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Interdisciplinary trip to Kampala, Uganda
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My interest lies in conservation medicine and endangered species preservation, which is how I ended up in the global health specialization, as people, animals, and the environment are interconnected; without a healthy environment, there will not be healthy people. And vice versa. The reason I chose to go on this trip was for the experience of working with an interdisciplinary team and to learn about many different aspects of global health, especially from the people side of things as the majority of my experience is in animal health. I ended up learning far more than I ever expected to, which only added fuel to the fire and now I plan to not only work with animals, but do outreach for people wherever I work.

I learned how important adaptability is in global health when five days before we left a veterinarian from Makerere University whom I was supposed to work with emailed me to tell me that the university had been shut down due to teacher strikes and the professors and students were asked to leave, which left him in a position where he would not be able to work with me. But I ended up meeting with lion and gorilla researchers the first two days and received a tour of the small animal clinic from vet students that still had to be there to take care of the animals. From the researchers, I was able to learn the issues surrounding the lions and gorillas and how people are affecting them. As far as the lions are concerned, poachers are killing their usual prey so they are going out of the parks to hunt livestock and are killed by farmers. And farmers also allow their cattle to illegally graze in the national parks and poison the lions when they attack their cattle. And Uganda Wildlife Authority (UWA) is not doing anything to help the situation and is making it very difficult for researchers to find ways to resolve the situation, and the government is not helping at all. Not only is it a problem for the lions, but hyenas are very vulnerable to the poisoning and leopards are in trouble too. Large predators are needed to control herbivore populations and humans cannot do a sufficient enough job without them. In America, the wolves were hunted almost to extinction and other large predators were hunted out of areas they previously occupied, which is part of the reason the deer population is so large and causing a problem. As far as the gorillas are concerned, local farmers overusing antibiotics has led to resistance. Also, ecotourism has allowed for human respiratory illnesses to be transmitted to the highly endangered gorilla population and has been deadly for them. And now when the veterinarians try to treat the illnesses, there is resistance to some of the antibiotics, so they are studying antibiotic resistance in local waters and trying to use antibiotics that bacteria are not resistance to. But conservation continues to be a challenge in Uganda.

I learned the most on this trip at the orphanages. According to UNICEF, in 2005 Uganda had 2.3 million orphans, largely due to the AIDS epidemic, and it has since increased. The first orphanage we went to, New Hope Orphanage is an orphanage/school created by a school teacher to allow orphans to stay in school until they reach an age where they can go to a university, otherwise they would have to drop out of school due to a lack of money. The kids were ages 5-15 and all very bright. In fact, they re-taught me the algebra and botany I had long forgotten. They did not even have 4 walls on their school and the school flooded when it rained due to the missing wall. They sleep in very

tight quarters with triple bunk beds crammed together in one room. They do not have electricity and had their water shut off at one point, but the meter is broken, so they use it anyways. One of the staff members is planning to plant a garden to grow more vegetables to increase the kids' nutrition. The clothes that the kids have are all donations. But they are very happy and were fun to interact with. One boy is now in his first year at a university studying law and makes bricks and "banana Jesus" (Jesus shaped pictures out of banana leaves) to pay for school. The orphanage desperately needs funding though. I also am really hoping to go back to Uganda one day and not only do conservation work with lions and gorillas, but also go back to New Hope to work with the kids and give more donations. I also want to teach conservation and environmental classes, as I noticed that there is a lot of trash around Kampala and the kids have a fear of snakes and do harmful things to kill them that aren't necessary. By teaching them more about conservation, hopefully when they are older they will be mindful of the impact humans have on the environment and try to find ways to preserve it.

We went to Sanyu Babies orphanage, which is an orphanage for kids age four and younger. Some of the kids are HIV positive and one has tuberculosis and was only separated by the other children by about ten feet. What shocked me the most was as soon as we walked up, the kids walked over to us crying with their arms up wanting to be held. And when we sat down they ran over to us and piled in our laps. They desperately clung to anyone they could because they do not have a mom figure. Even when the caretakers were changing diapers, children were clinging to their legs. It was very sad. And one can't help but wonder, what will happen in Uganda when an entire generation of orphans with poor care becomes adults?

