



BAT CONSERVATION AFRICA (BCA)
www.batconafrika.net

Position Statement on Bats and Ebola

Summary: Bats and the current Ebola outbreak

The Ebola epidemic raging in parts of West Africa has now claimed almost 5,000 lives. The great concern about this crisis has led to speculations about the outbreak's origin based on limited scientific information. Consequently, there is a great deal of public misconception about the virus, its source and its transmission. One such misconception is that fruit bats have played a role in the current outbreak. **In fact, there is currently no scientific evidence linking bats to the current outbreak of *Zaire ebolavirus* that originated in southeastern Guinea. While some bat species have been implicated as reservoirs of Ebola virus, scientists have been thus far unable to isolate live virus particles from bats, and the role of bats as reservoirs of Ebola virus in equatorial Africa has yet to be confirmed.** The wildlife source of the current Ebola outbreak in West Africa is as yet unknown.

While bats are linked to other zoonotic diseases, and remain a potential reservoir for Ebola, efforts to control their populations are likely to exacerbate the problem. Here we endeavor to correct some misconceptions about Ebola and bats:

- Despite claims in the media to the contrary, there is currently no scientific evidence that bats were the source of the current Ebola epidemic. "Patient Zero", or the patient in whom the outbreak began, has been identified as a two-year-old boy from southeastern Guinea. All cases since then appear to have stemmed from human-to-human-contact. **It is not known how the Patient Zero contracted the disease; media claims of a link to bats are speculative. More research is needed.**
- **The Ebola virus is not airborne** and, if bats are confirmed as a reservoir, the mere presence of bats could not lead to an outbreak of Ebola. However, handling bats should be strictly avoided. We advise that only bat experts should handle bats with appropriate personal protective equipment.
- Habitat destruction and hunting increases human contact with wildlife. **Direct contact with wildlife in general may increase the risk of contracting zoonotic diseases.** Humans may be exposed to hitherto unknown viruses and diseases via habitat destruction and human encroachment on wildlife habitats, including forests; harvesting and consumption of bushmeat; and unlicensed trade in wild animals such as primates.
- Attempts to relocate or exterminate bats lead to dispersal of bat colonies and will raise the risk of human contact. **Culling (killing) bats has, in the past, counter-intuitively resulted in increased rates of infection among bat populations.** This, in turn, can increase the likelihood of human zoonotic infection. Bats therefore should not be culled or their roosts disturbed.

Key facts about bats

Bats are flying mammals that occur on all continents except Antarctica. There are nearly 300 bat species in Africa, making up 20% of African mammalian diversity. Bats provide many ecosystem services that support human livelihoods: they contribute to forestry by pollinating flowers of trees, and aid reforestation by dispersing seeds. By consuming agricultural pests, insectivorous bats contribute enormously to agricultural productivity by reducing crop damage and pesticide use. This natural subsidy to agricultural productivity depends critically on healthy populations of bats.

Bats and Diseases

Although the ecological effects of bats on people are overwhelmingly positive, bats can carry diseases transmissible to humans. As social mammals, many bats live in dense aggregations that are conducive to infections by pathogens and transmission of parasites. Globally, some common bat pathogens include rabies (a virus that is transmitted via saliva or blood of infected mammals and can cause fatal encephalitis in humans) and histoplasmosis (a respiratory disease caused by a spore-producing fungus that grows in accumulated bat and bird droppings). Although bats are known to carry rabies, more than 99% of human deaths from rabies occurring in Africa and Asia are caused by infections from carnivores, including domestic dogs. African bats have also been associated with viruses such as Marburg virus, Duvenhage virus, and Shimoni virus, but whether the bats harbor the viruses long-term, as reservoir species, remains poorly understood.

Ebola: General information

Ebola virus is part of the filovirus family, which is comprised of four African species within the genus *Ebolavirus*: *Bundibugyo ebolavirus* (BDBV), *Zaire ebolavirus* (EBOV), *Sudan ebolavirus* (SUDV), and *Tai Forest ebolavirus* (TAFV; formerly *Côte d'Ivoire ebolavirus*). These species cause periodic disease outbreaks in humans and non-human primates, usually with very high mortality rates.

