

EPIDEMIC PROPORTIONS

The Johns Hopkins Undergraduate Public Health Research Journal

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THINK: GLOBAL
ACT: LOCAL

While touring health disparities in Southern India in 2011, Johns Hopkins student Vikas Daggubati stopped by the roadside on the outskirts of Hyderabad. Mari-gold-yellow concrete barriers surrounded the highway, beyond which was encamped a gypsy colony. There he captured this photograph of two gypsy children at play.

ABOUT:THEJOURNAL

Epidemic Proportions is a public health research journal designed to highlight JHU research and field work in public health. Combining research and scholarship, the journal seeks to capture the breadth and depth of the JHU undergraduate public health experience.

Take a look at our past issues on our website at www.jhu.edu/ep.

SUBMISSIONS:

We publish any student experiences locally or abroad, whether it is research, volunteer work, or an editorial. We also publish faculty research and perspectives.

To submit an article or request more information about submission procedures, we encourage you to contact ep@jhu.edu.

"Back in June 2007, my father and a few of his friends decided they wanted to build an orphanage, but the brief was, it couldn't be like any other orphanage. This one had to be home, and any child in this home would never be short of anything. So the idea passed from the heart to paper to sponsors and trustees, and became a home to tiny feet and beautiful smiles."

- Photographer and Australia National University student Riya Abraham





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Urban South Africa, occluded

Photographer: Andy Fang

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LETTER FROM THE EDITORS

Welcome to Epidemic Proportions!

Our journal's mission is to present the diverse perspectives on pressing global public health concerns and to enhance the conversation on the critical issues. This year's publication continues this pursuit with a forward-looking approach. After looking back at our accomplishments and what has transpired in the field of public health in our 10th anniversary journal last year, we now turn to "Focus on the Future."

Through our future-focused theme and articles, we at Epidemic Proportions hope to spread the word and add to the conversation on public health issues such as affordable healthcare and ready-access to sexual health education and services. We asked our authors to delve into these issues using knowledge gained from their public health research and experiences abroad and back at home in Baltimore, Maryland at Johns Hopkins University.

The middle spread of our journal shows a map of the world with photographs of people from various countries, and the inscribed message "Set Your Focus on the Future" is a call for greater international cooperation and support for public health initiatives. As the global population grows and becomes even more interconnected, we see a greater need for different governments, private institutions, and citizens of the world to come together to address these challenges.

The future of public health contains many uphill battles, but seeing the quality of research and public health related work done by the students and faculty featured in this year's journal gives us confidence that the future is in good hands. The technology, education, and public policy surrounding public health promoted by our authors and institutions around the world will make great impacts on our lives.

Many authors found themselves thinking about the theme of the journal while writing and offered insights to their "Visions of the Future" for public health, which we highlight in the articles. It then became apparent to us that we wanted to have a visionary -- with eyes set on the future -- write this year's Cover Letter. Vice Provost for Research at Johns Hopkins University, Professor Scott L. Zeger, embodies this idea with his pioneering biomedical and public health statistical research and his undergraduate teaching, helping educate future professionals.

We invite you all to read the many exciting articles in our journal this year, Epidemic Proportions, Focus on the Future, and we urge you to add your voice to the conversation that is getting louder and louder each day.

Sincerely,



Jeffery Li



Angela Roller

C O V E R L E T T E R

Interesting Times

The Chinese proverb says: “you are cursed to live in interesting times”. If so, Johns Hopkins public health faculty, students, and graduates are cursed by at least two interesting phenomena of this time. First, we live at the confluence of twin technology revolutions – in data science and bioscience. Moore’s remarkable law, that the cost of computing halves every 24 months, is surpassed by comparable six-month halving in the cost of DNA sequencing. The original human genome was sequenced for \$100,000,000 in 2001; you can sequence yours today for under \$5,000.¹

Second, the cost of the American healthcare system is breaking our society. The U.S. spends \$8,800 per person per year on health care totaling \$2.6 trillion per year or 18% of the GDP. If the U.S. per capita health cost equaled Norway’s, the world’s second most expensive country, the U.S. would save \$1 trillion per year.² If so, there could be no national deficit, no concerns about Social Security or Medicare solvency, and more resources for building infrastructure for our children’s future. Oh, and by the way, our current health outcomes are near the bottom of the developed countries. We can be healthier at much lower costs.

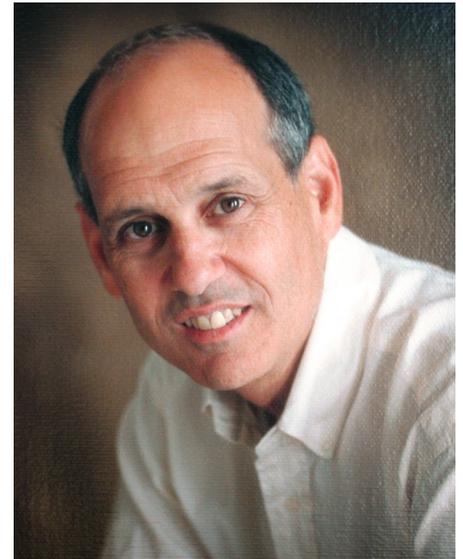
An interesting question in these interesting times is whether the biomedical and data science revolutions can drive dramatic improvements in health and reductions in the \$1 trillion annual waste? At Johns Hopkins, we are committed to demonstrating that the answer is a resounding YES.

Johns Hopkins University, Health System and Applied Physics Laboratory are collaborating to synthesize bioscience and data science to improve health at more affordable costs. We have jointly created the Johns Hopkins Individualized Health Initiative or Hopkins inHealth to discover and implement better ways to measure and track each person’s health state so that our health expenditures are tailored to the unique characteristics and circumstances of the individual and are both more effective and more efficient. For example, Johns Hopkins cancer scientists and doctors are developing, testing, and implementing cancer screening tools that keep populations healthier by focusing cancer tests and interventions where they are likely to do the most good and avoiding unnecessary tests and procedures.

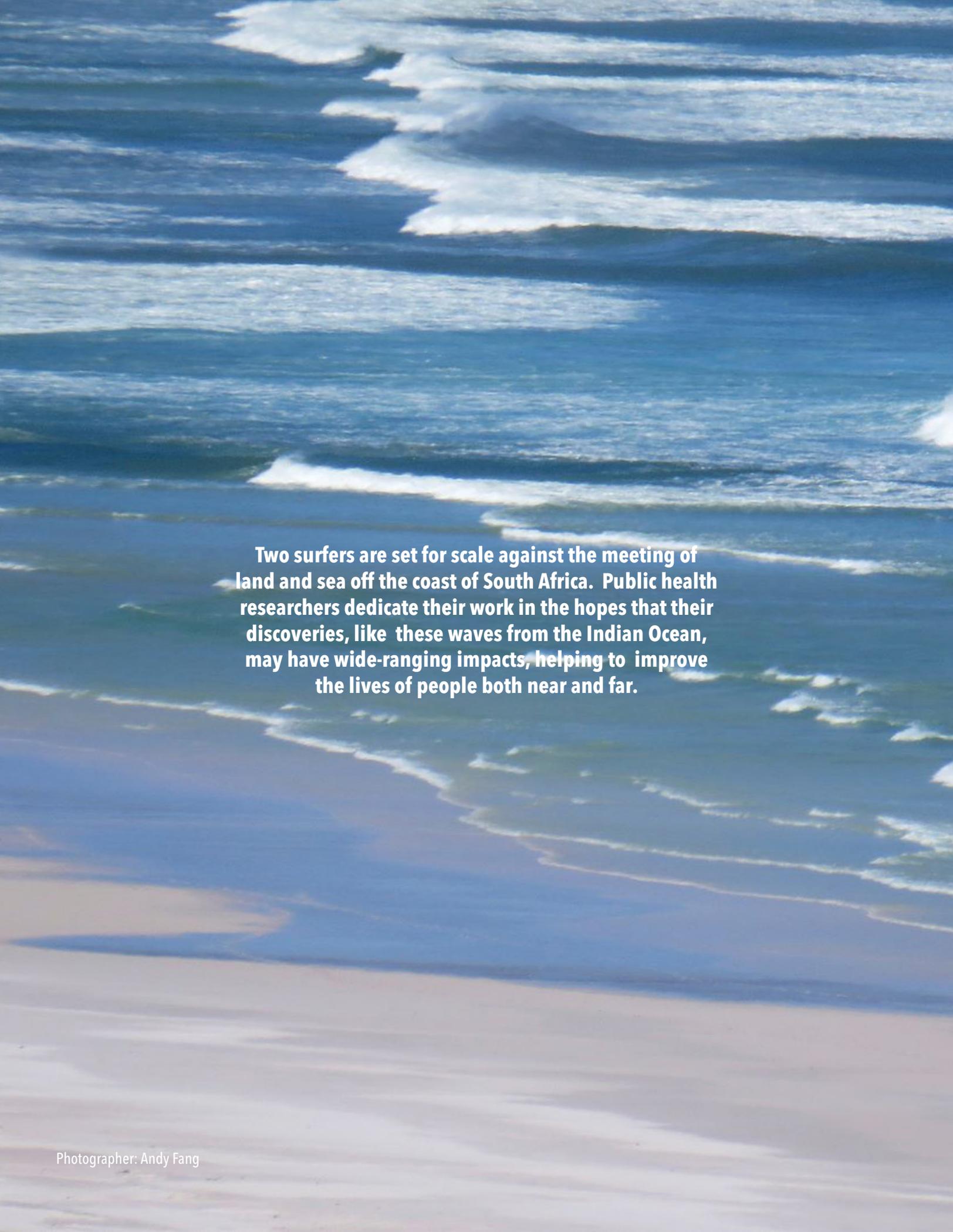
Public health graduates, these interesting times are not your curse, but your opportunity. Join with your Johns Hopkins colleagues and others around the U.S. who seek to exploit the remarkable advances in science and technology to improve the health of our people and to re-direct the annual trillion dollars of waste to more productive purposes.

