



# Australian bat lyssavirus risk management 2013-2014 audit report

## Introduction

Australian bat lyssavirus (ABLV) is a zoonotic disease (a disease that spreads from animals to people) which poses health and safety risks for people who have occupational contact with bats at workplaces.

### ABLV risks

All species of bats can potentially be infected with ABLV, including flying foxes and microbats. The virus is found in the saliva and neural tissues (brain and spinal cord) of infected bats. Human infection occurs when a person is bitten or scratched by an infected bat. Infection may also occur if the saliva or neural tissues of an infected bat comes into contact with a person's non-intact skin (e.g. cuts and abrasions) or the mucous membranes of a person's eyes, nose and mouth.

ABLV is an example of a low frequency, high consequence hazard. The likelihood of a person becoming infected with ABLV is low because the prevalence of the disease in free living bats is low. The consequences of ABLV infection however are very severe as clinical disease is invariably fatal. To date, three people have become infected and died from ABLV infection following bat bites and scratches. One of these incidents involved a micro-bat and the other two involved flying foxes.

### At-risk occupational groups

Occupational groups that are at-risk of exposure to ABLV from contact with bats include:

- wildlife conservation, rescue, rehabilitation and care workers
- wildlife veterinarians and veterinary nurses
- wildlife demonstrators
- zoological gardens and wildlife sanctuary workers
- bat scientists
- fauna spotter-catchers.

Other occupational groups may be at risk of exposure to ABLV from occasional or incidental contact with bats, such as local government workers, waste industry workers and electrical workers who collect and dispose of bat carcasses.

### Managing ABLV risks

Persons conducting a business or undertaking (PCBU) have a health and safety duty to ensure, so far as is reasonably practicable, the health and safety of themselves, their workers and other persons. Where ABLV risks exist at a workplace the PCBU must eliminate risks to health and safety, so far as is reasonably practicable. If it is not reasonably practicable to eliminate risks to health and safety, the PCBU must minimise those risks so far as is reasonably practicable.

ABLV risks at workplaces can be managed by implementing a suite of control measures to eliminate or minimise the risk so far as is reasonably practicable. These include:

- ensuring that bats are handled only by persons who have current rabies vaccination, are trained in the safe handling of bats and who are wearing suitable personal protective equipment (PPE)
- implementing an occupational immunisation program to ensure that at-risk workers have completed a course of three doses of the rabies vaccine to protect against ABLV infection (known as 'pre-exposure prophylaxis')
- ensuring that vaccinated workers who have ongoing contact with bats maintain their rabies immunity by undergoing a second yearly blood test to measure their rabies antibody titre level (a measurement of rabies immunity) and/or a booster dose of rabies vaccine (note: more regular testing is recommended for laboratory workers at risk of exposure to ABLV)

- implementing a safe system of work for handling bats
- providing ABLV information, instruction, training and supervision as necessary to ensure health and safety
- providing and ensuring that workers wear suitable PPE to protect against bat bites, scratches and other potential exposures
- ensuring that bat bites, scratches and other potential exposures are properly managed, including by ensuring proper first aid and wound management followed by immediate referral to a doctor for medical assessment of rabies vaccination requirements (known as 'post-exposure prophylaxis'). Additional doses of rabies vaccine may be required even if the person has previously been vaccinated.

Additional industry specific control measures may further reduce ABLV risks, for example by installing standoff barriers and warning signage at wildlife exhibits to protect members of the public, and by installing wildlife friendly fencing and netting to prevent wildlife entanglements.

### **ABLV audit program**

During 2013-2014, Workplace Health and Safety Queensland (WHSQ) conducted a small, statewide audit program of workplaces where PCBUs, workers and other persons were exposed to ABLV risks from contact with bats. The ABLV audit program was initiated in response to:

- WHSQ's investigation and subsequent prosecution of a business where non-immune workers and other persons were exposed to ABLV risks from contact with bats
- an increase in enquiries to WHSQ from businesses seeking information about how to manage ABLV risks at workplaces. This increase was subsequent to the death of a child from ABLV infection in 2013.

