Wildlife Health Australia

What's up with flying-fox health?

Keren Cox-Witton
Wildlife Health Australia

Photo: Sarah (antean) / Flickr

Who is Wildlife Health Australia?

WHA is the coordinating body for wildlife health in Australia

Core funding from Department of Agriculture and State/Territory Governments

A network of >700 wildlife health professionals

International connections

Coordinates Australia's general wildlife health surveillance system

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Bat Health Focus Group

Bat health issues within the context of public health, domestic animal health, biosecurity and environmental impacts in Australia

- Federal and State / Territory Government
  - Public health, Agriculture, Environment
- CSIRO-AAHL
- Researchers & scientists
  - Veterinarians, biologists, ecologists, virologists, epidemiologists
- Australasian Bat Society
- Wildlife carers / bat carers
- Australian Speleological Federation

Collaborative One Health approach

Today

Diseases of flying-foxes – latest updates
Reporting disease events
Keeping up to date

Cartoon: Jason Adam Katzenstein

Australian bat lyssavirus

- ABLV infects Australian flying-foxes and insectivorous bats.
- Similar to but distinct from rabies virus.
- Transmitted by saliva introduced via a bite or scratch, or contamination of mucous membranes or broken skin.
- Can cause neurological signs in bats e.g. paralysis, inability to fly, tremors, seizures, unusual vocalization, abnormal aggression
- Can spill over into other species – humans, horses
- REMINDER: always use appropriate PPE when handling bats, maintain current rabies immunity, first aid and medical attention for a bite, scratch or other significant contact

ABLV - updates

Cases

- No further **non-bat cases** since horses and human in 2013. Still no infection confirmed in dogs or cats, but antibodies detected in dogs (exposure).
- Outbreak of ABLV in **juveniles** in care in 2016. Reminder that bats of any age can be infected.

Policy

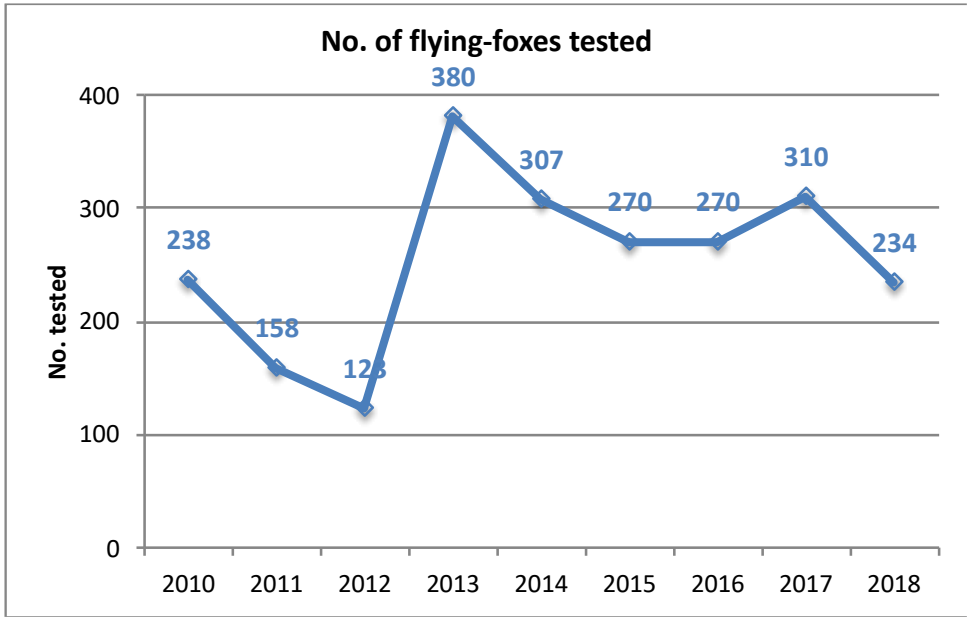
- **AUSVETPLAN** manual revision. New appendix on managing ABLV risk in bats in captivity/care: prevention, reducing risk to humans, dealing with a suspect bat, managing in-contact bats
- **Public health guidance:** revision of the rabies/ABLV SoNG and Immunisation Handbook

