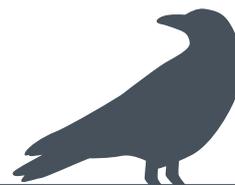


# Wildlife Health Australia



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Wildlife Health Australia

Wildlife Health Australia (WHA)<sup>2</sup> is the peak body for wildlife health in Australia. WHA was established as the Australian Wildlife Health Network in 2002 as an Australian Government initiative to coordinate wildlife health surveillance information across Australia to support Australia's animal health industries, human health, biodiversity, trade and tourism. WHA collates information from multiple sources into a national database – the Wildlife Health Information System (eWHIS)<sup>3</sup> – including submissions by WHA subscribers, state and territory WHA coordinators, researchers, and university, zoo and sentinel clinic veterinarians.

During the quarter, 144 wildlife disease investigation events were reported in eWHIS (Table 1 and Figure 6) and samples were collected from 1819 wild birds for avian influenza (AI) surveillance.

This report details some of the disease and mortality events in free-living wildlife recorded in eWHIS this quarter. WHA thanks all those who submitted information for this report.



**Table 1 Number of disease investigations reported into eWHIS, April to June 2018<sup>a</sup>**

Mammals				Birds <sup>c,d</sup>	Reptiles
Bats <sup>b</sup>	Marsupials	Feral mammals	Monotremes		
64	27	2	1	48	2

<sup>a</sup> Disease investigations may involve a single animal or multiple animals (e.g. mass mortality event).

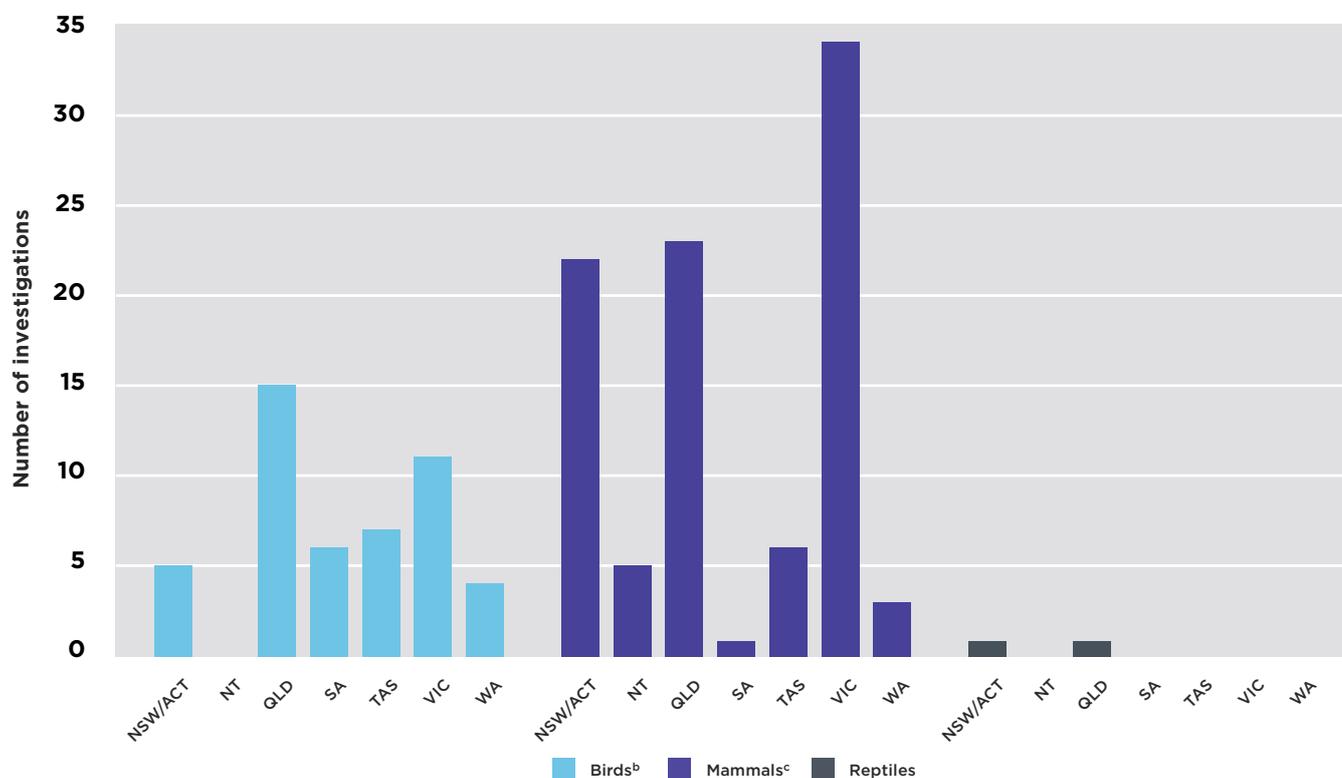
<sup>b</sup> The majority of bat disease investigations are single bats submitted for Australian bat lyssavirus testing.