The program aimed to achieve the following objectives:

- obtain information about how ABLV risks are being managed by at-risk businesses
- provide practical information and advice about ABLV risk management to assist at-risk businesses to meet their health and safety duties
- identify barriers to effective ABLV risk management and work with at-risk industries to identify possible solutions
- promote engagement and collaboration with at-risk businesses and industry associations
- promote compliance with regulatory requirements
- increase the capacity of inspectors to respond to zoonotic disease issues.

### **What did the ABLV audit program involve?**

WHSQ consulted with key stakeholders, including government agencies and industry associations and networks.

A fact sheet on [Australian bat lyssavirus and handling bats](#) was developed in consultation with stakeholder groups. This was disseminated through industry associations and networks and posted on the WHSQ website.

Nineteen workplaces were chosen from a cross section of at-risk industries. Workplaces were identified using web-based industry information sources and regional inspectorate knowledge of local businesses. These included nine businesses that provided wildlife conservation, rescue, care, rehabilitation and/or veterinary services, three businesses that exhibited wildlife or provided wildlife demonstrations, five businesses that provided bat carcass disposal services and two businesses that provided other bat related services. Of these, three businesses were located in the Brisbane North and Sunshine Coast region,

seven were located in the Brisbane South and Gold Coast region, two were located in the South West region, five were located in the North Queensland region and two were located in the Central Queensland region.

Inspectors visited the nominated workplaces between November 2013 and June 2014. At each workplace inspectors conducted a desktop audit of ABLV risk management systems and a walk through inspection. The inspectors used an audit checklist that incorporated health and safety regulatory requirements, federal and state health department recommendations for rabies vaccination and the management of potential exposures, and relevant industry standards. A modified version of the audit checklist is provided in Appendix 1.

### **What were the results of the ABLV audit program?**

Workers were reported to have direct contact with bats at 15 of the audited workplaces and to have indirect or incidental contact with bats at the remaining four workplaces.

All at-risk workers had completed a course of rabies vaccination. Documented staff immunisation records were available at 11 of these workplaces. The due date for blood tests to measure rabies antibody titre levels and/or for booster doses of rabies vaccine was documented at 7 of these workplaces.

Information, training and instruction on ABLV risks and associated control measures were provided at all of the workplaces where workers were employed, with the exception of one workplace where workers had received training outside of work in their capacity as volunteer wildlife carers. Documented training records were available at 11 of the workplaces.

Some level of PPE (e.g. gloves) and associated items (e.g. towels) for handling bats were provided at all of the workplaces. The following PPE issues were common to many of the businesses that were audited:

- a limited range of gloves, for example the provision of suitable gloves for handling adult flying foxes but not for handling juvenile flying foxes or microbats where gloves providing a higher level of dexterity may be required
- a limited range of PPE other than gloves, for example gauntlets to protect the forearms
- inconsistent use of PPE, for example the use of PPE for rescuing bats but not for the ongoing care and rehabilitation of bats or for handling juvenile flying foxes and microbats.

Non-immune workers and others (e.g. members of the public) were restricted from contact with bats at all of the workplaces. This was achieved by using a range of control measures including the provision of suitable enclosures for exhibiting, housing and transporting bats, installing stand-off barriers to restrict public access to bat enclosures, installing warning signage, and allocating non-immune persons to non-contact tasks such as preparing fruit. At two workplaces where bats were exhibited there was the potential for members of the public to gain direct access to the outside of the bat enclosure because of inherent design features of the stand-off barrier; these issues were promptly rectified.

