malay | 19 | 14 | 33 | 25.4 | 6.1 |
| Indian | 9 | 5 | 14 | 10.8 | 3.9 |
| Others | 2 | 1 | 3 | 2.3 | 2.3 |
| Foreign residents | 10 | 5 | 15 | 11.5 | 0.9 |
| Total | 81 | 49 | 130 | 100 | 2.3 |

[^]Excluded four tourists and foreigners seeking medical treatment in Singapore.

*Rates are based on 2019 estimated mid-year resident population.

(Source: Singapore Department of Statistics)

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Table 2.31
Ethnic-sex distribution and ethnic-specific incidence rate of reported invasive pneumococcal disease cases[^], 2020

| | Male | Female | Total | % | Incidence rate per 100,000 population* |
|---------------------|-----------|-----------|-----------|------------|--|
| Singapore residents | | | | | |
| Chinese | 19 | 7 | 26 | 61.9 | 0.9 |
| Malay | 4 | 3 | 7 | 16.7 | 1.3 |
| Indian | 2 | 3 | 5 | 11.9 | 1.4 |
| Others | 0 | 0 | 0 | 0 | 0 |
| Foreign residents | 4 | 0 | 4 | 9.5 | 0.2 |
| Total | 29 | 13 | 42 | 100 | 0.7 |

[^]Excluded one tourist in Singapore.

*Rates are based on 2020 estimated mid-year resident population.
(Source: Singapore Department of Statistics)

Table 2.32
Distribution of pneumococcal serotypes among children cases, 2019 and 2020

| Pneumococcal Type/ Group | 2019 | 2020 |
|--------------------------|--------------------------------|--------------------------------|
| | Number of isolates (n = 4) (%) | Number of isolates (n = 4) (%) |
| Group 11 | 0(0) | 1 (25) |
| Type 14 ^{+§} | 1 (25) | 0(0) |
| Group 15 | 0(0) | 1 (25) |
| Type 19A [§] | 2 (50) | 1 (25) |
| Non-groupable | 1 (25) | 1 (25) |

⁺ Serotype included in PCV7.

[§] Serotype included in PCV13.

Table 2.33
Distribution of pneumococcal serotypes among adult cases, 2019 and 2020

| Pneumococcal Type/ Group | 2019 | 2020 |
|----------------------------|------------------------------------|------------------------------------|
| | Number of isolates (n = 74) (%) | Number of isolates (n = 28) (%) |
| Type 3 § | 13 (17.6) | 4 (14.3) |
| Type 4 +§ | 1 (1.4) | 0(0) |
| Type 6A § | 2 (2.7) | 0(0) |
| Type 6B +§ | 2 (2.7) | 2 (7.1) |
| Type 6C | 0(0) | 1 (3.6) |
| Type 7F § | 1 (1.4) | 0(0) |
| Type 8 | 3 (4.1) | 0(0) |
| Group 10 | 1 (1.4) | 1 (3.6) |
| Group 11 | 1 (1.4) | 0(0) |
| Group 12 | 2 (2.7) | 1 (3.6) |
| Type 14 +§ | 2 (2.7) | 1 (3.6) |
| Type 15A | 1 (1.4) | 0(0) |
| Type 15B | 1 (1.4) | 0(0) |
| Type 15C | 2 (2.7) | 0(0) |
| Group 18 (not 18C and 18F) | 1 (1.4) | 0(0) |
| Type 19A § | 9 (12.2) | 3 (10.7) |
| Type 19F +§ | 3 (4.1) | 1 (3.6) |
| Group 20 | 6 (8.1) | 1 (3.6) |
| Type 22F | 1 (1.4) | 1 (3.6) |
| Type 23A | 8 (10.8) | 4 (14.3) |
| Type 23F +§ | 4 (5.4) | 3 (10.7) |
| Non-groupable | 10 (13.5) | 5 (17.9) |

+ Serotype included in PCV7.