<sup>c</sup> Additional sampling for targeted avian influenza surveillance is presented elsewhere in this report.

<sup>d</sup> Includes free-ranging birds (native or feral species) and a small number of events involving birds from zoological collections and captive breeding programs.

<sup>2</sup> [www.wildlifehealthaustralia.com.au/Home.aspx](http://www.wildlifehealthaustralia.com.au/Home.aspx)

<sup>3</sup> [www.wildlifehealthaustralia.com.au/ProgramsProjects/eWHISWildlifeHealthInformationSystem.aspx](http://www.wildlifehealthaustralia.com.au/ProgramsProjects/eWHISWildlifeHealthInformationSystem.aspx)



**Figure 6 Number of disease investigations reported, by taxonomic class and jurisdiction, into eWHIS, April to June 2018<sup>a</sup>**

- a The chart shows the number of disease investigations or events reported into eWHIS. Each disease investigation may involve one or multiple animals.
- b Birds includes free-ranging birds (native or feral species) and a small number of events involving birds from zoological collections and captive breeding programs.
- c Investigations involving mammals include individual bats submitted for Australian bat lyssavirus testing.

## Wild bird mortality event summary – Newcastle disease and avian influenza exclusion

WHA received 48 reports of wild bird mortality or morbidity investigations from around Australia during the quarter. Investigations may involve a single animal or multiple animals (e.g. mass mortality event). A breakdown of wild bird events by taxonomic order is given in Table 2. Reports and samples from sick and dead birds are received from members of the public, private practitioners, universities, zoo wildlife clinics and wildlife sanctuaries. AI was excluded by polymerase chain reaction (PCR) testing for influenza A in 23 of the events as part of Australia's general (sick and dead bird) AI surveillance program. Disease caused by AI was excluded in the remaining 25 events based on clinical signs, history, histopathology, prevailing environmental conditions or other diagnoses. Avian

paramyxovirus was excluded in 14 events by PCR testing specifically for Newcastle disease (ND) virus or pigeon paramyxovirus type 1 (PPMV-1), or both. PPMV-1 was diagnosed in a number of wild bird mortality events this quarter, as detailed above.

### Pigeon paramyxovirus type 1 detected in feral pigeons

This quarter, Wildlife Health Australia received reports of PPMV-1 detections in Victoria and, for the first time, in the Australian Capital Territory.

In the Australian Capital Territory, a feral pigeon (rock pigeon; *Columba livia*) morbidity and mortality event started in February 2018 in the suburb of Mitchell. Over a 6-week period, approximately 15 to 20 birds were found dead each day. Before death, pigeons were observed with polydipsia (drinking in excess). Three birds submitted for investigation were

in poor nutritional condition. PPMV-1 was confirmed by PCR on pooled cloacal and tracheal swabs tested at NSW DPI Elizabeth Macarthur Agricultural Institute, Menangle. AI, *Chlamydia psittaci* and pigeon rotavirus were excluded via PCR assay.

