



Government of **Western Australia**
Department of **Health**

Review of Notifiable Infectious Diseases in Western Australia 2020

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Review of notifiable infectious diseases, 2020

There were 30,593 communicable disease notifications in Western Australia (WA) in 2020 (Figure 1) (Table 1). This was just over half the number of notifications reported in 2019 (n=54,274 respectively). A record high influenza season in 2019 accounted for most of the difference in notifications between the two periods.

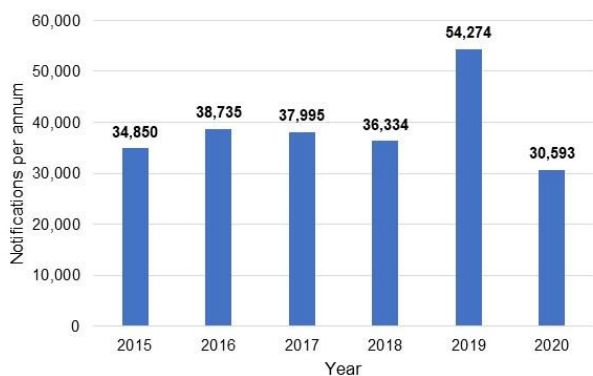


Figure 1 Notifications per year in WA, 2015-2020

In late 2019, a novel coronavirus, SARS-CoV-2, emerged in China, causing the COVID-19 pandemic. Public health measures implemented to combat COVID-19, corresponded with a decline in diseases such as campylobacteriosis, rotavirus infection, salmonellosis, pertussis, invasive pneumococcal disease, measles and mumps. In addition, diseases commonly acquired overseas (e.g. dengue virus infection and malaria) declined in 2020 due to reduced overseas travel and importation.

Half of all notifications were sexually transmissible infections (STI) (Figure 2). The most frequently notified diseases in 2020 were chlamydial infection (n=10,743 cases), varicella zoster infection (n=4,892 cases), gonococcal infection (n=3,559 cases), campylobacteriosis (n=2,884 cases), and influenza (n=1,197 cases).

In 2020, 871 COVID-19 notifications were reported in WA. Over half of the notifications acquired their infection overseas (55.2%), a third were acquired at sea (33.4%) and the remainder (11.4%) were acquired locally.

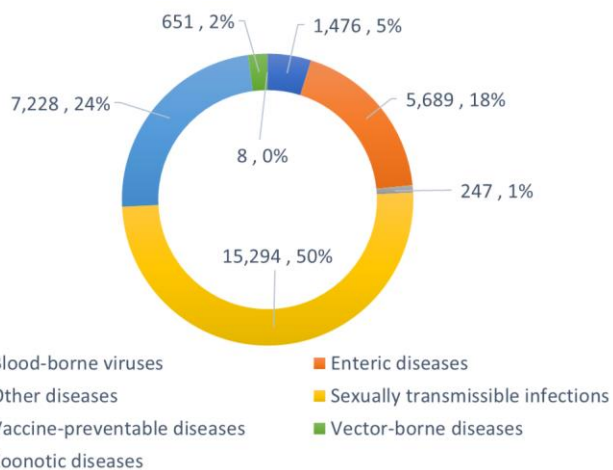


Figure 2 Notifiable infectious diseases in WA, 2020, by disease group

Public health measures

In 2020, a range of public health measures were introduced to reduce importation and transmission of SARS-CoV-2 in WA, as a vaccine was not available at this time. These measures included closing of international and state borders, quarantine requirements for returned travellers, physical distancing measures, infection prevention and control recommendations such as mask use, strong public communications regarding hand hygiene and isolating if any respiratory symptoms, restricting social interactions and recommendations to work from home. The transmission of other notifiable infectious diseases were also impacted by these measures.

Enteric diseases

In 2020, there were 5,689 enteric disease notifications in WA, with a rate of 216.1 cases per 100,000 population, which was 13% lower than the historical 5-year average rate (249.5 per 100,000). Most notifiable enteric diseases in 2020 had lower or comparable rates to the previous five-year average. Notable increases were observed for cryptosporidiosis (n=491, 1.9-fold increase) and shiga toxin-producing *E. coli* (STEC) infection (n=105, 1.5-fold increase) (Figure 3).

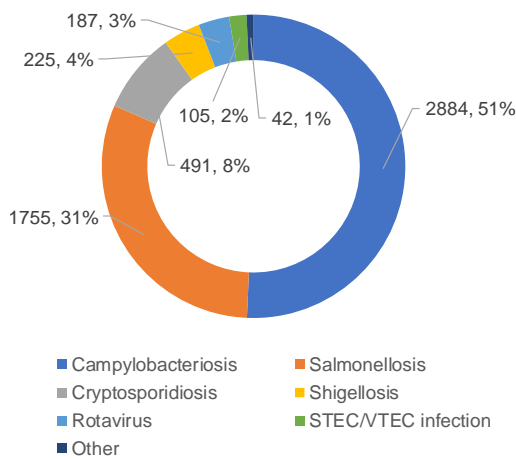


Figure 3 Notifiable enteric infectious diseases in WA, 2020

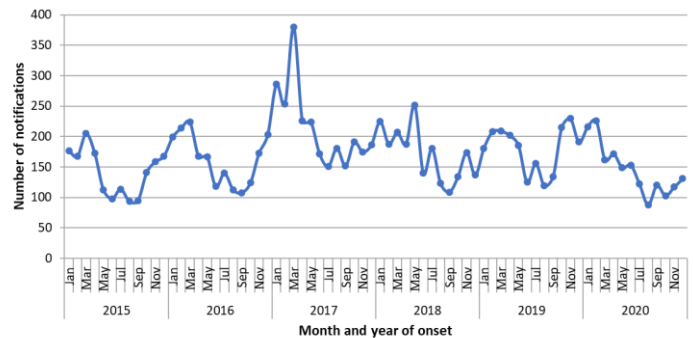
The enteric disease rate was highest among children aged 0-4 years with 604.0 cases per 100,000 population. The rate of enteric disease for Aboriginal people was 40% higher than for non-Aboriginal people. The region with the highest rate was the Kimberley with 462.0 cases per 100,000 population.

Where place of acquisition was known, 92% acquired their infection in WA, 8% reported overseas travel and less than 1% reported interstate travel. In the 2015-2019 period, an average of 25% of enteric notifications with known acquisition were acquired overseas. Of those reporting overseas travel, 57% had travelled to Indonesia. The decrease in enteric notifications in 2020 is likely partially due to the decline in overseas acquired infections following travel restrictions from March onwards.

As in previous years, **campylobacteriosis** was the most commonly notified enteric disease in 2020 (n=2,884; 51%); however, the notification rate was 15% lower than the previous five-year average (109.6 per 100,000 compared with 128.9 per 100,000 population, respectively).

Salmonellosis was the second most commonly notified enteric infection in WA (31%) in 2020 with 1,755 cases and a rate of 66.7 cases per 100,000 population. The 2020 rate was 17% lower than the previous five-year average (80.7 cases per 100,000

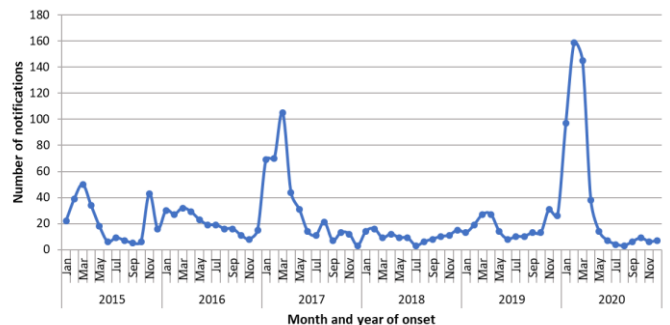
population) but higher than the national average of 48 cases per 100,000 population¹. The most commonly notified *Salmonella* serotype in WA was *S. Typhimurium* (STM), with 1,165 notifications, which accounted for two-thirds (66%) of all salmonellosis notifications and was 15% higher than the previous five-year average.



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Figure 4 Salmonellosis notifications by year and month, WA, 2015 to 2020

There were 491 **cryptosporidiosis** cases notified in 2020, with a notification rate of 18.7 cases per 100,000 population, which was almost two-times higher than the previous five-year average (9.6 cases per 100,000 population). There was a large increase in notifications in the Perth metropolitan region between January and March with a total of 358 cases. Of the 158 cases interviewed, 58 (37%) were linked to nine waterborne outbreaks at separate aquatic facilities. The 0-4 years age group had the highest notification rate (87.5 per 100,000 population) and accounted for 31% of cryptosporidiosis notifications.



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Figure 5 Cryptosporidiosis notifications by year and month, WA, 2015 to 2020

¹ Department of Health | Public datasets

There were six cases of **hepatitis A** notified in 2020 with a rate of 0.2 cases per 100,000 population, which was 71% lower than the average rate of the previous five years. Cases ranged from 8 to 74 years of age. All cases acquired their infection overseas in either India, South Africa, Cambodia, Malaysia, Pakistan or on a cruise ship that traveled through South East Asia. The decrease in 2020 (6 cases compared to 23 cases in 2019) was likely due to overseas travel restrictions.

There were three cases of **hepatitis E** notified in 2020. Cases had travelled to India (n=2) and Pakistan (n=1).