However, we went to some orphanages/ schools that were hopeful. We went to an all girls school and walked around the farm with a veterinarian who helped the school set up a farm to teach the girls how to raise livestock so that they will have a way of making money and acquiring food when they're older. After seeing the orphanages, I was afraid of what I would walk into, but the welfare of the animals was better than in the U.S. The chickens were in an open pen where they had room to walk around and the cows were on pasture. The animals had a small flight zone because they were not constantly stressed and afraid. And all of them were very healthy. In fact, I have never seen chickens look so healthy and shiny before. It was impressive. Another school we went to, Watoto, raises the kids all the way through university age. They even support them through college and give them some money after to start life. There are moms that raise the kids and someone brings milk and food from the market every week so that the moms do not have to worry about going far into town and can devote all of their time to caring for the children. The children also had a much healthier interaction distance. They touched us more out of curiosity rather than being desperate for human affection. It is a great system they have in place and is funded by a church. It is amazing how much money makes a difference. But they are hoping that since these kids have been given a chance, they will hopefully pay it forward and one day do good things for their communities.

We also went to Namuwango, which is where Jeremy Goldberg got the inspiration to start the Global Youth Partnership for Africa (GYPA). It's a slum that is extremely poor. When it rains, the water levels and sewage raise to floods people's homes. Sometimes during the night, people have to take their kids to higher ground and scoop the water out with buckets. There is a river behind Namuwango that floods and carries sewage and

trash to Lake Victoria. The children walk barefoot through the sewage because they do not know any better. They also had never seen “muzungos” before (white people) and were very curious. They followed us around the slum and held our hands, trying to see if our light skin was real. It was a good insight into poverty and how much money affects quality of life. My entire experience in Uganda taught me a lot and made me appreciate what I have even more.

Now I understand just how much people tie in to conservation. Without healthy people and a healthy infrastructure, conservation is not possible. This in turn leads to more degradation of the environment, limiting resources, and causing more problems in the human population. In essence, everything is linked and all parts need to be working in order for the whole to work. Now when I do conservation work, I will also make it a priority to outreach to people and help in underserved areas. In conclusion, this trip was a well-rounded experience and I really feel that it has helped to enhance my education and career goals.

Ecotourism and the effects on habitat, animals, and communities:

Developing countries use ecotourism as a way to make money but also for conservation purposes. The goal is to promote conservation of the environment, provide economic support to the community, and minimize adverse socio-cultural conflicts between visitors and residents (Clifton and Benson, 2006). However, it is debated as to whether ecotourism is really a good thing that promotes conservation or if it is harmful to the animals. Furthermore, research-based ecotourism, where people pay to do research projects in biodiverse areas, has a different economic and socio-cultural impact than nature-based ecotourism (Clifton and Benson, 2006).

A lot of the success of ecotourism depends on infrastructure and how money is being used. For example, In Uganda, the Uganda Wildlife Authority officials take a lot of the money for themselves and do not pay the rangers a good salary or compensate farmers for livestock losses as a way of persuading them not to kill lions (Siefert, 2011). Furthermore, they also get upset when researchers ask tourists to contribute money to compensating farmers. And in a poor country where the farmers depend heavily on cattle for food, they need some kind of incentive to not kill animals that are eating their livestock. In this case, the money that is generated from ecotourism is not being used to benefit the animals, but being used for salaries of higher authorities.

The purpose of community-based ecotourism is to improve the quality of life for people and also conserve natural resources (Scheyvens, 1999). It is highly recommended that a portion of the profits from ecotourism go to community development in order to benefit people (Bookbinder et al 1998), but this does not always occur. A study by Bookbinder *et al* (1998) at the Royal Chitwan National Park in Nepal, found that ecotourism did not increase employment or serve to benefit the community. In East Africa, the authorities are protecting wildlife due to the income that they generate, but the money is used to pay governments, foreign tourism companies, and local entrepreneurs rather than being used for community development projects (Scheyvens, 1999). Ecotourism could potentially be beneficial for communities if jobs are provided to local citizens to increase their income and if development or public health projects are put in place. If the profits could be put to good use, then ecotourism could potentially be a sustainable industry that benefits conservation and local communities.

