Ten cases of Australian bat lyssavirus (ABLV) infection were reported in bats in Australia between January and June 2020, four from New South Wales, four from Victoria and two from Queensland (Table 1). These cases are described below.

**New South Wales**
Three grey-headed flying-foxes (*Pteropus poliocephalus*) and an unspecified flying-fox (*Pteropus* sp.) from the south coast, Sydney and northern rivers regions of NSW were found to be infected with ABLV in the first half of 2020. All four presented with neurological signs. One bat was found hanging low in a tree, then fell and showed jerking movements and head tremors. The others presented with various signs such as twitching, shaking, biting, change in voice and weakness in the legs.

**Victoria**
Four grey-headed flying-foxes from the Melbourne region were found to be infected with ABLV from January to June. One presented with neurological signs and died in transit. Two were found on the ground, and one was found with a broken foot.

(continued overleaf)
Bats are submitted for ABLV testing for a variety of reasons. A common reason is contact between the bat and a person with the potential for ABLV transmission (e.g. a bite or scratch). Bats are also regularly submitted following contact with a pet dog or cat (Figure 1). Bats displaying unusual or aggressive behaviour or other neurological signs may be tested; these signs can occur with ABLV infection but can also be due to a number of other diseases. Bats that show other clinical signs e.g. respiratory signs, bats that die or are euthanased due to trauma, and bats that are found dead may also be submitted for testing.

Figure 1: ABLV tested bats – Contact with people and pets

Figure 1 presents reported human-bat contacts which, based on Young & McCall 2010, is an underestimate of the true contact frequency. Not all bat contact is reported, and for the majority of reports the bat is not available for testing. Some of the bats that had human contact also had contact with a pet (not shown in the graph).

ABLV prevalence in bats and public health significance

There are no recent surveys on the prevalence of ABLV infection in wild bats. Surveys of wild-caught bats in the early 2000s indicated an ABLV prevalence in the wild bat population of less than 1%. ABLV infection is more common in sick, injured and orphaned bats, especially those with neurological signs. People are more likely to have contact with bats that are unwell or debilitated, as these bats may be found on or near the ground. ABLV infection causes a range of clinical signs in bats, which can include abnormal behaviour such as uncharacteristic aggression, paralysis or paresis, and seizures. The behavioural changes may increase the likelihood of a person or pet being bitten or scratched when coming in contact with the bat. The likelihood of a person developing ABLV disease from contact with a bat is influenced by a number of factors including whether the bat was ABLV-infected, the type of contact e.g. bite or scratch, the vaccination status of the person, and whether the person sought medical attention.
Some of the bats that come into contact with people or pets are tested for ABLV. The percentage of ABLV infection in bats submitted for testing is of interest as an indicator of public exposure, however it is also heavily influenced by factors affecting which bats are submitted for testing.

A total of 252 bats were tested for ABLV in Australia between January and June 2020 (Table 2). Ten cases of ABLV infection were reported in bats (4.0% of the bats submitted for testing) (Table 3). As described above, testing of unwell bats is not representative of the whole bat population; consequently these results over-estimate the level of ABLV infection in the wider bat population.

The number of bats submitted for ABLV testing appears to be returning to normal after an unusually high number of submissions in 2019, which was believed to be due to starvation, heat stress and bushfires resulting in large numbers of sick and weak bats. Similarly, the proportion of tested bats infected with ABLV has returned to the usual range for the first half of 2020, compared to a lower than normal level in 2019.

