

COMMENTARY

**Could risk of disease change bushmeat-butcher-
ing behavior?**M. C. Monroe¹ & A. S. Willcox²¹ School of Forest Resources and Conservation, University of Florida, Gainesville, FL, USA² Department of Wildlife Ecology and Conservation, University of Florida, Gainesville, FL, USA

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LeBreton *et al.* (2006) have added yet another important consideration to the current bushmeat crisis that continues, largely unabated, in Central and West Africa. The issue of disease carried by wildlife to bushmeat hunting and butchering communities brings the medical profession into the collaborative effort to conserve hunted wildlife that includes local communities, resource extraction companies, governments and politicians, and conservation scientists (see the review by Milner-Gulland, Bennett & the SCB 2002 Annual Meeting Wild Meat Group, 2003). We believe, however, that the value gained by associating disease risk to bushmeat conservation must be further evaluated before conservation organizations integrate disease risk into campaigns. Even LeBreton *et al.* (2006) admit that food supply, poverty and corruption must be addressed before the practice of harvesting bushmeat can be changed. In this commentary, we raise several questions that future researchers may consider and outline elements of a potentially successful public education campaign.

There are three different steps to a behavior change. First, the audience must be aware of the problem or risk. Second, they must believe that the consequence of maintaining the *status quo* is harmful and real enough to them to make a change appealing. Third, they must change their behavior. At each step, barriers and challenges can doom a campaign. Past experience tells us that even when it is possible to promote awareness through education, people may not believe the hazard is important enough or that it could affect them. And even when people believe the risk is real and relevant, there is often little evidence that this knowledge promotes a change in behavior (McCaffrey, 2004).

In the case of bushmeat hunting and butchering, there is apparently a large percentage of respondents who are aware of a risk. We do not know from this paper if the perceived risk reported by some butchers is a risk of disease as the authors assume. A respondent may have answered that touching blood is risky because of religious or cultural practices. For example, in Islam, it is considered haraam

(unfit) to consume blood. Therefore, if the respondent was Muslim, it would be unclear if the risk of touching blood was from fear of disease or of haraam. In both Islam and Judaism, religious laws govern how both domestic and wild animals are butchered. A respondent may have perceived a risk of butchering bushmeat to be the same as butchering any domestic animal. In either of these hypothetical cases, associating a health risk with bushmeat would not be likely to change butchering behavior. Because hunters do not perceive a risk of infection from bushmeat and are arguably more susceptible than butchers, one must question exactly what risk the butchers perceive.

We agree this could be a moot point because only 12% of the respondents reported Islam as their religion; however, as they were given only one option in the interview, this result might hide those who also hold animistic beliefs along with their acceptance of an organized religion. In some areas of rural Cameroon, local beliefs regarding killing, butchering and eating of both domestic and bushmeat coexist with Christianity. For example, in the Banyangi (Kenyang-speaking, sampled in LeBreton *et al.*, 2006) regions of south-western Cameroon, some hunted animals such as pythons and leopards must be brought before traditional councils and then butchered by certain qualified members of a local cultural society (A. S. Willcox, pers. obs.). In these cases, if someone were to undertake the butchering of these animals without the approval of the local society leaders, the perceived butchering risk would most likely not be a disease risk, but rather a risk of punishment by the traditional society and animist beliefs.

If we assume the perceived risk is of disease, we must wonder if the threat of illness is severe enough to warrant concern. Perceived risk is more likely to change behavior when there is an obvious connection between the risky behavior and personal health, and this connection is widely promoted by trusted sources. If illness does not immediately follow the risky behavior, if the illness could have many causes, and/or if the illness is merely inconvenient rather

than severe, it will be difficult to change the perception of risk. From our understanding of retrovirus infection, there is often a delay before the onset of symptoms, making a direct association between the causative event and the actual disease difficult. In such cases, a campaign would rely upon the trustworthiness of the messenger. Other health campaigns in rural Africa have not been successful, perhaps in part because health workers are not trusted members of the community, as LeBreton *et al.* suggest.

Even when a behavior is perceived as risky, people have been known to underestimate their risk in cases where the hazard is natural, voluntary or uncontrollable (Gardner & Stern, 1996). Native wildlife might fall into these categories. This underestimation contributes to denial of the hazard and continued practice in the risky behavior, adding challenges to an outreach campaign. Our experience with wild-fire, floods and other natural hazards suggests that even when a behavior is understood as risky, people often choose to avoid change.

When the risky behavior is associated with a beneficial activity, such as earning money or providing food, the threat must be large enough to warrant a great sacrifice or an alternative behavior must be easy to adopt. Again, in the case of bushmeat, the risk may not be strong enough to easily change behavior. Bushmeat is very valuable both as a source of local protein and as income in rural Cameroon (Willcox & Nambu, 2006). In other African communities, increased awareness of animal-borne disease has not led to perception of risk to humans or to behavior change. In Ghana, for example, knowledge, attitudes and behavior related to bovine and human anthrax, pervasive and potentially fatal domestic zoonotic diseases, have been documented (Opore *et al.*, 2000). In this case, 96% of cattle butchers, owners, herdsman and consumers in Ghana reported knowledge of anthrax and were versed in the clinical signs of bovine anthrax, yet when asked if it was risky to consume cattle that had died of unnatural causes, significant proportions of respondents reported there was no risk at all or no risk if the meat was cooked with special herbs. When asked why people ate meat from cattle suspected of having died from anthrax, most (64%) said that it would be a good source of meat for a large community. Even in a controlled slaughterhouse in Ghana where zoonotic diseases were frequently detected, professional butchers did not wear protective gear, when they felt sick they would merely take antipyretic drugs, and work surfaces were not sanitized during the processing hours (Otupiri *et al.*, 2000). In both these instances, people's knowledge of zoonotic diseases and the risks they associated with them did not change behavior.

It would be noble, however, to protect human health if possible, as LeBreton *et al.* suggest. If some butchers are already willing to take precautions to reduce a perceived risk of disease from bushmeat, there is the possibility that a campaign could help other butchers protect themselves. Such a campaign should not rely on the power of the risk of infection to change behavior, but rather use community leaders to change cultural norms associated with hunting

and butchering. Winning the support of religious, cultural and traditional leaders in each village should be the first step (Rogers, 1995). Their approval of and participation in the campaign will be critical. Examples of how to safely butcher bushmeat should be easy to observe and easy to practise. If personal communication is used to increase awareness, it should be possible to ask willing butchers to make a commitment to adopt the new behavior and provide feedback of who and how many have adopted the new practices (Jacobson, McDuff & Monroe, 2006).

We must be clear, however, that successful behavior change campaigns focus on one target audience and their behavior (McKenzie-Mohr & Smith, 1999; Jacobson *et al.*, 2006) – in this case butchers and cleanliness. It is not likely that the message will resonate with consumers or hunters or launch a general tide away from bushmeat. A 'butcher bushmeat with care' campaign will not only not change bushmeat-harvesting rates, it may actually be seen as an approval of bushmeat hunting and consumption.

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