A protocol for managing bat bites, scratches and other potential exposures was implemented at all of the workplaces and was documented at 10 of the workplaces. First aid facilities for managing bat bites, scratches and other potential exposures were provided at all of the workplaces. At 14 of the workplaces the first aid kits contained an iodine or alcohol containing antiseptic for managing bat bites and scratches, as recommended by federal and state health departments. At 17 of the workplaces there was a system to record incidents of bat bites, scratches and other potential exposures.

## Challenges to ABLV risk management

A number of challenges to effective ABLV risk management were identified through industry consultation and discussions at the audited workplaces. These included the following issues:

- the time required to implement and document policies and procedures, training records and immunisation records. This was considered to be particularly challenging during times of intense activity when large numbers of bats come into care, such as during extreme weather events and the tick paralysis season
- costs, particularly for not-for-profit and/or volunteer organisations
- design features of PPE, in particular the need for gloves that provide suitable levels of both puncture resistance and dexterity
- discomfort associated with wearing PPE, particularly when working in hot and humid conditions
- a high turnover of workers, particularly among volunteers.

Industry and individual practices, perceptions and beliefs that have the potential to impact on effective risk management and the safe handling of bats were identified through industry consultation and discussions at the audited workplaces. These included the following issues:

- self-protection being accorded a lower priority when faced with the immediate safety and welfare needs of an injured, sick or orphaned bat
- bat bites and scratches being considered as ‘part of the job’
- bat scratches, minor nips, and exposures involving juvenile bats and captive bats being considered very low risk
- vaccination being considered as the sole way to protect against ABLV exposure rather than being supported with control measures such as PPE
- risk assessments being made based on the likelihood of human infection but without also considering the consequences of human infection
- bat handling practices of the past which have not always incorporated PPE.

Despite the challenges, some positive changes were observed such as the recent introduction of additional items of PPE (e.g. gauntlets) at some workplaces, and workplace trials of different types of glove to better inform PPE selection. Industry consultation also provided evidence of industry leadership for the promotion of safer bat handling practices.

## Compliance outcomes

Each workplace was provided with information, advice and resources to further improve ABLV risk management practices. Non-compliance issues were rectified promptly and cooperatively by the PCBUs and as a result no improvement notices were required to be issued.

## Discussion and recommendations

Occupational exposure to ABLV risks from contact with bats occurs across a range of industries in Queensland. Recommended ABLV risk management practices provide PCBUs, workers and other persons with a high level of protection against occupational exposure.

The audit program provided evidence of knowledge and implementation of ABLV risk management practices by at-risk businesses in Queensland. Importantly, all of the persons who had direct contact with bats at the audited workplaces were reported as having completed pre-exposure prophylaxis with three doses of the rabies vaccine. Almost all of the workplaces reported providing training to their workers on ABLV risks

and associated control measures, and all of the workplaces reported having a protocol for managing bat bites, scratches and other potential exposures.

The audit program identified some issues with the provision and use of PPE for handling bats, for example not routinely wearing PPE for all bat handling activities. Although rabies vaccination is a critical control measure and provides a high level of protection against ABLV, no vaccine is considered to be 100 percent effective and vaccine-induced immunity can wane over time. Moreover, vaccination only provides protection after a person has been exposed to ABLV, for example following a bite or scratch from an infected bat. The routine use of PPE when handling bats can prevent a person from being exposed to ABLV in the first instance, with vaccination providing a critical safety net in the event of accidental potential exposures such as may occur as a result of PPE failure.

The audit program identified that documentation was a challenge, including the documentation of safe systems of work for handling bats, staff vaccination records, staff training records and protocols for managing bat bites, scratches and other potential exposures. Documentation of health and safety activities is important as a means to provide information to workers, to monitor and review health and safety performance and to demonstrate compliance.

