R25 Practicum Report

The Public Health Impact of Stray Animal Populations in Developing Countries

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Section I: Research Project

ABSTRACT

Toxoplasma gondii is a parasitic protozoa of global public health concern. Felines are the definite host of *T. gondii*, but it can infect any warm-blooded animal, especially important are humans and livestock. Humans contract toxoplasmosis by eating undercooked infect meat or by ingestion of food or water contaminated with oocyts. Previous serological studies have indicated high prevalence of *T. gondii* in humans living in areas where high prevalence of seropositive animals, specifically cats, has been found [1]. Cats have an important role in the transmission of *T. gondii* to humans and other animals because they are the only hosts that can excrete the oocysts in their feces, thus freely contaminating the environment [2]. The prevalence of *T. gondii* varies from country to country depending on the management of cats specifically housing and feeding, as well as the educational level of the population.

There is a lack of data regarding the prevalence of *T. gondii* in African countries due to the lack of funding for research. This study will investigate the prevalence of *T. gondii* in feral cats in Addis Ababa, Ethiopia. In a country where animal welfare and management are not viewed equally as in the United States, the prevalence of *T. gondii* in feral cats should be high. This in turn would suggest an important public health concern for the human population, specifically those immune-compromised and/or pregnant.

Feral cats will be humanely trapped and euthanized for this study. The Modified Agglutination Test (MAT) will be used to screen for *T. gondii* antibodies in the serum as described by Dubey and Desmonts [3]. Blood and fecal samples as well as the entire heart will be collected from MAT-positive cats. Samples will be transported to USDA-ARS laboratory on ice with an import permit secured from USDA-APHIS. Viable *T. gondii* will be isolated from heart tissues by bioassay in mice model using methods as described by Dubey [2]. The fecal samples will be examined for *T. gondii* oocyts as described by Dubey [2]. Tachyzoites from cell cultures and *T. gondii* isolates will be cryopreserved in liquid nitrogen for future studies.

Findings from the preliminary study will be summarized descriptively and presented at national and international venues, including the 1st International Congress of Pathogen of Human and Animal Interface in Developing Countries taking place in Addis Ababa, Ethiopia September 15th-17th, 2011.

THE PROJECT

Cats were brought to the Aklilu Lama Institute of Pathobiology (ALIPB) by local volunteers. A small monetary compensation of 100 birr (~\$6USD) per cat was provided. The cats were kept in cages and maintained by the resident animal caretaker at ALIPB. A paper collar with an identification number starting with 001 was put on each cat. Blood was drawn from the jugular vein and dispensed into a labeled serum separator tube. A sedative, Dexdomator®, was injected if the cat was not cooperative. The

Modified Agglutination Test (MAT) was performed on the serum in a 1:25 dilution to detect antibodies against *T. gondii*. The results were recorded. The following data was collected from each cat: location captured, arrival date to ALIPB, gender, approximate age based on dental structure (kitten, juvenile, or geriatric), general health findings, and interesting findings upon necropsy. The cats were kept in cages at ALIPB up until the last day of our stay when they were euthanized humanely through an injection of Dexdomator® and then placed in a chamber with ether. Necropsies were performed on all cats regardless of their MAT results.

Necropsy was performed the morning of departing for the US so that the samples were as fresh as possible. A new disposal scalpel was used for each cat. Gloves were also changed between each cat. The heart was excised first and put in a Whirl-Pak® bag. The bag was not sealed until the heart was cool to the touch. Then, using the same scalpel, the colon and rectum was removed and the fecal matter was squeezed into another Whirl-Pak® bag. All the samples were placed in an icebox with ice packs and were a part of our checked luggage. The stomach and small intestinal contents were examined. Other organs were briefly scanned in search of obvious pathological findings.