1. National Human Genome Research Institute. “DNA Sequencing Costs.” 7 Feb. 2014. <<https://www.genome.gov/sequencingcosts/>>. Accessed March 3, 2014.

2. Berwick DM, Hackbarth AD. Eliminating Waste in US Health Care. JAMA. 2012. 012;307(14):1513-1516.



Scott L. Zeger, Professor of Biostatistics at Johns Hopkins University, Vice Provost for Hopkins inHealth

An aerial photograph of a coastline. The top half of the image shows the ocean with several rows of waves breaking, creating white foam. The waves are moving from the top right towards the bottom left. The bottom half of the image shows a wide, sandy beach that meets the water's edge. The sand is light-colored and appears smooth. The overall scene is bright and clear, suggesting a sunny day.

Two surfers are set for scale against the meeting of land and sea off the coast of South Africa. Public health researchers dedicate their work in the hopes that their discoveries, like these waves from the Indian Ocean, may have wide-ranging impacts, helping to improve the lives of people both near and far.



RE:SEARCH

The Role of Mutations of C9orf72 Gene Mutations in Neurodegenerative Diseases

CHING XIE | *Public Health Studies, Class of 2016*

Neurodegeneration is a very misunderstood biomedical phenomenon and a challenging public health problem that we face today. Over 6 million people suffer from neurodegenerative diseases today, fueling research and studies to find cures for these misunderstood diseases. Further clarity in the mechanisms of protein misfolding and control in the nervous system is crucial to understanding neurodegenerative diseases, such as Alzheimer's, Parkinson's, amyotrophic lateral sclerosis (ALS), and Huntington's disease. Based on previous works, protein misfolding has been shown to have a central role in the degeneration and

diseases of motor neurons.¹

BACKGROUND

C9orf72 is a protein found in many regions of the human brain, neurons, and synaptic terminals. A mutation in the C9orf72 gene has been identified as genetically linked to neurodegenerative diseases such as frontal temporal dementia (FTD) and ALS. The mutation in the

C9orf72 gene is called a nucleotide repeat expansion (NRE) consisting of a GGGGCC string of DNA and RNA bases. This mutation has been discovered as the cause of ~20-50% of familial and up to 5-20% of sporadic ALS cases.¹

“The anticipated result from this project is to build a model for future neurodegenerative diseases associated with repeat expansions.”

The repeat expansion forms distinct DNA and RNA G-quadruplexes, where groups of four guanine bases are stacked on top of each other. These RNA structures may contribute to the formation



Nepal | A neonatal intensive care unit

Photo by: Melody Tan

of RNA foci and the non-canonical translation of repeat sequences seen in patients. Additionally, patients with neurodegenerative diseases have been shown to exhibit nuclear stress from the binding of nucleolin to the G-quadruplex.²

Meanwhile, hnRNP F, a class of mRNA binding proteins that bind with heterogeneous nuclear RNA, regulates alternative splicing and other aspects of mRNA processing and transport. The hnRNP F protein is found primarily in the nucleus and has a distinct nucleic acid binding preference for guanine-rich RNA sequences. Here, it is necessary to bind and stabilize pre-mRNAs in an unfolded state. Due to the guanine-rich sequences of the hexonucleotide expansion, hnRNP F has been shown to bind to RNA from the *C9orf72* NRE. By studying hnRNP F and its regulatory roles in intron splicing, which promotes mRNA accumulation and non-canonical repeat-linked protein expression, along with other aspects of the *C9orf72* mechanism(s), we can determine the function that hnRNP F has in the disease-exhibiting role of *C9orf72*.^{2,3}

SIGNIFICANCE

Preliminary data shows hnRNP F can bind and destabilize the primary hairpin complex of the *C9orf72* gene; however, hnRNP F has little ef-

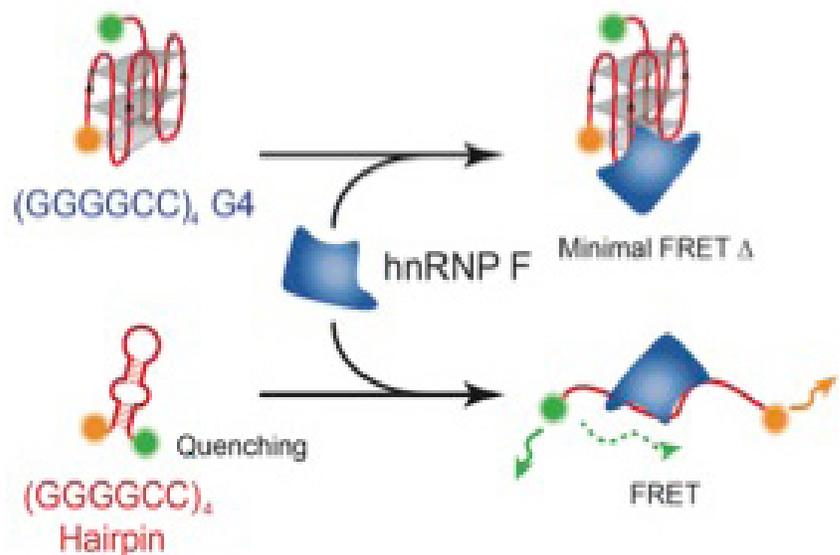


Figure 1. An example of the hairpin-like structure of the *C9orf72* gene that hnRNP F would unfold and an example of the quadruplex structure of the *C9orf72* gene that is unaffected by the binding of hnRNP F.¹

fect when bound on the RNA G-quadruplex of *C9orf72*. By analyzing the relationship between hnRNP F with the quadruplex and the primary amino acid sequence of the hairpin, we can determine the location where hnRNP F affects *C9orf72* regulatory mechanisms, most likely the nucleus or the cytoplasm.¹

While most hnRNP F are present in the nucleus, some show deviations in shuttling between the nucleus and the cytoplasm. The hnRNP F protein has distinct binding properties, binding to RNAs that have guanosine-rich sequences. Through the implementation of biomarkers

and cell imaging, we can determine the location of hnRNP F's effect on the *C9orf72* gene, allowing treatment methods to develop and target the location of these mutation. In addition, by analyzing these effects, we hope to determine why it unfolds the primary hairpin structure and why the quadruplex is unaffected. From this we can determine how and what the effects of the hnRNP F gene are on *C9orf72* and how we can prevent future mutations and diseases.^{1,4}

PROJECT DESIGN

One major theory about how the *C9orf72* mutation leads to dis-

THINK: GLOBAL::ACT: LOCAL

I think the research that we are doing can have a lot of applications in helping those with neurodegenerative diseases. While neurodegenerative diseases are commonplace and dispersed throughout the world today, our local actions and research efforts in the lab can help impact those around the world.

Ching Xie



El Zurzular, Honduras | Locals await medical and dental care at a medical clinic run by Johns Hopkins Medical Brigade volunteers.

Photo by: John Jiao

ease is that the accumulation of RNA in the nucleus and the cytoplasm causes the cell to become malignant and RNA binding protein sequestration occurs. Since hnRNP F prefers guanine-rich RNA and binds to both the G-quadruplex and the alternative hairpin of the GGGGCC repeat, we hope to demonstrate hnRNP F's effects on the expression of the *C9orf72* by overexpressing and inhibiting hnRNP F's activity during transcription. We hope to demonstrate that by overexpressing WT (wild type) hnRNP F in the nucleus, the quadruplex bound to the mRNA will be spliced out during transcription, leading to the expression of *C9orf72*. In addition, through the overexpression of hnRNP F with a mutated nuclear localization signal, we can differentiate the effects of pre-mRNA and mRNA processing when hnRNP F is excluded from the nucleus. The anticipated result is increased splicing by hnRNP F, which will lead to reduced pro-

tein aggregation and production of repeat-dependent polypeptide containing glycines, arginines, and prolines after translation. Therefore, we hope to demonstrate that hnRNP F can account for the *C9orf72* mutations through interference with RNA G-quadruplex formation and proper RNA splicing of the intron containing the G-quadruplex.

CONCLUSION

The anticipated result from this project is to build a model for future neurodegenerative diseases associated with repeat expansions. From our findings, we can provide a clarifying distinction between the role of hnRNP F in the binding of these G-quadruplexes, while providing a clear context of the relationship between *C9orf72* and hnRNP F. We hope to determine how hnRNP F affects intron splicing on *C9orf72* and how it contributes to neurodegenerative diseases

and the field of public health in understanding the mechanisms behind these diseases, which could lead to future findings in other related neurodegenerative diseases.