In 2020 there were seven cases of **typhoid fever** (caused by *Salmonella Typhi*) notified, with a rate of 0.3 cases per 100,000 population, which was 40% lower than the average rate of the previous five years. Three cases had travelled to India prior to illness onset. There were four locally acquired cases notified in November 2020 from two separate family groups. Both groups involved symptomatic cases that were later linked to a household member identified as an asymptomatic carrier through screening. The two asymptomatic carriers had travelled to India in 2019 and were the suspected source of illness for their linked cases.

There were no cases of **paratyphoid fever** (caused by *Salmonella Paratyphi*) notified in WA in 2020. The decrease in typhoid and paratyphoid fever in 2020 is likely due to overseas travel restrictions.

There were three cases of **Vibrio parahaemolyticus** infection notified in 2020 with a rate of 0.1 cases per 100,000 population which was substantially lower than the average rate of the previous five years (0.6 cases per 100,000 population). This decrease was likely due to overseas travel restrictions. The 2020 cases were all male, ranging in age from 25 to 63 years. One had travelled to Indonesia during their incubation period. Of the two cases who acquired their illness in WA, one had an infected wound following swab swimming in

a river. The second case had gastroenteritis and while their source of illness could not be confirmed, consumption of cooked shellfish was identified as a potential risk factor.

There were 16 cases of **yersiniosis** notified in 2020, with a rate of 0.6 cases per 100,000 population, which is similar to the average rate of the previous five years (0.7 cases per 100,000). There were eight female and eight male cases, with an age range of 2 to 85 years. Eight cases had acquired their illness in WA, two cases acquired their illness overseas in Indonesia (n=1) and South America (n=1), and the place of acquisition was unknown for the remaining six cases.

There were seven cases of **listeriosis** notified in 2020 with a rate of 0.3 cases per 100,000 population, which was similar to the average rate of the previous five years. There was one maternal-foetal pair in 2020. Five cases with immunocompromising illnesses aged between 67 and 85 years, comprised of four males and one female. Three deaths were reported in non-pregnancy related cases.

There were 105 cases of **STEC** infection reported in 2020 with a rate of 4 cases per 100,000 population, which was higher than the five-year average (2.6 cases per 100,000 population). The increase is likely attributed to the introduction of STEC PCR tests by two pathology laboratories in 2016 and 2018. Notifications in January and February of 2020 were consistent with 2019 levels but declined sharply in March,

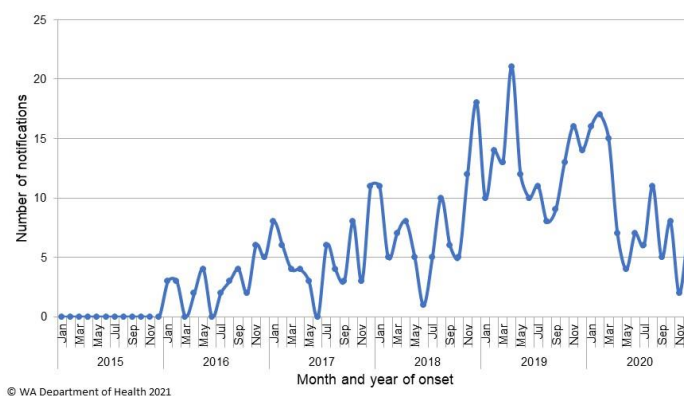


Figure 6 STEC notifications by year and month, WA, 2015 to 2020

coinciding with the introduction of COVID-19 restrictions in the State.

There were 225 cases of **shigellosis** notified in 2020, with a notification rate of 8.5 per 100,000 population, which was marginally higher than the previous five-year average (8.0 per 100,000 population). Similar to previous years, the number of notifications in 2020 was highest in January. Most of the 2020 infections were acquired in WA.

The notification rate was 25-times higher in the Aboriginal population compared to the non-Aboriginal population (109.9 and 4.4 per 100,000 population, respectively). The region with the highest shigellosis notification rate was the Kimberley (156.7 cases per 100,000 population) followed by the Midwest and Pilbara regions (57.1 and 31.7 cases per 100,000 population, respectively). Multi-drug resistant (MDR) *Shigella* have steadily increased since 2017, with 22 reported in 2020.

There were 187 cases of **rotavirus** infection in 2020 (7.1 per 100,000 population). The notification rate in 2020 was 57% lower than the previous five-year average of 16.4 cases per 100,000 population. Historically, rotavirus notifications typically peak in the winter months, however this did not occur in 2020 with low notification numbers reported across the year. As in previous years, the 0-4 years age group had the highest notification rate (103.6 cases per 100,000 population). The region with the highest rotavirus notification rate was the Great Southern (11.5 cases per 100,000 population). Overall, notification rates were 1.5-times higher for the Aboriginal population compared to the non-Aboriginal population (12.2 and 8.0 per 100,000 population, respectively). Of those rotavirus cases with known place of acquisition, 95% acquired their illness in WA with the remaining 5% acquiring their illness overseas. One person-to-person outbreak due to rotavirus in a hospital was reported.

Botulism is rare in WA, with the last case reported in 2015. **Cholera** is mainly seen in

people who have travelled overseas. The last case in WA was in 2017.

Gastrointestinal disease outbreaks

In 2020, 20 **foodborne disease** outbreaks were investigated in WA that resulted in at least 490 cases of illness and 49 hospitalisations. This was below the five-year average of foodborne outbreaks (n=27.6) with a decrease reported each year since 2017 when the number of outbreaks investigated peaked at 42.

Of these 20 outbreaks, 16 were caused by *S. Typhimurium*, one due to norovirus, one was due to *Clostridium perfringens* and the aetiology was unknown for two outbreaks (but suspected to be a viral agent).

Table 3 Foodborne outbreaks investigated in WA by aetiology, 2015-2020

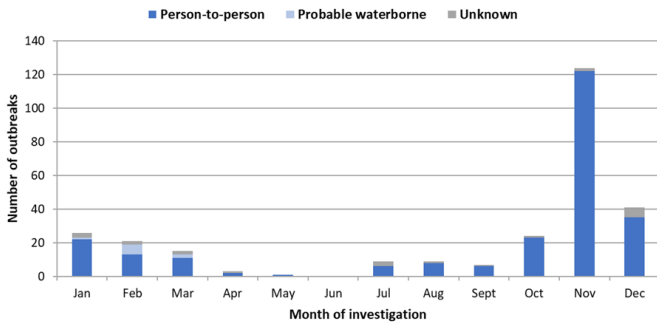
Aetiological agent	Number of Outbreaks					
	2015	2016	2017	2018	2019	2020
<i>Salmonella</i>	7	17	37	33	24	16
Norovirus	1		3		2	1
<i>Clostridium perfringens</i>		2				1
<i>Campylobacter</i>		1				
Hepatitis A	1					
<i>Vibrio parahaemolyticus</i>		1				
Unknown	1		2	4		2
Total	10	21	42	37	26	20

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Investigations identified food vehicles for 14 outbreaks. Similar to previous years, eating egg-containing dishes was the most (n=11, 79%) common vehicle identified. These egg-containing dishes included raw egg sauces such as mayonnaise and aioli, breakfast egg dishes, tiramisu and beef lasagne, which contained undercooked pasta sheets made with raw eggs.

Non-foodborne enteric disease outbreaks are a major cause of illness, especially in institutions such as residential care facilities (RCFs) and childcare centres (CCCs). There were 280 non-foodborne outbreaks reported in 2020, which resulted in 3,671 ill people, 69 hospitalisations and 6 associated deaths. Most of these outbreaks were in RCFs and CCCs as a result of person-to-person transmission. There was a large increase in outbreaks at CCCs in 2020, mostly in the fourth quarter (151 outbreaks). This is 12.8 fold higher than the previous five year fourth quarter average

(12 outbreaks). Most outbreaks were in the Perth metropolitan region.



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Figure 7 Number of non-foodborne gastroenteritis outbreaks by mode of transmission and month, 2020

→ See also: *OzFoodNet quarterly and annual reports (Enteric infection reports and publications (OzFoodNet) (health.wa.gov.au))*

Vaccine-preventable diseases

COVID-19 was first reported in January 2020, and the World Health Organisation declared a pandemic on 11 March 2020. The range of public health measures implemented to help reduce the importation and transmission of COVID-19 in WA also reduced other vaccine preventable diseases.

There were 920 **COVID-19** notifications in WA in 2020, 871 of these were confirmed COVID-19 cases and 49 were historical cases (positive by serology). WA reached a daily peak of 33 cases on 20 March 2020.

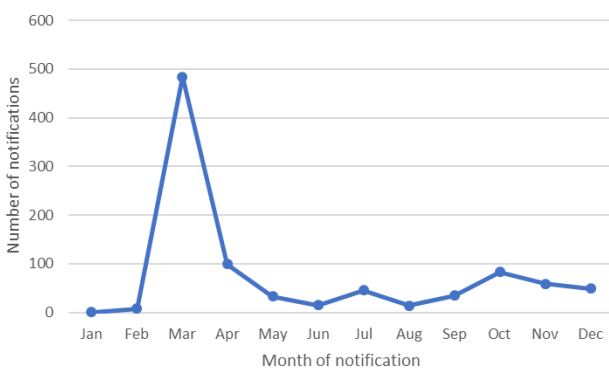


Figure 8 COVID-19 notifications by month in WA, 2020

Of the confirmed cases, 55.2% acquired their infection overseas, a third acquired it at sea (33.4%) and the remainder (11.4%) acquired it locally. Of the 99 notifications that acquired COVID-19 locally, 79% (n=78)

were a contact of a confirmed case(s) and/or in a known cluster, 7% (n=7) were acquired interstate and 14% (n=14) had unknown source of infection.