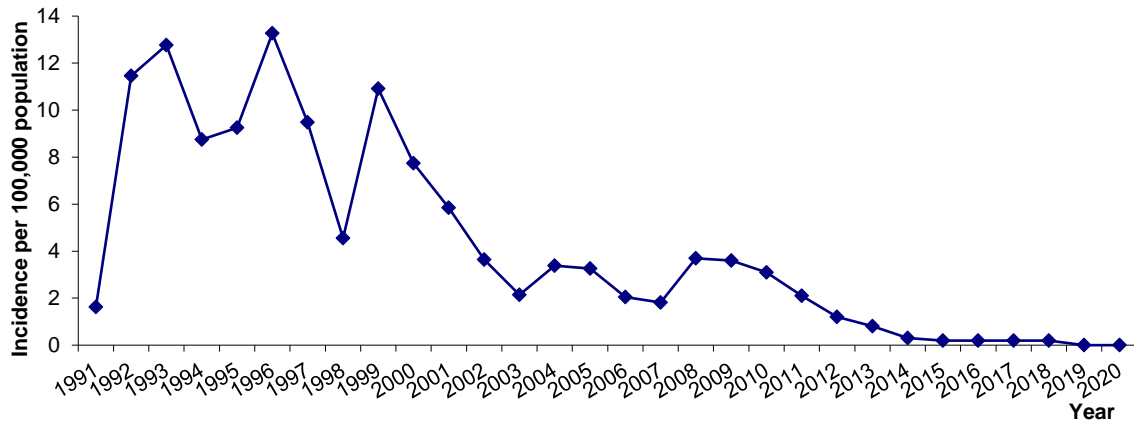
§ Serotype included in PCV13.

RUBELLA

Rubella infections, also known as German measles, are usually mild and characterized by febrile illness with a diffuse punctate and maculopapular rash sometimes resembling that of measles or scarlet fever. However, as it is a teratogen, infection in pregnant women can result in fetal death and congenital abnormalities. The causative agent is the rubella virus (genus *Rubivirus*) from the *Togaviridae* family and it is spread through droplets or by close contact with the nasopharyngeal secretions of an infected person.

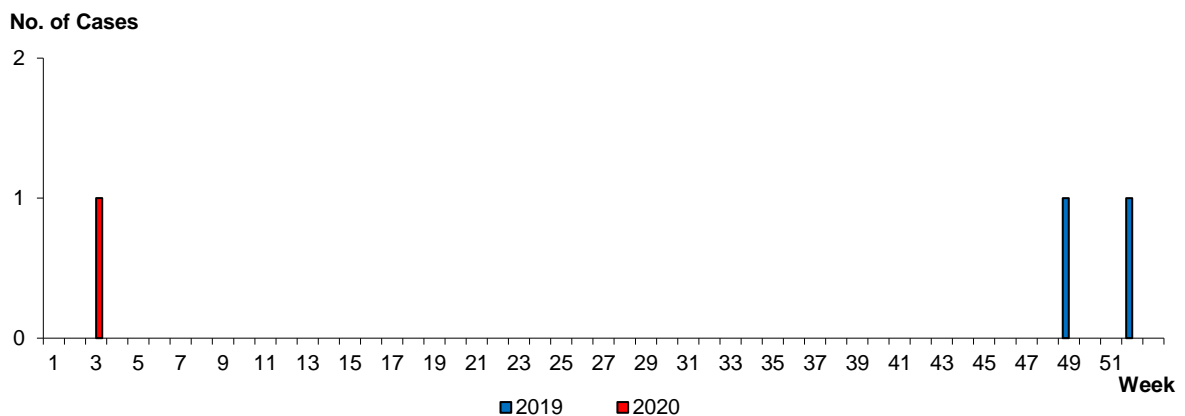
Rubella incidence fluctuated during 1991-1999. This was followed by a steady decline from 1999 to 2020 (Figure 2.15).

Figure 2.15
Incidence of reported rubella cases, 1991-2020



A total of one laboratory confirmed case of rubella was reported in 2020, compared to two cases reported in 2019 (Figure 2.16). There were no cases of Congenital Rubella Syndrome (CRS) reported to the Ministry of Health in 2019 and 2020. Of the two laboratory confirmed cases in 2019, one was an indigenous case and the other was a tourist in Singapore, while the laboratory confirmed case in 2020 was an imported case (Table 2.34). The indigenous case reported in 2019 was a 23-year-old male (Table 2.35), while the imported case reported in 2020 was a 36-year-old female (Table 2.36).