The audit program also identified that individual perceptions and beliefs have the potential to contribute to unsafe bat handling practices. This includes a perception that ABLV risks are low. Although the prevalence of ABLV in free-living bats is low and therefore the likelihood of human infection is low, the consequences of human infection are very severe as clinical disease is invariably fatal. Moreover the prevalence of ABLV infection may be higher among sick, injured and orphaned bats, and it is this cohort of bats that is more likely to be handled by workers in businesses such as wildlife conservation, rescue, rehabilitation and veterinary services. Ensuring that bats are only handled by persons who have current rabies vaccination, are trained in the safe handling of bats and are wearing suitable PPE, regardless of the perceived risk, will provide a high level of protection for at-risk PCBUs, workers and other persons.

A number of opportunities for enhanced protection of PCBUs, workers and other persons were identified as a result of the audit program. These include the following:

- ensuring that gloves with varying levels of puncture resistance and dexterity are made available so that workers can be properly protected when handling different species and ages of bats and when performing a range of bat handling tasks
- where disposable gloves are required to be worn, for example during some veterinary procedures, choosing disposable gloves that have a puncture resistance rating
- providing training to workers on how to select suitable PPE to achieve the best fit between the puncture resistance and dexterity needs of the task, and the safety and welfare needs of the bat
- routinely wearing PPE for all bat handling activities
- wearing enhanced PPE including puncture resistant gloves, gauntlets to protect the forearms, long sleeved shirts and long pants to protect exposed skin on the arms and legs, enclosed footwear to protect the feet, and risk-based safety eyewear if there is a risk of exposures involving the eye (e.g. working at eye level with a bat)
- ensuring that policies, procedures and protocols for ABLV risk management are properly documented and readily available
- ensuring that staff training records are kept and maintained
- ensuring that staff immunisation records are kept and maintained. These should clearly identify the due date for ongoing blood tests to measure rabies immunity and/or booster doses of rabies vaccine

- ensuring that first aid kits are properly stocked with recommended items for managing potential ABLV exposures, including an iodine or alcohol containing antiseptic
- ensuring that the design of bat enclosures and stand-off barriers at workplaces where wildlife are exhibited are effective in restricting public access.

The proper management of ABLV risks at workplaces is important to protect PCBUs, workers and other persons from potential exposure to ABLV and to meet health and safety duties. It is also important to ensure the safety and welfare of bats so that avoidable euthanasia of bats following potential ABLV exposures is prevented. This is a particularly resonant issue for people working in the important area of wildlife conservation, rescue and rehabilitation.

## **Limitations**

The limitations of these findings include the small sample size and the potential for bias created by self-reported health and safety practices especially in the absence of supporting documentation.

## **Where to from here?**

Since the completion of the audit program, WHSQ has developed a short film on safe bat handling that can be used as a training tool by at-risk businesses and volunteer associations. This is available from the WHSQ website at <https://www.worksafe.qld.gov.au/forms-and-resources/films/safe-bat-handling>.

WHSQ will continue to strengthen partnerships with government and industry stakeholders through consultation. It will also support the capacity of at-risk businesses to meet work health and safety duties for ABLV risks through the development of further resources to promote safe systems of work.

## **Further information**

For more information on work health and safety, visit [www.worksafe.qld.gov.au](http://www.worksafe.qld.gov.au) or call 1300 362 128.

For more information on ABLV and animal health, visit the Department of Agriculture and Fisheries (Queensland) at [www.daff.qld.gov.au](http://www.daff.qld.gov.au) or phone 13 25 23.

For more information on ABLV and human health, visit Queensland Health at [www.health.qld.gov.au](http://www.health.qld.gov.au) or phone 13HEALTH (13 43 25 84).

For more information about bats and environmental issues, including safe netting and damage mitigation permits, visit the Department of Environment and Heritage Protection at <http://www.ehp.qld.gov.au/> or phone 13QGOV (13 74 68).

## **Acknowledgment**

WHSQ wishes to acknowledge the positive interactions with the businesses that were audited and the commitment and dedication of those working in bat conservation, rescue and care. It also acknowledges the valuable support and assistance of key stakeholders, in particular Queensland Health, the Queensland Department of Agriculture and Fisheries, the Queensland Department of Environment and Heritage Protection, Bat Conservation and Rescue Queensland Inc., the Australasian Bat Society, Tolga Bat Hospital, and the Royal Society for the Prevention of Cruelty to Animals.