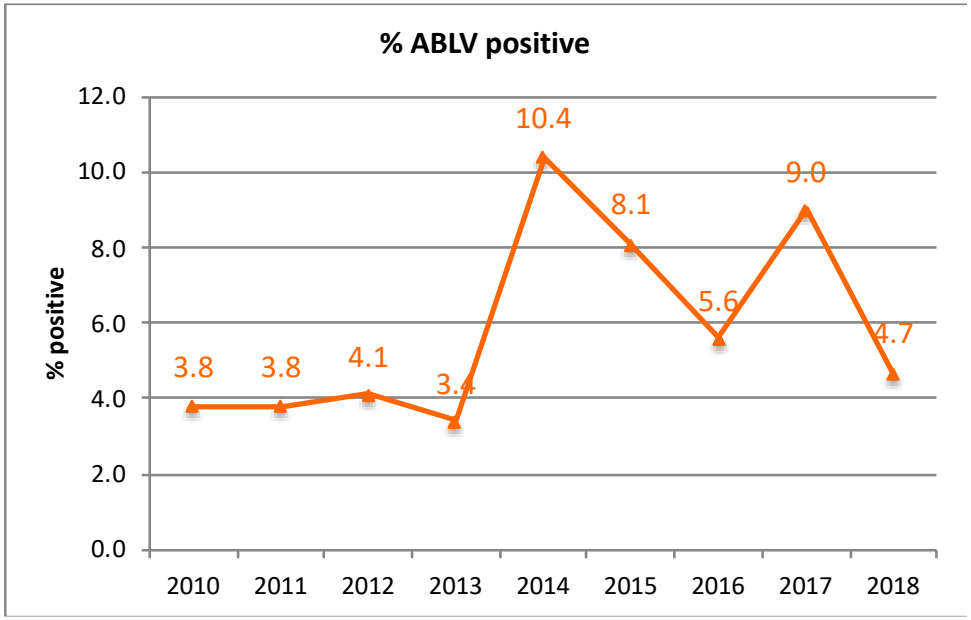
Wright T (2013) A dog tests antibody positive for lyssavirus. NSW Animal Health Surveillance July-September 2013, 3–4.
NSW Department of Primary Industries (2016). CVO Bulletin to Wildlife Carers: Australian bat lyssavirus infection in juvenile bats.

ABLV - updates

ABLV testing of flying-foxes 2010-18

- Over 2,000 flying-foxes tested (human/pet contact, neurological signs, trauma, found dead). Increased submissions due to media attention e.g. 2013 human & horse cases, heat stress events.
- 141 flying-foxes infected. Proportion each year ranges 3.4 - 10.4%. Variation could be a real effect OR change in why bats are submitted. [Not representative of wild bat population]
- Analysis for publication underway.





Hendra virus - updates

2019 horse case

- Scone, June: Hendra virus infection confirmed in an unvaccinated stock horse.
- Southern-most case of HeV (previously Kempsey) and first case in the Hunter Valley.
- Flying-fox roost assessment by research team including bat ecologists. Small numbers of black flying-foxes (primary host for HeV) found in some roosts. Pooled urine sampling under roosts.
- High horse population in Hunter Valley - considerable public interest, increase in vaccination uptake for horses.

Hendra virus in the Hunter Valley region (2019). NSW Animal Health Surveillance, January–June 2019, Issue 2019/1

Botulism in flying-fox aviary - NSW

- March 2019, NSW North Coast flying-fox release facility: wildlife carer reported sudden onset of paralysis and death affecting all 29 animals (mostly black flying-foxes, some grey-headed). Similar but less severe events at the same facility in 2014 and 2017.
- Protruding tongue, inability to swallow & hang, weakness, breathing difficulty.
- Post mortem on 7 bats, samples to NSW government lab (EMAI): no significant pathology in most, all negative for ABLV.
- Gastrointestinal tract samples from 2 of 5 bats positive for Botulinum C toxin (qPCR).
- High blowfly numbers – fly egg masses on chopped fruit suspected as source of botulism toxin.
- Believed to be the first time that botulism has been documented in flying-foxes.
- Example of an unusual disease event in wildlife that was reported and investigated.

