Hi reddit, we're Jesse and Hannah, and our research into zoonotic infections and hunting practices in Sierra Leone shows women and children interact with animals differently than men – Ask Us Anything!

PLOSScienceWednesday [1] and r/Science AMAs[1]

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the WINNOWER

REDDIT

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As someone who hasn't gotten a clue, does this mean that women and children's immune system react differently? Or is it just different behavior?

Lunar_Reindeer

This is an interesting question but was outside the scope of our study. We know that when people hunt, butcher, and prepare animals for consumption they can put themselves at risk of contracting disease because they often come into contact with the bodily fluids (e.g. organs, blood, saliva, urine, faeces) of animals. But there wasn't enough information available about how exactly people were hunting to know about the real risks people were taking. We also suspected from earlier research that we carried out on Lassa Fever (a disease spread by small rodents that are also hunted and eaten) that children might be quite heavily involved in hunting. We found similar results with hunting of other species, in that children and women are also involved, but that they hunt in different ways to adult men, for example they choose different species to hunt (generally smaller species) and use different techniques (smaller traps or opportunistic trapping). This means that they are also potentially exposed to infectious fluids as men are, and that these exposures might be different, although this still needs to be proven.

You mention

Our research could have benefited from more interviews with women, for which a female field researcher would have been beneficial.

Was that a major holdback in determining the results and do you think any patterns may have emerged with a stronger female relationship?

Zemiakovy

The problem is that since the Ebola virus disease epidemic when hunting was banned, hunting is a very sensitive topic. We spent a long time in the field and build up relations of trust, but still, sometimes differences like gender can make people less open than they might otherwise be. Also, it would have been useful to talk to a greater number of women about the kind of hunting that they did. As you say,

we might have missed certain behaviours altogether, but we don't think this is a major limitation of the study, as we did include women in our research. We do think that further research would benefit from using both male and female researchers.

Interesting. How do adult men react differently?

BigHogDaddy

Adult men who hunt tend to use equipment like guns and nets, and often hunt larger prey. They usually bring meat back home and distribute or sell it. One thing that is really important and different about children's hunting is that they often do it in secret and don't always bring the meat home, as adults do. They feel hungry, so they try to secretly hunt and cook small animals that they find in the forest and eat their quarry alone or with their friends. Because they are hiding from their parents and other adults, the meat is not always properly cooked and therefore they might be more at risk of contracting diseases from the animals that they hunt. Adult men can also use communal hunting expeditions (e.g. with nets) as a social opportunity to talk about topics that they do not want women or children to listen too, for example discussions pertaining to secret societies.

Did you see any differences in the interactions when it came to the gender of children? If not, around what age did it become apparent? Thank you!

kinkycornfreak

Boys and girls do mirror the responsibilities of men and women respectively. For example boys from the age of 7 will already have "boy's cooking" where they catch and eat animals and exclude girls. Boys are also the ones that use dogs and build traps, rather than girls. Playing with animals however, is pretty uniform across gender, especially for toddlers.

Did the animals react differently to men as they did to women/children? Socially, do you believe men are in general raised to act differently towards animals and can this behaviour then be transferred to how men interact with children (for example) differently? What implications does this have on the way we as a a society view and treat animals do you think?

Sorry for so many questions! Anthrozoology is my dream to study (a mere zoology student currently but working on it!) and this is so interesting!!

kirainthewoods

Wow - lots of questions. We didn't study the behaviour of animals and how they reacted to people, but this is a key research topic in human animal interactions. We did anecdotally observe that certain human beahviours in turn affect animal behaviours. For example leaving out sows to roam in the village can attract wild hogs boars, monkey traps changes the behaviours of monkeys that learn how to avoid them.

Fuentes has written some interesting papers on the topic e.g. Human-Nonhuman Primate Interconnections and Their Relevance to Anthropology

We also recently published an article on how human behaviours encourage peridomestic rodents to live inside homes (http://www.ajtmh.org/content/journals/10.4269/ajtmh.16-0675)

And the results are? EILI5 please.

Other than the fact that we already know that people do what they need to do to survive, regardless of who they are (gender or age differences).

My_soliloquy

The key finding is that not only men hunt, but children and women are also involved a lot in hunting and are also at risk of contracting diseases from animals. Future research and public health messaging needs to be changed to include children and not only study/target adult men. Also, its not just about survival, people hunt differently at different ages because of changing social expectations and obligations to their families, as SriBri correctly says below.