In the same month at a property in the suburb of Weston in the Australian Capital Territory, approximately seven feral pigeons (*Columbiformes* sp. unidentified) presented with neurological signs, including tumbling and difficulty in righting, over a 10-day period. The birds were from a flock of 30 to 50 permanently resident feral pigeons at the property. One pigeon was vomiting and presented with watery faeces. The birds were easy to catch and subsequently died or were euthanased due to the severity of illness. Four pigeons were submitted to an ACT Government veterinarian for gross necropsy and collection of samples for histopathology and specific

**Table 2 Wild bird disease investigations, by taxonomic order, reported into eWHIS, April to June 2018**

Bird order	Common name for bird order <sup>a</sup>	Events reported <sup>b</sup>
Anseriformes	Magpie geese, ducks, geese and swans	3
Columbiformes	Doves and pigeons	5
Charadriiformes	Shorebirds	1
Falconiformes	Falcons	4
Passeriformes	Passerines or perching birds	12
Pelecaniformes	Ibis, herons and pelicans	2
Psittaciformes	Parrots and cockatoos	23
Sphenisciformes	Penguins	1
Strigiformes	Typical owls and barn owls	2
Suliformes	Gannets, boobies and cormorants	1

a Common names adapted from: del Hoyo and Collar, 2014, *HBW and BirdLife International Illustrated Checklist of the Birds of the World. Volume 1 – Non-passerines*, Lynx Editions, Barcelona. (Courtesy of the Australian Government Department of the Environment and Energy.)

b Disease investigations may involve a single or multiple bird orders (e.g. mass mortality event). This quarter six wild bird events involved multiple bird orders. Two events involved the bird orders Passeriformes and Columbiformes, the third event involved Falconiformes and Strigiformes, the fourth involved Passeriformes and Charadriiformes, the fifth involved Passeriformes, and Pelecaniformes, and the sixth involved Passeriformes and Strigiformes.

testing at Elizabeth Macarthur Agricultural Institute.

On gross assessment, all birds had prominent keels (were underweight) but full crops. Histopathological lesions were consistent with PPMV-1 and included necrotising pancreatitis ( $n = 4$ ), tubulointerstitial nephritis ( $n = 3$ ) and encephalitis ( $n = 1$ ). Pooled tracheal swabs and cloacal swabs ( $n = 4$  birds) tested positive for PPMV-1 via PCR assay. AI and pigeon rotavirus were excluded via PCR assay.

In the following months, PPMV-1 was confirmed in two domestic pigeon lofts in the Australian Capital Territory.

A number of sick pigeons from the first loft were presented to a local veterinarian in April following the death of eight pigeons from a free-fly aviary (domestic pigeons and a small number of feral pigeons are free to fly in and out of the aviary). The pigeons had not been vaccinated by the owners.

Samples from one dead pigeon, necropsied by the ACT Government veterinarian and submitted to Elizabeth Macarthur Agricultural Institute for investigation, had histopathological

lesions in the kidneys and pancreas consistent with PPMV-1. This was confirmed by positive PCR results. Cloacal samples from two additional sick birds tested positive for PPMV-1 via PCR assay at Elizabeth Macarthur Agricultural Institute.

PPMV-1 was confirmed via PCR assay in a second unvaccinated loft in the Australian Capital Territory, after an investigation of a mortality and morbidity event involving nine birds. In June, seven feral pigeons (*C. livia*) died at a property in the centre of Canberra. Despite the event being noted as unusual, samples were not submitted for testing due to autolysis.

One feral pigeon (*C. livia*) was found weak and unable to fly in Fitzroy North, Melbourne, Victoria in May. The incident was reported to an Agriculture Victoria veterinary officer and the bird submitted to Agrificio Veterinary Diagnostic Services, Bundoora for testing.

The cloacal swab was positive for PPMV-1 via PCR assay, and microscopic renal lesions were also consistent with the disease.