Another concern is that visitors can cause degradation of habitat and natural resources, especially in areas of high visitor activity (Farrell and Marion, 2001). If visitors are constantly touring, this could put stress on the habitats and the animals that inhabit them. When we were on our safari at Murcheson Falls, our guide probably broke just about every rule. He took us off-roading in areas we were not supposed to and let us get out of the matatu to take pictures. In fact, just about every tour vehicle stopped to allow passengers to get out and take pictures, even though there was a sign at the entrance of the park that said not to get out of the vehicle unless there was an emergency (such as the vehicle catching on fire). They also have a private airport right in the national park so that rich visitors can fly right in. In a way it seems to contradict the purpose of conservation and does not serve the best interest of the animals. Tour guides need to be well trained and monitored for breaking rules during safari. If the point of

ecotourism is conservation, then activities need to be done in the best interest of the animals and habitat.

Another problem is the transfer of disease between animals and people. Bwindi National Forest, which is shared by Uganda, Rwanda, and the Democratic Republic of the Congo, has the only population of mountain gorillas in the world and they are currently endangered. Ecotourism has allowed for human respiratory diseases to be transmitted to gorillas, which has been a challenge to combat due to antibiotic resistance and is fatal to this already endangered species (Nizeyi, 2011). In fact, the national park now requests that visitors who are sick do not come in the park to see the gorillas. Furthermore, ecotourism has allowed for some of the gorillas to become habituated to humans and allowed for parasites to be transmitted from the gorillas to humans (Nizeyi *et al* 1999). In fact, several parasites, including *Giardia lamblia* and *E. coli*, were recovered in both human and gorilla stool. Also, the transfer of parasites from gorillas to humans leads to diarrhea, which is one of the leading causes of death in developing countries. Human encroachment upon wildlife habitat has led to the transmission of zoonotic diseases, which make up approximately 75% of emerging infectious diseases (Wolfe, 2011). Therefore, ecotourism can have a negative impact on human and animal health by promoting negative human-wildlife interaction.

In conclusion, there is the potential for ecotourism to serve a beneficial purpose for both local communities and nature, but currently the infrastructure is poor and the right measures are not being put into place to allow it to be successful. Instead of putting the funds generated into conservation and community development, the funds are used to pay higher authorities, governments, and tourism companies. Part of this is due to corruption in the government and authorities having selfish motivations. The money should really be put into habitat preservation, finding humane solutions to human-wildlife conflict, and improving local communities. For example, farmers should be compensated for livestock losses as an incentive to not kill large predators. In fact, in Montana, farmers are compensated for livestock losses due to wolves (Montana Fish, Wildlife and Parks) as an incentive to tolerate the wolves. Also, local citizens should be employed in conservation to increase employment and also increase their income. Furthermore, community projects should also be implementing with the money generated to improve the quality of lives of people. However, the development projects should also be done in a way that meets the goals of conservation. In fact, it is suggested in the Population, Health and Environment Basics USAID course (2011) that conservation projects should also incorporate a public health component in order to aid communities and promote conservation. After traveling to Uganda and learning about human health care and spending time at orphanages, I will always incorporate some type of public health or education component with my conservation projects.

One health is an interaction between human health, animal health, and environmental health. If one is not healthy, then the other two parts will not be healthy as well. An example of this is the transmission of diseases between animals and people and human encroachment on habitat has led to the emergence of new infectious diseases. Therefore another concern of ecotourism is transmission of disease and also accidental destruction of habitat. If the tours are managed better and the guides follow rules, some of these problems can be prevented. In the future, better infrastructure should be put in place to

manage ecotourism and the money needs to be used in proper ways. Only then can ecotourism fully benefit people, animals and the environment.