## Appendix 1: Self-assessment tool for Australian bat lyssavirus risk management

ISSUE	YES	NO	COMMENT
<b>Staff vaccination</b>			
Is there a documented policy/procedure for staff vaccination?			
Do all persons who have contact with bats at the workplace have evidence of having completed a course of 3 doses of the rabies vaccine?			
Are rabies vaccination records kept and maintained for each person?			
Do all persons who have ongoing contact with bats at the workplace undergo a second yearly blood test to measure rabies immunity and/or a booster dose of the rabies vaccine?			
Is a record kept of the due date for each person's blood test to measure rabies immunity and/or a booster dose of the rabies vaccine?			
<b>Safe bat handling</b>			
Is there a documented procedure for the safe handling of bats?			
<b>Information, instruction, training and supervision</b>			
Are persons who handle bats at the workplace provided with information, instruction and training to ensure their health and safety from ABLV risks?			
<p>If yes, does the training include the following content?</p> <ul style="list-style-type: none"> <li>• ABLV risks</li> <li>• rabies vaccination and ongoing second yearly blood tests to measure rabies immunity/booster doses of rabies vaccine</li> <li>• safe handling of bats</li> <li>• selection, use and wearing of PPE</li> <li>• managing bat bites, scratches and other potential exposures</li> <li>• hand hygiene</li> <li>• covering cuts and abrasions.</li> </ul>			
Are training records kept and maintained?			
Are persons who handle bats at the workplace provided with supervision as necessary to ensure their health and safety from ABLV risks?			



<b>Personal protective equipment (PPE)</b>			
Is suitable PPE provided and worn for bat handling activities? For example: <ul style="list-style-type: none"> <li>• puncture resistant gloves</li> <li>• puncture resistant gauntlets</li> <li>• long sleeved shirts</li> <li>• long pants</li> <li>• enclosed footwear</li> <li>• other PPE as identified by a risk assessment (e.g. safety eyewear).</li> </ul>			
Do puncture resistant gloves meet relevant Australian Standards <sup>1</sup>			
Where applicable, are puncture resistant gloves available for handling various species and ages of bats and for tasks requiring varying levels of puncture resistance and dexterity?			
Is reusable PPE (e.g. gloves, gauntlets) maintained in a clean and hygienic condition?			
<b>Work restrictions</b>			
Are persons who do not have current rabies vaccination, who have not received training on the safe handling of bats and who are not wearing suitable PPE restricted from handling bats at the workplace?			
Where applicable, is there a system to restrict access to bats? (e.g. physical barriers, suitable enclosures and cages, warning signage)			
<b>Management of captive bats</b>			
Are new bats isolated for 1-3 days to reduce the risk of introducing ABLV to other captive bats?			
<b>Bat bites, scratches and other potential exposures</b>			
Is there a documented procedure for managing bat bites, scratches and other potential exposures?			
If yes, does this include content on: <ul style="list-style-type: none"> <li>• first aid and wound management</li> <li>• immediate medical referral</li> <li>• incident reporting requirements</li> </ul>			
Are first aid kits for the management of bat bites, scratches and other potential exposures readily available at the workplace?			

Do first aid kits contain an iodine or alcohol containing antiseptic for the management of bat bites and scratches?			
Have first aid personnel received training on the management of bat bites, scratches and other potential exposures?			
Are records kept and maintained of incidents involving bat bites, scratches and other potential exposures?			
<b>Facilities</b>			
Are workers provided with suitable hand washing facilities (e.g. soap and water)			

Additional industry specific control measures may be required to eliminate or minimise ABLV risks so far as is reasonably practicable.

1. Standards Australia AS 2161.3 *Occupational Protective Gloves. Protection Against Mechanical Risks*