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3. The GeneCards Human Gene Database. Heterogeneous Nuclear Ribonucleoprotein F. 2014. Available at: <http://www.genecards.org/cgi-bin/carddisp.pl?gene=HNRNPF>.
4. Renton AE, Majounie E, Waite A, et al. A hexanucleotide repeat expansion in C9ORF72 is the cause of chromosome 9p21-linked ALS-FTD. *Neuron* 2011;72(2):257-68. doi:10.1016/j.neuron.2011.09.010.



El Zurzular, Honduras | A boy drinks water outside the medical brigades clinic.

Photo by: John Jiao

A taxi follows the flow of vehicles through a tunnel underneath the Huangpu River in Shanghai, China. Skyrocketing pollution, including particulates from vehicle exhaust, is a major public health concern in China. Public health workers and policy-makers are seeking to implement more measures to curtail the issue. The articles in this section offer glimpses into similarly pressing public health problems and proposed solutions the world over.





PRINCIPLES & POLICIES



Uganda | An orphan child in the care of a faith-based NGO.

Photo by: Ellie Roper

Tech Education: The Key to South African Competitiveness

SHAUN VERMA | *Public Health Studies, Class of 2017*

South Africa is the latest addition to the BRICS, a group of rising economic powers, and yet still ranks near last in worldwide science, math, and information communications technology ratings. In order to have an industrial and IT base capable of supporting an economically competitive nation, South Africa desperately needs to invest capital into SMICT (Science, Math, and Information & Communications Technology) education. The current failure in tech education has its roots in Apartheid projects, especially the Bantu Education system that segregated schools as part of racial engineering projects. Ubuntu Africa is a NGO, based in Khayelitsha, South Africa, that is attempting to address this disparity by providing services to HIV+ children.

During the Summer of 2014, I was given the opportunity to study abroad in Cape Town, South Africa, working at UBA to build a tech hub and design an Electronic Learning

curriculum to support SMICT education for primary and secondary school students. The team and I incorporated a holistic model that promotes educational equity and addresses societal issues like HIV/AIDS through STEM/ICT education. A rudimentary program evaluation implemented beforehand showed that the construction of a tech hub and the establishment of secondary school training session would require laptops, tablets, and desks. After construction and design, the tech hub now provides access to technology while creating a template for instructors to teach the established E-Learning curriculum. Despite the success of Ubuntu Africa, broader investment is needed moving forward to continue to promote South African competitiveness. The next steps are broader investment and implementation of programs that stress SMICT education in secondary schools and the building of tech education programs across the country to promote South

African competitiveness.

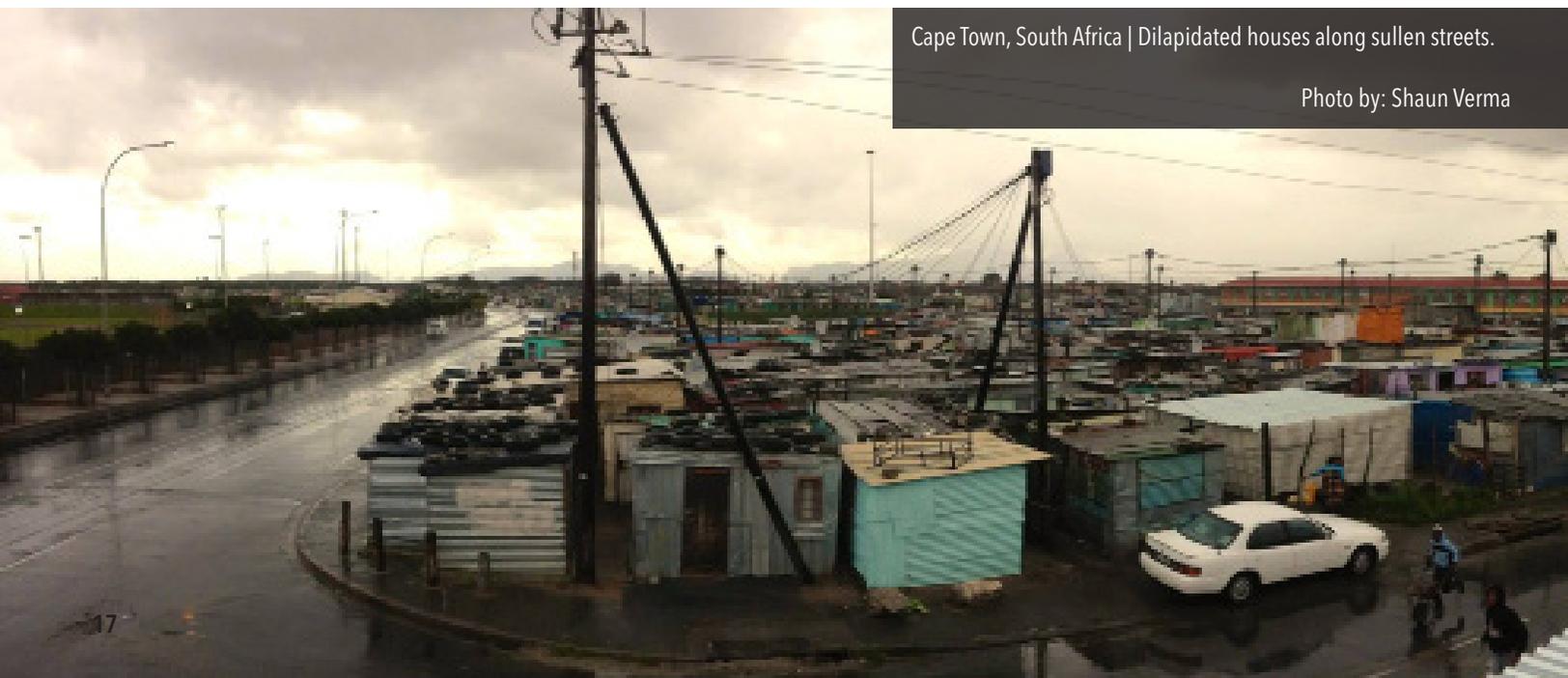
SOUTH AFRICAN COMPETITIVENESS

Added to the BRICS due to its vast natural resources and market innovation, South Africa can only live up to expectations by building a competitive economic base that will ensure current and future growth. However, the lack of equitable technology education is creating a drag on South African competitiveness, preventing millions from entering innovative markets and industrial positions. STEM (science, technology, engineering, mathematics) and ICT (information communication technology) education may just be South Africa's key to surpassing other major economic powers.

In the 2014 Global Competitiveness rankings, economic benchmarks released by the World Economic Forum, South Africa ranked 53rd in the world for overall economic compet-

Cape Town, South Africa | Dilapidated houses along sullen streets.

Photo by: Shaun Verma



itiveness (Osorio et al, 2014). In the last several years, South Africa has actually been experiencing a decline in competitiveness despite scoring first in key indicators such as financial markets and anti-monopoly policy (Stanlib, 2014). The lack of STEM and ICT education equity means that disadvantaged youth are not given the opportunity to enter the workforce,

especially in key industrial and market positions that are vital to the overall national economy's success. In fact, in the last Global Competitiveness Report, South

Africa was ranked the worst in the world for STEM education. Similarly, the latest World Economic Forum report suggests that South Africa ranks among the lowest in the world for ICT education (Osorio et al, 2014). In an interview with BBC News, Annette Lovemore, a shadow minister (functionally a "vice" minister) of basic education in South Africa, said that the worst education programs are clustered in the rural townships of South Africa "where a lack of teaching materials and teacher absenteeism are the major problems" (BBC News, 2014).

Technology education, therefore, is particularly at risk in disadvantaged regions due to the advanced knowledge, skills, and equipment required.

The deficiency in ICT has historical roots in apartheid, the system of racial segregation and domination that prevailed in South Africa for the latter half of the 20th century.

"Beyond just being HIV positive, these children come from the poorest of areas and lack access to technology education."

As part of the racial social engineering projects implemented by many of the Afrikaner Nationalists during the mid 20th century, advanced technology was only available to white populations. Black and other non-white children were relegated to systems of Bantu Education by the Bantu Education Act of 1953, which forced many minority populations into poverty by focusing education solely on training for manual labor and servitude (Hurwitz, 1964). Despite the end of Apartheid in 1994, equal access to quality ICT and STEM education in historically "Black" and "Colored" townships has not yet been restored.

TECHNICAL COMPETENCY

Technology solutions and mobile technology may offer the solution to the technology education problem. Across South Africa, these technologies have started to replace traditional methods of learning and working, sweeping away dusty old textbooks and big school desks. The use of technology in education can be seen easily in two different aspects. The first incorporates technology into the teaching of core curriculum courses, particularly in STEM subjects (BBC News, 2014). This means using computers and tablets to teach students topics like science, English, and math. The second method aims to teach students how to use critical mobile applications and tech software to gain technical competency for software, engineering, computer science, and telecommunications jobs. These two forms are considered benchmarks for tech education, especially in industrial countries (BBC News, 2014).