Of the confirmed cases, 67% of the notifications were metropolitan Perth residents, 22% were overseas or interstate residents and 11% were regional WA residents.

There was one Aboriginal person among the 871 confirmed notifications in 2020. The median age of COVID-19 notifications was 53 years with the highest rate occurring in 70-74 year-olds, (55.9 cases per 100,000 population); 54.4% of notifications were male, 45.6% female. In 2020, 36 (4%) of the 871 COVID-19 notifications were admitted to an intensive care unit (ICU) and 26 (3%) were ventilated. In 2020, there were nine (1%) COVID-19 related deaths in WA; eight were aged 69 years or older, one was in the 40-44 year age group.

In 2020, there were 29 outbreaks of COVID-19 reported, comprised of 361 (41%) confirmed cases. Cruise ships had the greatest number of cases, with 221 cases linked to 10 outbreaks. This was followed by merchant maritime vessels with 69 cases across five outbreaks, and flights with 32 cases linked to four outbreaks. There were two outbreaks in hospitals that collectively had seven cases, and one outbreak in a RCF that had three cases.

There has been no endemic **measles** transmission in WA since the late 1990s, and the number of measles notifications remains low, associated with importation from overseas and occasional limited local transmission. In 2020, there were four notifications of measles (0.2 cases per 100,000 population), with ages ranging from <1 year old to 48 years. The illness onsets were in January, prior to the COVID-19 related border closures. Two index cases acquired their infection overseas and one locally acquired case likely acquired their infection from an unidentified index case. The fourth case acquired their illness locally from a known index case. One of the cases

was not vaccinated against measles as they were too young. The vaccination status for the other three cases was unknown.

One case of **rubella** was notified in 2020 (0.04 per 100,000). The adult case was diagnosed with uveitis, which was likely a latent infection following a rubella infection in childhood.

Mumps activity remained low in 2020, with 10 notifications and a rate of 0.4 cases per 100,000 population, compared to the previous 5-year average of 7.9 cases per 100,000 population. Five cases had recently returned from overseas. The remaining five cases were locally acquired, and the source of infection was unknown, with two cases from the same household.

There were three notifications of **invasive *Haemophilus influenzae* type B** infection in 2020 (0.1 cases per 100,000 population) compared to an average of 1 case per year over the previous 5 years. All three cases were Aboriginal, two were children under 6 years of age (both partially vaccinated with 1 dose) and one was an unvaccinated adult from the Kimberley region.

The number and rate of notifications of **invasive pneumococcal disease (IPD)** decreased from 247 cases (9.4 per 100,000) in 2019 to 178 cases (6.8 per 100,000) in 2020. The overall decrease was attributed to an almost 50% decrease in cases in non-Aboriginal people, from 178 (7.1 per 100,000) to 92 cases (3.6 per 100,000). However, the rate in Aboriginal people increased by 50% compared to the average five-year rate. Where serogroup information was available, just under one-third (30%, 50/167) were non-vaccine preventable.

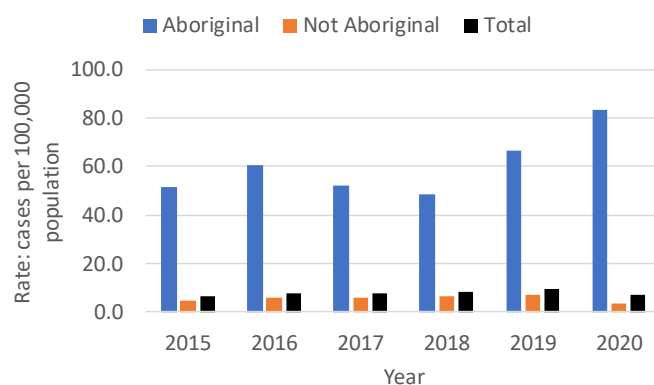


Figure 9 Rates of invasive pneumococcal disease by Aboriginality and year in WA, 2015 to 2020

There was a dramatic decrease in **influenza** notifications in 2020 (n=1,197, 45.5 cases per 100,000 population), compared with 2019 (n=23,198, 887.4 cases per 100,000 population). The low number of notifications in 2020 was likely due to public health measures in response to the COVID-19 pandemic. Of the 1,197 influenza cases notified, 706 (59%) were influenza A (unspecified), 252 (21%) A/H1N1 (2009), 60 (5%) A/H3N2, and 144 (12%) were influenza B (unspecified).

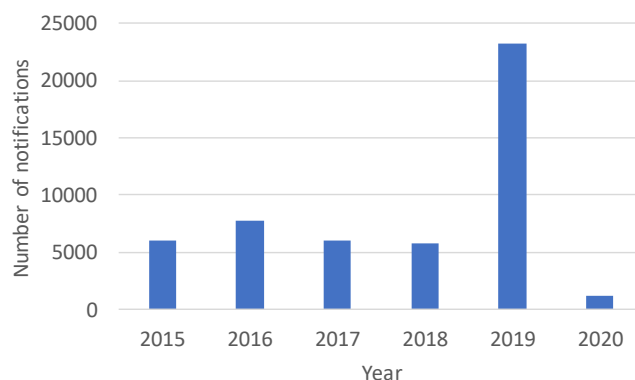


Figure 10 Influenza notifications by year in WA, 2015 to 2020

Pertussis notifications have steadily decreased from a peak of 4,023 notifications in 2011 (170.9 per 100,000) to 125 cases (4.7 per 100,000) reported in 2020. Notifications in 2020 were 91% lower than the previous five-year average (n=1351). Of these, 25% were under 9 years old. The highest notification rates were recorded in the Kimberley (8.6 per 100,000) and South West regions (8.3 per 100,000), which were

nearly 2-fold higher than the overall WA rate (4.7 per 100,000).

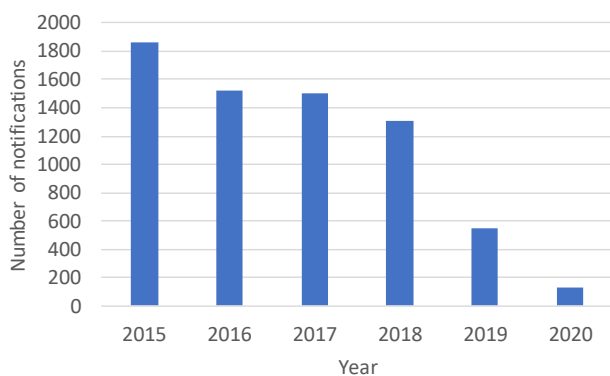


Figure 11 Pertussis notifications in WA, 2015 to 2020

Varicella zoster virus notifications increased by 21% in 2020 with 4,892 cases compared to the five-year average of 4,021 cases. Notifications were comprised of chickenpox cases (13%; 24.6 cases per 100,000 population), shingles cases (52% ; 97.0 cases per 100,000 population) and unspecified varicella zoster (35%; 64.2 cases per 100,000 population). Typically, unspecified varicella zoster notifications lack the clinical information required to specify whether the case is either chickenpox or shingles.

There was one **tetanus** notification in 2020 in an unvaccinated male in his 80s, who sustained a scratch during manual outdoor labour.

Vector-borne diseases

The most common vector-borne disease (VBD) in 2020 was **Ross River virus (RRV)** infection, with 519 notifications and a rate of 19.7 cases per 100,000 population, which was 27% lower than the previous five-year average. **Barmah Forest virus (BFV)** infection (n=21, 0.8 cases per 100,000 population) was the second most common locally acquired VBD with 21 notifications in 2020, with a rate 34% lower than the five-year average.

The Kimberley (22.8 per 100,000) region recorded the highest notification rate for BFV in 2020.

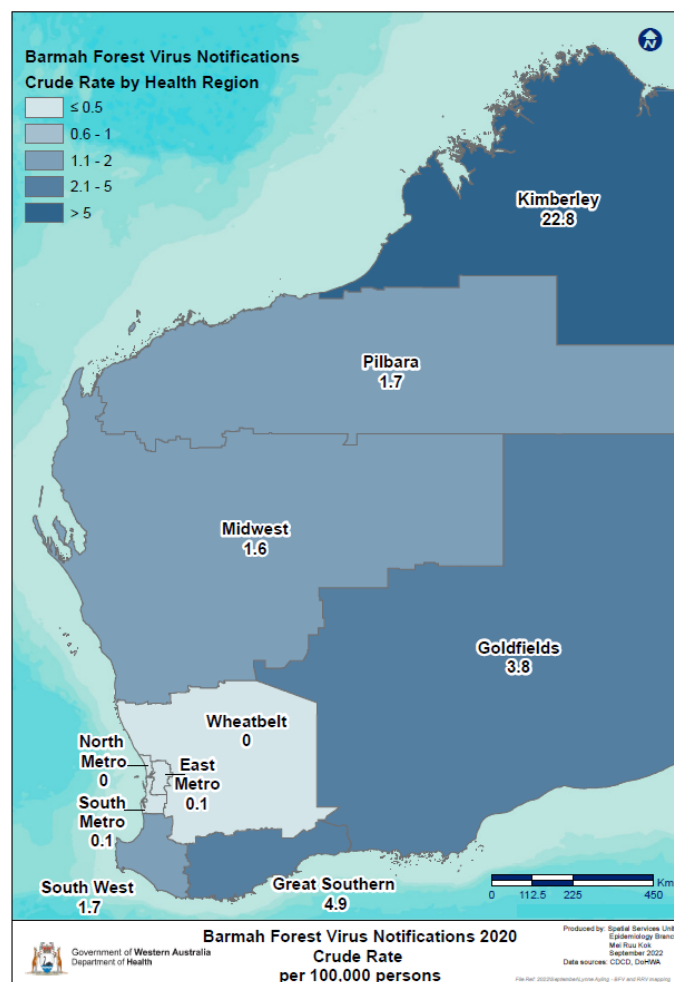


Figure 12 Map of Barmah Forest virus infections in WA, 2020

The South West (98.3 per 100,000) and Kimberley (79.8 per 100,000) regions recorded the highest notification rates for RRV in 2020.