### Table 2: ABLV testing by bat species (Jan - Jun 2020)

<table>
<thead>
<tr>
<th>Species</th>
<th>No. tested</th>
<th>No. ABLV infected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flying-foxes, blossom &amp; tube-nosed bats</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Pteropus poliocephalus</em> (Grey-headed flying-fox)</td>
<td>115</td>
<td>8</td>
</tr>
<tr>
<td><em>Pteropus alecto</em> (Black flying-fox)</td>
<td>62</td>
<td>0</td>
</tr>
<tr>
<td><em>Pteropus scapulatus</em> (Little red flying-fox)</td>
<td>13</td>
<td>0</td>
</tr>
<tr>
<td><em>Pteropus sp.</em></td>
<td>16</td>
<td>2</td>
</tr>
<tr>
<td>Insectivorous bats (microbats)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Chalinolobus gouldii</em> (Gould’s wattled bat)</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td><em>Nyctophilus geoffroyi</em> (Lesser long-eared bat)</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td><em>Chalinolobus morio</em> (Chocolate wattled bat)</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td><em>Molossidae</em> sp.</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td><em>Nyctophilus walkeri</em> (Pygmy long-eared bat)</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td><em>Vespertilionidae</em> sp.</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td><em>Rhinolophus megaphyllus</em> (Eastern horseshoe bat)</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td><em>Vespertulus regulus</em> (Southern forest bat)</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td><em>Vespertulus darlingtoni</em> (Large forest bat)</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td><em>Miniopterus</em> sp.</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td><em>Vespertulus vulgarus</em> (Little forest bat)</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td><em>Chalinolobus</em> / <em>Chalinolobus</em></td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td><em>Nyctophilus</em> / <em>Nyctophilus</em></td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td><em>Ozimops planiceps</em> (South-eastern free-tailed bat)</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Microbat; species not identified</td>
<td>17</td>
<td>0</td>
</tr>
<tr>
<td>TOTAL</td>
<td>252</td>
<td>10</td>
</tr>
</tbody>
</table>

### Table 3: ABLV infection (%) in bats submitted for testing (Jan-Jun 2020)

<table>
<thead>
<tr>
<th>Species</th>
<th>No. tested</th>
<th>No. infected*</th>
<th>% infected*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flying-foxes, blossom &amp; tube-nosed bats</td>
<td>206</td>
<td>10</td>
<td>4.9%</td>
</tr>
<tr>
<td>Microbats</td>
<td>46</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>252</td>
<td>10</td>
<td>4.0%</td>
</tr>
</tbody>
</table>

* This figure represents the percentage of ABLV infection in the bats tested. The level of ABLV infection in the wider bat population is estimated to be significantly lower.
* In one bat there was an equivocal FAT or PCR result. This bat is not included in these figures as it was not confirmed to be ABLV infected.
ABLV is a virus that infects Australian flying-foxes and insectivorous bats.

ABLV is closely related to rabies virus, but distinct from it.

ABLV can infect people and other mammals with a fatal outcome. ABLV infection has led to the deaths of three people, two horses and many bats in Australia.

Community members should not handle bats. If you find an injured or sick bat, contact a wildlife care organisation or your local veterinarian.

People trained in the care of bats should be vaccinated and always use appropriate protection when interacting with bats.

ABLV is transmitted by the saliva of an infected animal introduced via a bite or scratch, or by contamination of mucous membranes or broken skin. In the event of a bat bite, scratch or other significant contact, seek medical attention URGENTLY. Bite or scratch wounds should immediately be washed thoroughly with soap and copious water for approximately 15 minutes and a virucidal antiseptic applied. Bat saliva in the eyes or mouth should be rinsed out immediately and thoroughly with water.

For more information contact your local Public Health agency for advice.

ABLV can also be transmitted to other mammals. Prevent pets and other animals from coming into contact with bats. If an animal might have been bitten or scratched by a bat, seek urgent veterinary advice.

If you suspect a bat is infected with ABLV contact your biosecurity authority (department of agriculture or primary industries) for advice about testing.

Where to find more information: See page 5 & 6.

Clinical signs of ABLV

An ABLV infected bat may display any of these clinical signs:

- Abnormal behaviour such as excitation / agitation / aggression
- Paralysis or paresis
- Unprovoked attacks
- Unusual vocalisation
- Inability to fly
- Convulsions / seizures / tremors

APPARENTLY HEALTHY BATS WITH NORMAL BEHAVIOURS MAY STILL BE INFECTED WITH ABLV

DO NOT ATTEMPT TO HANDLE AN INJURED, UNWELL OR AGGRESSIVE BAT — REPORT IT TO YOUR LOCAL WILDLIFE SERVICE, VET OR BAT CARER GROUP

Bat facts

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An unprecedented cluster of Australian bat lyssavirus in *Pteropus conspicillatus* indicates pre-flight flying fox pups are at risk of mass infection


Seroprevalence of three paramyxoviruses; Hendra virus, Tioman virus, Cedar virus and a rhabdovirus, Australian bat lyssavirus, in a range expanding fruit bat, the Grey-headed flying fox (*Pteropus poliocephalus*)

https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0232339

Abstract: “Habitat-mediated global change is driving shifts in species’ distributions which can alter the spatial risks associated with emerging zoonotic pathogens…. Over three years, we investigated the seroepidemiology of paramyxoviruses and Australian bat lyssavirus in a range-expanding fruit bat, the Grey-headed flying fox (*Pteropus poliocephalus*), in a new camp in Adelaide, South Australia… Unexpectedly, all sera were negative for Australian bat lyssavirus…”