Also in May, another feral pigeon (*C. livia*) found weak was

submitted to Agrificio for testing as part of a multi-species mortality event in Werribee involving house sparrows (*Passer domesticus*). PPMV-1 was detected in cloacal swabs by PCR assay. Three house sparrows submitted to Agrificio as part of the investigation tested negative for avian paramyxoviruses via PCR assay. This event was consistent with a common environmental factor and suspected to be due to organophosphate poisoning.

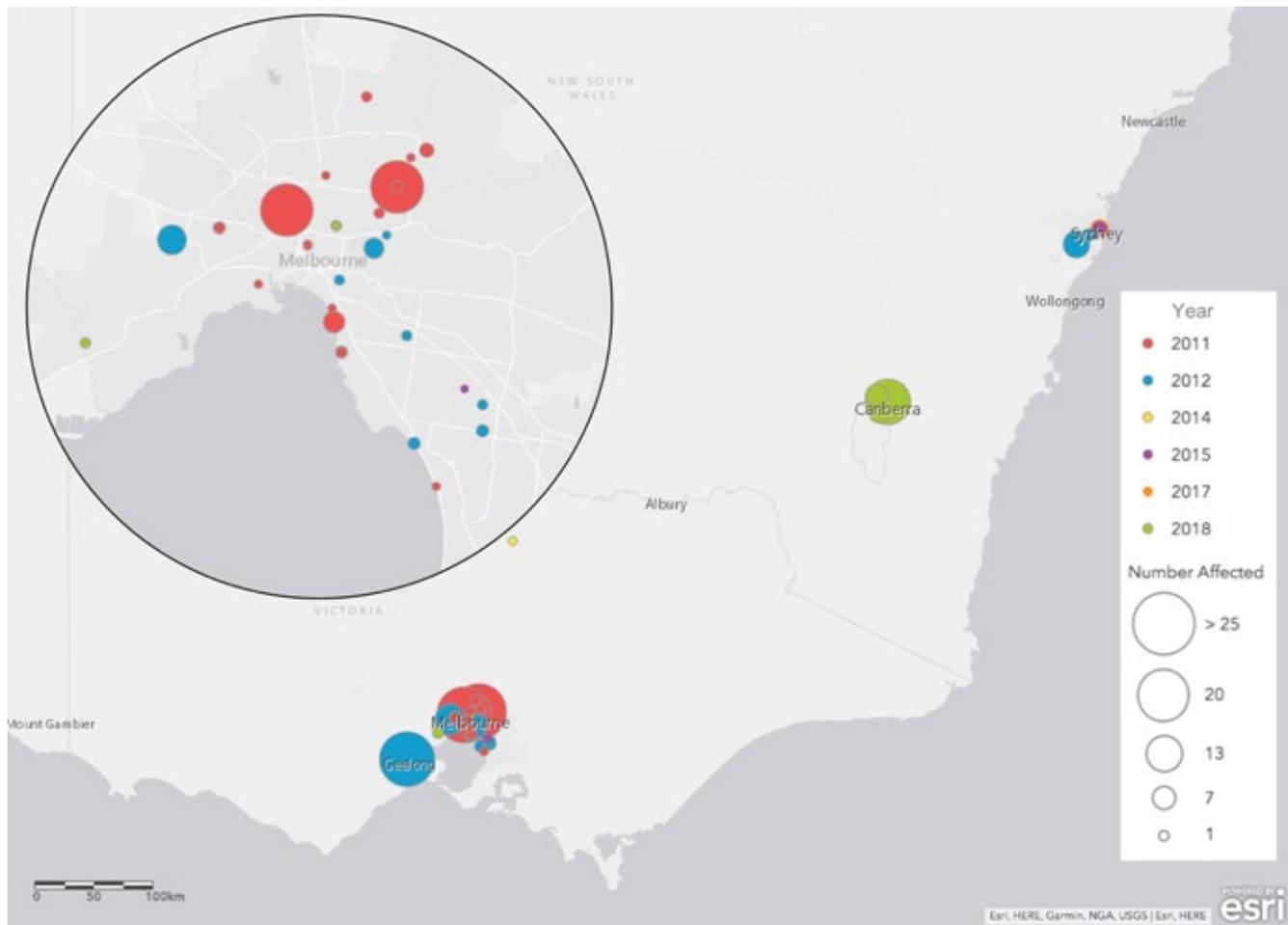
PPMV-1 was first detected in domestic loft pigeons in Shepparton, Victoria, in August 2011.<sup>4</sup> The first confirmed case in a free-ranging bird was reported in October 2011 in a feral pigeon in Melbourne, Victoria.<sup>5</sup> Since then, PPMV-1 in free-ranging feral pigeons has been detected in the Greater Sydney region, New South Wales and Victoria, primarily around Melbourne. In several cases, the likely source of infection was domestic pigeons.<sup>6,7</sup> This is the first detection of PPMV-1 in pigeons in the Australian Capital Territory (Figure 7).