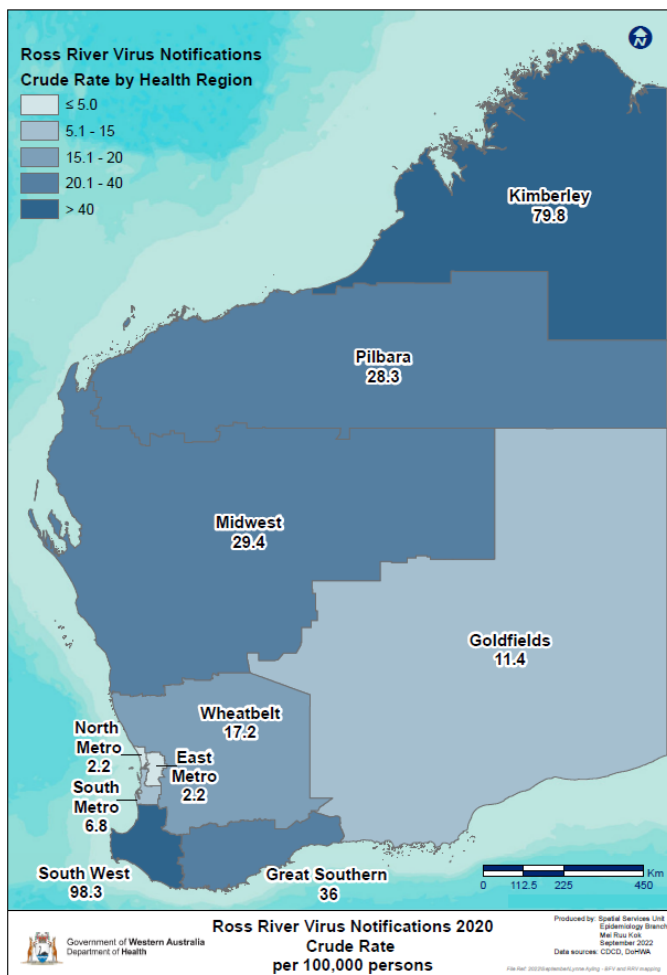


Figure 13 Map of Ross River virus infections in WA, 2020

No cases of **Murray Valley encephalitis virus** infection were reported in 2020; the last notification was in 2018.

There were 59 **dengue virus** infection notifications in 2020 and the rate (2.2 cases per 100,000 population) was 83% lower than the five-year average. Dengue virus infection is not an endemic disease in Australia, with infections predominantly in tourists or returning residents. All cases in 2020 were acquired overseas, with travel to South East Asia (Indonesia = 44, Malaysia = 2, Thailand = 2, Vietnam = 1, Singapore = 1, Philippines = 1) reported in 86% of notifications. All four dengue serotypes are present in Indonesia, and in 2020, serotypes 1, 2 and 4 were detected in returning travellers. Other overseas acquired cases included travel to South America, Southern East and North Africa, Southern and Central

Asia and Melanesia. The travel details of one case was unknown.

There were seven **Chikungunya virus** infection notifications in 2020 with a rate of 0.3 cases per 100,000 population, which is similar to the rate over the previous 5 years (0.4 cases per 100,000 population). All infections were acquired in India (n=1) or Southeast Asian (Malaysia, n=5, Myanmar, n=1) countries.

Malaria notifications (n=24, 0.9 cases per 100,000 population) were 60% lower in 2020 compared to 2019 (n=59, 2.3 cases per 100,000 population), and the lowest recorded since 2004.

Zoonotic diseases

Notifications for brucellosis, leptospirosis, psittacosis and Q fever continue to be infrequent. No cases of **brucellosis** or **psittacosis** were reported in 2020. There were three cases of **leptospirosis** reported (0.1 cases per 100,000 population), two from the Great Southern region, and one from the South West region. All three cases worked on farms.

There were five notifications of **Q fever** (0.2 cases per 100,000), which was lower than the previous 5-year average (0.4 cases per 100,000 population). Four reported animal exposure through employment in the Midwest region of WA and had not been vaccinated. The fifth case was an adult who had travelled overseas.

Sexually transmissible infections

While **chlamydial infection** remained the most notified disease in WA in 2020, the number of notifications (n=10,743) was 7% lower than the historical five-year average (n=11,478 notifications per year).

People aged between 15 and 29 years accounted for 70% of chlamydial infection notifications and the highest rate was in the 20 to 24 year age group. Female notification rates were higher than male notification rates in those aged under 25 years, whereas the converse was true in older individuals.

The notification rate for chlamydial infection was three-times higher in Aboriginal people compared to non-Aboriginal people.

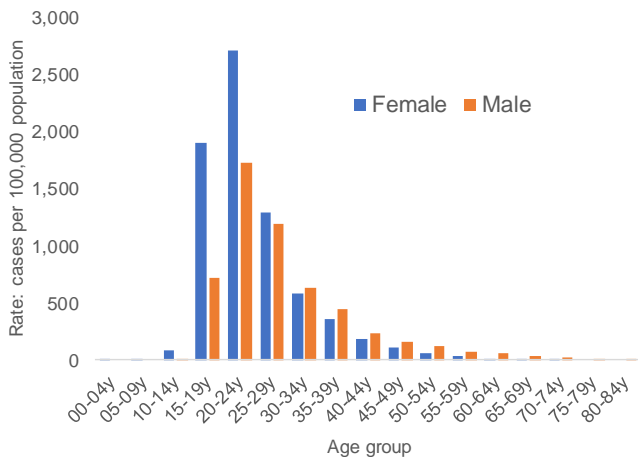


Figure 14 Rate of chlamydial infection notifications in 2020, WA, by age group and gender

The Kimberley region had the highest chlamydial infection notification rate in 2020 with 1,641 cases per 100,000 population, which was almost four times greater than the WA rate (408.1 per 100,000).

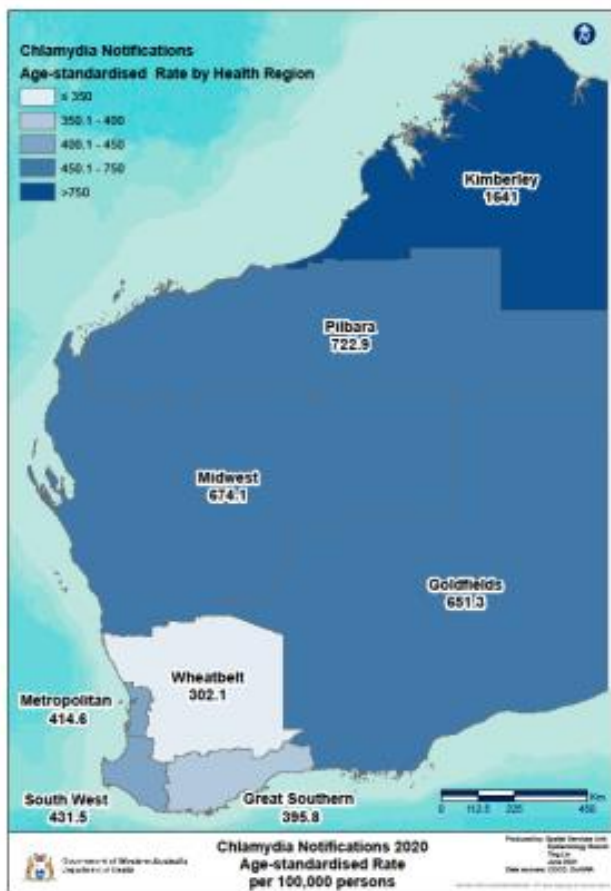


Figure 15 Age standardised rate of chlamydia notifications by health region, WA, 2020

Gonococcal infection notifications in 2020 decreased by 9% (n=3,559, 135.2 cases per 100,000 population) from a peak of 3,914 notifications in 2019 during the 2011-2019 period. The 2020 notifications were 7% higher than the historical five-year average (3,297 notifications per year, 126.4 notifications per 100,000).

As in previous years, 60% of gonococcal infection notifications in 2020 occurred in people aged between 20 and 34 years and the highest notification rate occurred in those aged 20 to 24 years.