RESULTS AND DISCUSSION

The goal of this project is to provide epidemiological and seroprevalence data on the parasite *Toxoplasma gondii* in the feral cat population in Addis Ababa, Ethiopia. This parasite is a concern for the immunocompromised population as well as pregnant women. The high rate of HIV in Ethiopia as well as the culture of eating raw meat as a delicacy both supports the importance of this study in this particular part of the world. The large feral cat population, the close proximity of humans and animals, the large population of urban livestock, and the general hygienic conditions all aid in the transmission and survival of *T. gondii*.

A total of 49 cats were brought to ALIPB, however, 13 died due to unknown definitive causes resulting in 36 necropsies. The majority of the cats (63%) were captured in the subcity of Lideta of Addis Ababa, which is where ALIPB is located. The subcity of Ketema is the closest neighboring subcity to Lideta and 16 (33%) cats were captured there. Finally, one cat was from the subcity called CMC, which is the newest part of the capital city and another from the subcity Kirkos. Two-thirds (n=29) of the cats were female and 5 (17%) of them showed physical evidence of having given birth recently, nursing, or were currently pregnant. The majority of the cats were identified as juveniles between the ages of 1 to 3 years old. Six cats (12%) were estimated to be \geq 8 years based on their severe dental disease or complete lack of teeth, and out of these geriatric cats 2 passed away under our care. The serum of one of the deceased geriatric cat was icteric suggesting possible liver disease. Twelve cats (24%) were \leq 6 months and were considered kittens. The majority of the cats were in good physical condition based on the 1 to 5 body score (BS) system used in veterinary medicine with 1 being emaciated and 5 being severely obese. Eighty-percent (n=39) of the cats had a BS3 which is normal and only 4 cats had a BS2 which is less than

the ideal body condition. The rest of the cats (n=6) were determined to have BS2+ which is slightly less than ideal body condition. The majority of the cats were infested with fleas.

A 4-month old male kitten captured in subcity Lideta with BS3 was an interesting case. First of all, it had oddly enormous eyes for a feline and they popped out slightly from the sockets. It had a distended abdomen and was extremely nervous and anxious upon handling. He had tachycardia, tachypenia, and extensive muscle twitching all over his body. After an injection of 0.15ml Dexdomator® in the left hind limb, he awoke semi-paralyzed in both hind limbs. They still had some movement and response but it was weaker than normal and he was reluctant to bear weight on them. We suspect an underlying neurologic disease.

The Modified Agglutination Test was performed on all the serum samples except for cat 002. Blood was not collected due to severe dehydration on the day it was admitted, and it died later that day before it could be attempted again. Based on the preliminary 1:25 dilution of the serum, nearly all cats (n=42, 88%) were positive for antibodies against *Toxoplasma gondii* except for 6 (12%) which were all \leq 4 months. This finding is not surprising since the kittens have had less exposure to the environment than the older cats. Further dilutions will be necessary to determine a titer.

Upon necropsy, two of the five female cats that looked pregnant were actually pregnant and carrying fetuses in the uterus. Cat 029 from subcity Lideta with an approximate age of 3 years, BS3, and sero-positive for antibodies against *Toxoplasma gondii* at a 1:25 dilution was carrying 3 fetuses about 55-60 days gestation. Cat 047 from subcity Ketema with an approximate age of 5 years, BS3, and also sero-positive was carrying 5 fetuses about 21-28 days gestation. No significant necropsy findings were discovered in the neurologic kitten described above. Of the 36 necropsies performed, about half (47%) were infected with worms upon inspection of the small intestines. Tapeworms were found in 13 (36%) cats and roundworms were found in 4 (11%) cats. Wood chips were found in the stomach of 5 (13%) cats. Wood chips was used as their bedding in the cages and the boiled sheep lung that they were fed were placed directly on top of the bedding thus the wood chips were ingested along with the food.

