
NSW Health

NSW Zoonoses Annual Report 2020

Health Protection NSW

July 2024



Health Protection NSW acknowledges the traditional owners of the lands on which we work, live and play. We pay our respect to Elders past, present and emerging. This report was produced on the lands of the Cammeraygal People of New South Wales. The knowledge, resilience and strength of Aboriginal Peoples is key to supporting health for Aboriginal communities.

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1. Overview

A zoonosis is any disease or infection that is naturally transmissible from vertebrate animals to humans. Worldwide, at least 61% of all human pathogens are zoonotic organisms, and during the past decade up to 75% of emerging pathogens were zoonoses.¹

This report focuses on:

- Notifications of selected zoonoses in humans to NSW public health authorities during 2020
- Animal health events investigated in collaboration with the NSW Department of Primary Industries (DPI) and Local Land Services (LLS) requiring a public health response.
- Post-exposure risk assessments and treatments delivered for the prevention of rabies and Australian Bat Lyssavirus (ABLV).

Beyond the scope of this report are numerous zoonoses transmitted through food, water, or vectors – many of which are notifiable to NSW public health and animal health authorities ([Appendix 2](#)).

Surveillance findings on enteric and other zoonoses are routinely published in other reports available via the [NSW Health website](#). A wealth of further information and resources are also available ([Appendix 3](#)).

2020 Highlights

- NSW observed a threefold increase in the number of psittacosis notifications, compared to 2019. These were predominantly associated with direct or indirect contact with wild birds. There was a slight increase in the number of brucellosis and leptospirosis notifications. There were fewer notifications of Q fever in humans compared to 2019. Two probable cases of tularaemia were detected, the first in NSW since the disease became notifiable in 2004, both of whom had contact with unwell wildlife.
- No human infections of anthrax, avian/animal influenza, Hendra virus or rabies/ABLV were reported (Table 1, overleaf).
- NSW observed a 57% overall reduction in the numbers of people exposed to animals at risk of rabies and ABLV requiring assessment and prophylactic treatment, compared to 2019. This was predominantly driven by a reduction (77%) in the number of people exposed to potentially rabid animals while travelling overseas. This is largely owing to the closure of Australia's international border to non-essential travel in March 2020 due to the COVID-19 pandemic. There was a smaller (25%) reduction in the number of people with local bat exposures in the same period, compared to 2019.
- Sporadic animal infections with anthrax, brucellosis, Hendra virus, psittacosis and Australian bat lyssavirus (ABLV) were reported in NSW, requiring public health investigation of exposures and some interventions to prevent human infections.

Table 1: Incidence of selected zoonotic diseases in humans notified in 2020 compared to the previous 5 years (2015–2019), by local health district (LHD) of residence, NSW.

LHD	n (Rate per 100,000 ^c)									
	Brucellosis		Leptospirosis		Psittacosis		Q fever		Tularaemia	
	5yr mean 2015-2019	2020	5yr mean 2015-2019	2020	5yr mean 2015-2019	2020	5yr mean 2015-2019	2020	5yr mean 2015-2019	2020
Central Coast	<1 (0.06)	0	<1 (0.12)	0	<1 (0.06)	0	2 (0.35)	4 (1.13)	0	0
Far West	0	0	0	0	0	1 (3.32)	5 (16.02)	3 (9.95)	0	0
Hunter New England	3 (0.33)	1 (0.1)	3 (0.33)	5 (0.52)	1 (0.13)	4 (0.42)	52 (5.59)	41 (4.3)	0	0
Illawarra Shoalhaven	<1 (0.05)	0	<1 (0.1)	1 (0.24)	0	0	13 (3.07)	12 (2.86)	0	0
Mid North Coast	<1 (0.09)	0	12 (5.34)	2 (0.89)	<1 (0.09)	0	27 (12.23)	17 (7.53)	0	0
Murrumbidgee	<1 (0.08)	0	<1 (0.25)	1 (0.41)	2 (0.58)	3 (1.23)	14 (5.55)	13 (5.33)	0	0
Nepean Blue Mountains	0	0	<1 (0.05)	0	2 (0.42)	8 (2.05)	2 (0.42)	3 (0.77)	0	0
Northern NSW	<1 (0.07)	1 (0.32)	4 (1.2)	2 (0.64)	0	0	31 (10.34)	34 (10.95)	0	0
Northern Sydney	<1 (0.02)	0	<1 (0.09)	1 (0.1)	<1 (0.04)	1 (0.1)	4 (0.48)	4 (0.42)	0	2 (0.21)
South Eastern Sydney	0	0	<1 (0.07)	0	<1 (0.04)	1 (0.1)	<1 (0.09)	1 (0.1)	0	0
South Western Sydney	2 (0.16)	1 (0.1)	<1 (0.02)	0	<1 (0.08)	2 (0.19)	3 (0.31)	1 (0.1)	0	0

Southern NSW	0	0	0	0	0	3 (1.38)	17 (8.34)	7 (3.22)	0	0
Sydney	<1 (0.06)	0	<1 (0.03)	0	0	1 (0.14)	<1 (0.09)	0	0	0
Western NSW	<1 (0.07)	0	1 (0.29)	0	2 (0.5)	3 (1.05)	66 (23.37)	62 (21.75)	0	0
Western Sydney	1 (0.12)	1 (0.09)	<1 (0.04)	0	<1 (0.02)	3 (0.28)	1 (0.12)	3 (0.28)	0	0
NSW total	8 (0.10)	4 (0.05)	23 (0.3)	12 (0.15)	8 (0.1)	30 (0.37)	236 (3.01)	206 (2.52)	0 (0.0)	2 (0.02)

2. Brucellosis

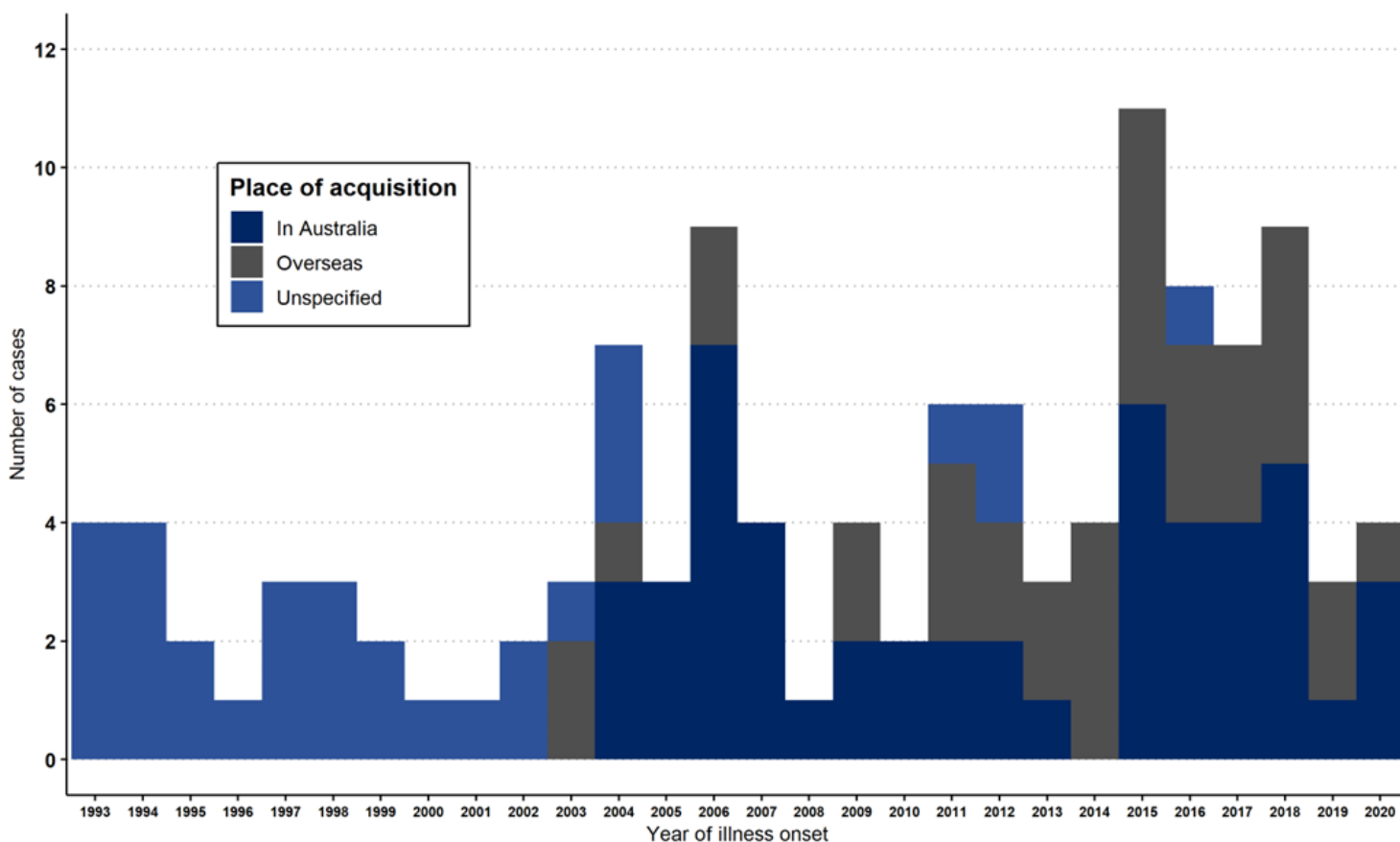
Brucellosis is an infection that can be transmitted to humans from animals such as cows, sheep, goats, and pigs. *Brucella suis* remains a potential source of human infection in Australia, while other *Brucella* species have either been eliminated or never detected. Human cases in NSW are rare and usually result from contact with feral pigs in north-western NSW, or from consuming unpasteurized dairy products while overseas.