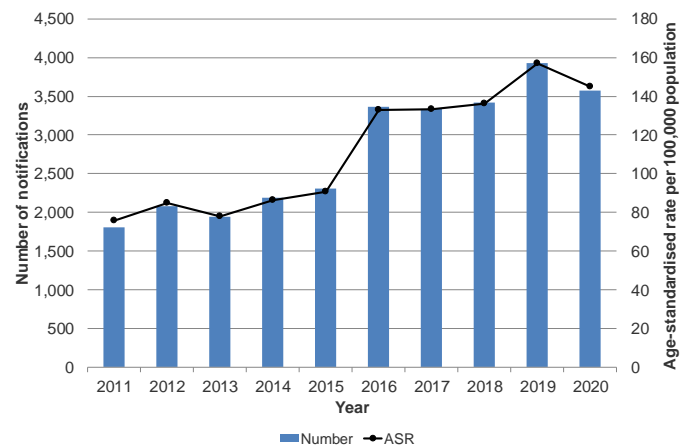


Figure 16 Number and age standardised rate of gonococcal infection notifications, WA, 2011 to 2020

The rate of notification was higher among females compared to males in the 15 to 19 year age group, whereas the converse was true in older individuals. The notification rate for gonococcal infection in Aboriginal people was 12 times higher than the rate in non-Aboriginal people.

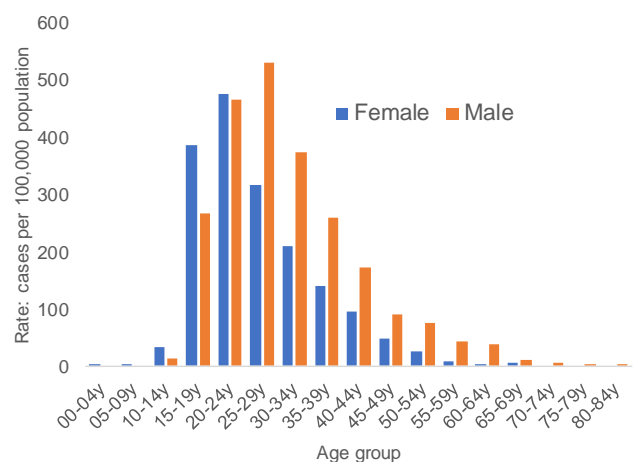


Figure 17 Rates of gonococcal infection notifications in 2020, WA, by age group and gender

The highest gonococcal infection notification rate in 2020 was in the Kimberley region (1,561 per 100,000), with a rate 11-times greater than the WA rate (135.2 per 100,000). While the rate in the Kimberley region remained relatively stable from 2011 to 2020, the rate in the South West and Wheatbelt regions increased by almost seven-fold and four-fold, respectively.

The number of **infectious syphilis** notifications reached a ten-year peak in 2020 (n=713, 27.1 cases per 100,000 population), with a rate 90% higher than the previous five-year average. This has been attributed to an ongoing outbreak among Aboriginal people across northern Australia. The increase was also observed in the Perth metropolitan region among people with a heterosexual exposure and a continuing increase among 'men who have sex with men' (MSM).

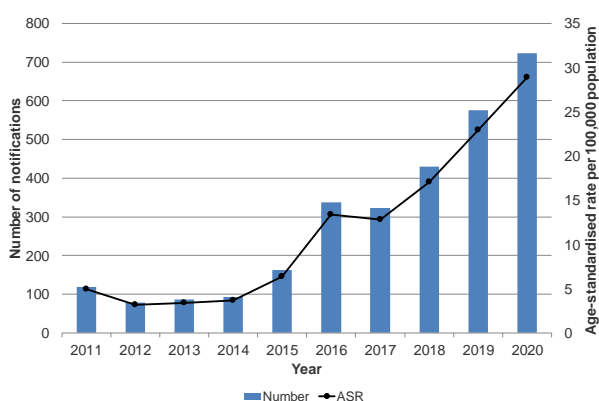


Figure 18 Number and age standardised rate of infectious syphilis notifications, WA, 2011 to 2020

In 2020, 54% of infectious syphilis notifications occurred in people aged 20 to 34 years and the highest notification rate occurred in people aged 25 to 29 years. Among those aged 20 years or older, most (70%) notifications were in males.

In 2020, while 41% of infectious syphilis notifications occurred in Aboriginal people and 59% in non-Aboriginal people, the Aboriginal to non-Aboriginal rate ratio was 14.9:1.

The highest infectious syphilis notification rate in 2020 was observed in the Kimberley

region (284.9 per 100,000), where the rate was 10 times higher than the WA rate (27.1 per 100,000). There was also a notable increase in the rates in the South West, Perth metropolitan and Midwest regions in comparison to 2019.

The highest notification rate among Aboriginal people was from the Pilbara region; and among non-Aboriginal people the highest notification rate was from the Kimberley region.

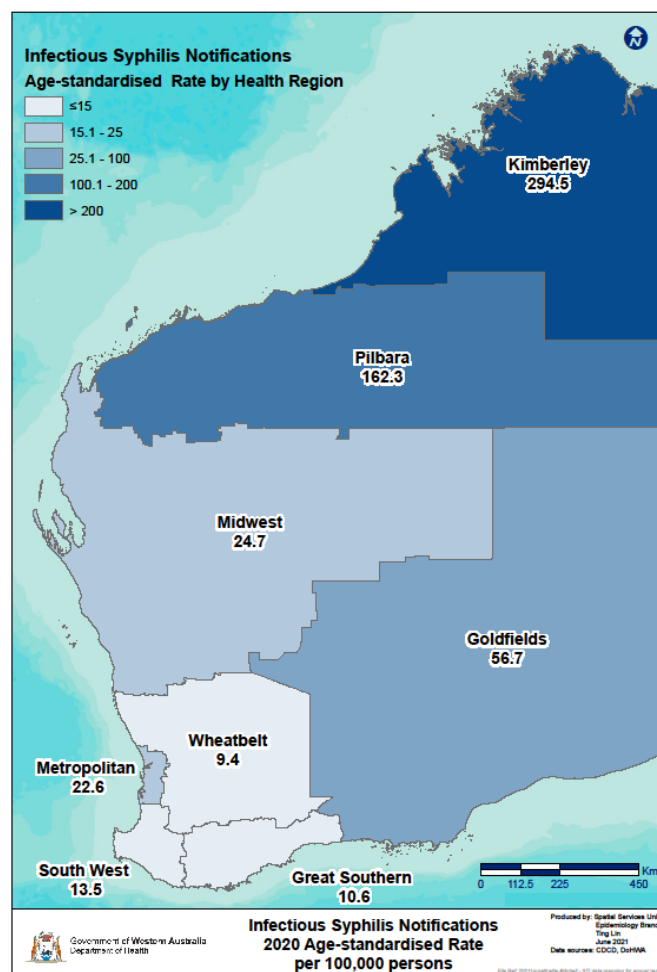


Figure 19 Age standardised rate of infectious syphilis notifications by health region, WA, 2020

Prior to 2014, there had been no infectious syphilis notifications in the Kimberley region for two years. A total of 372 cases among Aboriginal people (156 male, 216 female) were notified in the Kimberley region from June 2014 to the end of 2020. Following the increase in the Kimberley region, syphilis subsequently increased in other regions.

Further information about the infectious syphilis outbreak affecting Aboriginal people living in northern Australia is available online².

In the Pilbara region, a total of 201 cases among Aboriginal people (91 male, 110 female) were notified since the outbreak was declared in that region in February 2018. A total of 57 cases among Aboriginal people (25 male, 32 female) were notified in the Goldfields region since the outbreak was declared in that region in January 2019. Almost all cases across these three regions reported heterosexual exposure.

Separate outbreaks were declared in the Perth metropolitan region in August 2020 and the South West region in October 2020, with differing epidemiology to the outbreaks in remote regions. In the metropolitan region high numbers of notifications have occurred in the MSM community. In the South West region there has been an increase in the number of notifications reporting a heterosexual exposure, including females who were pregnant at the time of diagnosis.

The number of **non-infectious syphilis** notifications in 2020 (n=203, 7.7 cases per 100,000 population) was 35% higher than the previous five-year average of 150 notifications per year (5.5 cases per 100,000 population).

In 2020, there were four **congenital syphilis** cases notified (0.2 cases per 100,000 population). Two notifications were in Aboriginal children (one in the Perth metropolitan region and one in the non-metropolitan area) of whom one was stillborn. The two notifications in non-Aboriginal children were in the Perth metropolitan region. From 2011 – 2019 there were 4 congenital syphilis cases reported in WA (two in 2013, and one each in 2018 and 2019).

In 2020, **HIV** notifications first diagnosed in WA declined by 31% to 72 notifications from

104 notifications in 2019. The decline from 2019 to 2020 was largely due to a 52% decrease in the number of males reporting heterosexual acquisition in South-East Asia (23 to 11 cases). Compared to the previous five-year average, notifications decreased by 19% in 2020. This decline was mostly due to a reduction in MSM notifications, which was likely related to uptake of pre-exposure prophylaxis (PrEP) since 2017.

Of the 72 HIV cases newly diagnosed in WA in 2020, 60 were male (84%), 11 were female (15%) and one person was transgender (1%). In 2020, the median age of HIV cases in WA was 42 years, ranging from 19 to 76 years. The median age for females was almost 10 years younger (35 years) than the median age for males (44 years). The number of HIV notifications decreased in nearly all age groups between 2019 and 2020.