The fact that the majority of the cats were between the ages of 1-3 years old is not surprising since they are at their peak in regards to health and ability to hunt. However, receiving 6 geriatric cats was quite surprising just by the shear fact that they can live that long in such uninviting conditions and almost all of them had some dental issues that would also hinder their ability to hunt and eat. The cats were significantly smaller in size, and consequently in weight, as compared to cats in the West. This could be attributed to genetics, nutrition, and lifestyle. Death due to severe dehydration, stress, intestinal obstruction and severe upper respiratory disease were likely the reasons the 13 cats passed away during the study.

Section II: Practicum Report

ZOONOTIC DISEASES AND ITS EFFECTS ON PUBLIC HEALTH IN DEVELOPING COUNTRY

Most developing, and even parts of developed countries, have a serious problem with stray cats and dogs. Not only is this an animal welfare concern, but more significantly, it is an important public health problem due to the zoonotic diseases that can be transferred from animal to human.

Addis Ababa, Ethiopia is certainly not exempt from these problems. This capital city is the central hub of many African governmental agencies such as the African Union, the Organization of African Unity, the Common Market for East and Southern Africa, the African Development Bank, the United Nations, and the African Economic Commission. For such a high-profile capital city with many significant international visitors, issues regarding animal welfare, zoonotic diseases, and public health are low on their priority list.

With an estimation of 250,000 total dogs in 2005 in Addis Ababa alone, and nearly half of them strays, rabies is a major concern [4-5]. The number of cats and stray cats in Addis Ababa has not been investigated. This is mainly due to their indirect public health impact compared to a direct bite from a rabid dog and secondly, to the fact that cats are less visible than dogs on the streets. Dogs seek human attention and affection while cats do not. However, that does not dismiss cats from playing a role in disease transmission to the human population, specifically the immunocompromised population of HIV patients and pregnant women.

Based on the World Health Organization Country Health System Fact Sheet 2006 on Ethiopia, 4% of death among children less than 5 years of age between 2000 and 2003 was caused by HIV/AIDS [6]. On the list of top 10 causes of death on the Fact Sheet, HIV/AIDS was the 2nd leading killer of Ethiopians in 2002 [6]. In 2003, the prevalence of HIV among adults 15-49 years of age of both genders was 4.4% [6]. HIV patients are very susceptible to various infectious diseases due to their severely immune-compromised status. Those infectious agents include intestinal parasites from animal origin such as *Cryptosporidium parvum* from bovine found in one HIV patient in northern Ethiopia [7]. Previous studies have demonstrated high seroprevalence of *Toxoplasma gondii* in HIV and non-HIV infected people as well as pregnant women in various parts of Ethiopia [8-9].

ANIMAL WELFARE AND PUBLIC HEALTH IN ADDIS ABABA

In a country where pet animals, like dogs and cats, are not viewed equally as in the Western world, the welfare of the stray animal population is a great concern for veterinary medicine as well as public health.

Very few people in Ethiopia have pets as defined by the Western world. It is a luxury to be able to feed and properly care for another living non-human creature in developing countries. In Ethiopia, people will

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say they have a pet, usually a dog. This animal sleeps outdoors, eats leftovers, and does not receive preventive veterinary treatment. If the dog gets into trouble for example, bites someone, the animal suddenly does not belong to them anymore. They simply feed the animal to keep it alive but do not take full responsibility for its welfare and actions. There were 2 dogs at the guesthouse that we stayed at in Addis Ababa. The female was spayed but the male was not castrated. This was done solely to prevent reproduction rather than for the sake of the animal's health or for the larger stray animal population if the male were to escape. The male dog now is at high-risk for prostate cancer as well as behavioral issues; the latter was very evident. These dogs, like many of the street dogs, were not fed a well-balanced diet suitable for the species which can cause liver and dental problems along with many other issues. I saw them being fed raw femurs, boiled beef, and raw beef. They were also fed leftover meat from a restaurant next door that specialized in the local delicacy of raw minced meat, which has a high risk of being contaminated with parasites, tapeworms, and bacteria.