Phillip Kemsley, North Coast LLS: Botulism in bats (2019). NSW Animal Health Surveillance, January–June 2019, Issue 2019/1

Disease reporting - what to look out for

- Ecologists, biologists, field researchers, rangers, land managers, carers…. have first-hand experience and know what's 'normal'
- Increased numbers of sick or dead bats – 'clusters'
- Unusual signs – something you haven't seen before
- Change in pattern – in a new species, a new location or a different time of year

Cartoon courtesy of Robert Johnson

How to report

Who would you call?

- Wildlife care group
- Veterinarian

Who else may need to know? What else should you do?

- Report to a government agency – what to expect
- Submit samples for testing – get advice from the lab before collecting

Photo: James Cox

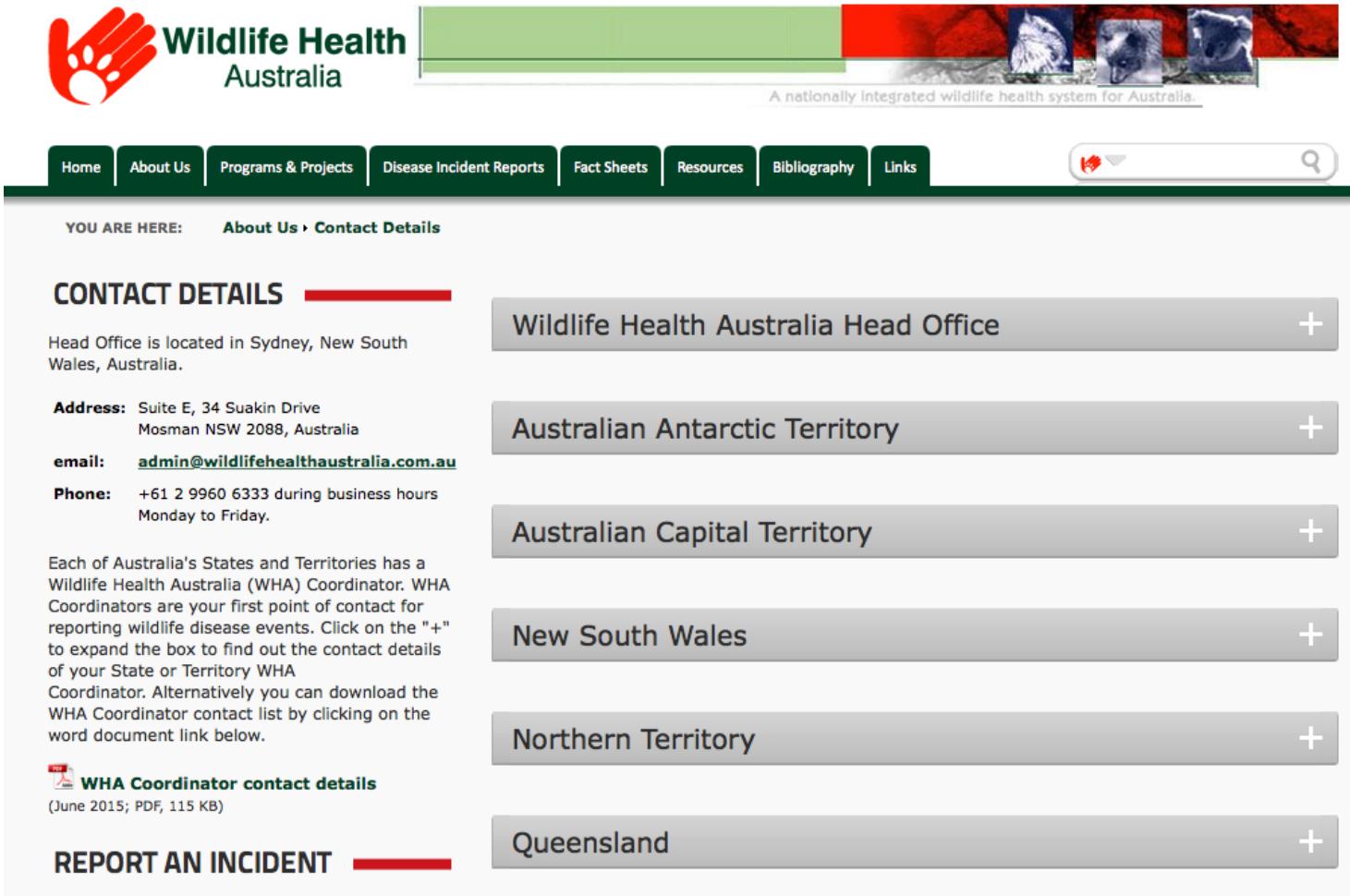
If you see any ***signs of disease that are unusual or clusters of wildlife deaths***
you should contact your local **WHA Coordinator** or call the
Emergency Animal Disease Watch Hotline: **1800 675 888**