Seems like really fascinating research! I conducted primate reintroduction research in Republic of the Congo, helping facilitate reintroduction of captive animals into the wild. Poaching was a constant issue. Have you done any conservation education of the different age groups? Im curious if you found that reaching out to the children helped shape behavior of their parents. Either in conservation or food handling practices. Or was it easier to educate the adults directly?

crotalusoreganus

Unfortunately, we did not look at understandings of conservation issues. However from working in the region and informally talking to people, conservation is a well known topic, albeit controversial. Some people accept the concept, sometimes noting that biodiversity has fallen in their lifetimes. Others think that conservation prevents them from utilising natural resources that they are entitled too and also conflate it with conservation efforts run by national parks that are often funded and staffed by westerners. Your question on conservation perceptions among age groups is very interesting and worth exploring further to see how their needs (nutritional and livelihoods), education from parents, and education from NGOs or at school could change their perceptions.

Hello,

I'm a fourth year medical student also finishing my masters in public health (epidemiology and global health). I noticed the essays you used were from children ages 14-16. At what point for the purposes of the study did you change the classification from child to adult? Would you expect and if so, how did you account for, older children following more adult patterns of behavior? I would expect that older children would follow more of the adult gender roles due to socioeconomic norms, but this is just my own assumption. What is the average educational attainment level? Does this impact the behavior of children with regards to animals?

kmackh

In reply to you and Sir_Rowan_of_Ithor below, children began to be considered adult at around 16 years of age, but pregnancy and marriage were the key markers of adulthood. We spoke to older and younger children in our study, and the school essays were a helpful tool for accessing the thoughts of older children. Certainly, as children grow up they take on a more adult role, including becoming involved in communal hunts. See also our reply to kinkycornfreak above

How aware are the people of Sierra Leone about the dangers of zoonotic diseases? Do they take any preventative measures when hunting and preparing game?

Itsafinelife

Lassa fever (transmitted by a species of rodent) was very well known in our area of study thanks to heavy sensitisation campaigns. The ebola virus disease outbreak heavily emphasised the risk of contacting the disease from wild animals, so the theoretical knowledge of zoonotic disease is very present (at least in our study area). However this does not necessarily mean people believe it, or that it transmit into concrete protective actions, and we are about to finalise a new manuscript on this topic! Overall, understanding how people perceive zoonotic disease is very important, and could benefit from further research.

Zoonotic infections interest me! They represent the biggest source of possible new diseases, as we saw with ebola, and that is at once terrifying and fascinating. Are there any books on the subjects that you would recommend?

Friday9

"Spillover" by David Quammen offers a nice introduction to zoonotic diseases.

Guns, Germs, and Steel by R. Dawkins has a very nice historical perspective on zoonotic/infectious diseases, agriculture, and how these contributed to world history.

At what point does a male child become a man in your definition, and do female children and adults women act more similar than male children? Also is it known what causes men to act different than the others?

Sir_Rowan_of_Ithor

Hi we replied to your question above

Do the differences between the demographics dictate speed of transmission? Do kids expedite the transmissions? (little mucus monsters)

Ember357

We didn't actually measure disease transmission from animals to children vs animals to adults, but building on our findings, this would be our hypothesis. Actually in 3 known Ebola virus disease outbreaks, children are thought (but not proven) to be the index case - i.e. the first human infection.

What was your reason for conducting this particular line of investigation?

nysdad

We wanted to provide evidence that could help in disease control efforts, especially in the light of the recent Ebola virus disease epidemic. There simply isn't enough finely grained detailed information about how and why people actually interact with animals that might spread disease, so we wanted to fill that gap and hopefully provide some data to inspire future qualitative and quantitative research on the topic.

Thank you for sharing your knowledge! This might seem like a dumb question, but following the concept of toxoplasma gondii, could there be a possibility that animals carrying zoonotic diseases just happen to come into human contact more often than those that are not carrying any? Or simply just

based on the assumption that sick animals are more easily hunted.

whaaaaaaatisthis

It's not a dumb question at all. We don't know about the ways that some diseases that can be spread from animals to humans affect animal behaviour. Some evidence (and we are not experts on this so you should research it further) showed that toxoplasmosis can change the behaviours of mice, which makes them more likely to be hunted. This makes sense from an evolutionary perspective, as this would benefit T. gondi replication in the lifecycle. From our research, we also know that some of of participants said that they would avoid meat of animals that were sick, but others said that they would eat it. In our research we are also interested in how humans respond to sick animals, and how this might increase the risk of disease transmission.

Thank you for posting this ama, I found the cultural rituals described in your study (especially the social implications of 'boys' cooking').

My question is this: Would it be possible to initiate some kind of new ritual behavior in the boys that would encourage them to cook their food more thoroughly?

It seems to me that they are at the greatest risk of parasitic infection due to poor cooking habits and risky prey choices.

That said, this is a fascinating look into hunter economies and meat as a social currency.