4 AHSQ, Vol. 16, Issue 3.

5 AHSQ, Vol. 16, Issue 4.

6 AHSQ, Vol. 17, Issue 1.

7 AHSQ, Vol. 17, Issue 4.



**Figure 7 Feral pigeon mortality events in which birds were tested positive for pigeon paramyxovirus type 1 (PPMV-1), by year and number of birds affected in each suburb, reported to eWHIS**

NSW: 2012, 2015, 2017; Victoria: 2011, 2012, 2014, 2015, 2017, 2018; ACT: 2018

A total of 40 PPMV-1 positive events have been reported into the eWHIS database between 2011 and 2018 (Figure 7), involving from one to more than 600 birds per event.

With the exception of one collared sparrowhawk (*Accipiter cirrocephalus*) and one spotted turtle dove (*Streptopelia chinensis*), both detections in January 2012 in Melbourne (AHSQ Vol. 17 Issue 1), all events reported into eWHIS have involved feral pigeons. The collared sparrowhawk is the only native bird that has tested positive for PPMV-1. The spotted turtle dove is an introduced feral species. Of note, the affected collared sparrowhawk was a juvenile bird and may have been predisposed to infection with PPMV-1 due to concurrent fungal infection. Necropsy findings in the collared sparrowhawk

included mycotic pneumonia and mycotic hepatitis. In addition to histological lesions, there were molecular evidence (PCR) and positive immunohistochemistry (IHC) diagnostic for infection with PPMV-1. PPMV-1 infected feral pigeons had previously been confirmed in the immediate area and it is likely that infection in the sparrowhawk may be the result of high virus challenge associated with recent predation on diseased pigeons, based on reports from other countries in which pigeon paramyxovirus is endemic.<sup>8</sup>

The ability of the PPMV-1 strain present in Australia to cause disease in native pigeons and

doves remains unknown.<sup>9</sup> Australia has 22 native species of pigeons and doves;<sup>10</sup> to date, none have tested positive for PPMV-1. While PPMV-1 has caused disease in poultry in Europe and South Africa, a study using the Australian variant suggests this virus has limited disease potential in poultry.<sup>11</sup> The PPMV-1 detection in domestic and feral pigeons and other avian taxa emphasises the importance of continued surveillance and biosecurity measures in Australia.

9 WHA (2016). *Avian paramyxoviruses and Australian wild birds*. Fact sheet, November 2016, Wildlife Health Australia. [www.wildlifehealthaustralia.com.au/FactSheets.aspx](http://www.wildlifehealthaustralia.com.au/FactSheets.aspx)

10 AHSQ, Vol. 16, Issue 3.

11 Shan S, Middleton D, Williams D, Wang J, Gard G, Bruce K, Bingham J, Douglas S, Frazer L, Walker S & McCullough S (2013). Pathogenicity study in chickens of an avian paramyxovirus type 1 isolated from domestic pigeons in Victoria, 2011. Oral presentation. In: *Australian Association on Veterinary Laboratory Diagnosticians*, 28–29 November 2013, Geelong, Victoria. <https://publications.csiro.au/rpr/pub?pid=csiro:EPI42328>

8 Forbes NA & Simpson GN (1997). A review of viruses affecting raptors. *Veterinary Record* 141: 123126.

## Avian influenza surveillance

Australia's National Avian Influenza Wild Bird (NAIWB) and Surveillance Program comprises two sampling components: pathogen-specific risk-based surveillance by sampling of apparently healthy, live and hunter-killed wild birds and; general surveillance by investigating significant unexplained morbidity and mortality events in wild birds, including captive and wild birds within zoo grounds (with a focus on exclusion testing for AI virus subtypes H5 and H7).