Key points:

- 4 confirmed cases notified in 2020.
- 3 locally acquired cases.
- 1 overseas acquired

During 2020, 4 (0.05 per 100,000) cases of brucellosis were notified in NSW (Figure 1). Three cases were male and one female, with a mean age of 48 years. None identified as Aboriginal. Three cases acquired *Brucella suis* infection in Australia. Two cases reported frequently engaging in feral pig hunting activities, whereas one case was engaged in smallholder pig farming in a peri-urban setting. One case was diagnosed with chronic *Brucella melitensis* infection, acquired overseas (Iraq or Jordan), with no known risk factors reported. *Brucella melitensis* is not found in Australian animals.

Figure 1: Trends in brucellosis notifications by place of acquisition, NSW, 1993–2020



3. Leptospirosis

Leptospirosis is a disease of humans and animals caused by *Leptospira* bacteria, found in infected animal urine and animal tissues. Although relatively rare in Australia, leptospirosis is more common in warm and wet areas such as north-eastern NSW. Infections usually occur in people who have close contact with animals or who have been exposed to water, mud, soil, or vegetation contaminated by animal urine.

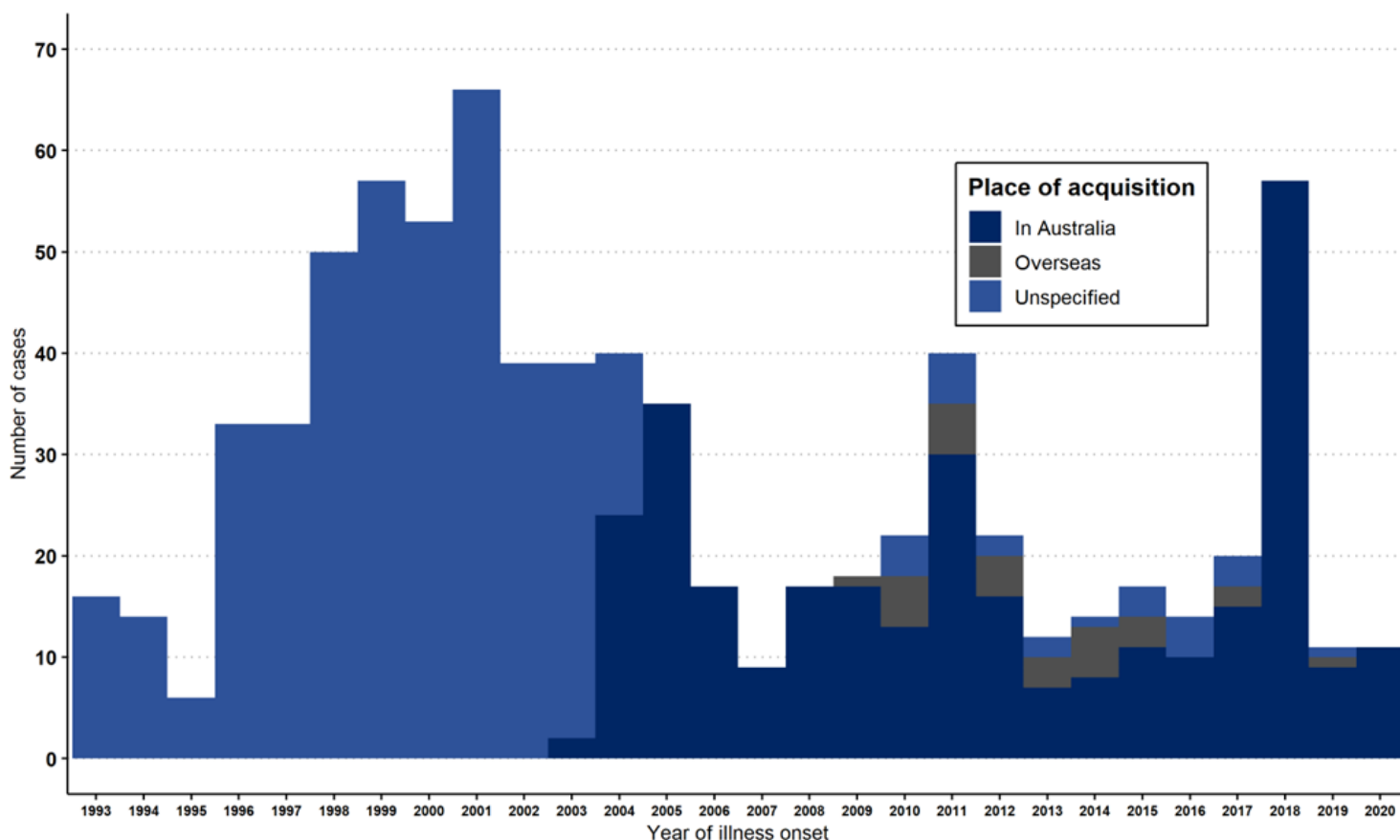
Key points:

- 12 confirmed cases notified in 2020.
- 12 locally acquired cases.
- 10 cases engaged in farming activity.

During 2020, 12 (0.15 per 100,000) confirmed cases of leptospirosis were notified in NSW. This is a decrease compared to the period 2013–2018, but the same as 2019 (Figure 2). Cases were predominately male (91%, n=11), ranging in age from 24–73 years (mean: 48 years). None identified as Aboriginal.

All cases acquired their infection in NSW. Ten cases (83%) engaged in farming activity; one was a regular hunter. Exposures recalled by cases included: contact with livestock (n=9), including assisting in cattle birthing (n=4); exposure to potentially contaminated fresh water sources (n=4), and contact with rodents or environments potentially soiled by urine from rodents (n=3).

Figure 2: Trends in leptospirosis notifications by place of acquisition, NSW, 1993–2020



4. Psittacosis (Ornithosis)

Psittacosis is an uncommon disease caused by the bacterium *Chlamydia psittaci*. The bacteria can also cause disease in animals which is usually called chlamydiosis. Most human cases in NSW develop the disease by inhaling feather dust, and particles contaminated with secretions and droppings from infected birds. More rarely, people can contract the disease from other animals, such as sheep, cattle, and horses.

Key points:

- 14 confirmed cases notified in 2020.
- 16 probable cases notified.