Wildlife Health Australia

WHA website

www.wildlifehealthaustralia.com.au

About Us - Contact Details



Keeping up-to-date: Wildlife Health Fact Sheets

Brief, factual information on >100 wildlife diseases in Australia

ABLV, Coronaviruses, Hendra Virus, Menangle Virus, Zoonoses in Australian Bats

www.wildlifehealthaustralia.com.au/FactSheets.aspx

Wildlife Health Australia

Hendra virus and Australian wildlife

Fact sheet

Introductory statement

Hendra virus (HeV) causes a potentially fatal disease of horses and humans. HeV emerged in 1994 and cases to date have been limited to Queensland (Qld) and New South Wales (NSW), where annual incidents are now reported. Flying-foxes are the natural reservoir of the virus. Horses are infected directly from flying-foxes or via their urine, body fluids or excretions. All human cases have resulted from direct contact with infected horses. Evidence of infection has been seen in two dogs that were in contact with infected horses. HeV has attracted international interest as one of a group of diseases of humans and domestic animals that has emerged from bats since the 1990s. HeV does not cause evident clinical disease in flying-foxes and direct transmission to humans from bats has not been demonstrated. Ongoing work is required to understand the ecology and factors driving emergence of this disease.

Aetiology

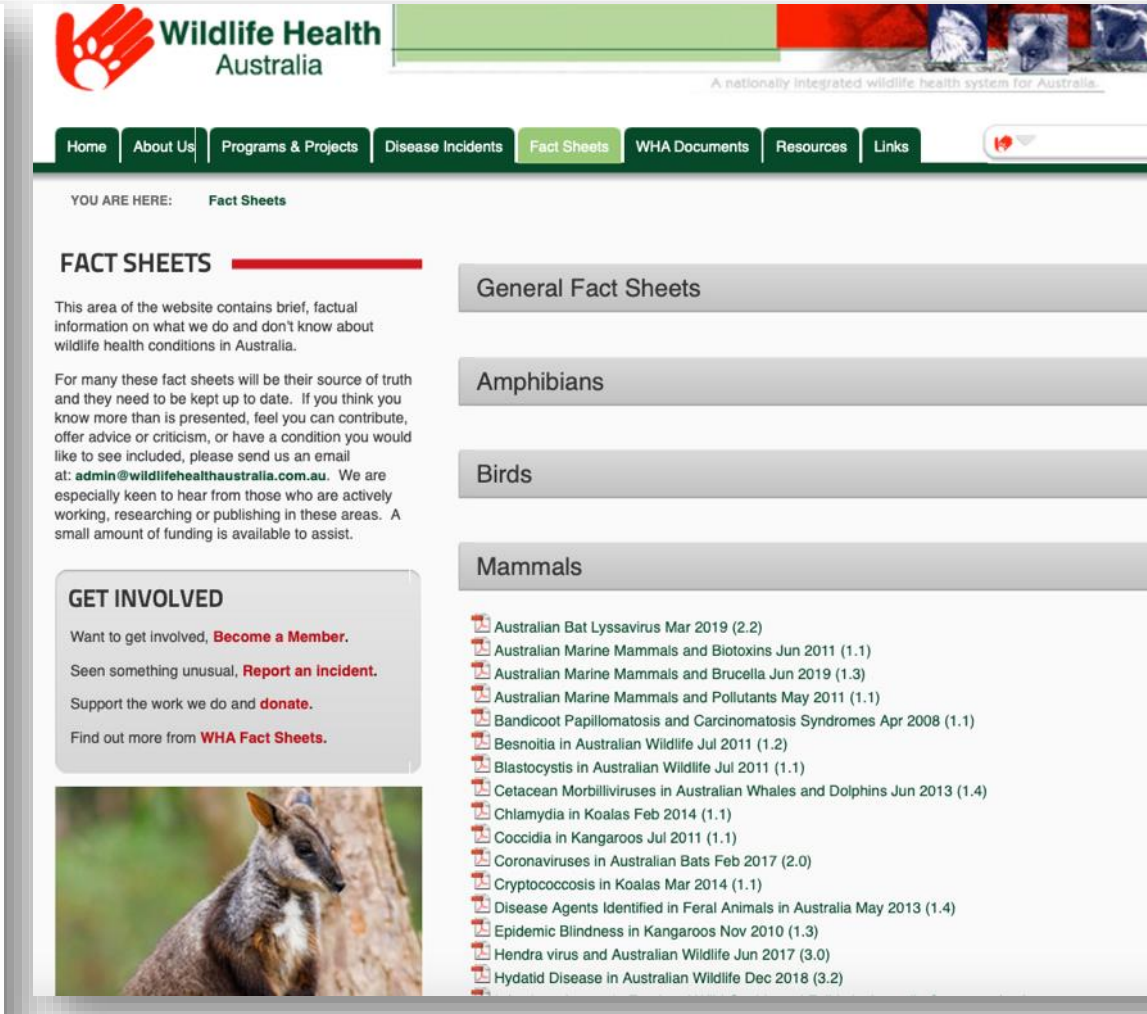
HeV is a RNA virus belonging to the family *Paramyxoviridae*, genus *Henipavirus*.

Natural hosts

There are four species of flying-fox on mainland Australia:

- *Pteropus alecto* black flying-fox
- Pteropus *conspicillatus* spectacled flying-fox
- *Pteropus scapulatus* little red flying-fox
- *Pteropus poliocephalus* grey-headed flying-fox

While serologic evidence of HeV infection has been found in all four species (Field 2005), more recent research suggests that two species, the black flying-fox and spectacled flying-fox, are the primary reservoir