During my time in Addis Ababa, I have seen countless stray dogs and cats roaming the streets and rummaging through piles of trash throughout the city. One interesting piece of information that I learned from a local while talking about the stray animal population is that most Ethiopians prefer to keep male dogs to act as a guard for the home. Thus, the female puppies in a litter are discarded. I experienced this first-hand when I found 2 female puppies, about a week old still with their eyes and ears closed, scattered along a major street amongst piles of trash. At first, I thought they were dead but upon closer inspection, they were still alive. I picked them up. They were cold and wet but still had life in them. After a long debate with a colleague, we concluded that they were too young to keep alive with the limited resources that were available there. I had only seen one veterinary clinic for small animals and found only one store that carried commercial pet food at an extraordinarily inflated price.

In addition to seeing stray animals everywhere, there were waste from animals and humans everywhere as well. The smell of ammonia was very evident in certain parts of the city, and we witnessed many urinating publically. We were there during the rainy season which made sanitary conditions worse because everything was washed and mixed together. There were large puddles of standing water everywhere too due to potholes in the sidewalk and the streets. Some roads were not even paved and because the ground was so saturated the puddles would be there for weeks. There were numerous puddles in the dirt road that lead to our guesthouse and they were there the entire 2 months of our stay. All these conditions are a hazard to public health.

Uncontrolled breeding, a high risk of contracting infectious diseases such as parvovirus, distemper and rabies for dogs and feline leukemia virus and upper respiratory infections for cats, a significant risk of injury and premature death, considerable infestation of internal and external parasites, plus starvation all contribute to decreased quality of life of the stray population in Addis Ababa. Most importantly, some of the infectious diseases that plague the stray animal population can be transmitted to the human

population affecting mostly the immunocompromised population of HIV patients. The poor hygienic conditions compound the situation by increasing the probability of transmission of some of the infectious agents.

INFECTIOUS DISEASES OF CATS AND THEIR EFFECTS ON PUBLIC HEALTH

Intestinal parasites that are transmitted via the fecal-oral route, usually by contaminated food, is the major public health issue relating to felines. Of relevance to the cat population is the issue of toxoplasmosis, a protozoan infection which cycles through cats. It has been found to infect small rodents, ruminants and immunocompromised people. Others include toxocariasis caused by the roundworm *Toxocara cati*, babesiosis caused by a protozoan parasite, and gnathostomiasis caused by the roundworm *Gnathostoma spinigerum*, just to list a few. These gastrointestinal helminthes have been discovered in stray cats in India, Egypt, Thailand, and the West Indies [10-13]. A zoonotic ringworm outbreak in Spain was caused by a strain of *Microsporum canis* from stray cats which infected 4 veterinary students, 4 dogs, and 6 cats living in 5 separate locations of the region [14]. There was one rare case of an outbreak of human rabies transmitted by a cat in Colombia in 2008 [15]. Two people died in that outbreak. This demonstrates the fact that cats also play a role in disease transmission to humans, although not as publicized as a bite from a rabid dog would be. Controlling the cat population probably will have benefits here, as well as good food and personal hygiene.

According to Dr. Abraham Ali from Ethiopian Health and Nutrition Research Institute [16], these conditions are a problem in rural Ethiopia, but not significantly in Addis. However, with large numbers of free-roaming dogs and cats, poor sanitary and living conditions, in addition to a large population of urban livestock, it is not unlikely for the stray cat population to become a public health issue. Goats, sheep, donkey, and even cows can be easily seen wandering the busy streets and sidewalks of Addis Ababa in search of a tiny plot of green grass to indulge in amongst a city of cement. The transmission of *T. gondii* between cats and livestock would endanger the food supply and become a potential form of transmission to humans through undercooked infected meat. A study conducted in the United States found 53.4% of 234 goats for human consumption were seropositive against *T. gondii* [17]. There is currently no published data regarding *T. gondii* in livestock in Ethiopia, but it can be assumed that the prevalence would be higher due to the large stray cat population and the large urban livestock population.