The future of South African education and broader Sub-Saharan African educational practices relies on the collective strength of SMICT education, specifically in secondary

THINK: GLOBAL::ACT: LOCAL

Technology education is something that is widely being taken for granted in many places in the United States, with computer labs and software curriculums being integrated in most primary schools. However, something as simple as a computer or Internet is deficient in many countries across the world. South Africa is an example of a country experienced economic drag because of its lack of investment in technology education. Experience in technology education in the use of STEM and ICT in the United States is what informed the technical competency curriculum that we developed for students in the Khayelitsha Township of South Africa.

Shaun Verma

education (Ottevanger, 2007). A program called “Secondary Education in Africa” is buttressing these necessary skills to allow increased economic growth and social development through heightened workforce competency. Major goals of this secondary technical education program include expanding educational equity, improving SMICT competency, and educating students on societal issues (Ottevanger, 2007).

COMPREHENSIVE CARE FOR KIDS

During my time in South Africa, I was given the opportunity to develop a Technology Education program for Ubuntu Africa (UBA), a nonprofit based in the township of Khayelitsha in Cape Town. The mission of UBA, which has been active since 2007, is to improve the health and well-being of HIV-positive children through community-based health and support services. These services constitute a four-pronged approach: psycho-social support, life skills and education, health and nutrition, and community engagement.

Beyond just being HIV positive, these children come from the poorest of areas and lack access to

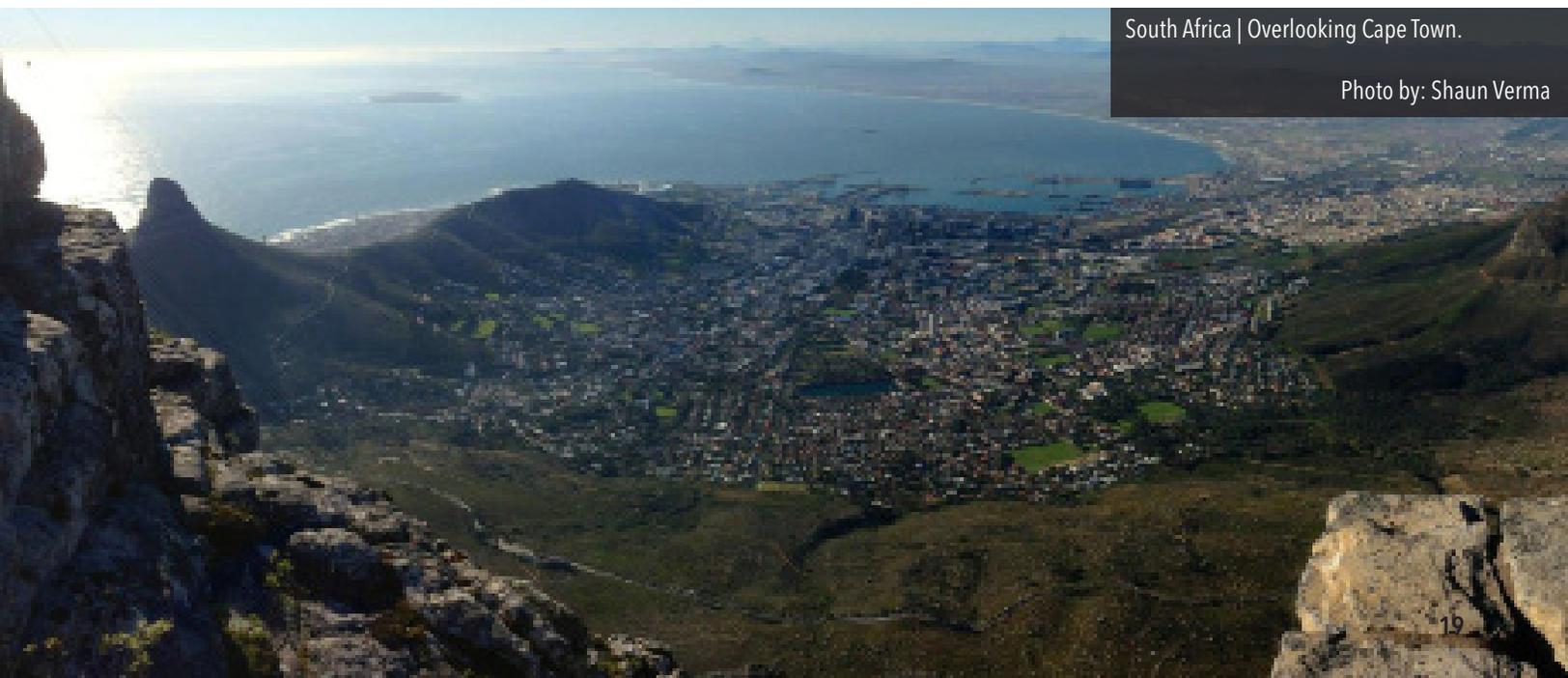
technology education. At UBA, there are several applications for the Electronic Learning curriculum, which is aimed at promoting technical competency and improving overall SMICT education. Younger students focus on educational programs that complement the basics of what they are learning in school. This includes subjects such as English, science, engineering, mathematics, and computer competency—rooted in STEM education—in order to lead up to the more nuanced post-secondary education topics. Introducing students early on to devices like computers and tablets can help them use technology for more complex purposes in later years.

The Electronic Learning curriculum for older students focuses upon increasing workforce competency by equipping students with technological skills necessary to succeed in jobs. Instruction includes computer training on how to use Microsoft Office, the “cloud,” and the Internet for research. Other portions of the curriculum help students develop managerial abilities and an understanding of microfinance. These skilled graduating secondary students also receive guidance on entering

the STEM and ICT workforces with résumé-building workshops. This program also provides complementary mobile applications that enable students to pursue other passions including music, art, photography and video production. Allowing students to pursue their hobbies and positive passions may help keep some away from more negative activities like gang involvement.

E-LEARNING PROGRAM EVALUATION

The UBA Tech Education program can be conceptually divided into different components: inputs, activities, outputs, outcomes, and impacts (see graphic) (Funnell & Rogers, 2011, 1.3). The program requires several different inputs, namely the hardware (laptops and tablets), the software (mobile apps, Microsoft Office, Internet Explorer), the broadband (either wireless or wired), the physical apparatus (in the form of fold-down desks), and the trained staff. The three program activities will be tailored to the specific needs of the different age groups; first as a supplement to the educational curriculum taught at UBA, second as a supplement to what is taught in school, and third as a way of developing critical



South Africa | Overlooking Cape Town.
Photo by: Shaun Verma

elements of workforce competency:

- UBA Curriculum: Subjects include how to live through adolescence and puberty being HIV+, sex education, hygiene, sanitation, disease and the maintenance of a balanced diet. There will also be an Internet safety component, focusing on privacy, plagiarism, and porn.
- School curriculum: Academics include reading, writing, grammar, history, geography, culture, math, and science.
- Workforce Competency: The section entails teaching Microsoft Word, Excel, PowerPoint, typing, researching, résumé-building, and writing a professional letter.

The output is in the form of bi-weekly sessions for each class (total of twice a week usage of the tech hub). Each class will have projects to complete that will be graded to assess their progress. The outcomes will be a technical application of UBA education, more in-depth academic education, and technical literacy. The positive impacts of these outcomes for the students include more awareness of topics related to health, sex, HIV, and privacy, better education overall, and increased chances of getting better-paid technical jobs.

CONCLUSION

Now is the time for South Africa to invest in technical competency. The key to future growth and industrial competitiveness is providing students with critical skills in STEM and ICT subjects. With South Africa having placed in the lowest echelons for science, math, and ICT education, there is a critical need for an increased investment of capital in tech education. SMICT education at the secondary school level may just provide the key to South Africa's future



South Africa | A local living room.