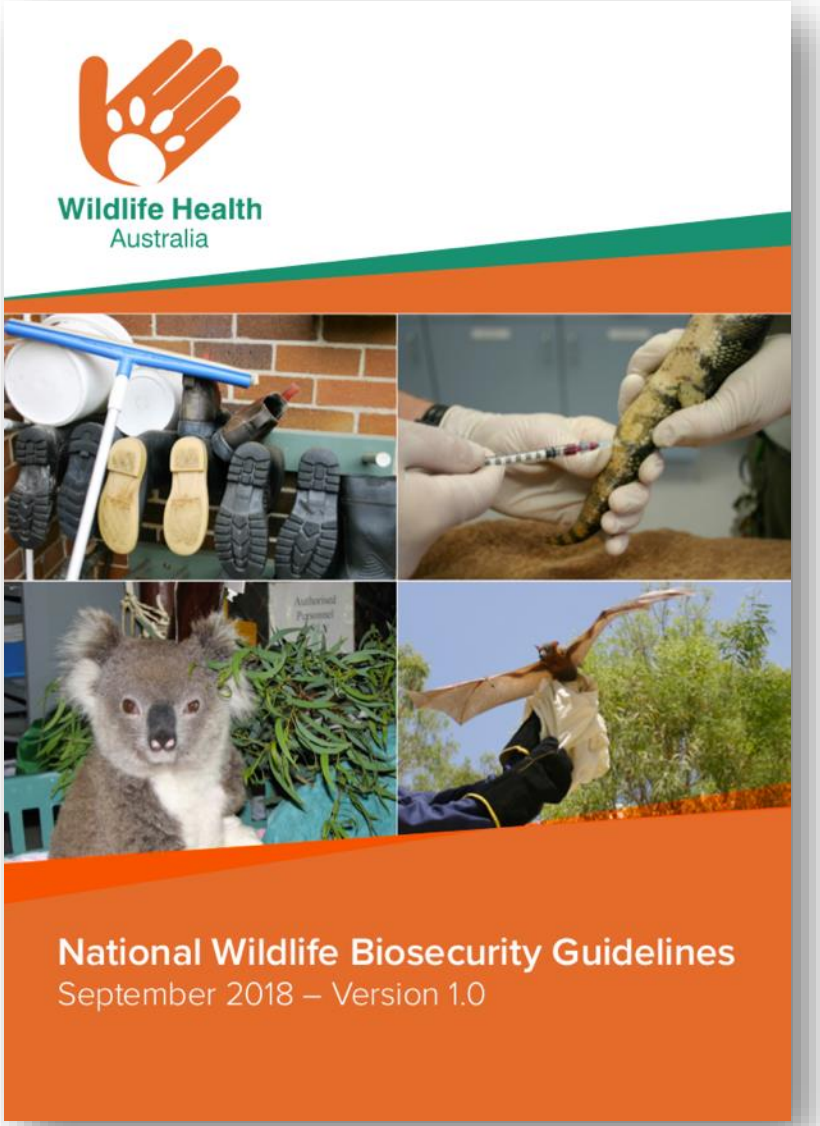


National Wildlife Biosecurity Guidelines

Outlines best practice biosecurity measures

For anyone who works or interacts with Australian wildlife including wildlife managers, researchers, veterinarians, carers and others

www.wildlifehealthaustralia.com.au/WHADocuments.aspx



ABLV BAT STATS

Australian Bat Lyssavirus Report - June 2019

Cases of ABLV infection - January to June 2019

Six cases of Australian bat lyssavirus (ABLV) infection were reported in bats in Australia between January and June 2019, all from New South Wales (Table 1). These cases are described below.

New South Wales

Six flying-foxes from various areas of NSW were found to be infected with ABLV.

A little red flying-fox (*P. scapulatus*) in north-eastern NSW was rescued after falling from a tree. In care it displayed lethargy, head tremor, salivation, inappetence and respiratory distress.

An adult female flying-fox (*Pteropus* sp.) was found in a backyard in north-eastern NSW. The bat was depressed, had unilateral hindlimb paresis/paralysis and involuntary face and body movements. It drank water but seemed unable to eat. Its condition declined rapidly and it was euthanased.

A sub-adult male little red flying-fox was part of a colony affected by a heat wave. It was found hanging in a tree close to the ground, was distressed and unable to fly.