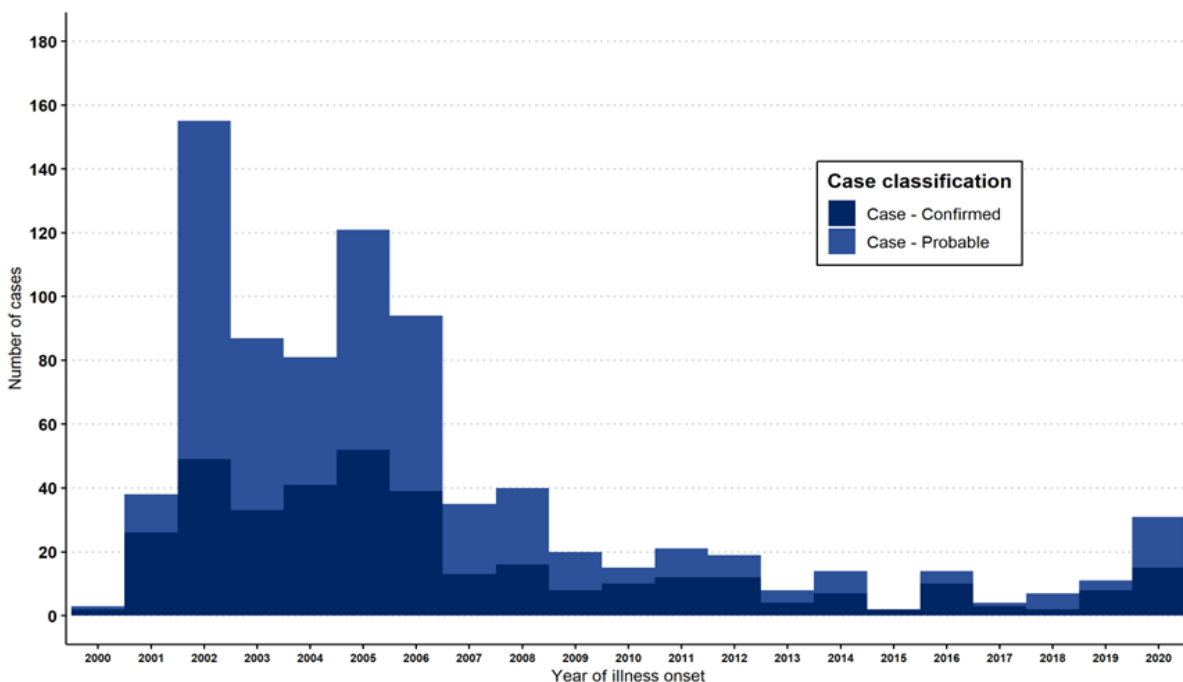
Since surveillance began in 2000, relatively high case incidence rates and sporadic outbreaks were observed from 2002–2006 in NSW, followed by a steady decline (Figure 3).

During 2020, 14 confirmed and 16 probable cases were notified in NSW (0.37 per 100,000); a threefold increase compared to 2019. These 30 cases were predominately male (53%, n=16), ranging in age from 25–81 years (mean: 57). One case identified as Aboriginal (3%). Twenty-one (70%) cases reported direct exposure to domestic birds (n=6) or wild birds (n=10), or both (n=5).

Six of those with wild bird exposures and 2 with pet bird exposures reported illness or death in the birds with which they had contact prior to their own illness. An additional 8 cases reported activities associated with exposure to potentially contaminated environments, including doing garden maintenance, motorised lawn mowing in areas contaminated by bird droppings, and cleaning aviaries also frequented by wild birds. One case was unable to be contacted for interview.

This higher number of psittacosis cases in NSW in 2020 may be explained by several factors, including environmental drivers of disease shedding (extensive bushfires) and increased testing of respiratory infections to rule out COVID-19 associated infections.

Figure 3: Trends in psittacosis notifications by case classification, NSW, 2000a–2020



5. Q Fever

Q fever is caused by the bacterium *Coxiella burnetii*. The main carriers of the disease are cattle, sheep, and goats but other animals, including marsupials, can also be infected. People are usually infected by inhaling aerosols or dust when working with infected animals, animal tissues or animal products. The bacteria survive for long periods in the environment as they are resistant to heat, drying and many disinfectants.

Key points:

- 206 confirmed cases notified in 2020.
- Adult males, Aboriginal people and populations in regional/remote areas were overrepresented.
- 8 cases were reported in children aged less than 16 years.
- Most adult cases (61%) worked in a known high-risk occupation.
- Most cases (92%) were exposed to animals or animal products, tissues, or discharges

During 2020, 206 confirmed cases of Q fever (2.5 cases per 100,000) were notified in NSW. This was a slight decrease compared to the five-year annual mean (236 cases, 3.1 cases per 100,000) (Figure 4). Most cases notified in 2020 were males (n=150, 73%), and cases ranged in age from 2–87 years (mean: 48) (Figure 5). Only 2 cases were acquired overseas (China and Yemen).

During this period, Indigenous status completeness for notified Q fever cases in NSW was 82% (n=170). Of these, 9 cases identified as Aboriginal or Torres Strait Islander. The rate for Q fever in Aboriginal and Torres Strait Islander residents in NSW was 3.1 per 100,000.

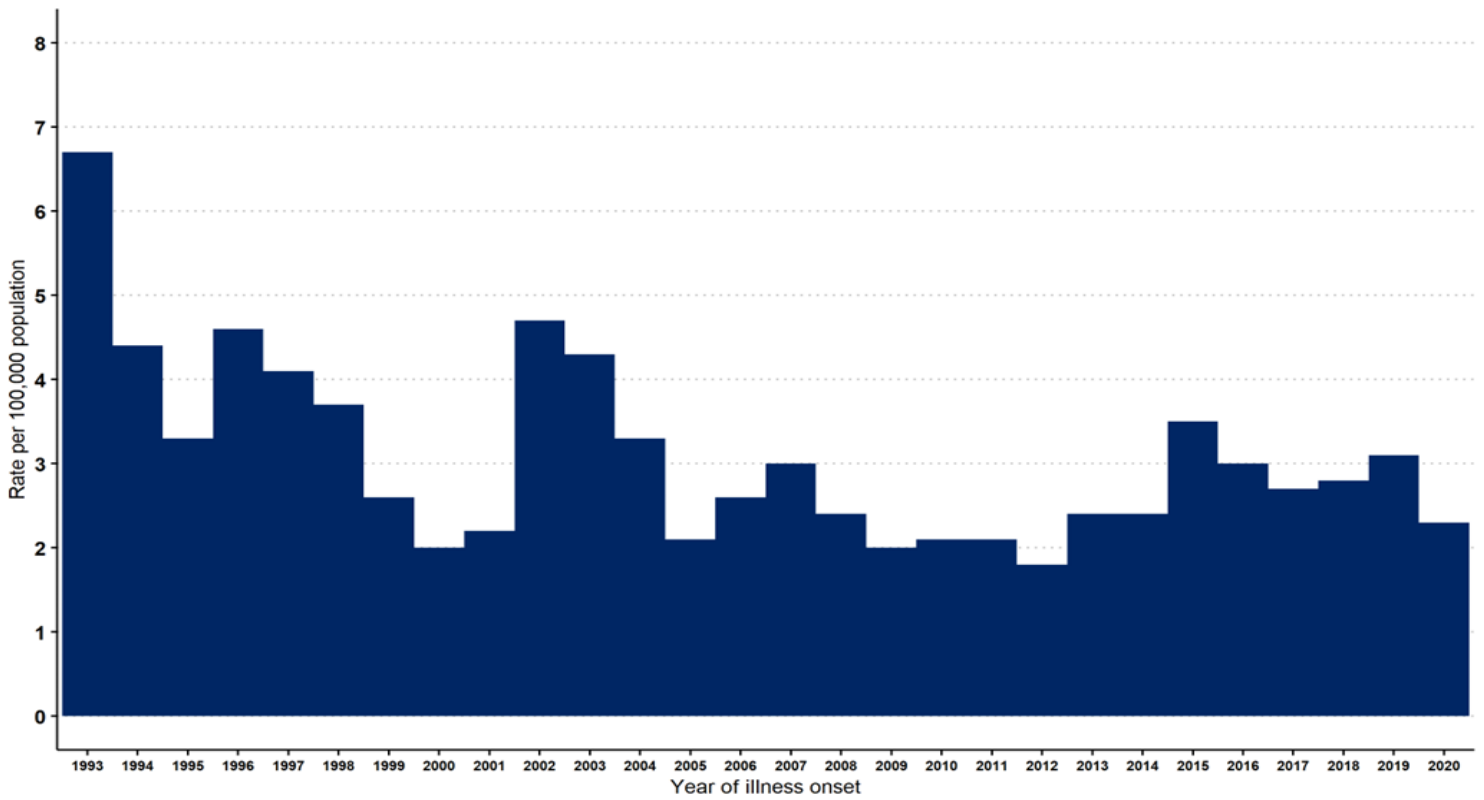
Compared to the five-year mean (2015–2019), the most substantive increases were observed in Central Coast and Northern NSW LHDs, whereas Far West and Western NSW observed a slight decrease (Table 1). The highest incidence of disease was observed in remote areas of the state (Figure 6) – especially Lachlan Shire (n=9, 144.9 per 100,000), Warrumbungle Shire (n=10, 104.7 per 100,000), Carrathool Shire (n=2, 78.1 per 100,000) and Warren Shire (n=2, 72.9 per 100,000) local government areas (LGAs).