The virus is transmitted to people by close contact with wild animals (often carcasses) of primates, and potentially, bats, and spreads among people through human-to-human contact. Infection results from direct contact with blood, saliva, urine, feces or other bodily fluids of infected (sick) people or animals, or through indirect contact with environments or objects contaminated with such fluids.

Bats as potential reservoirs of Ebola virus

As with humans, primates such as gorillas and chimpanzees are susceptible hosts and succumb to Ebola. Human disease has been linked to contact with those *Ebolavirus*-infected primates, which are hunted or scavenged and consumed as bushmeat. Before 2005, the history of Ebola outbreaks included potential exposure to bats, but it was not until 2005 that the first scientific evidence implicated bats as a reservoir of Ebola virus. Bats that seemed healthy tested positive for Ebola antibodies, and carried fragments of the virus. However, live virus could not be isolated from the bats, making them a likely, but not proven, reservoir. It is only in three fruit bat species (see Table), including the hammer-headed fruit bat (*Hypsignathus monstrosus*), Franquet's epauletted fruit bat (*Epomops franqueti*) and the little collared fruit bat (*Myonycteris torquata*) that substantial evidence was found. The straw-coloured fruit bat (*Eidolon helvum*), a migratory bat widely distributed through sub-Saharan Africa, had very low levels of antibodies in one study in Ghana and no viral fragments, making it an unlikely Ebola virus reservoir. Very few studies have focused on Ebola virus ecology, and the links between bats, non-human primates, humans and Ebola viruses are not clear. For a comprehensive review, see Olival, K.J. & Hayman, D.T.S., 2014. Filoviruses in bats: Current knowledge and future directions. *Viruses* 6, 1759-1788.

Table: Basic ecological and geographical information about bats implicated as Ebola virus reservoirs

Species	Distribution	Habitat	Day roosts	Migratory?
Franquet's epauletted fruit bat (<i>Epomops franqueti</i>)	West to Central Africa, marginally East Africa	Common in rainforests, woodlands, and farmbrush	Densely foliated large trees	Non-migratory
Hammer-headed fruit bat (<i>Hypsignathus monstrosus</i>)	West to Central Africa, marginally in East Africa	Common in rainforests	Densely foliated trees, often near water	Non-migratory
Little collared fruit bat (<i>Myonycteris torquata</i>)	Central Africa	Common in rainforests	In bushes and trees in the forest	Possibly migratory

The dangers of disturbing bat roosts

Disturbance of bat roosts and culling (killing) of bat colonies has proven an ineffective method for controlling zoonotic diseases when present in bat populations. In Uganda, Egyptian fruit bats (*Rousettus aegyptiacus*) were culled in the aftermath of a 2007 Marburg virus outbreak among humans. Soon thereafter, a new population of bats colonized the roost. The immigrant population had a higher rate of Marburg virus infection, which led to a second outbreak among

humans. Likewise, long-term culling of vampire bats (*Desmodus rotundus*) in Peru has had a similar effect: colonies that were subjected to culling had higher rates of rabies infection. Consequently, **where bats are harboring diseases that are potentially dangerous to humans, disturbing roosts or killing bats will likely increase rather than decrease the risk of people getting infected by such diseases.**

The wisest way forward is to simply leave bats alone. Don't disturb, touch or hunt them. Do not try to evict or cull/exterminate bat colonies. Wildlife hunting and "bushmeat" consumption is currently considered the most likely route for the Ebola virus to enter the human population.

For details about signs and symptoms of Ebola refer to these links:

World Health Organization (WHO): www.who.int/mediacentre/factsheets/fs103/en

Centre for Disease Control (CDC): www.cdc.gov/vhf/ebola

A position statement by Bat Conservation Africa (BCA)

BCA is a network of bat researchers and conservationists working with African bats. Our mission is to facilitate research on, and conservation actions for, bats in Africa, through providing a network open to all bat conservation workers in the continent. Find more information on our [website](#).