Samples from sick or dead birds were discussed earlier. Sources for targeted wild bird surveillance data include state and territory government laboratories, universities and samples collected through the Northern Australia Quarantine Strategy (NAQS).

During the quarter, pathogen-specific, risk-based surveillance occurred at sites in New South Wales, the Northern Territory, Queensland, Victoria, Tasmania and Western Australia. Cloacal and faecal environmental swabs were collected from 1819 waterbirds, with 1819 tested for AI. No highly pathogenic AI viruses were identified. However, this quarter targeted surveillance activities continued to find evidence of a wide range of subtypes of low pathogenic AI (LPAI) viruses, including low pathogenic H5.<sup>12, 13, 14</sup> Molecular analysis of AI viruses detected through the targeted surveillance activities contribute to understanding of AI viruses dynamics in Australia, help maintain currency of diagnostic tests, and serve as a point of



comparison when novel AI virus strains of importance emerge overseas.

### Salmonella spp. infection in wild pelicans and ravens

Salmonellosis was diagnosed in two separate incidents in wild birds this quarter, one in Victoria and one in South Australia. Salmonellosis outbreaks are not uncommon in wild birds and are often associated with areas where birds congregate, such as bird feeders and watering areas.<sup>15</sup>

In April, a group of four Australian pelicans (*Pelecanus conspicillatus*)

with abnormal wing conformation were observed around a pier at Swan Bay on the Bellarine Peninsula in Victoria. Three of the pelicans were caught and examined at Melbourne Zoo. Pelican 1 was thin, had chronic cloacal prolapse and abnormal carriage of the right wing. Radiographs showed increased soft tissue opacity and sclerotic bone in the left shoulder joint. Blood analysis showed moderate anaemia, hypoproteinaemia and leucocytosis. Pelican 2 was in good body condition with luxation of the right elbow. Pelican 3 was severely emaciated.

The three birds were euthanased due to poor prognosis. On necropsy, all three had hepatomegaly with suspected miliary abscesses.

12 Grillo T et al (2015). Avian influenza in Australia: a summary of 5 years of wild bird surveillance. *Australian Veterinary Journal*. 93 (11): 387-393

13 Haynes L et al (2009). Australian surveillance for avian influenza viruses in wild birds (July 2005 to June 2007). *Australian Veterinary Journal*. 87 (7): 266-272

14 [www.wildlifehealthaustralia.com.au/ProgramsProjects/WildBirdSurveillance.aspx](http://www.wildlifehealthaustralia.com.au/ProgramsProjects/WildBirdSurveillance.aspx)

15 Velarde R et al (2012). Septicemic salmonellosis caused by *Salmonella* Hessarek in wintering and migrating song thrushes (*Turdus philomelos*) in Spain. *Journal of Wildlife Diseases* 48(1): 113-121.

Pelican 1 had a large abscess in the left shoulder that had destroyed the normal architecture of the joint. Histopathological changes in Pelican 1 included multifocal granulomatous hepatitis and splenitis with intralesional bacteria. Swabs from the shoulder abscess and liver cultured *Salmonella* spp. group B. This bird showed severe chronic lymphoplasmacytic and granulocytic enteritis with intramucosal trematodes and possible protozoa.

Pelican 2 showed acute and chronic multifocal hepatitis with degenerating parasites present in some lesions.

Pelican 3 had acute multifocal hepatic necrosis and mild hepatitis with intralesional bacteria in one instance, which was considered consistent with *Salmonella* infection.