Media release: 11/05/2020 The University of Adelaide: Flying foxes in SA exposed to zoonotic viruses

Canberra hailstorm leaves more than 300 bats dead in Commonwealth Park

21/01/2020 The Canberra Times: “ACT Wildlife president Marg Peachey said volunteers from the group had found 322 bats that had died or needed to be euthanised after the destructive storm. Volunteers worked for seven hours on Monday to treat injured bats that had fallen from trees or had been pelted by hailstones…”

Bushfires & extreme heat during summer - selection of media

7/01/2020 National Geographic: Flying foxes are dying en masse in Australia’s extreme heat

7/01/2020 The Northern Daily Leader: Tamworth flying fox numbers dwindle as the heat soars

8/01/2020 The Grenfell Record: Local flying fox colonies threatened with rising temperatures and fires [NSW]

20/01/2020 The Western Weekender: “Hot conditions spark spike in flying fox deaths [Western Sydney]
This document has been approved by the Wildlife Health Australia (WHA) Bat Health Focus Group. Using a collaborative One Health approach, the Bat Health Focus Group considers bat health issues in relation to the broader context of biosecurity, public health, livestock health and environmental impacts in Australia. Members come from organisations including Australian and State Government departments of agriculture, public health and environment; CSIRO Australian Animal Health Laboratory, universities, the Australasian Bat Society and the Australian Speleological Federation. Members include veterinarians, biologists, ecologists, virologists, epidemiologists and wildlife/bat carers.

For further information please contact WHA on admin@wildlifehealthaustralia.com.au

### Australian Bat Lyssavirus Report

This report presents the latest information on Australian bat lyssavirus (ABLV) testing across Australia. Information has been made available by CSIRO Australian Animal Health Laboratory, Janine Barrett PhD thesis 2004 (with permission), QLD Health, zoo & wildlife veterinarians, universities, Wildlife Health Australia members, and State/Territory WHA Coordinators (representatives of Chief Veterinary Officers), and is collated by Wildlife Health Australia. More detailed information is available in the electronic Wildlife Health Information System (eWHIS): www.wildlifehealthaustralia.com.au

### References


### State/Territory WHA Coordinators

If you would like information on ABLV testing or wish to report a suspected ABLV infected bat please contact your State/Territory Department of Primary Industries/Agriculture or local WHA Coordinator (below).

<table>
<thead>
<tr>
<th>STATE</th>
<th>CONTACT</th>
<th>PHONE</th>
<th>EMAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT</td>
<td>Wendy Townsend</td>
<td>(02) 6205 3737</td>
<td><a href="mailto:wendy.townsend@act.gov.au">wendy.townsend@act.gov.au</a></td>
</tr>
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<td>NSW</td>
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<td><a href="mailto:claire.harrison@dpi.nsw.gov.au">claire.harrison@dpi.nsw.gov.au</a></td>
</tr>
<tr>
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<td><a href="mailto:cathy.shilton@nt.gov.au">cathy.shilton@nt.gov.au</a></td>
</tr>
<tr>
<td>QLD</td>
<td>Anita Gordon</td>
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<td><a href="mailto:anita.gordon@daf.qld.gov.au">anita.gordon@daf.qld.gov.au</a></td>
</tr>
<tr>
<td>SA</td>
<td>Allison Crawley</td>
<td>(08) 8429 0866</td>
<td><a href="mailto:Allison.Crawley@sa.gov.au">Allison.Crawley@sa.gov.au</a></td>
</tr>
<tr>
<td>TAS</td>
<td>Annie Philips</td>
<td>(03) 6165 4549</td>
<td><a href="mailto:annie.philips@dpipwe.tas.gov.au">annie.philips@dpipwe.tas.gov.au</a></td>
</tr>
<tr>
<td>VIC</td>
<td>Mark Hawes</td>
<td>(03) 9032 7275</td>
<td><a href="mailto:Mark.Hawes@agriculture.vic.gov.au">Mark.Hawes@agriculture.vic.gov.au</a></td>
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<tr>
<td>WA</td>
<td>Hennie Swanepoel</td>
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