Stray dogs and cats can present a number of public health problems for the local human population, and these problems may influence the strategies and processes towards a cleaner, healthier, and more civilized country. By emphasizing the public health benefits of stray animal control, it may be easier to encourage the involvement of agencies focused on human health which might otherwise be disinterested in animal issues. Thus, two birds can be dealt with by one stone: both animals and humans benefit under the public health umbrella.

ANIMAL CONTROL AND WELFARE POLICIES IN ADDIS ABABA, ETHIOPIA

Developing countries, such as Ethiopia, lag behind in animal control efforts due to various socioeconomic factors and low understanding of the actual trend of the diseases as well as the actual threat of zoonotic disease potential and lack of concern for animal welfare.

With respect to government policy, animal welfare is considered important because it has an effect on society at large, and is therefore a 'public good' in that everyone benefits from its pursuit: both animals and humans. There is a criminal code (No. 414/2004) in place in Ethiopia that codifies cruelty and mistreatment of animals as a criminal offence, however, owners may inflict any cruelty on his own animal since they are considered personal property.

Of the many non-governmental organizations operating in Addis Ababa, few are concerned directly with the stray animal problem. Currently, the Donkey Sanctuary and the Brooke Organization are working successfully to improve the lives of equine, however, there are not any groups advocating for the small animal population nor are there animal shelters in place.

HOW TO ADDRESS THE STRAY POPULATION ISSUE IN ADDIS ABABA

The main problem with any stray animal population is the uncontrolled reproduction. A dense population of stray animals increases disease transmission between the animals and to the humans. A mass neutering program would be a good idea, however, how feasible logistically, financially, and personnelwise may be an issue. JK Levy from Maddie's Shelter Medicine Program at the College of Veterinary Medicine at University of Florida proposed 2 contraceptive vaccines to control the feral cat population [18]. This would be ideal for developing countries because it would cut down on the need for people with specialized skills (ie: veterinarians) and all the equipment and medication needed to perform surgical sterilization. It would also be faster and cheaper to perform.

Trap-neuter-return programs would work well with cats because they are great survivors and do not need human assistance. Healthy, rabies-free, neutered cats will occupy a niche and help reduce rodents, especially in developing countries where rodents, insects and other pests are also a major public health problem. Levy et al. [19] found that a long-term neutering program followed by adoption or return resulted in a decrease in the free-roaming cat population in Florida. An adoption program would not work in a developing country like Ethiopia but trapping and releasing would be work well.

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CONCLUSION

Before any of these ideas can be put into play, the people need to be educated on animal welfare and zoonotic diseases first. Without the understanding from the people and especially the government, there will be no support at all. This will take time, a long time. Changes in politics, environmental policies, veterinary care, government, attitudes towards animals, education, healthcare, culture, social norms and the economy must all take place before the animals will get any attention. The idea of prevention does not exist in developing countries. The idea of preventing human illness by controlling the stray animal population is a foreign concept in developing countries. The focus is on the control of infectious diseases and illnesses, to reduce the impact of the diseases that are already present in the human population. Eradication and prevention are concepts of the developed world. On the brighter side, all countries are capable of changing. It will not be overnight, however, all have the capacity to change and adopt new ideas.

Section III: Personal Assessment of the Practicum Experience

PREVIOUS TRAVELS AND WORK ABROAD

I have performed research and participated in many (veterinary) public health programs. In Brazil, I collected raw milk samples for my MS thesis project. I went to Peru as an Emerging Infectious Disease Fellow through the CDC for training in tropical parasitic diseases. Through a program at North Dakota State University, I spent 2 months in Uganda learning about infectious diseases that plague the country and about the public health impact of the local African wildlife. Food safety issues were discussed in a program called "Farm to Table" in Uruguay.