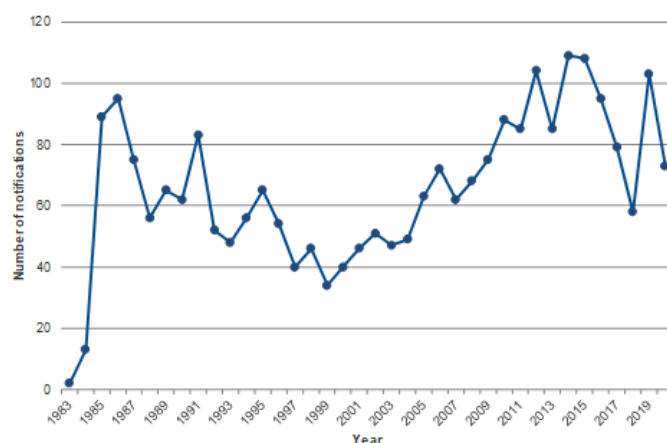


Figure 20 Number of HIV notifications, WA, 1983 to 2020 (excludes cases previously diagnosed outside WA)

Of the 72 notifications in 2020, 51% (n=37) reported MSM and 40% (n=29) reported heterosexual sexual exposure.

The number of HIV notifications in MSM was similar in 2020 to 2019 (n=36). Most MSM cases in 2020 reported acquiring their infection in Australia (81%). For cases in 2020 with a heterosexual exposure, there was a 58% decrease (n=43 vs n=18) in the

2

<http://www.health.gov.au/internet/main/publishing.nsf/Content/ohp-infectious-syphilis-outbreak.htm>.

number of male and 39% decrease in female (n=18 vs n=11) notifications compared to 2019. Most cases with a heterosexual exposure had acquired HIV overseas (79%, n=23).

In 2020 two Aboriginal people were notified with HIV. Between 2015 and 2019 a total of 19 Aboriginal people were notified with HIV, ranging between two and six cases per year.

No cases of **donovanosis** have been notified in WA since 2014.

Chancroid infection is rare in WA, with the last case reported in 2009.

Blood-borne viruses

Newly acquired hepatitis B notifications reached a ten-year high in 2013 (n=39) and the number of notifications in 2020 (n=20) was lower than the previous five-year average (24 notifications per year).

Unspecified hepatitis B notifications peaked in 2015 (n=630) and the number of notifications in 2020 (n=517) was comparable to the previous five-year average (564 notifications per year).

In 2020, notification rates for newly acquired and unspecified hepatitis B were highest in the 35 to 39-year (2 cases per 100,000 population) and 40 to 44-year (47 cases per 100,000 population) age groups, respectively.

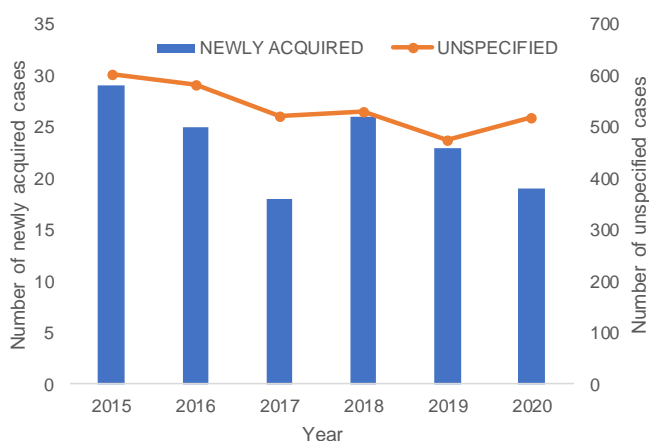


Figure 21 Number of hepatitis B notifications, WA, 2015 to 2020

For newly acquired hepatitis B, Aboriginal people had seven-times higher rate than non-Aboriginal people (4.4 vs 0.6 cases per 100,000 population) and almost three-times higher for unspecified hepatitis B (43.5 vs. 16.4 cases per 100,000 population).

In 2020, the highest hepatitis B rates were reported in the Midwest region for newly acquired infections (3.6 cases per 100,000 population) and in the Kimberley region for unspecified infections (53.1 cases per 100,000 population).

Where place of acquisition was known, 56% of newly acquired infections were reported as acquired in WA and 84% of unspecified infections were reported as acquired overseas.

In 2020, enhanced surveillance forms (ESF) were sent to the diagnosing clinicians of all newly acquired hepatitis B infections in WA. Forms were completed for 70% (n=14/20) of notifications. Overall, having symptoms of hepatitis or abnormal liver function test results were the most common reasons for hepatitis B testing. While 29% of cases reported injecting drug use in the previous two years, 71% reported no history of injecting drug use. Unprotected casual sex with a person of the opposite sex was reported among 43% of cases. Forty-three percent of cases were born in Australia and acquired the infection in Australia.

Newly acquired hepatitis C notifications peaked in 2015 (n=182) before decreasing to a ten-year low in 2020 (n=88).

Unspecified hepatitis C notifications peaked in 2016 (n=1,227) before reaching a ten-year low in 2020 (n=848).

In 2020, notification rates were highest in the 20 to 24-year age group for newly acquired infections (14 cases per 100,000 population) and unspecified infections (58 cases per 100,000 population).

Notification rates among Aboriginal people compared to non-Aboriginal people were 12-times higher (28 vs. 2 cases per 100,000 population) and 11-times higher (230 vs. 21

cases per 100,000 population) for newly acquired and unspecified hepatitis C, respectively.

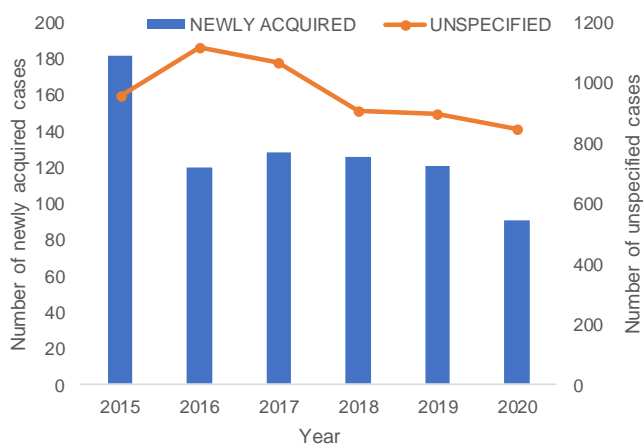


Figure 22 Number of hepatitis C notifications, WA, 2015 to 2020

The Great Southern region had the highest rate of newly acquired hepatitis C infections (5 cases per 100,000 population) and the Midwest region had the highest rate of unspecified hepatitis C infections (61 cases per 100,000 population).

Among hepatitis C notifications that had place of acquisition recorded, 100% of newly acquired infections and 82% of unspecified infections were acquired in WA.

To help identify risk factors in 2020, ESF were sent to the diagnosing clinicians of all newly acquired hepatitis C infections and a randomly selected one-third of unspecified hepatitis C infections in WA. Forms were completed for 69% (n=61/88) of newly acquired infections and 52% (n=131/253) of applicable unspecified infections.

Overall, having a history of risk factors (for example injecting drug use or imprisonment) was the most common reason for hepatitis C testing among both Aboriginal and non-Aboriginal people. A greater proportion of Aboriginal people were diagnosed with hepatitis C as part of voluntary prison entry testing, while a greater proportion of non-Aboriginal people were diagnosed as a result of an abnormal liver function test. Injecting drug use was the most common

(67%) hepatitis C risk factor for both Aboriginal and non-Aboriginal people.

Needle and syringe programs are an integral evidence-based public health strategy to reduce the transmission of blood borne viruses. In 2020, over 5.6 million needles and syringes were distributed in WA. A campaign specific to Aboriginal people, titled 'Look After Your Blood', continued in 2020 on regional TV and radio, metropolitan radio, social media, outdoor, print and online.

→ See also: *STI and BBV annual and quarterly reports (Epidemiology of STIs and BBVs in Western Australia (health.wa.gov.au))*

Other diseases

Notifications of **invasive meningococcal disease** declined from a peak of 45 cases in 2017 to 10 cases in 2020 (0.3 cases per 100,000 population). This decrease has been attributed to the introduction of ACWY meningococcal vaccines to the [WA vaccination schedule](#). The cases reported in 2020 included 2 serogroup B; 5 serogroup W135, 2 serogroup Y, and 1 serogroup C. Of the cases notified in 2020, 10% were aged less than 20 years versus the previous five-year average of 51%. The reduction in cases of this younger age group is the likely result of the vaccination campaign targeting these age groups. There was one death in 2020.

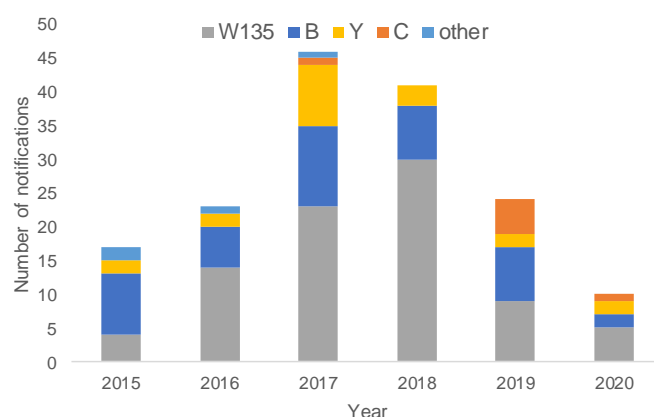


Figure 23 Number of invasive meningococcal disease notifications by serogroup, WA, 2015 to 2020

The number of **legionellosis** notifications in 2020 (n=80, 3.0 cases per 100,000

population) increased from low numbers of cases reported from 2017 to 2019 (range 36 to 43). As is typical for WA, the majority of infections were due to *L. longbeachae* (64%), which is associated with exposure to gardening soils and potting mixes. The remainder were caused by *L. pneumophila*, associated with spray mists from warm water sources such as air conditioning cooling towers, spas, fountains and hot water systems. No outbreaks of *L. pneumophila* were detected.