In suburban Adelaide in April, a member of the public reported one sick and three dead Australian ravens (*Corvus coronoides*) in their backyard. The ravens had reportedly been fed raw chicken necks by a neighbour. The sick bird was lethargic, had slightly droopy wings and coughed when trying to eat. It was euthanased due to poor prognosis.

AI and avian paramyxovirus were excluded by PCR testing of cloacal and tracheal swabs in the euthanased bird and one of the birds found dead. Histology revealed similar lesions in the two birds, including granulomatous pneumonia, duodenitis, myositis, myocarditis and ventriculitis, with clusters of gram-negative coccobacilli within the lesions. *Salmonella* sp. cultured from pooled lung, liver and kidney samples was identified as *Salmonella enterica* subsp. *enterica* serotype Hessarek. This serotype was identified in 2011 in an Australian raven that presented with nystagmus and head tremor. *S. Hessarek* has been identified in

an Australian magpie (*Cracticus tibicen*) in Victoria. Outside Australia, this serotype has been described in outbreaks in song thrushes (*Turdus philomelos*) in Spain and starlings (*Sturnus vulgaris*) in Israel.<sup>11,16</sup> It is reported to have caused egg-associated salmonellosis outbreaks in humans in Australia.<sup>17</sup>

## Australian bat lyssavirus

Reports to WHA for the quarter included 66 bats tested for Australian bat lyssavirus (ABLV) from the Australian Capital Territory, New South Wales, Northern Territory, Queensland, South Australia, Victoria and Western Australia.

Bat submissions were made for a variety of reasons:

- 30 cases involved contact with a pet dog (24) or cat (5) or both (1)
- 17 cases involved contact with the potential for ABLV transmission to humans; of these
  - five were also associated with trauma (e.g. netting or barbed wire fence entanglement, fracture)
  - two displayed neurological signs (e.g. behavioural changes, paralysis)
  - two involved contact with a pet cat
  - one displayed other (non-neurological) signs
  - the remainder had no further history reported
- 11 cases were associated with trauma (e.g. netting or barbed wire fence entanglement, fracture)
- three bats displayed other (non-neurological) signs (sudden death)

- two bats displayed neurological signs (e.g. aggression, paralysis)
- two bats were found dead
- one bat had no further history reported at this time.

During the quarter, three flying-foxes were confirmed positive for ABLV by fluorescent antibody test or PCR assay for pteropid ABLV ribonucleic acid (RNA), or both. Details of the cases are as follows:

- A juvenile male black flying-fox (*P. alecto*) from south-east Queensland was found hanging low in a public street. In care, it was behaving aggressively (attacking suspended fruit) and died overnight. There were no significant gross findings on necropsy. Some gliosis and Negri-like bodies were detected histologically in the brain.
- A female grey-headed flying-fox (*P. poliocephalus*) from Victoria, which was found on the ground, was submitted for ABLV testing due to potentially infectious human contact.
- A black flying-fox from south-east Queensland was reported to be aggressive, and potentially infectious human contact had occurred when a person tried to rescue the bat.

In the two cases where there was potentially infectious human contact, clinical advice was provided by an experienced public health official.

More information on ABLV testing of bats in Australia is available in [ABLV Bat Stats](#).<sup>18</sup> ABLV is a nationally notifiable disease in Australia. Cases of suspect ABLV infection or exposure should be reported to the Emergency Animal Disease Watch Hotline on 1800 675 888.

<sup>16</sup> Singer N et al (1977). Isolation of *Salmonella* Hessarek from starlings (*Sturnus vulgaris*). *Avian Diseases* 21, 117-119

<sup>17</sup> Moffatt CR et al (2016). *Salmonella* Typhimurium and outbreaks of egg-associated disease in Australia, 2001 to 2011. *Foodborne Pathogens and Disease*, 13(7), 379-385

<sup>18</sup> [www.wildlifehealthaustralia.com.au/ProgramsProjects/BatHealthFocusGroup.aspx](http://www.wildlifehealthaustralia.com.au/ProgramsProjects/BatHealthFocusGroup.aspx)