Occupations were reported for 138 cases aged 16 years or over in 2020. Of these, 61% (n=84) worked in high-risk occupations, including: farmers, farm hands or property managers (n=58), shearers (n=7), abattoir and other meat industry workers (n=7), graziers (n=4), stockyard workers (n=3), veterinary professionals (n=1), or other high-risk occupations. The remainder of adult cases (39%, n=54) were retired, unemployed or worked in a non-animal related occupation. Eight infections were reported in children under 16 years of age.

Exposure history was available for 131 cases in 2020. Of these, most (92%, n=121) reported one or more types of exposure to animals or animal products, including exposures to livestock or their products (50%, n=66), direct contact with animal tissues or discharges (17%, n=22), exposures to native wildlife (15%, n=20), exposure to other animals or animal product (6%, n=8), or exposure to animal faeces or other products (4%, n=5). The remainder reported no discernible exposure to livestock or wildlife (8%, n=10).

Over the period 2018-2021, NSW Health is running a campaign to increase awareness about Q fever in the community and amongst GPs, including advertising in mass media and development of an [online learning module](#) hosted on the Australian College of Rural and Remote Medicine website. Further information and resources can be downloaded from the [NSW Health Q fever webpage](#).

Figure 4: Trends in Q fever notifications, NSW, 1993–2020



*1994: Vaccine introduced; †2001: National Q-fever management program commenced; ‡2007: National Q-fever management program end.

Figure 5: Q fever incidence rate by age, gender and Aboriginal and Torres Strait Islander status, NSW, 2020

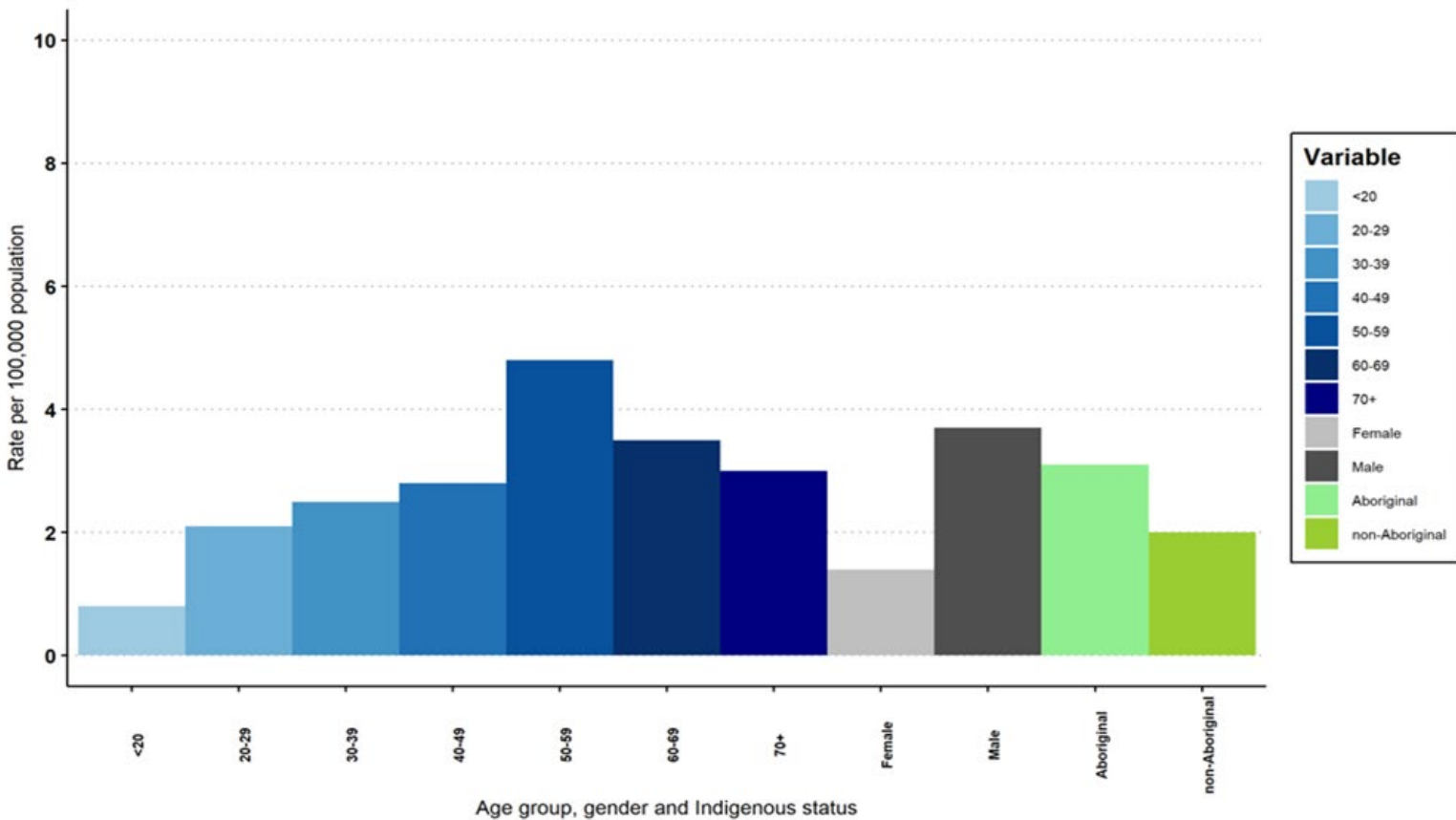
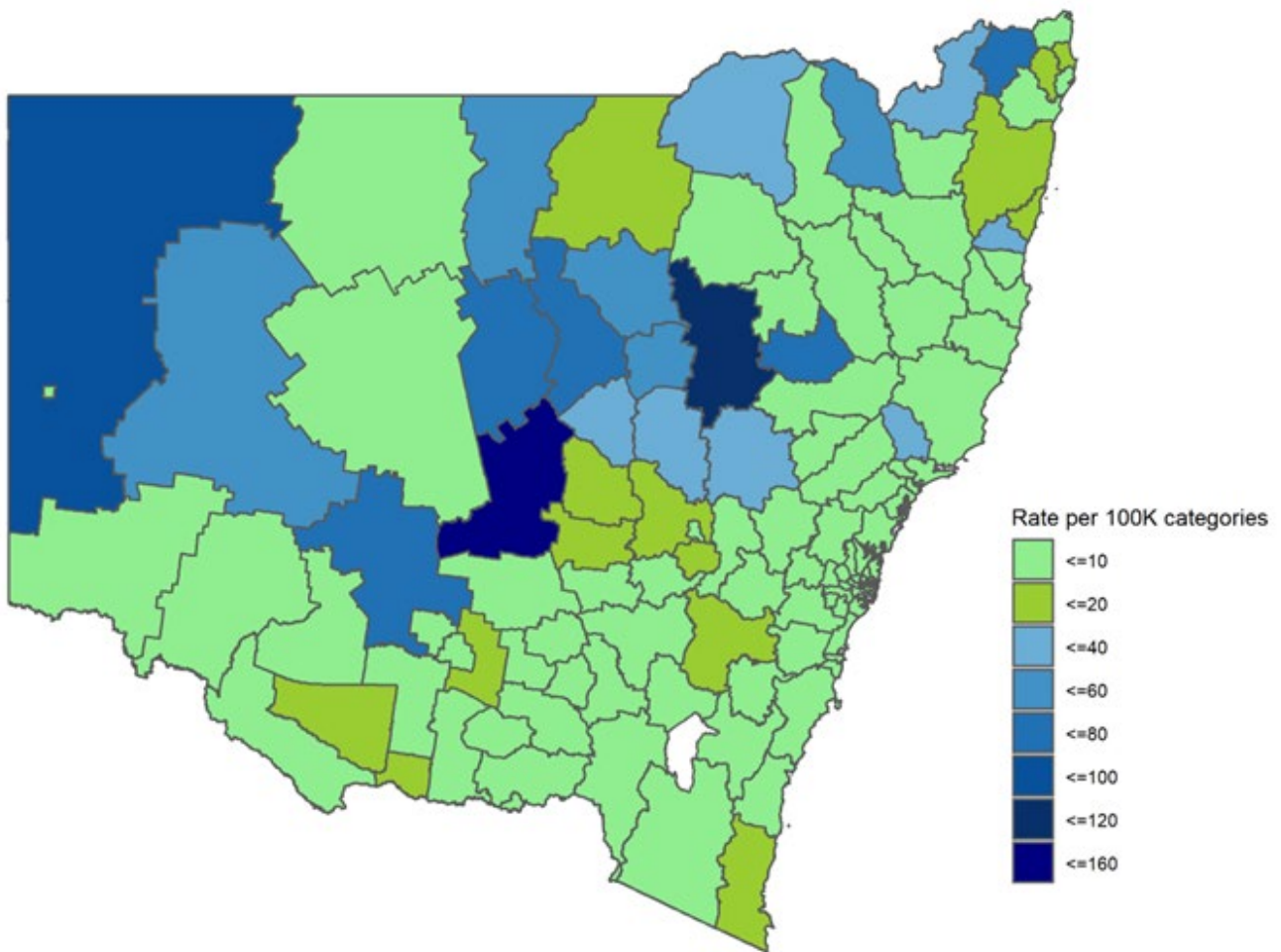