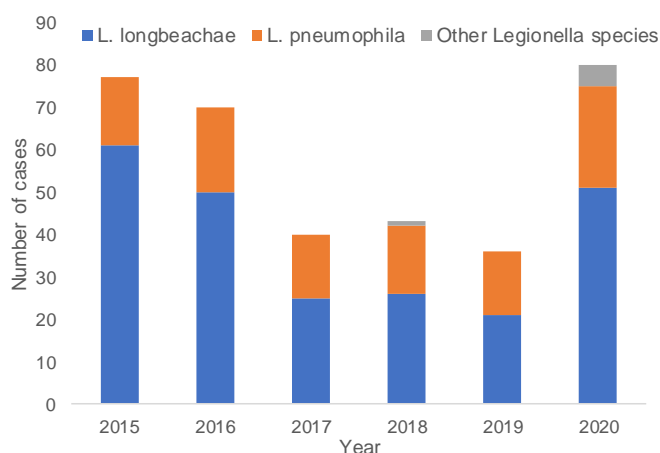


Figure 24 Number of legionellosis notifications by species, WA, 2015 to 2020

Compared to 2019, the number of **tuberculosis (TB)** notifications remained stable at 134 cases in 2020, of which 5 were relapses. The 2020 rate (5.1 cases per 100,000 population) was similar to the historic 5-year rate (5.2 cases per 100,000 population). The majority (91%) of cases were born overseas and of the 13 Australian-born cases, 2 were Aboriginal people. Almost all cases acquired their infection overseas (84%), with the most common countries India (26/112, 23%), the Philippines (12/112, 11%), Indonesia (12/112, 11%), China (11/112, 10%) and Bhutan (10/112, 9%). Two cases had multi-drug resistant TB.

Four cases of **haemolytic uraemic syndrome (HUS)** associated with enteric infections were notified in 2020. Cases were aged <1 to 63 years. Three cases were diagnosed with STEC and were from country regions with possible environmental exposures, including one case that resided

on a sheep station. The fourth case was diagnosed as a probable *Shigella* case (PCR positive only), with a household epidemiological link positive for *Shigella flexneri* 2B.

Five cases of **melioidosis** were notified in 2020 (0.2 cases per 100,000 population), with an age range of 20 to 50 years. All cases were Kimberley residents and likely acquired their infections in this region.

There were three **leprosy** notifications in 2020 (0.1 per 100,000), in immigrants from India, Myanmar and Eritrea.

Seven cases of **Creutzfeldt-Jakob disease** were notified in 2020 (0.3 per 100,000), with an age range of 59 to 86 years.

Table 1 Number of notifications in WA by year, 2015 to 2020 (see Appendix for notes)

Disease Category/Disease	Notifications						Rate		Rate ratio
	2015	2016	2017	2018	2019	2020	5-year	2020	
Blood-borne viruses	1,757	1,832	1,736	1,586	1,516	1,476	65.5	56.1	0.9
Hepatitis B	630	604	539	552	495	537	21.9	20.4	0.9
Hepatitis C	1,127	1,227	1,194	1,026	1,011	936	43.4	35.6	0.8
Hepatitis D	0	1	3	8	10	3	0.2	0.1	0.7
Enteric diseases	5,616	5,968	7,199	6,338	7,035	5,689	249.5	216.1	0.9
Botulism	1	0	0	0	0	0	0.0		0.0
Campylobacteriosis	2,881	3,391	3,373	3,444	3,526	2,884	128.9	109.6	0.8
Cholera	0	0	1	0	0	0	0.0		0.0
Cryptosporidiosis	255	244	400	122	211	491	9.6	18.7	1.9
Hepatitis A	25	16	12	12	23	6	0.7	0.2	0.3
Hepatitis E	2	3	4	2	4	3	0.1	0.1	1.0
Listeriosis	6	6	6	8	7	7	0.3	0.3	1.0
Paratyphoid fever	11	12	4	9	9	0	0.3		0.0
Rotavirus	596	179	519	297	518	187	16.4	7.1	0.4
Salmonellosis	1,696	1,944	2,566	2,050	2,140	1,755	80.7	66.7	0.8
Shigellosis	97	92	198	263	388	225	8.0	8.5	1.1
Shiga toxin (verotoxin)-producing E. colic STEC/VTEC	0	33	60	93	150	105	2.6	4.0	1.5
Typhoid	8	9	21	13	19	7	0.5	0.3	0.5
Vibrio parahaemolyticus	7	24	20	14	16	3	0.6	0.1	0.2
Yersiniosis	31	15	15	11	24	16	0.7	0.6	0.8
Other diseases	223	252	239	254	227	247	9.3	9.4	1.0
Acute post-streptococcal glomerulonephritis (APSGN)	NN	NN	5	24	10	5	0.3	0.2	0.6
Creutzfeldt-Jakob disease	4	6	6	7	11	7	0.3	0.3	1.0
Haemolytic Uraemic Syndrome	1	3	3	1	1	4	0.1	0.2	2.2
Legionellosis	72	69	38	43	36	80	2.0	3.0	1.5
Leprosy	3	8	1	2	3	3	0.1	0.1	0.9
Melioidosis	6	3	7	5	3	5	0.2	0.2	1.0
Meningococcal infection	17	21	45	40	23	10	1.1	0.3	0.3
Tuberculosis	120	142	134	132	140	134	5.2	5.1	1.0
Sexually transmissible infections	13,786	15,600	15,347	15,595	16,338	15,294	592.8	581.0	1.0
Chlamydia (genital)	11,144	11,767	11,450	11,487	11,544	10,743	445.6	408.1	0.9
Gonorrhoea	2,303	3,348	3,331	3,404	3,914	3,559	126.4	135.2	1.1
HIV	108	95	79	58	104	72	3.3	2.7	0.8
Syphilis - Infectious	162	331	324	427	567	713	14.0	27.1	1.9
Syphilis - Non-Infectious	69	59	163	218	208	203	5.5	7.7	1.4
Syphilis (congenital)	0	0	-	1	1	4	0.0	0.2	9.9
Vaccine-preventable diseases	11,821	13,897	11,992	11,811	28,326	7,228	602.6	274.6	0.5
COVID-19	NN	NN	NN	NN	NN	871		33.1	
Diphtheria	0	0	1	0	0	0	0.0		0.0
H. influenzae type b	2	1	0	1	2	3	0.0	0.1	2.4
Influenza	5,976	7,817	5,994	5,839	23,198	1,197	377.2	45.5	0.1
Measles	7	11	17	36	52	4	0.9	0.2	0.2
Mumps	454	481	23	18	32	10	7.9	0.4	0.0
Pertussis	1,866	1,521	1,507	1,312	550	125	52.6	4.7	0.1
Pneumococcal infection	166	200	197	206	247	178	7.9	6.8	0.9
Rubella (non-congenital)	2	1	2	1	1	1	0.1	0.0	0.7
Tetanus	0	1	0	1	0	1	0.0	0.0	2.4
Varicella (chicken pox)	486	615	692	667	624	648	23.9	24.6	1.0
Varicella (shingles)	1,458	1,727	2,000	2,218	2,240	2,554	74.8	97.0	1.3
Varicella (unspecified)	1,404	1,522	1,559	1,512	1,380	1,690	57.3	64.2	1.1
Vector-borne diseases	1,633	1,166	1,467	732	821	651	45.3	24.7	0.5
Barmah Forest virus	46	13	47	36	14	21	1.2	0.8	0.7
Chikungunya	11	15	11	3	9	7	0.4	0.3	0.7
Dengue fever	542	553	172	132	327	59	13.4	2.2	0.2
Malaria	48	55	57	48	59	24	2.1	0.9	0.4
Murray Valley Encephalitis	NN	NN	0	1	0	0			
Ross River virus	953	476	1,156	494	383	519	26.9	19.7	0.7
Typhus	31	39	19	18	29	21	1.1	0.8	0.8
West Nile virus/Kunjin virus	NN	NN	4	0	0	0	0.0		0.0
Zika virus	2	15	1	1	0	0	0.1		0.0
Zoonotic diseases	14	20	15	18	11	8	0.6	0.3	0.5
Brucellosis	0	2	0	0	0	0	0.0		0.0
Leptospirosis	1	6	3	5	4	3	0.1	0.1	0.8
Psittacosis	1	0	3	0	0	0	0.0		0.0
Q Fever	12	12	9	13	7	5	0.4	0.2	0.5
Grand Total	34,850	38,735	37,995	36,334	54,274	30,593	1500.5	1162.3	0.8

Table 2 Number of notifications in WA by health region, 2020 (see Appendix for notes)