Figure 2.16
Weekly distribution of reported rubella cases, 2019-2020



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Table 2.34
Total number of notifications* received for rubella, 2016-2020

| Age group | 2016 | | 2017 | | 2018 | | 2019 | | 2020 | |
|--------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| | Local | Imported | Local | Imported | Local | Imported | Local | Imported | Local | Imported |
| < 6 mths | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 mths-< 1yr | | | | | | | | | | |
| 1-4 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5-9 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10-14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 15-24 | 1 | 0 | 2 | 0 | 2 | 0 | 1 | 0 | 0 | 0 |
| 25-34 | 2 | 1 | 4 | 1 | 4 | 1 | 0 | 0 | 0 | 0 |
| 35-44 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 1 |
| 45-54 | 0 | 0 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 0 |
| 55+ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 8 | 2 | 8 | 4 | 8 | 2 | 1 | 0 | 0 | 1 |

*Excluded tourists and foreigners seeking medical treatment in Singapore.

Table 2.35
Age-sex distribution and age-specific resident incidence rate of reported rubella cases[^], 2019

| Age group | Number of notifications | | | | 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 | 1 | 0 | 1 | 100 | 0 |
| 25-34 | 0 | 0 | 0 | 0 | 0 |
| 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 | 1 | 0 | 1 | 100 | - |

[^]Excluded one tourist in Singapore.

*Rates are based on 2019 estimated mid-year population.
(Source: Singapore Department of Statistics)

Table 2.36
Age-sex distribution and age-specific resident incidence rate of reported rubella cases, 2020

| Age group | Number of notifications | | | | 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 | 0 | 1 | 1 | 100 | 0.2 |
| 45-54 | 0 | 0 | 0 | 0 | 0 |
| 55-64 | 0 | 0 | 0 | 0 | 0 |
| 65+ | 0 | 0 | 0 | 0 | 0 |
| Total | 0 | 1 | 1 | 100 | - |

*Rates are based on 2020 estimated mid-year population.
(Source: Singapore Department of Statistics)

Table 2.37
Ethnic-sex distribution and ethnic-specific incidence rate of reported rubella cases[^], 2019

| | Male | Female | Total | % | Incidence rate per 100,000 population* |
|---------------------|----------|----------|----------|------------|--|
| Singapore residents | | | | | |
| Chinese | 0 | 0 | 0 | 0 | 0 |
| Malay | 0 | 0 | 0 | 0 | 0 |
| Indian | 0 | 0 | 0 | 0 | 0 |
| Others | 0 | 0 | 0 | 0 | 0 |
| Foreign residents | 1 | 0 | 1 | 100 | 0.1 |
| Total | 1 | 0 | 1 | 100 | 0 |

[^]Excluded one tourist in Singapore.

*Rates are based on 2019 estimated mid-year population.
(Source: Singapore Department of Statistics)

Table 2.38
Ethnic-sex distribution and ethnic-specific incidence rate of reported rubella cases, 2020

| | Male | Female | Total | % | Incidence rate per 100,000 population* |
|---------------------|----------|----------|----------|------------|--|
| Singapore residents | | | | | |
| Chinese | 0 | 0 | 0 | 0 | 0 |
| Malay | 0 | 0 | 0 | 0 | 0 |
| Indian | 0 | 0 | 0 | 0 | 0 |
| Others | 0 | 1 | 1 | 100 | 0.8 |
| Foreign residents | 0 | 0 | 0 | 0 | 0 |
| Total | 0 | 1 | 1 | 100 | 0 |

*Rates are based on 2020 estimated mid-year population.
(Source: Singapore Department of Statistics)

TETANUS

Tetanus is an acute disease caused by *Clostridium tetani* at the site of an injury and is characterized by muscle spasms or hypertonia. The mode of transmission is through introduction of *Clostridium tetani* spores into the body via a wound or breach in the skin.

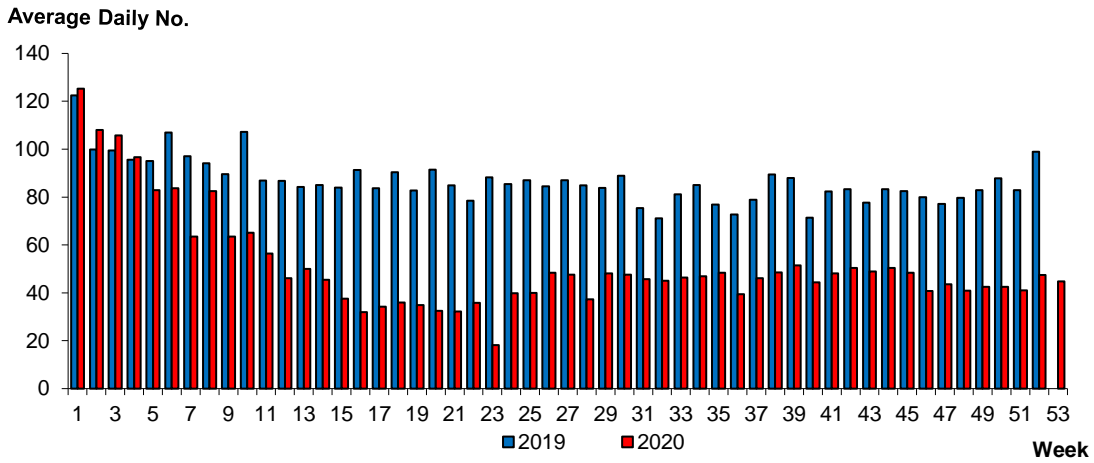
There were no cases of Tetanus reported in years 2019 and 2020 in Singapore.

