

# Navigating an International Research Elective in a Resource-Poor Setting

Jorina Elbers

Can. J. Neurol. Sci. 2010; 37: 909-911

In the fall of 2008, I completed a 2-month international elective and traveled from Toronto, Canada to Zambia. Zambia is a peaceful, land-locked country in sub-Saharan Africa, neighboring Zimbabwe, Angola, and the Democratic Republic of Congo. Zambia ranks number 164 out of 182 in the United Nation's Human Development Index (2009), with 64.3% of the nation's population living below the World Bank poverty threshold of \$1 a day. The estimated adult prevalence of human immunodeficiency virus (HIV) is 15%, with greater than 50% of the population less than 18 years old, and an average life-expectancy of 42 years (Unicef, 2007).

The University Teaching Hospital (UTH) is the only public hospital servicing approximately two million people in the capital city of Lusaka. In addition to working at UTH, I wanted my international elective to include a research project exploring the neurological complications in children with HIV, a problem not well described in this region of the world. I confess that I was unprepared for the difficulties I faced conducting such a research project, and naïve to the resource limitations that affect the ability to practice Pediatric Neurology in a developing country.

## *Public health care in Zambia*

Although Zambia is one of the poorest countries in the world, the cost of living is surprisingly high. In a country where nearly 65% of the population makes less than US \$1 a day, the cost of gas is over US\$3 per liter and a loaf of bread is US \$1.50. In 2006, the Zambian government introduced free public health care to rural areas, where user fees previously prohibited people from accessing medical services. In urban centers however, user fees still exist. Although patients referred from outside clinics can be seen for free, self-referrals to UTH cost the equivalent of US\$3.00, and blood tests cost US\$1.50. With transportation to and from the hospital an additional US\$3.00 by bus each way, a single trip to the hospital may cost more than a week's worth of wages.

Despite free health care in rural settings, medical care for patients throughout the country remains inadequate, with limited human and material resources. There is a critical shortage of physicians in Zambia, with one doctor for 18,000 patients, compared to one doctor for approximately 450 patients in Canada. Over the past decade, Zambia has seen an exodus of its health care workers to South Africa and overseas, in response to low wages and poor working conditions. Nursing shortages result in a huge burden of work where one nurse must single-handedly cover a ward of 60 patients. At UTH, laboratory investigations can be purchased, or provided free for patients unable to afford the necessary tests. In-patient results are available the same day; however obtaining out-patient results

can be fraught with difficulty. A patient with HIV requires testing from three separate labs. There is no centralized data collection, and porters or nurses are required to drop-off specimens and pick-up results from each lab separately. Results are often misplaced or blood samples are notoriously lost. At times, patients are required to return to the hospital on multiple occasions before a lab result is obtained. Finally, the short list of available medications is punctuated by unreliable accessibility, where a patient on an anticonvulsant can be stopped abruptly due to pharmacy shortages. Similar shortages of anticonvulsants and antibiotics are not uncommon in the in-patient setting.

Neuroimaging in Zambia is performed by two computed tomograms (CT): one is located at UTH, the other is six hours away. The second-hand CT at UTH functions less than 50% of the time, with a repair process time of two to three months. During this time, adults and children may succumb to otherwise treatable conditions such as brain abscesses, hematomas and surgically resectable brain tumors. The lack of neuroimaging directly affects patient care, and also impacts the training of physicians. When diagnostic equipment is unavailable, physicians must rely solely on clinical examination, with the inability to confirm a suspected diagnosis.

## *Cultural beliefs and barriers*

While the majority of tests and medicines in the hospital are accepted, there is reluctance towards procedures such as lumbar punctures. Since many children die of acute central nervous system illnesses, parents often refuse to give consent for lumbar punctures, believing that the procedure itself is to blame for the death of a child.

Zambian people enjoy political and religious freedom. There remains, however, a predominant belief system deeply rooted in their ancestry. Children with epilepsy are often felt to be "bewitched", or under spiritual possession. Traditional healers are a popular alternative to Western Medicine. Even though they are more expensive (US\$6 to \$100), they are often more accessible to people in rural areas. Although it is difficult to understand, or even imagine, a modern myth exists which suggests that sexual intercourse with a child would cure HIV/

---

From the Division of Neurology, Department of Pediatrics, Hospital for Sick Children, Toronto, Ontario, Canada.

RECEIVED APRIL 12, 2010. FINAL REVISIONS SUBMITTED MAY 14, 2010.