Photo by: Shaun Verma

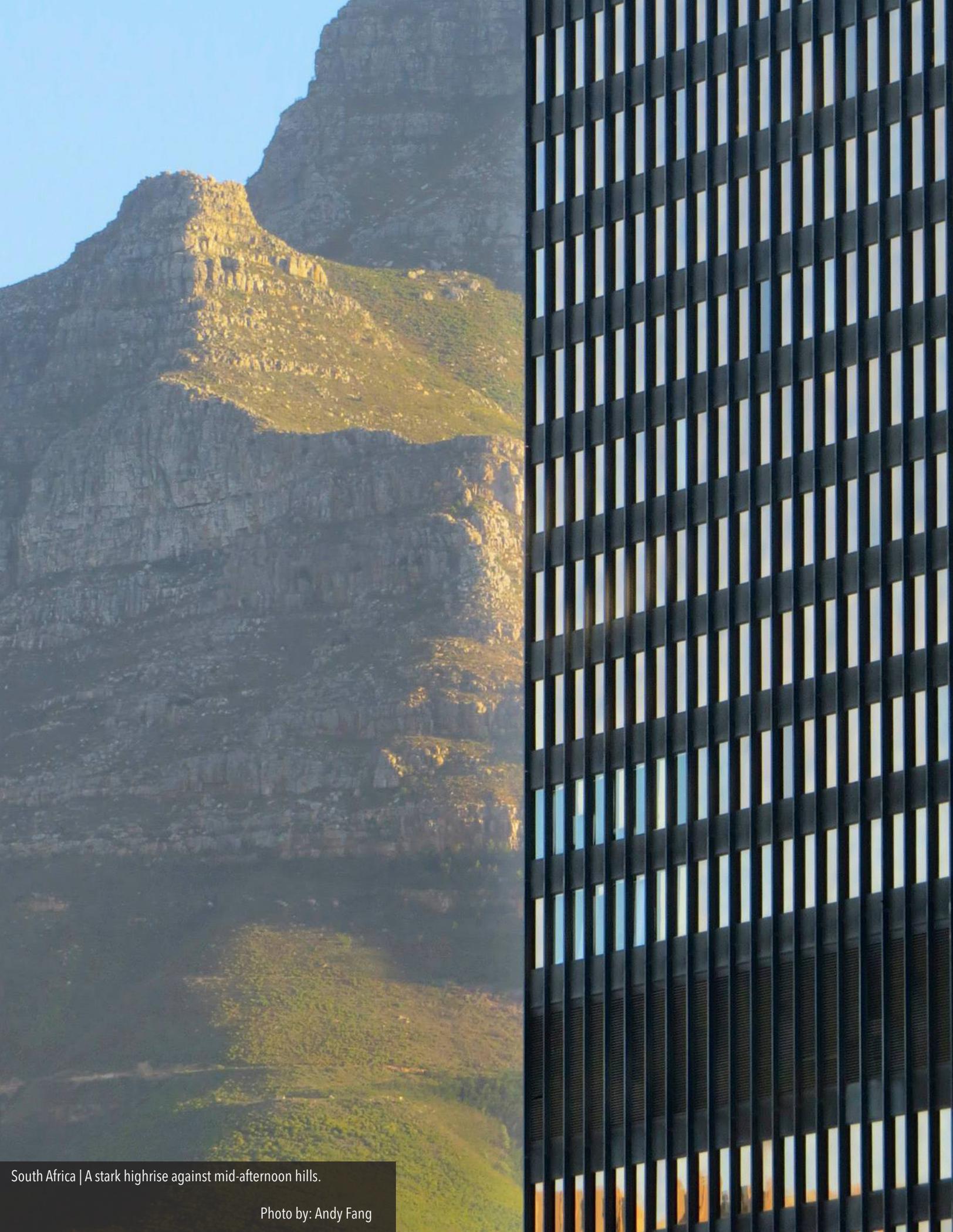
growth. The problem, however, is access to resources, capital, and training in areas that have been disadvantaged due to the Bantu Education Acts put in place during the Apartheid era.

Ubuntu Africa provides a microcosmic example of an organization that addresses a key societal issue such as the stigma toward people with HIV/AIDS. During my time in Cape Town, we were able to develop an E-Learning program for secondary students living in these areas that have historically been disadvantaged. The E-Learning curriculum that we developed at UBA surrounds three major topics of interest: UBA curriculum (information on living with HIV, sexual awareness, puberty, etc.), the school curriculum (science, math, English), and workforce competency (topics critical to the information and communications technology industry). This three-pronged approach aims to provide a holistic use of mobile application technologies while teaching critical competencies in technology.

Our Ubuntu Africa E-Learning program incorporates several key elements that should set a precedent for the tech hub movement that is spreading across South Africa. Educational equity for all, the instruction

on societal issues like HIV/AIDS, and, of course, the holistic curriculum model that includes STEM and ICT are the keys to South Africa's technology oriented future and global competitiveness. If not now, then when?

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South Africa | A stark highrise against mid-afternoon hills.

Photo by: Andy Fang

The Role of Faith-Based NGOs in the Care of Orphans and Vulnerable Children in Uganda

ELLIE ROPER | *Public Health Studies, Class of 2016*

Walking through the dusty roads of rural northern Uganda, I can't help but notice that I have stepped into a much simpler world. Far from the reach of cellular service, data networks and the day-to-day rush of life in the United States, it feels as if I have taken a step back in time. Two mothers sit conversing on the stoop of a grass-thatched hut, whilst keeping their eyes on their children playing under a mango tree in the distance. The younger children scramble to get their hands on the mangoes as they fall, while an older child, around eight years old, is busy caring for her 9-month old brother. With the sound of birds chirping in the early morning and the rustling of the wind through fields of maize, there is only one word

to describe this scene—*peaceful*.

For many areas of Uganda, it is a peace that has been long awaited following decades of political turmoil and the rise of Joseph Kony and the Lord's Resistance Army (LRA) in the North. Despite a now stable government and the LRA's flight from Uganda, the violence and conflict has disproportionately impacted Uganda's children. Uganda alone has over 2.2 million orphans,¹ that is, children who have lost one or both of their parents,² with 1 million alone being orphaned by HIV/AIDS.³ In addition to the overwhelming number of orphans and vulnerable children, there are very limited resources to care for them, including willing and able

adults. With 77% of its population under the age of 30,⁴ Uganda is, quite literally, a nation of children caring for children.

TRENDS

With such a high level of need and an incredible lack of resources, many faith-based nongovernmental organizations have stepped in to support orphans and vulnerable children in Uganda alongside the government and secular humanitarian organizations. Last summer, I interned with InterVarsity Christian Fellowship's Global Issues Program in Uganda and returned this past Inter-session for a course organized by the Johns Hopkins Public Health Studies



Uganda | Two young women smile for the camera.

Photo by: Ellie Roper

department. On both trips, the vast majority of the sites I had the opportunity to visit that targeted young, vulnerable populations, whether they were schools, orphanages, or community centers, had some sort of Christian affiliation. In Uganda, where 41.9% of the population identifies as Roman Catholic and 42% identifies as Protestant,⁵ the large presence of such organizations makes sense. However, many of these faith-based organizations carry with them the tint of colonialism and a long history of western exploitation in Uganda as well as the rest of Africa. I was impressed to see how community leaders and public health professionals working with these agencies are striving to break from that history and build relationships with the people they serve that are based on mutual respect and long-term sustainability. They expressed a strong desire to develop systems and structures aiding orphans and vulnerable children that are largely locally supported, fostering a sense of community empowerment and preventing dependency on foreign aid.

Another recurring trend I noticed during my interactions with faith-based NGOs was the insistence on community-based change. Most of the organizations with which I came into contact were small-scale initiatives with limited resources, although they had made a remarkably large impact for their size. Lack of funding has limited the scope of many faith-based agencies, despite the respect and recognition that many of them have garnered in the communities they serve. For example, the Rakai Orphans' Hope Project (ROHP), a Christian organization seeking to support and sponsor orphans of HIV/AIDS in the rural region of Rakai, recently had to close the doors of its orphanage. ROHP has had to relocate to a small office and place the children



Uganda | Children happy to see someone.

Photo by: Alexandra Saichin

with temporary foster families in the community until sufficient funds can be raised to reopen the orphanage.

With such a persistent lack of resources amongst small, faith-based agencies that target specific communities, increased partnership between smaller faith-based NGOs and larger international organizations is worth considering. While international organizations such as the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) likely have more access to the necessary resources and funding, smaller faith-based agencies can provide the knowledge and expertise on caring for and responding to the specific needs of children in a particular community. Through such a partnership, perhaps the delivery of health-care and support to the most vulnerable members of society in a timely, efficient and effective manner would be possible.

CONCLUSION

Despite the challenges faced by many faith-based organizations, the development and transformation that has occurred in many communities throughout Uganda as a result

of their efforts is undeniable. During my first trip to Uganda in the summer of 2014, I had the pleasure of working with one such organization: ChildVoice International (CVI). Founded in 2006 in response to the war waged against the Acholi people by Joseph Kony and the LRA, ChildVoice is a Christian organization "seeking to restore the voices of children silenced by war" in Northern Uganda through targeted intervention and community development. The organization has since grown and been tremendously successful, developing a therapeutic residential center just outside the town of Gulu, which provides a comprehensive rehabilitation program for 19 former girl soldiers, war orphans and war-affected children.⁶ The program includes counseling as well as education, life skills and vocational training. Additionally, CVI seeks to develop a mutual and sustainable relationship with the surrounding community, working alongside local residents to improve sanitation, health care and the local economy.⁶

While I had many formative experiences during my time at CVI, I was struck most by the sheer resilience of these young Ugandans. Although some of the women at CVI

were abducted as young as age 11 and were forced to fight as child soldiers in the LRA for up to 15 years, they have such an incredible joy and strength that touches everyone around them, and I feel so blessed to have been given the opportunity to see that

and children, I was overcome with joy as I realized that they are now free to live without the fear of abduction by the LRA. Not only that, but CVI has given them the opportunity to experience emotional, mental, and spiritual healing that otherwise may not have been possible. The lives of the young Ugandans at ChildVoice are a testament to the untapped potential of millions of orphans and vulnerable children around the globe, and the importance of initiatives and programs that support them. Not only will they go on to recover, many

2. Orphans. *UNICEF*. Available at: http://www.unicef.org/media/media_45279.html. Accessed February 1, 2015.
3. UNAIDS. *Uganda*. Available at: <http://www.unaids.org/en/regionscountries/countries/uganda>. Accessed February 1, 2015.
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“Most of the organizations with which we came into contact were small-scale initiatives with limited resources, although they had made a remarkably large impact for their size.”

firsthand as part of the InterVarsity Global Issues Internship. My last night at ChildVoice was bittersweet as my fellow Global Issues interns and I sang, danced, and celebrated with the women late into the night. Despite the thought of the tearful goodbyes that would inevitably come the next morning, as I danced with the women

of them will become world-changers, impacting their communities, country and the lives of other vulnerable children.