MY RESPONSIBILITIES DURING THE PRACTICUM

My responsibility was to conduct the proposed research project. I recorded and maintained the data collected from each cat. There were a lot of logistical issues to overcome. I had to speak to many different people to gather the materials that we needed and to make sure that the housing for the cats were ready ad appropriate. I participated in the necropsy of the cats as well as the serology test. I made a poster for the College of Veterinary Medicine Summer Research Program regarding my practicum experience.

FEEDBACK ON THE EXPERIENCE. POSITIVE AND NEGATIVE ASPECTS

It was a great experience. Although we experience hardships with the project and just with daily life in general, which is normal while traveling to a foreign country, I would do it all over again. I already live and perform outside of my comfort zone, but this experience pushed me just a little bit further out. It was a personally, academically, mentally, and physically challenging 2 months, but it made me feel alive and reminded me of why I am still in school at the age of 27. With every trip abroad, I am reminded of the importance of my contribution to global public health as a future veterinarian.

UNIQUE EXPERIENCES/EVENTS

<u>WEDDING</u>: We were invited to a traditional Ethiopian wedding by some local friends and it was very culturally rewarding. We learned how to dance the traditional Ethiopian dance.

<u>LIVING SITUATION</u>: Our living situation was amazing. It was like living with an Ethiopian host family. We caught a glimpse of what life is like for an Ethiopian and we lived it.

<u>SIMIEN MOUNTAINS</u>: I took a week off and spent 4 nights in the Simien Mountains. We hiked up to 4000m above sea level and it was absolutely breath-taking, literally. The complete contrast between the chaotic, noisy, dirty city of Addis Ababa and the serene, cleanliness of the mountains was quite shocking for me. It was a nice break.

BAHIR DAR: After the mountains, I visited the source of the Blue Nile and visited the Blue Nile Falls.

OVERALL ASSESSMENT OF EXPERIENCE

Overall, I am grateful to have had this opportunity to perform research that will benefit a country in need. I am also grateful that OSU developed this Global Health Program that gives students from all disciplines the opportunity to have experiences similar to mine through scholarships, and to implant the importance of global health in this increasing interconnected world.

I learned a lot about myself, my future career path, about toxoplasmosis, about the local culture, about public health issues in Ethiopia, about animal welfare issues in Ethiopia, and so much more that I cannot list them all here. I will take all the lessons learned on this trip forward with me for the rest of my life.

Thank you.

Section IV: Travel and Survival Tips

Tips for Traveling to Ethiopia:

<u>WHEN TO GO</u>: There are two seasons in Ethiopia: rainy and dry. The rainy season is from mid-March to September with the heaviest rain falling from July and August. The dry season is from October to mid-March.

VACCINES/MEDICATIONS: Malaria is generally absent at altitudes above 1800 meters; however, it's safe to err on the side of caution and take prophylactics anyway. Addis Ababa and Northern Ethiopia are above 1800 meters but that doesn't mean it is absolutely free of malaria. Southern, Eastern, and Western Ethiopia are below 1800 meters and have high-risk for malaria. Check the CDC website for the recommended vaccinations. Some require multiple injections so see a doctor as soon as you know you are going to Ethiopia.

VISA: A visa is required for American citizens to enter Ethiopia. You can get one once you arrive to Bole International Airport in Addis Ababa. It cost \$20 USD. You can pay using the US dollar. However, if you do not want to wait in a long, disorganized line after a long and tiring flight, I recommend getting the visa BEFORE departing the US. Check online for the nearest Ethiopian Embassy and contact them for more information.