Cranky_Kong

Yes, we hope that our research can be used to inform public health campaigns or awareness raising, perhaps in schools

could you explain it as if i was five . do woman and children get the same illness as man and as often as man eventhough they behave differend from animals ?

squarecoinman

Our research tried to show how social behaviours and practices might put people at risk of disease transmission. Looking at our results we would hypothesise that children might be at greater risk than adults and that women and children might be at risk of different diseases than adult men, but this would need to be explored further by epidemiologists.

Could this explain why historically the cultural "men bring in the meat" women and children stay home has been the predominant societal norm for most cultures?

Kihr

Our study suggests that we might need to question this assumption. Do we really have the data that proves this? Perhaps it's time to look again at the ethnographic record.

This is a question hat has been recently been debated in the journal Current Anthropology: Why Do Men Hunt? A Reevaluation of "Man the Hunter" and the Sexual Division of Labor by Michael Gurven and Kim Hill

Being that your work outlines the fact that men and women are different, how do you feel about the news explanation of/public reaction to the Google Memo?

johnspacedow

What our research shows is that there are some differences between what (some) men do and what (some) women do, but that this is quite complicated. Both men and women hunt, usually but not always in different ways, but men and women also sometimes do the same things. A really important finding from our study is that we show the assumption that only men are hunters has been quite damaging in public health terms, because in this community children are hunting a lot, and the kind of hunting they do is might actually be more dangerous from a disease transmission perspective than what men do (e.g. by undercooking meat from wild animals) . We need to get away from stereotypes about differences between men and women and look at what men and women actually do and the ways in which their behaviours are similar or different. Agustin Fuentes recently made a nice response to the google memo drawing on this kind of anthropological approach, you might like to read ithttp://blogs.plos.org/scicomm/2017/08/14/the-google-manifesto-bad-biology-ignorance-of-evolutionary-processes-and-privilege/

Would you consider this to be a biological difference or a social difference? The combination of biology and society is what makes us what we are and do what we do...so in this instance how do you interpret the data?

DustinHammons

Children, men and women are biologically different and they also act differently socially, so in this sense the differences that we discuss are both biological and social.

Probably too late for the AMA but I believe pt 0 in the West African Ebola outbreak was a child. In WA who usually handles/butchers the meat after it was killed? The woman, men, or children?

Our results suggest that women and children interact with animals in different ways than do adult men

That seems like common sense.

dawnbandit

Everyone does, but crucially this depends on the setting. Women will often butcher if cooking for the whole family. If a man is alone on the farm and does not want to share a small prey, he will do it himself. Children can butcher and cook if they want to eat alone or with other children, but not with their parents. The key here to understand is that everyone of all genders and age frequently come into contact with animal fluids that are potentially infectious. And yes indeed, it sounds like common sense, but it has not been studies in detail before and there is a bias towards studying adult males.

What is a zoonotic disease? What sort of different behavior is seen between the sexes?

Shaeos

A zoonotic disease is a disease spread from animals to humans

I've got to ask since it's in the news. What do you think of https://firedfortruth.com/ - it's the site that has the interacted Google Memo by James Damore? Is there anything inaccurate or sexist in it? I

personally thought it was helpful but I'm just a science junkie instead of an actual scientist. Your thoughts?

Varrick2016

We made a comment about the Google Memo above to johnspacedow

Do current surveillance systems in Sierra Leone capture this exposure of women and children?

If not, what modifications to the current system would you suggest to make it more robust and effective?

st4n13l

Although we are not experts in disease surveillance systems in Sierra Leone, the country has made great strides since the Ebola virus disease outbreak. In general, zoonotic disease surveillance is can be more challenging because it requires a coordinated approach from various ministries (Health, Agriculture, Wildlife/Forestry/Environment) and we don't know how strong these mechanism currently are in Sierra Leone. In any case, surveillance is a great example though of how our research can help inform the implementation of a strong surveillance system. Some options would be not to target zoonotic disease surveillance towards adult male hunters, as is the case in some areas. Including children and women, who hunt different species is important as they are very frequently in contact with animals (and as we say above, children have been putatively implicated as the index case in at least 3 ebola virus disease outbreaks). Also, it is important to recognise the current importance of wild meat in people diets (domestic meat is too expensive for most rural villagers). This means that rather than banning meat from wild animals indiscriminately, a thoughtful approach to instituting surveillance for wild animals and their meat needs to be considered that respects both food security and conservation issues.

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Sorry that you didn't like the paper. We wanted to highlight children's involvement in hunting, because we think that they are more involved than has been assumed by public health interventions and quantitative research studies, which have a tendency to bias towards studing male adults. So although our results may be common sense to you, we thought it was important to study and publish these findings so as to encourage future research and public health interventions not to forget such "common sense" findings.

Also, although men, women and children are all involved in hunting (yes, because they are hungry) we show in our paper social differences and obligations mean that children might be even more at risk than adults men and women.