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1. The Nyaka AIDS Orphans Project. *About*. Available at: http://www.nyakaschool.org/about.php#the_hiv/aids_pandemic_in_uganda. Accessed February 1, 2015.



Uganda | A young boy smiles for a photo.
Photo by: Ellie Roper





Interview with Dr. Alan Stone

DR. ALAN STONE | *Professor, Department of Geography & Environmental Engineering*

Dr. Alan Stone is a Professor of Geography and Environmental Engineering at the Johns Hopkins University, renowned for his work in natural biogeochemical phenomena and synthetic chemicals in environmental media. Jeffery Li, co-editor-in-chief at Epidemic Proportions, sat down with Dr. Stone to discuss one of his latest research studies of Chromium, as well as his experience working with undergraduate research assistants.

Li: Can you tell me about some recent publications you've had, any results you're particularly proud of?

Stone: We recently had a paper go out for publication that resulted from our study of chromium. There was a town in California where chromium was detected in the drinking water. Erin Brockovich, a local activist, picked up on this and noticed that the local utility was responsible for some of this contamination. The power company was using chromium compounds as an anti-corrosion agent in their pumping stations. Chromium in the environment can exist in two oxidation states, +3 and +6. The +6 is really soluble, meaning if it gets into water supplies it can spread very quickly. Comparatively, the +3 state likes to absorb and is not as mobile as the +6 state. So anything that can oxidize chromium-3 to chromium-6 or reduce chromium-6 down to chromium-3 is going to be important.

One of the difficulties with chromium studies is that it reaches equilibrium very slowly. Looking at various elements in a periodic table – manganese, iron, cobalt, nickel, copper, zinc, cadmium, mercury, lead – most of these metals have simple equilibrium constants and relationships. In other words, they will reach an equilibrium point very quickly. Chromium, however, is an outlier. Chromium-3's exchange reactions are really, really slow. To further complicate the issue, chromium-3 can exist in many different forms. Most people investigating chromium oxidation have prepared their solutions using inorganic chromium salts where it's likely that the chromium-3 in their solutions have not reached equilibrium yet. As a consequence, they are unable to say definitively what form their chromium solution is in, and thus cannot speak conclusively about the properties of the various forms of chromium

I had a student who realized that procedures have

been published for synthesizing very specific chromium-3 complexes with common chelating agents. Using these pre-synthesized complexes, he could overcome the problems posed by the slow equilibrium constant and know exactly what form of chromium-3 he had made. Then, when comparing the different forms of chromium-3, we discovered that some forms of chromium-3 were a million times more reactive than other forms! With this information, we can change the way we conduct environmental studies by looking not only at whether or not chromium-3 exists, but what form it may exist in.

Another example illustrating the importance of chromium research can be found by looking at the chromium in Baltimore Harbor. There used to be chromium mines in Baltimore County some two hundred years ago. When all the chromium was used up, people started buying chromium ore from Africa and processing it in the Inner Harbor. When you work with ores, there's a certain amount of re-

“One of my lab's future goals is to be able to utilize capillary electrophoresis, a technique usually used in DNA sequencing, for environmental chromium studies.”

covery that's economical, and at some point, you just give up. The leftover material, called 'tailings', were used as fill dirt in the Inner Harbor area. There's a whole peninsula in the Inner Harbor built on chrome tailings.

When they started doing this, they didn't realize it was a problem. But then, it would rain, and they would notice the puddles in the harbor were orange from the chromi-

um. If the chromium is in the sediment, then you have to worry – does the chromium ever get mobilized? That is, will a substantial amount of chromium run off and potentially enter the Chesapeake Bay? To answer this problem, we really have to see what chemical form this chromium is in, which is difficult because we don't have the necessary analytical methods. One of my lab's future goals is to be able to utilize capillary electrophoresis, a technique usually used in DNA sequencing, for environmental chromium studies. Currently though, we are limited by the technology because the concentration of chromium in sediment is too low for the technology to detect reliably.

Li: Have you had any undergraduates working with you on these types of projects?

Stone: On the chromium work – one of our finest papers was from an undergrad. Usually we match undergrads up with graduate students so that there's someone who can supervise on a day-by-day basis. One particular graduate student suggested, "Let's do an experiment. I'll advise this undergrad the same way you advise me". With my consent, they picked a subject for the undergrad to work on independently. I was pulled in occasionally for input, and lo

and behold, we got a really nice publication out of it!

This investigation involved the simplest chromium species that we could make and study: precipitated chromium-3 hydroxide. One way this chromium could be dissolved is through chelating agents. A good example of a chelating agent is laundry detergent – the water going into the washing machine has calcium and magnesium. If all you have is the soap, the calcium and magnesium will bind to the soap and cause it to precipitate out – you end up with what's called a bathtub ring. The purpose of a builder chemical is to sequester the calcium and magnesium so that they don't bind to the soap to create a bathtub ring. The problem is if that builder ends up in the harbor and encounters precipitated chromium, it might form a new species with the chromium. As part of our study, we brought eight different builders into contact with chromium hydroxide and we watched how quickly the chromium dissolved. Then, we looked at what pH gave us the highest rate of dissolution. It turned out, the fastest reactions for absorbed builders were in a very narrow pH range, right around 8.5. The creepy part is that the pH of seawater is very close at 8.3. The big question now is why is it fastest at this pH? To investigate this, we'll need funding to launch a new project.



Baltimore, Maryland, USA | Industrial architecture of the buildings at Johns Hopkins University, housing many labs.

Photo by: Yuqing Zhu



El Zurzular, Honduras | Preparing to receive dental patients at the clinic.

Photo by: John Jiao

Li: Related to the topic of trying to secure funding, what have been some other roadblocks or challenges you've experienced in your career as a researcher?

Stone: In an ideal world, there would just be money and the student could be in the driver's seat the whole time. But, that kind of money is really hard to come by. We're in an era where the funding agencies are putting everybody on shorter and shorter leashes. Instead of giving us the freedom to investigate general

topics such as pharmaceuticals in drinking water, the requirements are much more specific, such as "we want a specific method of removing this particular pain relief chemical". The central activity of a lot of faculty in our department is exploring the question of "what manufactured chemicals in our environment might be a problem?" You'd like to be able to look around and say, "What chemicals are currently around, and have they been properly vetted? Could they have a property that we have not previously anticipated?" We'd like to be able to pick a compound and look into it. Instead, we get called in where there is already a problem and the answer is usually to just stop manufacturing that chemical. What we try to do is say, "well, we know you won't give us complete free reign, but why don't we talk about compound classes? For example, where do the chemicals used for dyeing fabric end up? Are there chemicals in that group that are bad actors?"

Li: What do you see as the impact of your research in public health, policy, and/or government regulation?

Stone: Most of it is the ability to predict. Baltimore knows it has a chromium problem in the inner harbor. If they leave it alone, how much chromium will leach out year by year? Is it a steady, everyday problem? Or does it only become an issue during hurricanes? We might be able to help determine which scenarios are bad and look at treatment strategies.

Imagine you're a chemical company and you're developing a new herbicide. Companies really like our research because it helps them identify compounds that will be problematic. Working with companies is really interesting – they're not going to directly tell us problems

because they're afraid we're going to talk to the press. Instead, they'll speak in more general terms: "Oh, have you ever thought about how anilines form covalent bonds with natural organic matter?" They won't say that they have a specific compound that they're interested in.

Li: Any advice for future undergraduates who might be interested in getting involved in the type of work you're in?

"Research trains people to reason, which is crucial regardless of the area of work [...] Scientific publications are about thinking clearly and communicating findings to others so that they can have widespread applicability."

Stone: Look around and find what you're passionate about. If it's more than two areas, that's a good thing. Suppose a chemical company wants to open a faculty in Mexico City. An applicant with a chemical engineering degree plus advanced courses in Spanish will have an advantage over another applicant with only a chemical engineering degree. Who knows what society is going to need in ten or twenty years?

Li: One of the things that Dr. Rene Schwarzenbach mentioned in a recent talk on behalf of the Charles and Mary O'Melia Lecture in Environmental Science is that research is going in the wrong direction – that publications are being judged not by the impact or quality of their content, but by the number of citations it may receive. Any thoughts on this matter?

Stone: Research trains people to reason, which is crucial regardless of the area of work. There's a lot of muddled thinking in the world that could really use some clarity. Scientific publications are about thinking clearly and communicating findings to others so that they can have widespread applicability.

When an assistant professor is up for promotion, we write letters to faculty at other universities and ask them a simple question: has this professor made an impact? We're not asking them to count the number of papers they have published, that's not what we care about. In the long run, one especially insightful paper is worth much more than a half-dozen 'business as usual' papers.