Figure 6: Q fever incidence rate by LGA, NSW, 2020



6. Rabies and other lyssavirus (including Australian Bat Lyssavirus)

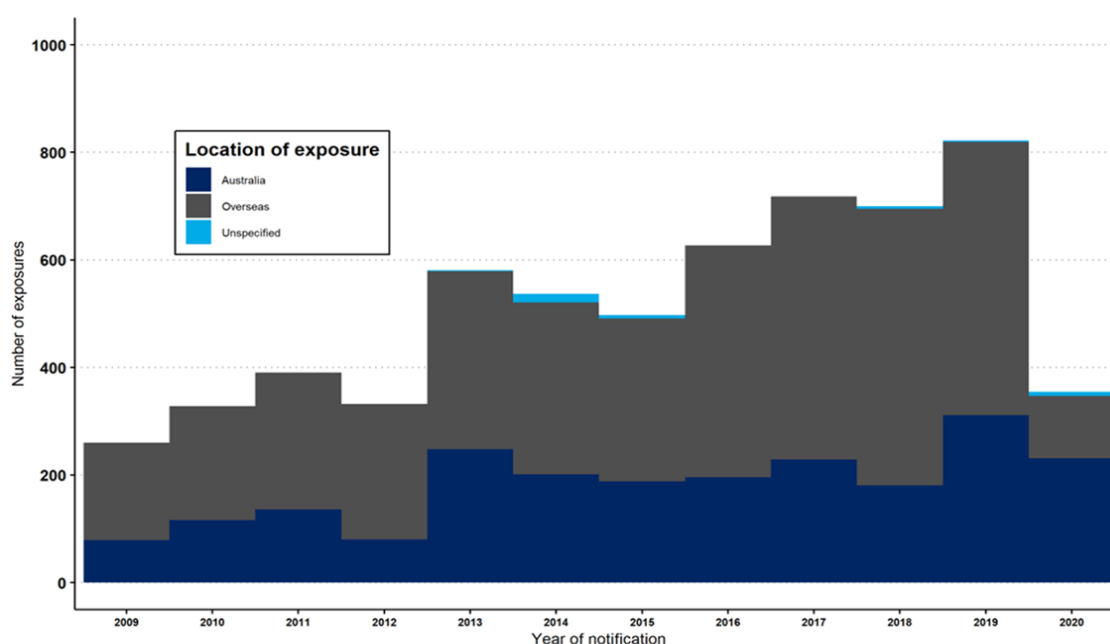
Lyssaviruses are a group of viruses that includes rabies and bat lyssavirus. Lyssavirus is carried by bats in Australia and worldwide. Rabies is carried by terrestrial mammals in many overseas countries. Both viruses are spread by bites and scratches from infected animals. Infections affect the central nervous system and are usually fatal. These diseases can be prevented by rapid and thorough cleaning of the wound and post-exposure prophylaxis (PEP).

Key points:

- No human cases notified in 2020.
- 355 exposures to potentially infected animals, of which 79% were assessed as requiring PEP to prevent infection.
- 97 exposures requiring PEP occurred overseas, of which 56% were in Southeast Asia; 38% were from dog bites/scratches, and 36% from non-human primate bites/scratches.
- 182 local exposures to bats requiring PEP occurred, of which 71% were from flying foxes. Five bats were positive for ABLV.
- 1,335 doses of vaccine and 1,158 vials of human rabies immunoglobulin (HRIG) were distributed for the purpose of PEP

During 2020, while there were no human infections of classical rabies or ABLV, a total of 355 potential exposures to lyssaviruses were notified to public health units. This represents a 57% overall reduction in the number of potential exposure events, compared to 2019 (n=822). This was predominantly owing to a reduction in the number of people exposed to potentially rabid animals during travel overseas (77% reduction), caused in part by the closure of Australia's international border to non-essential travel in March 2020 due to the COVID-19 pandemic (Figure 7). Of these exposures, 280 (79%) required PEP with either rabies vaccine or HRIG.

Figure 7: Exposures to rabies and other lyssaviruses by location, NSW 2009–2020



Overseas exposures

Of 116 exposures overseas (33%), PEP was initiated or continued for 97 people exposed to potentially rabid animals (84%). Of these, just over half occurred in males (n=50, 52%) and travellers aged 20–39 years accounted for the greatest proportion (n=55, 56%) – mean age: 31 years. The majority of overseas exposures requiring prophylaxis occurred in Southeast Asia (n=55, 56%); predominantly Indonesia or Thailand (Table 2). Most incidents involved bites or scratches from dogs (n=37, 38%), followed by primates (n=35, 36%).

Table 2: Potential overseas exposures to rabies and other lyssaviruses by location, NSW, 2020

Location	n	%
Southeast Asia:	55	56
Indonesia (including Bali)	28	29
Thailand	17	18
Philippines	4	4
Vietnam	3	3
Cambodia	3	3
South Asia ^b	8	8
China or Taiwan	6	6
Americas	6	6
Europe or Middle East	1	1
Other or Unknown	21	22
Oceania	0	0
Africa	0	0
Total	97	100