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I thought this interdisciplinary trip was a great experience. It is a really good idea to send a team of students in different disciplines somewhere together because they are able to work together, but also learn about different global health aspects from each other. For example, I learned about health care in Mulago Hospital from Angela and Jessica. Cara was the one who informed me on just how large of a scale the orphan problem is due to the AIDS epidemic. James taught me a lot about water treatment and how it is done. And in turn, Judi and I taught the others about animal health and conservation issues. In fact, I feel like a lot of my learning came from conversations with the others and talking about what all of us discovered.

The site was fabulous! Mulago Guest House was nice, it had running water, internet, and we didn't have too many problems with the power going out. The GYPA staff was great and did so much for us to make sure we had a full experience. They were also a lot of fun to hang out with. The people in Uganda were very kind too and always made us feel welcome. Kampala is a large city too and you can find anything you need there.

In a way the trip was more of an exploration, to see the issues and then figure out where we fit in and how we will be able to help one day. If there was a way to secure funding, it would be very beneficial to send an interdisciplinary group for a short time (like this trip) to explore different areas of global health and then send the same group the next summer for a longer time period so that they can spend more time working with the professionals they made contacts with and also do more outreach now that they know how they can help.

I think sending an interdisciplinary team helped us to learn how to work together and learn how to cope with differences. I think for the most part everyone got along fairly well, considering that we did not know each other prior to the trip and some of us met for the first time at the airport. I think in the future it may be more helpful to have the group schedule meetings once in a while before departure so that they get to know each other better and can figure out exactly what they are doing. Also, for the most part everyone was adaptable, but some were more adaptable than others. Considering that we did not know each other, we got along very well. However, we did not mesh as well as we could have. I know that the reason the six of us were chosen was because we were the only ones that volunteered to go. In the future, if more people apply for the trips, it may be beneficial to do an interview process to figure out which personalities fit best and who is most adaptable. Adaptability is important in global health, but even more so when it is a group effort. It is good to learn how to get along and settle differences, but at the same time, if you are sending a group across the world for a global health mission, they should be as cohesive as possible. These are just suggestions for future trips. Everything considered, I think we made a pretty good team!

For any future students traveling to Uganda, I would suggest bringing cold medicine. With the possibility of contracting deadly infectious diseases, I did not even consider catching a cold. But some type of respiratory virus went around the guest house before we got there and a few of us got sick from it. I got sick the second day and had to borrow medicine from a friend to help me sleep at night. So I would make sure they think about that ahead of time. I did not need a mosquito net. They usually have them wherever you stay in Kampala and even in the safari tents, the mosquitos weren't bad if you had bug spray on. I would also bring a water bottle and buy a large jug of water to refill it, that way they don't waste a lot of plastic buying individual bottles because Kamapala has a

lot of trash everywhere. I also recommend staying at Mulago Guest House and using the GYPA contacts, everyone was very nice and helpful. I would also check prices on laundry from the lady who runs it (Rosette) because one of the employees ripped me off and I found out later that the price was actually lower. Another person in the group was ripped off by a taxi driver. It doesn't happen often, so it is not something to be concerned about, just something to be aware of. I would also bargain prices whenever they can. I think my only other suggestions would be to get out of the city once in a while and go see nature; it really will make them feel better. There is so much air pollution in the city that you get sick while driving around. And go to Jinja to see the source of the Nile River. There is only one source of the Nile in the world and you might as well go see it while you are in Uganda. Also, there is bungee jumping there and it was a lot of fun. Even if you are afraid of heights, do it! Bungee jumping over the Nile River (and getting your head dunked into it while jumping) is a once-in-a-lifetime experience that no one should miss out on when they are in Uganda.

If I had the experience to do over again, I would do it in a heartbeat! I would highly encourage funding more interdisciplinary trips as it gives students a much broader perspective than just working in their professional area. And I just want to say thank you for this opportunity, it has been life-changing.