Correspondence to: Jorina Elbers, Division of Neurology, Department of Pediatrics, Hospital for Sick Children, 555 University Ave., Toronto, Ontario, M5G 1X8, Canada.



*Figure: At a safari lodge in Lwangwa National Park, elephants, giraffes and monkeys roam freely in the plain behind me.*

acquired immunodeficiency syndrome (AIDS). Unfortunately, this remains a commonly-held belief. A new program at UTH has been implemented to educate people about the negative aspects of sexual abuse to convict perpetrators, and to treat victimized children against pregnancy and HIV.

### ***Research in a resource poor setting***

For my study, I assessed children with HIV seen at UTH for stroke and other neurological problems. In addition, I collected all available laboratory and neuroimaging investigations to help confirm a diagnosis. Out of 200 children, I identified ten patients presenting with neurological symptoms or signs. Out of the ten, only one family consented to lumbar puncture. From the blood work collected, there were only three viral loads, two out-patient blood samples were lost, and three other patients had incomplete blood work, with at least one result missing. Without an EEG machine in the hospital, EEG could not be performed on any in-patient. When completed for an out-patient by an adult psychiatrist, the EEG only reports that “a focal abnormality suggesting organic brain disease” was found. None of the patients had neuroimaging as the CT scanner was broken, and had been down for several months.

As I scrambled to collect results from patients I had seen, I quickly recognized that my research project was significantly limited by unavailable data that was necessary for me to confirm a neurological diagnosis. Aside from my ability to conduct research, I realized - more importantly - that this was representative of the daily struggle for medical practitioners in Zambia, where physicians are required to train and practice medicine under these conditions. Although I was frustrated at the lack of diagnostic tools, I admired the clinical acumen of these physicians who must treat patients without the investigations we so heavily rely on in North America.

During my two-month stay in Lusaka, I not only drew from my experience of the limitations of training and practicing medicine in a developing country, but also from the beauty that permeates day-to-day life. Each morning I would walk to work on the rich red-brown colored soil of the sidewalk, surrounded by the purple blossoms of Jacaranda trees; each evening I would walk home under the red glow of the setting African sun. I loved to watch the way mothers draped their children over their backs and wrapped them in large pieces of colorful cloth, having done it a million times. I marveled at the warm smile and cheerful greeting, “Hello, how are you?” from strangers passing by.

***Hope for the future***

Traveling and working in a developing country is a challenging, yet incredibly rewarding experience. Many developing countries are unfortunately enveloped in civil war or other internal conflict, and safety is of paramount importance when considering the location for an international elective. Zambia is a very peaceful and safe country that was easily navigated by a single, female physician. The people were extremely warm and friendly, and always willing to help. There is an authentic African culture that, aside from a single Subway Restaurant, is virtually untouched by the Western world.

To say that the health care system in Zambia is overwhelmed would be an understatement. In order to care for the number of patients, physicians must endure exhaustive work hours without the luxury of diagnostic equipment we take for granted in North America. Even though physicians and nurses are submerged by daily patient care, there is still a desire to perform research and improve the current health programs in the country. Successful programs in Zambia include the “Under-5 Program”, which provides monitoring and immunizations for all children under five-years of age, as well as access to free medications to treat Tuberculosis and HIV.

As a Westerner, it is easy to become disillusioned by the complexity of issues that are responsible for the poverty of a developing nation. One person’s contribution can feel equivalent to the impact of a thumbprint in the dust. In contrast, to be witness to the daily life within these regions, can be an enriching and life-altering experience. It is the richness within the people that provides hope for a better future.

**ACKNOWLEDGMENTS**

I would like to thank Dr. Elwyn Chomba for her supervision and guidance during my elective at the University Teaching Hospital, and for providing editorial comments on this article. In addition, I would like to thank Dr. Mwiya Mwiya, and all the other physicians and nursing staff I worked with.

I would also like to express my sincere gratitude to Dr. Gabrielle deVeber and the Children’s Stroke Program at the Hospital for Sick Children, for providing the funding and opportunity to pursue this incredible international elective experience.

**DISCLOSURES**

Dr. Elbers is completing her fellowship in Pediatric Stroke at the Hospital for Sick Children, and has received a one-year clinical research salary grant from the Thrombosis Interest Group of Canada, to study outcomes of pediatric stroke in adults.

The study described in this article, and the funding for the author’s personal travel, was sponsored by an anonymous donor for the Children’s Stroke Program at the Hospital for Sick Children in Toronto, Canada.