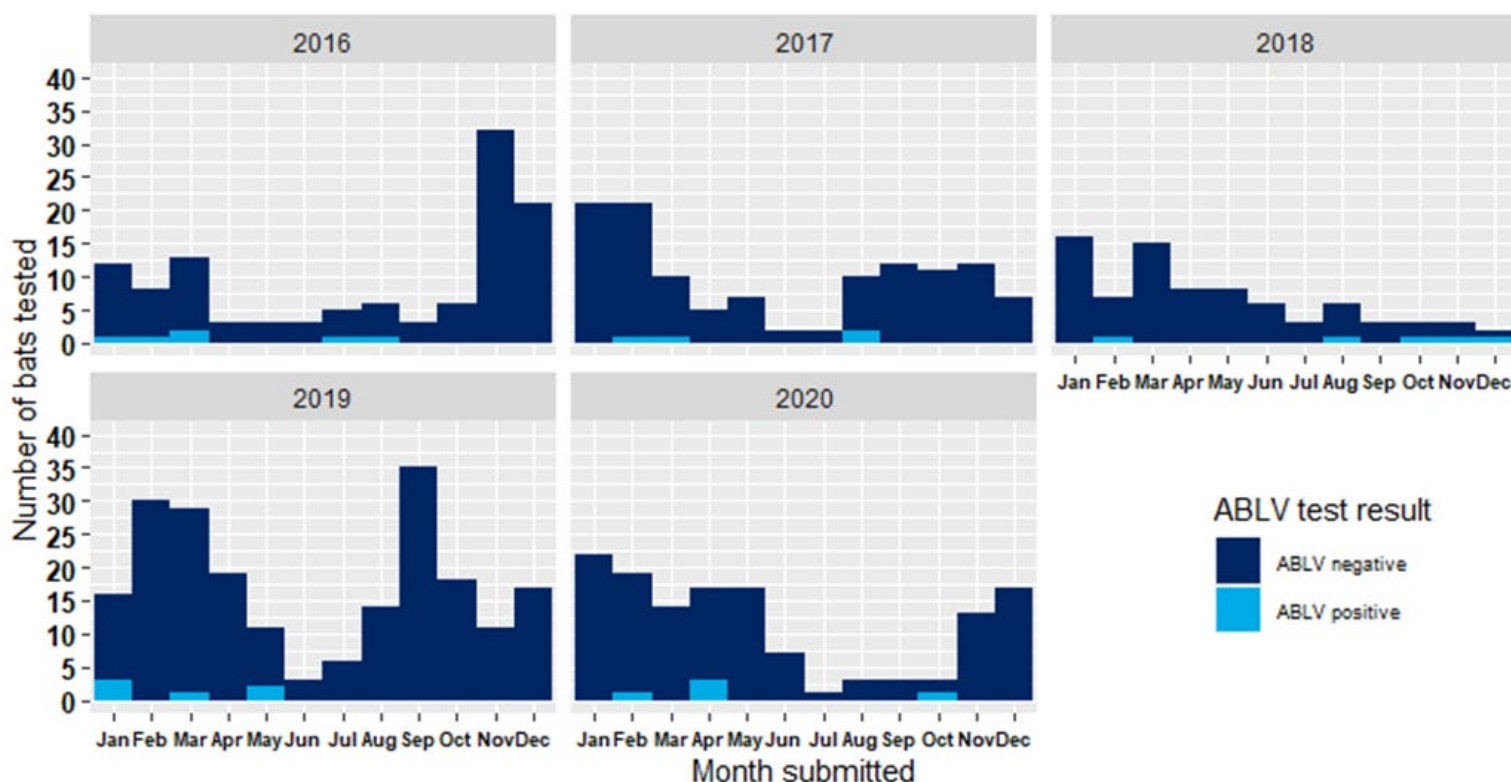
^b India, Sri Lanka, Nepal, Bangladesh, Bhutan, Pakistan

Local exposures

Of 231 exposures to bats in Australia reported during 2020 (65%), 182 required PEP (79%). The average age of persons exposed was 46 years. A higher proportion were in males (n=101, 55%). Occupation was reported for 78 exposures, of which 16% (n=37) were considered high-risk occupations (including wildlife workers/volunteers, veterinary professionals, etc.) and the remainder were members of the general public. The majority of bat exposures were megabats, which includes flying foxes (n=130, 71%).

Of 147 bats submitted for testing during 2020, 5 tested positive (3%) (see page 10). Submissions for testing peaked in January and December (Figure 8). The first positive bat was reported in February (n=1), followed by April (n=3) and October (n=1).

Figure 8: Number of bats tested for ABLV by month and year, NSW, 2016–2020



Post-exposure prophylaxis

NSW Health provides PEP, including vaccination and rabies immunoglobulin, free of charge to people potentially exposed to rabies and ABLV following a risk assessment with their medical professional (see [NSW Rabies and other lyssavirus infections control guidelines](#)). During 2020, NSW Health distributed 1,105 doses of rabies vaccine and 1,158 vials of HRIG to prevent infections, at a cost of approximately AUD 448,413.

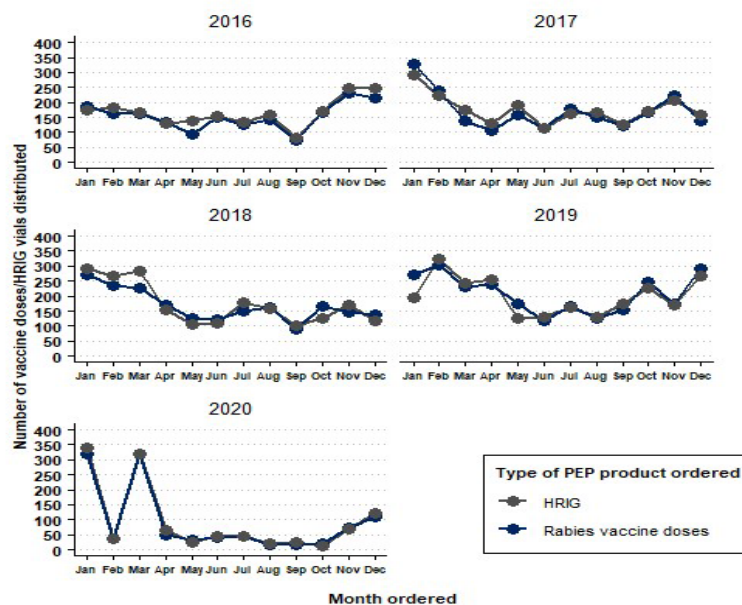
Most overseas exposures requiring PEP occurred among residents of metropolitan Sydney, particularly South eastern Sydney and Northern Sydney LHDs. The highest number of local exposures requiring PEP occurred among residents of Hunter New England and Northern NSW (Table 3).

Distribution rates of rabies vaccine peaked in January, March, and December 2020; whereas distribution rates of HRIG peaked in January, then declined significantly until increasing again from October to December. Overall, distribution rates of PEP were substantially lower in 2020 compared to recent years, consistent with the observed reduction in reported exposure events (Figure 9).

Table 3: Distribution of rabies vaccine and human rabies immunoglobulin by LHD, NSW, 2020

LHD	n		Total (%)
	Overseas	Local	
Central Coast	3	9	13 ^c (5%)
Far West	0	0	0
Hunter New England	7	36	43 (15%)
Illawarra Shoalhaven	3	17	20 (7%)
Mid North Coast	0	0	0
Murrumbidgee	0	10	10 (4%)
Nepean Blue Mountains	2	8	10 (4%)
Northern NSW	6	33	39 (14%)
Northern Sydney	21	17	38 (14%)
South Eastern Sydney	29	17	46 (16%)
South Western Sydney	7	4	11 (4%)
Southern NSW	0	4	4 (1%)
Sydney	7	7	14 (7%)
Western NSW	1	8	9 (3%)
Western Sydney	11	12	23 (8%)
NSW total	182	97	280

Figure 9: Distribution of rabies vaccine and human rabies immunoglobulin by month and year, NSW, 2016–2020



7. Tularaemia

Tularaemia is a rare bacterial disease caused by the bacterium *Francisella tularensis*. The infection is usually acquired from handling infected animals, bites of infected ticks or deer flies or from contaminated food or water. In Australia, ringtail possums have been associated with human infection and other wildlife may carry the disease.

Key points:

- 2 probable cases notified in 2020
- Both cases had physical contact with unwell wildlife, one of which was a ringtail possum.

During 2020, 2 (0.02 per 100,000) probable cases were notified in NSW; the first 2 cases detected in NSW since surveillance began in 2004.