(Continued overleaf)

Little red flying-foxes Photo: David King / Flickr (CC)

Table 1: ABLV infection in Australian bats as confirmed by FAT, PCR, IHC and/or virus isolation^

YEAR	NSW	NT	QLD	VIC	WA	SA	Total
1995	0	0	1[#]	0	0	0	1
1996	1	0	9	1	0	0	11
1997	7	1	27[*]	0	0	0	35
1998	1	0	26[*]	0	0	0	27
1999	0	0	6	0	0	0	6
2000	1	0	14	0	0	0	15
2001	0	0	9	1	4	0	14
2002	4	0	10	2	1	0	17
2003	5	0	3	2	0	0	10
2004	5	0	6	1	0	0	12
2005	6	0	5	0	0	0	11
2006	2	0	4	0	0	0	6
2007	6	0	2	0	0	0	8
2008	0	0	0	0	0	0	0
2009	2	0	8[#]	0	0	0	10
2010	0	0	8	0	1	0	9
2011	0	0	4[#]	2	0	0	6
2012	1	0	3	0	0	1	5
2013	3[#]	0	11[*]	0	0	0	14
2014	5	1	14[#]	1	11[#]	0	32[#]
2015	10	1	11[*]	0	0	0	22
2016	5	1	8[#]	1	0	0	15[#]
2017	4[#]	0	19[#]	3	2	0	28[#]
2018	5	0	5[#]	1	0	0	11[#]
2019 (to June)	6	0	0[#]	0	0	0	6[#]
Total	79[#]	4	213[#]	15	19[#]	1	331[#]

Source: see page 6, 'Australian Bat Lyssavirus Report'.

^ ACT and TAS have not recorded any cases of ABLV infection that satisfy this case definition.

[#] ABLV was first recognised in 1996. A black flying-fox from Townsville, QLD that died in 1995 was subsequently diagnosed with ABLV.

[*] Higher numbers of ABLV infected bats were associated with peak years of testing in 1997-1998.

[#] For some bats, one equivocal and one negative result (FAT/PCR) was recorded. These bats are not included in these figures as they were not confirmed to be ABLV infected.

A grey-headed flying-fox was euthanased after it was injured by a dog and subsequently developed ascending paralysis.

Two bats were submitted for testing due to potentially infectious contact with a human. One was a flying-fox from south-eastern NSW with unusual vocalisation but no other overt neurological signs. The other was a grey-headed flying-fox (*P. poliocephalus*) with no other history reported.

Human contact

Potentially infectious contact with humans was reported for four of the six ABLV infected flying-foxes reported for January to June 2019. In each case clinical advice was provided by an experienced public health official.

Little red flying-foxes Photo: Duncan McCaskill / Flickr (CC)

Why are bats submitted for ABLV testing?

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

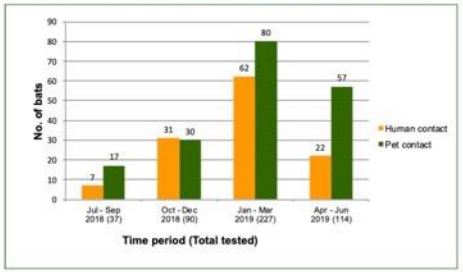


Figure 1 presents reported human-bat contacts which, based on Young & McCall 2010,[1] is an underestimate of the true contact frequency. Not all bat contact is reported, and for the majority of reports the bat is not available for testing. Some of the bats that had human contact also had contact with 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%.[2] ABLV infection is more common in sick, injured and orphaned bats, especially those with neurological signs.[3] 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.[4]

Chocolate wattled bat
Photo: Michael Pennay / Flickr (CC)

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.[5] 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.

Interested in bat health?

WHA Bat News

A monthly collation of recent media articles and publications

Sign up today or email:
admin@wildlifehealthaustralia.com.au

Bat News - WHA - September 2019

KC **Keren Cox-Witton**
Thursday, 3 October 2019 at 4:00 pm
Keren Cox-Witton
Show Details

Dear Bat News subscribers,
Please see below for recent news articles and publications relating to bat health.
Best regards,
Keren

Flying-fox mortalities NSW & Qld
- Mortality event in grey-headed and black flying-foxes in NSW & Qld

Hendra virus
- Synchronous shedding of multiple bat paramyxoviruses coincides with peak periods of Hendra virus spillover
- Hendra & related viruses – other publications