CONJUNCTIVITIS

Conjunctivitis is a clinical syndrome characterised by lacrimation, irritation and hyperaemia of the palpebral and bulbar conjunctivae. The common causative agents are the adenoviruses and the enteroviruses.

There were a total of 14,373 attendances in polyclinics for conjunctivitis in 2020, compared to 23,650 attendances in 2019 (Figure 2.17).

Figure 2.17
Weekly distribution of reported conjunctivitis cases, 2019-2020



CHICKENPOX

There were a total of 3,348 attendances in polyclinics for chickenpox in 2019. 91.3% of the attendances were by Singaporeans and Permanent Residents. Persons below the age of 20 years represented 62.6% of attendances for chickenpox (Table 2.39).

Amidst the COVID-19 pandemic in 2020, there were a total of 1,539 attendances in polyclinics for chickenpox, lower than what was observed in 2019. 93.1% of the attendances were by Singaporeans and Permanent Residents. Persons below the age of 20 years represented 54.2% of attendances for chickenpox (Table 2.40).

Table 2.39
Distribution of varicella (chickenpox) polyclinic attendances by sex, age group and nationality, 2019

| Age group | Singaporeans/PRs | | | Foreign residents | | | Total | % |
|--------------|------------------|--------------|--------------|-------------------|-----------|------------|--------------|------------|
| | Male | Female | Total | Male | Female | Total | | |
| 0-9 | 658 | 569 | 1,227 | 9 | 12 | 21 | 1,248 | 37.3 |
| 10-19 | 450 | 384 | 834 | 10 | 4 | 14 | 848 | 25.3 |
| 20-29 | 157 | 134 | 291 | 71 | 38 | 109 | 400 | 11.9 |
| 30-39 | 95 | 110 | 205 | 69 | 35 | 104 | 309 | 9.2 |
| 40-49 | 95 | 68 | 163 | 31 | 5 | 36 | 199 | 5.9 |
| 50-59 | 62 | 79 | 141 | 1 | 3 | 4 | 145 | 4.3 |
| 60+ | 113 | 83 | 196 | 1 | 2 | 3 | 199 | 5.9 |
| Total | 1,630 | 1,427 | 3,057 | 192 | 99 | 291 | 3,348 | 100 |

COMMUNICABLE DISEASES SURVEILLANCE SINGAPORE 2019 & 2020
CHAPTER 2

Table 2.40
Distribution of varicella (chickenpox) polyclinic attendances by sex, age group and nationality, 2020

| Age group | Singaporeans/PRs | | | Foreign residents | | | Total | % |
|--------------|------------------|------------|--------------|-------------------|-----------|------------|--------------|------------|
| | Male | Female | Total | Male | Female | Total | | |
| 0-9 | 279 | 241 | 520 | 6 | 4 | 10 | 530 | 34.4 |
| 10-19 | 174 | 127 | 301 | 2 | 1 | 3 | 304 | 19.8 |
| 20-29 | 83 | 80 | 163 | 20 | 21 | 41 | 204 | 13.3 |
| 30-39 | 57 | 61 | 118 | 29 | 10 | 39 | 157 | 10.2 |
| 40-49 | 50 | 25 | 75 | 9 | 3 | 12 | 87 | 5.7 |
| 50-59 | 56 | 34 | 90 | 0 | 0 | 0 | 90 | 5.8 |
| 60+ | 101 | 65 | 166 | 0 | 1 | 1 | 167 | 10.9 |
| Total | 800 | 633 | 1,433 | 66 | 40 | 106 | 1,539 | 100 |