MONEY: Ethiopia's currency is the birr. Coins come in 1, 5, 10, 25, and 50 cents, and bills comes in 1, 5, 10, 50, and 100 notes. During my stay, the exchange rate was steady at 1 USD=16.95 birr. You can exchange money when you arrive to the airport. There is no need to do it in the US. I strongly recommend bringing (brand new) one hundred dollar bills and one **VISA** debit card. Mastercard is not accepted. Credit cards have not use here in Ethiopia unless you plan to stay at a fancy 5-star hotel, buy plane tickets to travel or buy tour packages. Brand new bills will give you less trouble at the bank when exchanging money. Most African countries have some strange preference for brand new one hundred dollar bills. They may not accept a crumpled, old bill and they may not accept ones, fives or tens. ATM machines are located at larger branches of banks which may not always be convenient to get to. Look for the purple ATM machines. Most shops do not have change for large bills (50 and 100) so go to the bank and swap out for smaller bills (10 and 1).

CULTURE: Ethiopia is a very conservative and religious country. There are Muslims, Jews, and Orthodox Christians, which make up the majority of the population. People are very warm, friendly, hospitable and polite. You may not get that feeling when everyone is staring at you and saying things to you that you don't understand, but once you get to know them you find that they are extremely fascinated with foreigners and treat you very well. The lifestyle is very laid-back and flexible. It may become frustrating at times, especially when you need to get something important done. There is a severe lack of organization in regards to traffic and waiting for your turn for something. Streets have names but there are no signs and most people do not know the names, making finding a specific place very difficult.

DRESS: Dress is conservative. For females, do not pack short shorts or anything very revealing. The younger Ethiopian generation dresses like Westerners, however, the majority of the population dresses in traditional gear. Specifically, the women wear long dresses, head wraps, sandals, and conservative tops. Men wear sandals, pants, and shirts.

LANGUAGE: Amharic is Ethiopia's national language. There are regional languages as well, but Amharic is the most widely used and understood language throughout the country. Learn the basics before departure. The locals really enjoy and appreciate your effort. Most do not speak English outside of Addis Ababa. Even within the capital city, most adults do not speak English. Look for the college-aged locals. They know English because classes are taught in English at the university level. You may hear 'faranji' a lot, which means "Westerner/Foreigner".

FOOD: The national staple is injera. It is analogous to bread to the French or rice to the Asians. It is eaten with every meal every day for at least 2 meals per day, sometimes all 3 meals. It looks like an ultra-thin spongy pancake with a sour flavor. Different types of curries (called wat) and vegetables are put on top. Injera fills you up quick because it expands in your stomach, but it has very little nutritional value. It is an excellent source of iron, only, thus hunger looms shortly after. You eat with your right hand only. Generally, a big plate of injera is brought out and shared by a group of people. Avoid licking your fingers, touching your mouth as you eat, or over-stuffing your mouth as it is considered impolite. Every Wednesdays and Fridays are national fasting days, which means not eating any animal products. Most restaurants will only have vegetarian options those days, which I personally prefer over the carnivorous options. Pork is hard to find in Ethiopia. Beef, Chicken, and Lamb are the common meats. Always make sure the meat is cook thoroughly when eating at a restaurant. Raw minced beef called kitfo is a delicacy in Ethiopia. The good odds of getting a tapeworm should keep you from trying it. Drink bottled water only. Peel all fruits. Be warned that Ethiopian food is spicy hot (thanks to berbere, a type of red pepper). Do not eat salads or any vegetables raw. You have to try doro wat, which is Ethiopian chicken curry. It is the national dish and absolutely wonderful. The coffee ceremony typifies Ethiopian hospitality. If you have been invited for a meal at someone's home, you will experience this ceremony, and I have been fortunate enough to have experienced it.

Tips for Living in Addis Ababa:

<u>WEATHER</u>: The temperature during the rainy season ranges from 45F at night to upper 70F during the day. The afternoon sun can be very hot but when it rains, it becomes cold very quickly. The take home point is **DRESS IN LAYERS** and **ALWAYS** carry an umbrella/raincoat because it rains unexpectedly.