White-nose syndrome
- Australian priority list of exotic environmental pests and diseases
- Can Texas bats be saved?
- Fatal bat disease has made its way to Eastern Washington
- Recovery Plan for Québec's non-migratory bat species
- Other WNS news
- Are microclimate conditions in El Malpais National Monument caves in New Mexico, USA suitable for *Pseudogymnoascus* growth?
- Resistance is futile: RNA-sequencing reveals differing responses to bat fungal pathogen in Nearctic *Myotis lucifugus* and Palearctic *Myotis myotis*
- Other WNS publications

Other news
- Gardeners to face backyard blitz on netting with new laws proposed to protect wildlife [Vic]
- Bats turn north-west Queensland sky black as drought raises numbers earlier
- Flying-foxes – request to check for microchips
- 4th Annual National Flying-fox Forum [Canberra; 13-14 November 2019]
- International Bat Research Conference – Abstracts available
- Wildlife Disease Association Conference – Abstracts available

Publications
- Haematology of southern bent-winged bats (*Miniopterus orianae bassanii*) from the Naracoorte Caves National Park, South Australia
- Standard Operating procedure for lyssavirus surveillance of the bat population in Taiwan
- Time of administration of rabies immunoglobulins and adequacy of antibody response upon post-exposure prophylaxis: a #_Toc20392535 ospective
- Culture-dependent and metagenomic analysis of lesser horseshoe bats' gut microbiome revealing unique bacterial diversity and signatures of pote pathogens
- Natural history and medical management of Chiroptera
- Coronavirus - publications
- Bats & immunity - publications
- Publications – Other bat diseases

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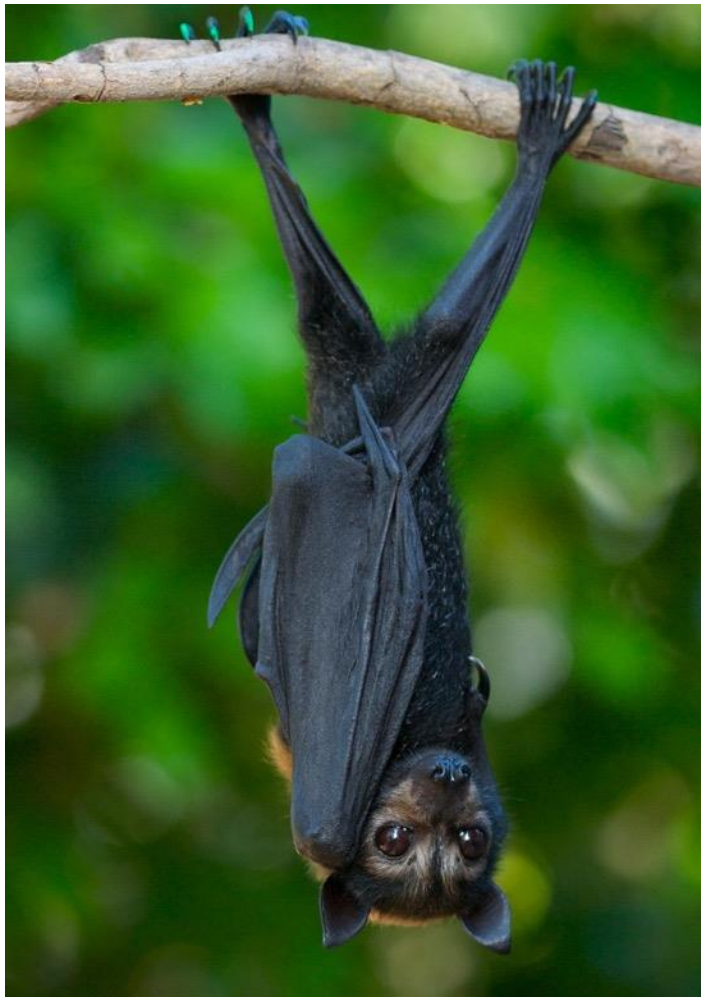

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WHA Bat Health Focus Group

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Photo: Jurgen Otto/Flickr (CC)

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Thank you

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