Disease	Region																				
	North Metro		South Metro		East Metro		Kimberley		Pilbara		Wheatbelt		MidWest		Great Southern		Goldfields		South West		
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	
Blood-borne viruses																					
Hepatitis B	131	6.22	132	6.27	186	8.83	21	59.82	18	30	17	22.6	12	19.6	1	1.6	8	15.2	11	6.1	
Hepatitis C	132	6.27	256	12.16	312	14.82	17	48.42	23	38.3	31	41.1	34	55.5	31	50.7	25	47.5	75	41.4	
Hepatitis D	0	0	0	0	2	0.09	1	2.85	0	0	0	0	0	0	0	0	0	0	0	0	
Enteric diseases																					
Campylobacteriosis	813	38.61	705	33.48	765	36.33	39	111.09	44	73.3	82	108.8	63	102.9	68	111.3	51	96.8	254	140.3	
Cholera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Cryptosporidiosis	211	10.02	100	4.75	114	5.41	1	2.85	20	33.3	5	6.6	5	8.2	5	8.2	0	0	30	16.6	
Hepatitis A	1	0.05	1	0.05	3	0.14	0	0	0	0	0	0	0	0	1	1.6	0	0	0	0	
Hepatitis E	2	0.09	0	0	1	0.05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Listeriosis	3	0.14	3	0.14	0	0	0	0	0	0	0	0	0	0	1	1.6	0	0	0	0	
Paratyphoid fever	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Rotavirus	59	2.8	35	1.66	60	2.85	1	2.85	4	6.7	5	6.6	2	3.3	7	11.5	2	3.8	12	6.6	
Salmonellosis	501	23.79	370	17.57	498	23.65	65	185.15	60	100	41	54.4	37	60.4	22	36	30	56.9	131	72.3	
Shigellosis	35	1.66	25	1.19	43	2.04	55	156.67	19	31.7	3	4	35	57.1	2	3.3	7	13.3	1	0.6	
Shiga toxin (verotoxin)-producing E. colic STEC/VTEC	33	1.57	13	0.62	34	1.61	1	2.85	0	0	2	2.7	10	16.3	3	4.9	1	1.9	8	4.4	
Typhoid	3	0.14	1	0.05	3	0.14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Vibrio parahaemolyticus	0	0	2	0.09	1	0.05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Yersiniosis	7	0.33	5	0.24	2	0.09	0	0	0	0	0	0	0	0	1	1.6	0	0	1	0.6	
Other diseases																					
Acute post-streptococcal glomerulonephritis (APSGN)	0	0	0	0	0	0	3	8.55	1	1.7	0	0	0	0	0	0	1	1.9	0	0	
Amoebic meningitis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Creutzfeldt-Jakob disease	2	0.09	0	0	3	0.14	0	0	0	0	1	1.3	1	1.6	0	0	0	0	0	0	
Haemolytic Uraemic Syndrome	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Invasive Group A Streptococcal (iGAS) Disease	NN	NN	NN	NN	NN	NN	NN	NN	NN	NN	NN	NN	NN	NN	NN	NN	NN	NN	NN	NN	
Legionellosis	20	0.95	18	0.85	22	1.04	0	0	1	1.7	4	5.3	1	1.6	3	4.9	3	5.7	8	4.4	
Leprosy	1	0.05	1	0.05	1	0.05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Melioidosis	0	0	0	0	0	0	5	14.24	0	0	0	0	0	0	0	0	0	0	0	0	
Meningococcal infection	1	0.05	1	0.05	3	0.14	1	2.85	2	3.3	0	0	1	1.6	0	0	1	1.9	0	0	
Respiratory Syncytial Virus (RSV)	NN	NN	NN	NN	NN	NN	NN	NN	NN	NN	NN	NN	NN	NN	NN	NN	NN	NN	NN	NN	
Tuberculosis	40	1.9	32	1.52	56	2.66	1	2.85	1	1.7	1	1.3	0	0	0	0	0	0	3	1.7	
Sexually transmissible infections																					
Chlamydia (genital)	2570	122.06	2648	125.77	3179	150.98	534	1521.11	303	505	153	203	315	514.3	168	275	304	577.1	569	314.2	
Gonorrhoea	643	30.54	704	33.44	937	44.5	548	1560.99	245	408.4	39	51.7	105	171.4	19	31.1	197	374	121	66.8	
Syphilis - Infectious	128	6.08	134	6.36	200	9.5	100	284.85	80	133.3	5	6.6	14	22.9	6	9.8	27	51.3	18	9.9	
Syphilis - Non-Infectious	57	2.71	36	1.71	85	4.04	1	2.85	8	13.3	2	2.7	4	6.5	0	0	7	13.3	4	2.2	
Syphilis (congenital)	0	0	1	0.05	2	0.09	0	0	0	0	0	0	1	1.6	0	0	0	0	0	0	
Vaccine-preventable diseases																					
Diphtheria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
H. influenzae type b	0	0	0	0	1	0.05	2	5.7	0	0	0	0	0	0	0	0	0	0	0	0	
Influenza	381	18.1	281	13.35	319	15.15	12	34.18	26	43.3	25	33.2	45	73.5	28	45.8	20	38	60	33.1	
Measles	2	0.09	2	0.09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Mumps	5	0.24	1	0.05	1	0.05	0	0	2	3.3	0	0	0	0	0	0	1	1.9	0	0	
Pertussis	35	1.66	42	1.99	22	1.04	3	8.55	1	1.7	1	1.3	3	4.9	1	1.6	2	3.8	15	8.3	
Pneumococcal infection	27	1.28	20	0.95	26	1.23	22	62.67	13	21.7	8	10.6	19	31	3	4.9	33	62.6	7	3.9	
Rubella (non-congenital)	0	0	1	0.05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Tetanus	0	0	0	0	1	0.05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Varicella (chicken pox)	199	9.45	161	7.65	135	6.41	0	0	45	75	13	17.2	11	18	11	18	26	49.4	40	22.1	
Varicella (shingles)	685	32.53	645	30.63	525	24.93	57	162.37	38	63.3	59	78.3	28	45.7	138	225.9	59	112	320	176.7	
Varicella (unspecified)	546	25.93	613	29.11	468	22.23	1	2.85	2	3.3	17	22.6	43	70.2	0	0	0	0	0	0	
Vector-borne diseases																					
Barmah Forest virus	0	0	2	0.09	1	0.05	8	22.79	1	1.7	0	0	1	1.6	3	4.9	2	3.8	3	1.7	
Chikungunya	0	0	1	0.05	2	0.09	0	0	0	0	0	0	0	0	0	0	0	0	4	2.2	
Dengue fever	15	0.71	16	0.76	17	0.81	1	2.85	1	1.7	2	2.7	1	1.6	0	0	4	7.6	2	1.1	
Malaria	6	0.28	4	0.19	12	0.57	0	0	0	0	0	0	0	0	0	0	1	1.9	1	0.6	
Ross River virus	46	2.18	144	6.84	47	2.23	28	79.76	17	28.3	13	17.2	18	29.4	22	36	6	11.4	178	98.3	
Typhus	3	0.14	2	0.09	4	0.19	1	2.85	2	3.3	2	2.7	1	1.6	4	6.5	0	0	2	1.1	
West Nile virus/Kunjin virus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Zika virus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Zoonotic diseases																					
Brucellosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Leptospirosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3.3	0	0	1	0.6	
Psittacosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Q Fever	0	0	0	0	2	0.09	0	0	0	0	0	0	3	4.9	0	0	0	0	0	0	

Appendix: Data notes

1. Data was extracted from the WA Notifiable Diseases Database (WANIDD) on 15 May 2022. Data are subject to change.
2. "Date of Onset" is a composite of the "true" date of onset provided by the notifying doctor, the date of the specimen collection for laboratory notified cases, and when neither of these dates are available, the date of notification by the doctor or laboratory, or the date of receipt of the notification, whichever is earliest. Most notifiable diseases are analysed by date of onset. For blood-borne viruses (whether newly acquired or unspecified), leprosy, syphilis (non-infectious) and tuberculosis, data are analysed by date of receipt at the PHU/CDCD. COVID-19 is based on date of notification or date of confirmed case.
3. Unless specified, crude rates per 100,000 population were used and calculated using the Rates Calculator Version 9.5.5 (Department of Health). Age-standardised and age-specific rates were included for comparisons between regions.
4. "Total" in Table 1 excludes cases with interstate or overseas residential addresses, or where no postcode was specified.
5. 5-year rate is average rate/year of the 5-year period preceding the reporting year.
6. Rate ratio is the ratio of the 5-year crude notification rate to the notification rate in the reporting year.
7. NN = not notifiable.
8. HIV notifications include WA residents and overseas students living in WA, but exclude overseas visitors, interstate residents and cases that have been previously notified in other States/Territories. HIV data is described within the report, and not presented per region in Table 2.
9. Foodborne outbreaks includes both foodborne and probable foodborne.

Infectious disease notification

Under the *WA Public Health Act 1916*, medical practitioners whose patients are diagnosed with a notifiable disease and pathology laboratories that have diagnosed notifiable diseases in testing are required by law to notify these cases to the Department of Health.

Dual notification allows the systematic reporting of notifiable diseases by laboratories and the capture of additional demographic and risk factor information from doctors.

Contributors/Editors

Lynne Ayling, Barry Combs, Carolien Giele, Jonathan Rodrigues.

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