Why do people risk infection from bat meat?

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Straw coloured fruit bat. Credit: Arran ET

Ebola, as with many emerging infections, is likely to have arisen due to man's interaction with wild animals – most likely the practice of hunting and eating wild meat known as 'bushmeat'. A team of researchers led by the University of Cambridge and the Zoological Society of London (ZSL) has surveyed almost six hundred people across southern Ghana to find out what drives consumption of bat bushmeat – and how people perceive the risks associated with the practice.

The Straw-Coloured Fruit Bat, Eidolon helvum, is widely hunted and eaten in Ghana, but carries a risk of infection with 'zoonotic' pathogens – diseases transmitted from animal to man. Hunting, butchering and

consuming wild animals for food can potentially transmit these infections through bites, scratches, bodily fluids, tissue and excrement. Bats in particular appear to host more zoonotic viruses per species than any other group of mammals, yet very little is known about how humans and bats interact, how people perceive bats and their accompanying disease risk, or who is most at risk.

Dr Olivier Restif from the Department of Veterinary Medicine at the University of Cambridge explains: "Knowing who eats bush meat and why, as well as how they perceive the risks, is important for informing both disease and conservation management plans. This requires a close-knit collaboration between epidemiologists, ecologists and social anthropologists. That is why we have teamed up with the Zoological Society of London and the University of Ghana to develop this research programme."

Dr Alexandra Kamins, a Gates Cambridge scholar alumna working with Dr Restif, adds: "All too often, local community voices go unheard, despite representing those most at risk of spillover and often shouldering negative impacts arising from intervention measures. That is why it was important for us to listen to them."

Dr Kamins and colleagues interviewed 577 people across southern Ghana, including hunters, vendors and consumers of bat meat. Of these, the majority (551) were interviewed using a general survey whilst the rest were interviewed in-depth through focus groups.

The researchers found that hunters used a variety of means to capture bats, including shooting, netting and scavenging, and that all of the hunters reported handling live bats, coming into contact with bat blood and getting scratched or bitten. None of the hunters reported using protective measures, such as gloves. Scavenged bats were collected alive, usually when a branch broke and bats fell to the ground, but this too

carried risks: four interviewees explained how people would fight over the bats when a large branch fell, sometimes even lying down on top of bats to prevent others from taking them, often sustaining bites and scratches.

The bats were prepared and cooked in a number of ways, the most common methods being to smoke the bats before preparing food and using the bats in soup. At odds with reports from other countries, the survey in South East Ghana revealed few uses of bat bushmeat associated with traditional beliefs or medical practices. In Ghana, bat bushmeat seems to function as both subsistence and luxury food. The large number of hunters who hunt for themselves or who keep some of their catch suggests that bats provide a readily available source of animal protein. At the same time, high taste ratings among consumers and relatively high prices suggest that bat meat is seen as a 'luxury food' in Ghana.

Hunters, vendors and consumers of bat meat all tended to be older than those people with no connection to the practice - on average seven to ten years older. The researchers believe this could imply a number of scenarios, the most likely being a decrease in youth interest in bat bushmeat.

They found a strong association between gender and roles in the bat-bushmeat commodity chain, with hunters primarily being male and vendors female, consistent with the cultural norms of rural Ghanaian society. This could mean that disease risk was also different between the sexes. The researchers also found that those people living in urban environments and those who were more educated were less likely to participate in bat bushmeat activities. Although this suggests that increased urbanisation and improvements in education could reduce the use of bats as bushmeat, it is possible that increased household income could lead to increased bushmeat consumption, particularly as the meat

appears to be seen as a luxury item.

Using focus groups, the researchers carried out more in-depth interviews to understand participants' likely reactions to interventions regarding bat bushmeat. They found that regulations by themselves are not effective solutions: laws and fines alone are unlikely to induce change. While only some of our respondents would be willing to risk paying fines if they continued to earn enough from selling bat bushmeat, essentially no one knew of the existing hunting laws in Ghana, suggesting that enforcement is a major issue.

Possible health risks appeared to be more of a deterrent than fines; some respondents suggested that disease risk could motivate them to stop. However, the risk of disease from bat bushmeat was considered to be greatest by those who did not consume the meat and lowest by those who hunted or sold the bats. This finding supports previous research suggesting that people can readily perceive risk and even intellectually acknowledge desire to reduce that risk, but actual behaviour might not change.

Professor James Wood, who leads the research programme at the University of Cambridge, says: "Understanding both actual and perceived risk factors is vital. If a bat-borne zoonotic disease outbreak were to occur in Ghana, our information could prove invaluable in helping target those groups at greatest risk and in planning disease control measures."

Dr Marcus Rowcliffe from ZSL adds: "Unfortunately, there may not be a simple way to minimise the risks of zoonotic spillover from bats. For example, bat hunting is a highly seasonal occupation and, like all bushmeat hunting, can be started and dropped at will, whereas rearing domestic animals – one possible sustainable solution for reducing bushmeat hunting – requires continuous activity throughout the year on a

daily basis.

"Although many programmes suggest economic opportunity as the major motivation behind livelihood choices and success of alternatives, it may not be enough on its own. We found people in Ghana to be responsive to education pieces about the disease risk from bushmeat but also the ecological role of bats in pollination and seed dispersal. Working with local communities to help them find effective and sustainable solutions in line with their economic needs must be a long-term commitment."

More information: A.O. Kamins, O. Restif, Y. Ntiamoa-Baidu, R. Suu-Ire, D.T.S. Hayman, A.A. Cunningham, J.L.N. Wood, J.M. Rowcliffe, "Uncovering the fruit bat bushmeat commodity chain and the true extent of fruit bat hunting in Ghana, West Africa," *Biological Conservation*, Volume 144, Issue 12, December 2011, Pages 3000-3008, ISSN 0006-3207, dx.doi.org/10.1016/j.biocon.2011.09.003.

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