Li: Dr. Stone, thank you for taking the time to talk with us today. It is clear that your work in environmental chemistry has astounding impacts on our everyday health and we're glad to have had the opportunity to learn about what you do.

A wide-angle photograph of three people riding horses on a sandy beach. The riders are seen from behind, moving away from the camera towards the ocean. The rider on the left is wearing a light blue tank top, the middle rider is wearing a red shirt, and the rider on the right is wearing a green long-sleeved shirt. The horses are dark brown. The beach is wide and sandy, with gentle waves lapping at the shore. The sky is clear and blue. The overall scene is peaceful and scenic.

Travelers on horseback experience the expansive landscape of South Africa. From the rowhomes of Baltimore to the mountain villages of Sichuan Province, China, the Features section showcases the public health landscape these authors have been a part of.

Photographer: Andy Fang



FEATURES:

Health Leads: The Health Care System Redesigned

STEPHANIE IRWIN | *Major, Class of 2016*

Health Leads is a national nonprofit organization that focuses on connecting patients at certain primary care clinics with basic socioeconomic resources that are vital to their health. Some examples of needs that Health Leads addresses include food, housing, transportation, health or dental insurance, adult education, and child-care. Integrating care for these needs into the overall health system helps to improve both patient outcomes and satisfaction.

The Health Leads model relies upon three sets of participants: volunteers, providers, and patients. The volunteer base is composed of college students who dedicate several hours per week to serve as advocates in the program. I volunteer as an advocate with the Johns Hop-

kins chapter of Health Leads in the Comprehensive Care Practice (CCP) located at Bayview Medical Center. Advocates work directly with patients to help them access the resources they need to be healthy. The responsibilities of this position consist of a weekly three-hour shift in the clinic, as well as additional time spent researching specific information about relevant resources or checking in with clients over the phone. Advocates are expected to follow up with their clients weekly to track the progress of potential resource connections as well as offer support to clients.

Health Leads also depends on mutual partnerships with providers such as physicians, nurses, and medical assistants. These providers are essential participants in the Health

Leads system as they help screen their patients with basic questionnaires and refer those who are interested in assistance to Health Leads advocates. These referrals allow the advocates to connect patients with effective and thoughtfully selected resources in their communities that address any non-medical issues they may be facing.

The Johns Hopkins chapter of Health Leads currently operates in three different clinics in Baltimore. The CCP clinic is first and foremost an adult primary care center, but it also offers HIV care and buprenorphine treatment for opioid dependence. Within CCP, representatives from the Ryan White program offer case management exclusively for HIV patients in order to coordinate the



Location | Caption

Photo by: Nikita Mehta

various medical and social services they receive. Ryan White is a federal program offering funding through community-based organizations to individuals living with HIV that do not have the financial resources to support their medical expenses. The Johns Hopkins Community Health Partnership, or J-CHIP, also has a staff of seven social workers and case managers affiliated with CCP. Both of these programs not only refer clients to Health Leads, but also occasionally provide informal guidance to aid the organization. The patient population at CCP is primarily older, low-income adults with a significant number of HIV-positive individuals. Additionally, many are receiving public disability benefits and suffer from a number of chronic diseases.

The role of a Health Leads advocate is a fulfilling one, but it comes with many responsibilities. Most advocates take on a caseload of four to eight clients, depending on the demands of their specific clinic. To start working with a new client, we begin with a referral from their provider. The provider asks their patient to fill out a screening tool, which is a form of basic questions that ask the patient if they need help with various needs such as paying their utility bills or feeding their family that month. If the patient indicates interest in working with Health Leads to address these needs, the advocates either meet with the patient in person or call them to do an intake over the phone. The client is entered into our database, Client Connect, so that we have a standardized system to securely store demographic records and other sensitive information. Then, the advocate begins working with the client by determining what needs the client has, as well as the priorities of each of those needs. The Health Leads model emphasizes partnership between the ad-

vocate and the client; every decision about which needs to address or what resources to investigate is guided by the advocate but primarily based on client preferences.

Once the client's needs are identified, the advocate begins search-

“The resource connections Health Leads works towards providing are primarily targeted at improving [the] social determinants of health, and thus supporting patients’ health care.”

ing for resources that are compatible. Finding a good resource involves a number of considerations: proximity to the client, cost, eligibility, time frame of accessing that resource, and so on. After a few potential resources for each need have been identified, the advocate compiles detailed information on those resources so that the client is empowered to access them on his or her own. After this initial discussion, advocates are required to follow up with the client each week to check on their progress in investigating these resources, as well as to offer additional support if those resources don't work out or if more needs arise. The ultimate goal of this process is to complete a successful resource connection, the definition of which depends on the need in question. Some examples of common resource connections at CCP are acceptance into the SNAP program (also known as food stamps), obtaining food from a neighborhood food pantry, or approval for an MTA reduced fare bus card.

As an organization, Health Leads has three overarching goals. First, we aim to increase patient resource connections with a scalable Health Leads model. Second, we support our clinic partners in achieving better pa-

tient care and clinical efficiencies. Lastly, Health Leads aims to build the next generation of leaders to champion quality care that extends into many aspects of patients' lives, not just their doctor's appointments. Many Health Leads advocates go on to work in the healthcare field, so

the experience of serving as an advocate helps our future providers, hospital CEOs, and health policy makers gain a more complete understanding of the many complexities and difficulties inherent in addressing the full array of needs for their patients.

The work that Health Leads does is important because it directly addresses the social determinants of health, which are defined by the World Health Organization as “the conditions in which people are born, grow, live, work, and age.”¹ This can include their neighborhood, economic status, educational level, or employment conditions. The resource connections that Health Leads works towards providing are primarily targeted at improving these social determinants of health, and thus supporting patients' health care.

The resource landscape, which is all of the resources that could potentially improve a client's social determinants of health, can be very difficult to navigate. Even something as seemingly simple as finding and accessing a neighborhood food pantry can be very difficult if a cli-

ent does not have access to the Internet, a reliable phone, or cannot read. Health Leads advocates help streamline the process of connecting clients with resources by researching eligibility requirements, helping clients fill out application forms and make interview appointments for different state programs, or even assisting with directions and maps. On one memorable morning, I spent two and a half hours calling Baltimore Gas and Electric to prevent a client's utilities from being shut off that afternoon, then negotiated a reduction in the amount of money she owed and created a payment plan for future months.

Through Health Leads I've been able to see the impacts of various health policy changes at the national level translated to the small-scale clinic setting. When SNAP benefits were reduced by \$8.6 billion in the 2013 Farm Bill², a majority of our patients came into the clinic worried about how they were going to make it through the rest of the month on their reduced benefits. It was frustrating to hear so many stories of people going from having \$150 a month in food stamps to only \$6, as well as having to scramble to find now-overwhelmed local food pantries that could help these clients keep food on the table. The holiday season was especially tough this year; I made a

number of painful calls with my clients to pantries that had completely exhausted their resources due to the high demand during Thanksgiving and Christmas.

Another major policy decision that affected CCP's patients was the Affordable Care Act's expansion of Medicaid coverage. Many of our clients are low-income adults with adult children, which means they no longer qualify for public family insurance plans. Extending Medicaid eligibility to single, childless adults earning up to 133% of the federal poverty line³ made affordable health insurance a possibility for a significant proportion of our clients. Earlier this year I was able to help two homeless clients apply for and receive Medicaid through Maryland's new online health exchange. Although it seems simple enough, these clients expressed to me how challenging that process would have been without a reliable computer and Internet access.

As a public health student, working for Health Leads provides invaluable exposure to the realities and shortcomings of health care delivery in America. So many patients are unable to afford the medications prescribed to them by their doctors or have to scrape together money just to afford the bus fare to their ap-

pointments. Working to connect clients with the resources they need has been incredibly eye opening to the complexity of the resource landscape. I've also been able to see firsthand how a lack of economic resources can become a pervasive, cyclic issue. Socioeconomic factors play a huge role in a patient's health status and have created systematic health disparities across the United States. The work that Health Leads does is essential in the Baltimore community because it tackles these disparities, one client and one resource at a time.

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India | Children at an orphanage spend time on the swings.

Photo by: Riya Abraham

Pilgrimage to Yele: A Firsthand Glimpse at the Yi Ethnic Minority's HIV Epidemic

ANNA DU | *Public Health Studies and Entrepreneurship and Management Minor, Class of 2018*

I am like a child peering into a snow globe, the scene before me so ethereal, yet frustratingly impossible to enter. The grassland amidst these remote mountains of Sichuan, China glistens even greener from recent rainfall. I am the first in my family to return to this land called Yele by the indigenous Yi people. I fixate on my destination: Apu's birthplace. It is a cluster of twenty huts across the river, but I cannot reach the place due to a thunderstorm that has inundated the only footpath to the village. Stillness prevails. For a long moment, I stand

turn to the nearby city of Xichang and reunite with six children to whom I have been teaching English at the Liangshan Yi Empowerment Center. Our exposure to different cultures is mutual; they learn about my life in the United States, and I absorb everything about their Yi heritage. Our conversations, occasionally peppered with Nuosu, are mostly in Mandarin. I once asked about their families and discovered that two of the children were orphans whose parents had died due to human immunodeficiency virus (HIV) infections. At that

in Sichuan Province, remains home to China's largest concentration of ethnic Yi. Known for their distinct culture and traditions like the Torch Festival, Yi clans lead predominantly pastoral lifestyles that contain vestiges of feudalism.² Less well known about the group is its most pressing public health concern: HIV. Out of an estimated 810,000 adults living with HIV in China, more reside in Sichuan and its neighboring Yunnan Province than any other region.³ The area's proximity to major heroin hubs and underdeveloped infrastructure contribute to the HIV proliferation amongst its minority inhabitants.