SOCIAL NORMS: Men are very affectionate with each other. You may see them holding hands, walking arm in arm, sitting very close to each other, etc. It indicates a close friendship between them. You may also see people feeding each other. It is also a sign of intimacy and appreciation for that person. Generally, it is the first bite of the food that is fed and the rest of the meal they feed themselves.

PACKING TIPS: A sturdy umbrella and a raincoat are essential during the rainy season. Pack for dressing in layers because the afternoon sun will burn you up while the rain will chill you to the bones. Good walking shoes, sandals, and hiking boots are useful. Pack all and enough toiletries to last your entire stay. They are very expensive. If you have room to pack toilet paper, do so. Public restrooms do not have toilet paper or soap, so hand sanitizer also come in handy. Pack lots of snacks, chocolate, trail mix, and anything else that may satiate your hunger when you can't find anything that you feel like eating.

FOOD: There are all different types of food available in Addis, if you are not a big fan of injera or need a break from it. Italy briefly conquered Ethiopia in the past so there is a large Italian influence in the food: pastas, pizza, lasagna, risotto, and spaghetti. There are also Chinese and Indian restaurants, which are priced like US prices. The fresh juices are to die for and range from avocado to mango to passion fruit. Burger and fries are also a common finding in many cafes and restaurants.

TRANSPORTATION: Addis has a great network of mini-buses that can take you to every nook-n-cranny of the city. You just need to learn the name of the area you are going to and learn to listen for it as the guys hanging out of the window are screaming it out. They are the cheapest form of quick transportation costing 1.25 birr, 2.60 birr or 3.60 birr depending on the distance. It should never cost more than 3.60 birr and always carry small bills to avoid being ripped off change. There are blue taxis that cost at least 10 times as much as the mini-bus for the same location. The mini-buses are safe and a great cultural experience. I definitely recommend taking the mini-buses over the blue taxis. Shout out "wahraj" to tell the driver you want to get off. There are no specific bus stops.

SIGHTS: There are quite a few museums in Addis, however, I did not get a chance to visit them. A road off of Churchill Ave is where all the souvenir shops are grouped. Meskel Square is where the hardcore runners practice and workout. There are many sub-areas of the city that may be interesting to visit, but most of it is all the same in my opinion. I recommend seeing the city by foot for the first week you arrive and then take mini-buses once you know your way around and recognize major landmarks. The best sights and sounds are **OUTSIDE** of Addis Ababa so if you get the chance, get out of Addis!

INTERNET: There are tons of internet cafes around Addis. Most cost less than \$1USD per hour. Be aware that the connection is very slow and unreliable, and the same can be said with the electricity. Patience is key. If you want to write a long email, it is safer to write it on a Word document and then save it on a jump drive that you do not care about because it will likely contract a virus from the public computers. Then send the Word document as an attachment. We learned the hard way and sat there writing long emails only to have the electricity cut out right in the middle of it. There are, however, good internet days when it is super fast but the majority of the days are bad internet days.

<u>ANNOYANCES</u>: You will draw attention to yourself no matter what you do to blend in. People will stare. Men will make comments if you are a female. Children will follow you with their hands out saying "hungry hungry". People will yell out "ni hao" or "China" if you look Asian. You won't know if the price you paid for that kilogram of tomatoes was 4 times what a local would pay. Despite these annoyances, people are very friendly about it and I have never felt threatened or afraid. I just ignore and continue walking. I would not suggest talking back or giving the beggars anything. They will just target you again the next time you walk by because they generally have a specific spot that they beg every time. ALWAYS haggle prices. If you don't like the price, just walk away and go to another shop. Many shops sell the same things. It may be a \$0.10USD difference but it's the principle of getting ripped off just for being a foreigner that is annoying.

Section V: My Photo Diary

ADDIS ABABA

















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HOME AWAY FROM HOME

















ETHIOPIAN FAMILY











FOOD



WEDDING



SIMIEN MOUNTAINS NATIONAL PARK





BLUE NILE FALLS



CATS



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