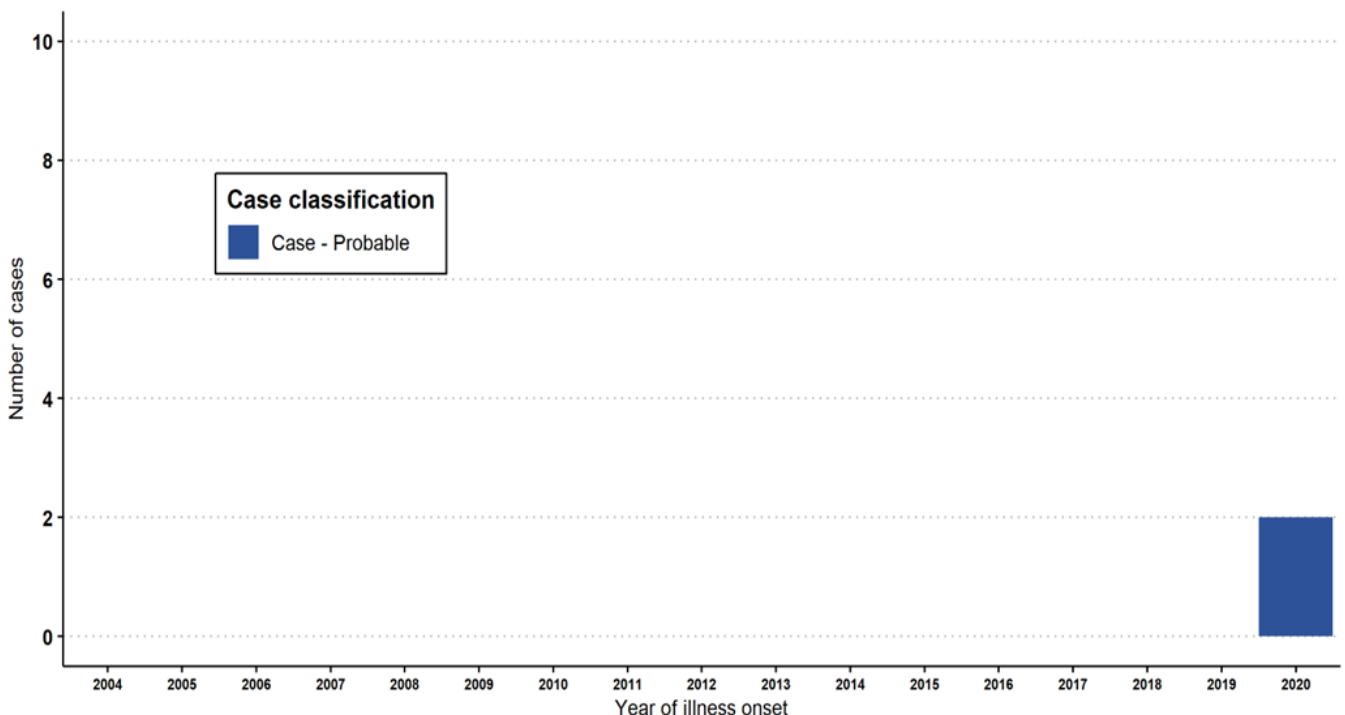
Both cases were adult women. One case reported being bitten and scratched by a ringtail possum that appeared obviously unwell. The second case had occupational exposure to multiple wildlife sources, potentially including possums.

Both infections were presumed to be Type B (*F. tularensis* subspecies *holarctica*), which has previously been isolated from common ringtail possums in NSW. Type B usually produces a mild ulceroglandular infection and is less virulent than Type A.

Both cases were appropriately treated with antibiotics and have since recovered from their infections. The specimens were referred to the United States Centers for Disease Control and Prevention (US CDC) for confirmatory testing, but neither case was able to be confirmed.

The animal sources of infection were unable to be identified for testing, despite attempts from multiple coordinating wildlife health agencies.

Figure 10: Trends in tularaemia notifications by case classification, NSW, 2004a–2020



8. Animal health events notified to NSW Health

Key points:

- Sporadic cases of ABLV, anthrax, brucellosis, psittacosis and Hendra virus infection were reported in animal populations in 2020

Notifications of significant zoonotic animal health events to the Department of Primary Industries (DPI) or Local Land Services (LLS) are rapidly communicated to NSW public health authorities. Depending on the disease and nature of the event, public health units (in collaboration with DPI, LLS and other relevant parties) will investigate human exposures and advise appropriate actions, which may include monitoring for symptoms and referral for laboratory testing and treatment. While animal health authorities work to confirm the diagnosis through laboratory tests at the Elizabeth Macarthur Agriculture Institute (EMAI) and the Australian Centre for Disease Preparedness (ACDP) and control spread in animal populations, public health authorities take steps to prevent human infections, such as providing education to reduce risk and post-exposure treatment, where indicated.

There were no incidents or clusters of highly pathogenic avian influenza, leptospirosis, terrestrial rabies or tularaemia reported in NSW animal populations during 2020.

During 2020, NSW authorities collectively responded to the following animal health events:

ABLV – 136 bats were submitted for testing following human exposures, exposure of a pet, or exhibiting signs suggestive of ABLV infection. Five bats tested positive for ABLV. Two of the positive bats were tested due to potential human exposure. In 2020, 4 investigations excluded ABLV infection in equines (3 investigations involving horses, and one investigation involving a donkey).

Anthrax – was investigated on 17 occasions as the cause of death of stock, of which one incident was confirmed. This event involving sheep occurred in January 2020, in a region within the anthrax belt of NSW. Shortly after infection was confirmed, the affected property and livestock were managed in accordance with biosecurity directions issued under the Biosecurity Act (2015) (e.g. tracing, movement restrictions and vaccination of at-risk livestock, carcass disposal, equipment decontamination, etc.). The public health unit determined all potential human exposures to be low-risk and no prophylactic treatment was required.

Brucellosis – samples from 179 dogs were submitted for *B. suis* testing during 2020, Of these, 25 were serologically positive. The majority of positive cases originated from the north west of NSW and had reported either contact with feral pigs or were fed raw feral pig meat. NSW DPI assists private veterinarians in assessing and managing the risks posed by *Brucella suis* infection in dogs, providing advice on infection control to prevent transmission to humans and other animals. All infections were reported to the local public health unit for human health assessment and advice.

Avian chlamydiosis – of the 44 birds that were tested for avian chlamydiosis in 2020, 5 were confirmed positive. Of the positive detections, 3 were from locations in the Blue Mountains, one in Sydney and one in Broken Hill. The detections coincided with human psittacosis cases in the same region, however the birds tested were not epidemiologically linked to reported human illness.

Equine Chlamydiosis – was investigated on 150 occasions in horses in NSW during 2020. *Chlamydia psittaci* was detected in 6 investigations. All infections were reported to the local public health unit for assessment of human contacts. Although the zoonotic potential of psittacosis from non-avian sources is not currently well understood, the case definition in the

NSW psittacosis control guideline was updated from 1 July 2019, to include epidemiological links to any animal with confirmed chlamydiosis.

Hendra virus infection – Of the 222 reports of sick or dead horses and 1 donkey where samples were submitted for Hendra virus testing in NSW during 2020, Hendra virus infection was confirmed on one property involving an unvaccinated horse. The event occurred in the Far North Coast of NSW in June 2020. The horse carcass was safely disposed of through burial and the property was managed in accordance with biosecurity directions issued under the *Biosecurity Act (2015)*. The event was reported to the local public health unit for assessment and was discussed by an expert panel. One person was deemed to be at high risk, and another at moderate risk of exposure to the infected horse. Both persons were offered prophylaxis with monoclonal antibodies. One young child was assessed as having low risk, and prophylaxis with monoclonal antibodies was not indicated. (Table 4).

Table 4: Human assessment and treatment following exposure to horses infected with Hendra virus, NSW, 2020

Month	Council Area	Number of Horses	Number of Human contacts			Human Risk Assessment
			High Risk	Moderate Risk	Low/Neg Risk	
June	Tweed Shire	1	1	1	1	3 people on the property were assessed, with each having high, moderate and low/negligible risk, respectively.
Total		1	1	1	1	

Only lists humans deemed 'exposed'. The table does not include people who wore appropriate personal protective equipment (PPE).

9. Appendices

Appendix 1: Methods

Human disease notifications:

Under authority of the [NSW Public Health Act 2010](#), NSW Health receives notifications of communicable diseases from laboratories, doctors, and hospitals. Cases are recorded on the NSW Notifiable Conditions Information Management System (NCIMS) – a confidential, internet-based system used by NSW public health units – and categorised based on the agreed [national cases definitions](#).

This report reflects notifications of anthrax, avian and other animal influenza virus infections, brucellosis, Hendra virus infections, leptospirosis, psittacosis, Q fever, and rabies and other lyssaviruses (including ABLV), recorded in NCIMS on or shortly after 15 September 2021. Unless specified otherwise, cases were categorised by calendar year based on notification date (i.e. the date of that public health were notified of the infection).

Incidence rates were calculated using mid-year estimated resident population (ERP) projections published by the Secure Analytics for Population Health Research and Intelligence (SAPHaRI) group, NSW Ministry of Health. This includes LGA based ERPs derived from estimates published by the NSW Department of Planning and Environment (prior to 2015)³ with projections from 2015 produced by using cubic spline interpolation, and Aboriginal/non-Aboriginal ERPs derived from estimates published by the Australian Bureau of Statistics.

The degree to which notification data reflect the true incidence of disease varies between conditions, as many people with infectious disease will not be diagnosed with the disease or notified. For some conditions (e.g. Q fever), where infections maybe asymptomatic or are not diagnosed, notifications likely underestimate the true incidence of disease. Notification data are also subject to retrospective changes – data are only accurate at the time of extraction.

Animal disease notifications:

Members of the public, veterinarians or animal owners or managers have a general biosecurity duty to notify certain suspected animal diseases under [legislation](#). This report reflects selected conditions prone to infect humans, notified to the DPI during 2020, and conveyed to public health authorities. This information is not intended to reflect overall incidence of disease in the animal population, but rather an indication of the scope of diseases upon which the DPI and NSW Health collaborate to prevent transmission to the public.

Rabies post-exposure treatment:

Doctors contact public health units for advice on the management of potential exposures to lyssaviruses. Where indicated, public health units arrange for the ordering, urgent delivery and administration of rabies vaccine and HRIG to prevent infection – a service provided free of charge to NSW residents. These events are routinely captured in NCIMS, and records of rabies vaccine and HRIG distribution are maintained by the Immunisation Unit.

Costs estimates provided in this report were based on the total number and costs of treatments distributed and courier distribution costs. This does not take into account any salaries, consumables, consultation costs, other incidental costs borne by NSW Health or costs associated with testing bats.

Appendix 2: Zoonoses notifiable to NSW human and/or animal health authorities

Disease	Status in NSW	Human health notification	Animal health notification
Anaplasmosis	sporadic		✓
Anthrax	sporadic	✓	✓
Arboviral infections	varies by virus	✓	some
Babesiosis	sporadic		✓
Borna disease	exotic		✓
Brucellosis - <i>Brucella suis</i>	sporadic	✓	✓
Brucellosis - NEC	exotic	✓	✓
Camelpox	exotic		✓
Campylobacteriosis	endemic	*	
Crimean-Congo haemorrhagic fever	exotic	✓	✓
Cryptosporidiosis	endemic	✓	
Cysticercosis – porcine, bovine	exotic/sporadic		✓
Encephalitides (tick-borne)	exotic		✓
<i>Escherichia coli</i> - STEC and HUS	endemic	✓	
Getah virus infection	exotic		✓
Giardiasis	endemic	✓	
Glanders	exotic		✓
Hendra virus infection except in pteropid bats	sporadic	✓	✓
Hepatitis E	sporadic	✓	
Influenza - highly pathogenic avian influenza	exotic	✓	✓
Influenza - swine/equine influenza	exotic	✓	✓
Leishmaniasis	exotic		✓
Leptospirosis	endemic	✓	
Listeriosis	endemic	✓	

Louping ill	exotic		✓
Lyssavirus - ABLV	endemic	✓	✓
Lyssavirus - Rabies	exotic	✓	✓
Menangle virus infection	sporadic		✓
Nairobi sheep disease	exotic		✓
Newcastle disease	exotic		✓
Nipah virus infection	exotic	✓	✓
Pigeon paramyxovirus	sporadic		✓
Plague	exotic	✓	
Psittacosis (Ornithosis) / Chlamydiosis in birds	endemic	✓	✓
Q Fever	endemic	✓	
Rift Valley fever	exotic	✓	✓
Salmonellosis - NEC	endemic	✓	
Salmonellosis - <i>Salmonella</i> Enteritidis	sporadic	✓	✓
SARS CoV	exotic	✓	
Transmissible spongiform encephalopathy	exotic	✓	✓
Trichinellosis	exotic		✓
Trypanosomiasis / Chagas' disease	exotic		✓
Tuberculosis - Bovine (<i>Mycobacterium bovis</i>)	exotic		✓
Tuberculosis - other mammal or avian	sporadic	✓	✓
Tularaemia	Exotic/sporadic	✓	✓
Turkey rhinotracheitis (avian metapneumovirus)	exotic		✓
Vesicular stomatitis virus	exotic		✓
Viral haemorrhagic fever, human – NEC	exotic	✓	
Warble-fly myiasis	exotic		✓
Wesselsbron disease	exotic		✓

NEC: Not elsewhere classified. * *Campylobacter* notifications commenced in NSW on 7 April 2019
Table correct as at 24 May 2019

Appendix 3: Additional sources of information

See NSW Health's [Infectious Diseases website](#) for further information for the general public and health professionals on all human health conditions presented in this report, as well as other notifiable conditions. This includes NSW-specific data and information, factsheets, and control guidelines on:

- [Anthrax](#)
- [Avian influenza](#)
- [Brucellosis](#)
- [Hendra virus](#)
- [Leptospirosis](#)
- [Psittacosis](#)
- [Q fever](#)
- [Rabies and ABLV](#)
- [Tularaemia](#).

See the DPI's [Animal health and diseases](#) and [Animal Biosecurity Zoonoses](#) websites for further information for general public, veterinarians, and animal health authorities about zoonoses in animals.

Appendix 4: List of acronyms

ABLV	Australian Bat Lyssavirus
ACDP	Australian Centre for Disease Preparedness
ACT	Australian Capital Territory
CDNA	Communicable Diseases Network Australia
DPI	Department of Primary Industries
EMAI	Elizabeth Macarthur Agriculture Institute
ERP	Estimated resident population
HRIG	Human rabies immunoglobulin
LGA	Local Government Area
LHD	Local Health District
LLS	Local Land Services
NCIMS	Notifiable Conditions Information Management System
NEC	Not elsewhere classified
NSW	New South Wales
NQFMP	National Q Fever Management Program
PCR	Polymerase chain reaction
PEP	Post-exposure prophylaxis
PPE	Personal protective equipment
SAPHRI	Secure Analytics for Population Health Research and Intelligence
Yr	Year

10. Contributors and acknowledgments.

This report was developed by staff of the One Health Branch and the Immunisation Unit, Communicable Diseases Branch, Health Protection NSW in collaboration with the NSW Department of Primary Industries.

Protecting the health of the community is a collaborative effort, involving public health units, clinicians, laboratory scientists, affected communities, and other government and community-based organisations. We sincerely thank all those involved for the role they played in NSW in 2020.

11. References

- 1 World Health Organization. Health Topics: Zoonoses. [updated: 2016; cited: 28 Apr 2016]. Available from: http://www.who.int/zoonoses/control_neglected_zoonoses/en/
- 2 Communicable Diseases Network Australia (CDNA). Australian national notifiable diseases and case definitions. [updated: 15 Apr 2016; cited: 5 May 2016]. Available from: <http://www.health.gov.au/casedefinitions>
- 3 Centre for Epidemiology and Evidence. Health Statistics New South Wales. Sydney: NSW Ministry of Health. Available at: www.healthstats.nsw.gov.au/Indicator/dem_pop_lhnmap/dem_pop_lhnmap. Accessed (19/02/2021).
- 4 Australian Bureau of Statistics. 3238.0 - Estimates and Projections, Aboriginal and Torres Strait Islander Australians, 2001 to 2026 [updated: 17 Dec 2015; cited: 5 May 2016]. Available from: <http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/3238.0Main+Features12001%20to%202026?OpenDocument>