“The [HIV] virus...exacerbates the impoverished conditions of families already suffering...[the] tremendous socioeconomic pressure exerted on Yi children and their families...is difficult to combat without access to educational resources as well as proper health care.”

there at the riverside imagining Apu as a boy, playing with his brothers in the pasture, sleeping at night surrounded by peaceful silence, and I wonder how much longer I must wait to visit his village.

I make my way back to the rocky trail still grateful to be liberated from city streets. My solo journey gives me unprecedented freedom to explore the homeland that Apu never had the chance to share with me. I re-

moment, what started as a personal pilgrimage to my roots transformed into a firsthand glimpse at the current HIV epidemic affecting Yi communities today.

In a country where ninety-two percent of the population is Han Chinese, the Yi minority—numbering over seven million people—is one of China's fifty-five non-Han ethnic groups.¹ The Liangshan Yi Autonomous Prefecture, a region located

The Liangshan Yi Empowerment Center strives to strengthen the development of Yi communities. In addition to providing a diverse range of educational opportunities for children, a few of its initiatives include school construction, AIDS awareness and treatment, and cultural events. The center's director Hou Yuangao travels extensively to villages like Yele where he advances HIV prevention initiatives. The virus, Hou tells me, exacerbates the impoverished conditions of families already suffering from low education levels, rampant drug abuse (the most common precursor to HIV), and a stagnant agricultural-dependent economy.⁴ He points out the children I've been teaching as examples of multigenerational HIV-induced cycles of adversity. Two boys lost both of their parents



China | Mist in the vales of the Yellow Mountain.

Photo by: Andy Fang

due to HIV. Their grandparents raised them in abject poverty, subsisting on finding and selling scrap metal. It was not until the Yi Empowerment Center funded the construction of a school near their village that they began to regularly attend classes. The tremendous socioeconomic pressure exerted

on Yi children and their families who are afflicted by HIV is difficult to combat without access to educational resources as well as proper health care.

Hou also tells me about the Liangshan Prefectural Five-Year Plan to Prevent and Control HIV/AIDS.

First conceived in 2010, this regional strategy incorporates community-based policymaking. For example in one county, the responsibility of HIV prevention is distributed between clan headmen and village committees. Individuals discovered with drugs face expulsion from their clans

and fines of up to 5,000 yuan. Furthermore, their immediate families may be suspended from receiving government subsidies.⁵ The Five-Year Plan, now nearing its last year of implementation, has received international attention for its commitment to HIV prevention.⁶ A similar strategy called C-MAP was initiated at the national level in 2005. Established between the U.S.-based Merck Foundation and the Chinese government, it was the first large-scale private partnership program that specifically focused on HIV/AIDS prevention and treatment. From 2007-2012, C-MAP expanded across Liangshan to other provinces. As a result, eight million people have received face-to-face HIV education (among other achievements).⁷

The children and I rarely discuss their hardships. “Do you have mgep nuo (buckwheat) in the United States?” a girl asks during lunch one day as I bite into a delicious potato plucked straight from the embers. I nod. Apu used to eat it at every breakfast when we were together. “How about corn?” She rattles off a few more foods and I realize she has named her entire diet. I share stories of my siblings and show the children pictures stored in my camera. A boy engages

me in an arm wrestling match. Our laughter connects us, and I no longer feel like a mere observer struggling to understand my heritage from the outside of a glass globe. Instead, I am happily absorbed at the source, guided by the children’s warmth and conversation.

After traveling to Yele, I was deeply touched by the courage my grandfather had in leaving his village at a young age to study in the city. In my mind, Apu had always been my knowledgeable travel guide. I remember how intently he read the newspaper, or when he gave me a Howard Carter biography before we explored Tutankhamen’s tomb in Egypt. After listening to villagers regale me with stories about my grandfather, recounting his childhood through his entering politics, teaching me about how powerful a name can be in evoking a sense of belonging, I realize that although my journey retraced Apu’s path, I have begun to take my own steps towards helping the Yi community.

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THINK: GLOBAL::ACT: LOCAL

Traveling abroad is one of the best ways to let global experience inform local actions. By visiting my grandfather’s birthplace in the rural mountains of Liangshan (a region of Sichuan Province, China), I was able to explore my heritage and also learn about a serious HIV epidemic amongst the indigenous population. My firsthand glimpse of the various socioeconomic consequences of HIV on Yi families was just an introduction to this popular public health issue. I was deeply touched by the people I met and am motivated to continue conducting HIV research in years to come.

Anna Du

Health Leads and Baltimore's Hispanic Population

RAQUEL SERRUYA | *Public Health Studies and French Major, Class of 2017*

A young woman sings a lullaby as she rocks her child back and forth. The soft Spanish music calms the child into a heavy sleep. Moving slowly, she walks up to our Health Leads desk. "Me puede ayudar?"* she asks timidly. Of course, I will try my best to help her.

Health Leads is a national organization that aims to connect patients with the basic resources they need to be healthy. Volunteers at Health Leads work closely with the physicians and social workers at their clinic to provide patients with access to community resources and public benefits. At the Bayview Children's Medical Practice (CMP) desk in Baltimore, we tackle a variety of public health issues on a daily basis; however, our focus is on addressing the needs of Baltimore's Hispanic community. The vast majority of our clients are Latin American families looking for food stamps, assistance in paying energy bills, English as a Second Language classes, and job assistance. Our aim is to provide resources that address their needs, help them apply to and connect with these resources, and then follow-up with the clients to assure that they have successfully received aid. The young mother with the sleeping child has just lost her job and does not have enough money to feed her child. I welcome her to the desk, record her basic demographic information and then choose a resource appropriate for her. I begin

translating a Supplemental Nutrition Assistance Program (SNAP) application so that she can receive money for food. The application takes at least a half hour to fill out, but the baby sleeps peacefully through the entire process.

The mother does not speak or understand English, so I slowly and carefully translate every question on the application. She's not an exception. Most of the clients who visit our desk have difficulty surpassing the language barrier. Although the Hispanic population in the US is growing, as of 2012, it only makes up 4.4% of Baltimore's population and 8.7% of Maryland's population.¹ It is difficult for our clients to adapt to and succeed in cities where they are the minority and have few Spanish-speaking resources to aid them. The language barrier prevents our clients from obtaining basic necessities; they are discouraged from applying for the Food Supplement Program, getting health insurance, finding jobs, and paying their bills.

Luckily, my client was not discouraged from visiting the desk today. At the Children's Medical Practice, parents are given a screening tool, in Spanish, where they indicate what aspects of their life they need help with (obtaining enough food, childcare, energy assistance, job searching, etc). Sometimes physicians refer them directly to our desk before they even fill

out a form, and other times the client is just a walk-in. Regardless of how a client arrives at our desk, as soon as they sit down to work with us, Health Leads begins helping not just the individual client, but also his or her entire family.

The most common need I have addressed is help in applying for food stamps. The best way to complete and send a food stamps application is online; however, it is only available in English.² The mother and her child sit patiently as I translate the form and enter her information on the application. When the tedious process is over, I remind her that I will be calling her within the week to follow-up. Although it is unlikely that she will receive news from the Departments of Social Services (DSS) within this time period, I usually call in case she has questions or other needs she wants addressed. Eventually, I will translate an interview between the client and the DSS. If the client cannot come to the desk to speak to the DSS for the interview, we conduct a three-way call. This process is particularly daunting for the clients due to the language barrier and often is what discourages families from applying for their basic food necessities. However, with a Health Leads advocate working alongside the client and explaining and translating every step, the clients are able to get access to the resources they need.



Baltimore, Maryland, USA | A building typical of the style seen in less affluent Baltimore neighborhoods.

Photo by: Yuqing Zhu



El Zurzular, Honduras | Children waiting.

Photo by: John Jiao

Once we finish the SNAP application, I search for food pantries near the young mother's home. Her application will not be finalized for another 30-60 days, a long time for a mother and child to wait for food. I find two pantries near her home and write down their addresses and phone numbers. "Gracias+," the mother's eyes seem to say.

Before she leaves, I ask her if she needs help finding a new job. Her eyes light up. "Si, por favor!" she replies, relieved. The job seeking process can also be intimidating for individuals who do not speak the work environment's primary language. Health Leads does not find jobs for our clients, but we can connect them with the Spanish-speaking resource Casa de Maryland. Casa de Maryland brings together employers and people looking for one-day jobs. Its target population is the Hispanic community, so they are prepared to work with individuals who speak

standing of what it does or how to administer it. Sometimes, physicians request that Health Leads advocates translate the directions. Usually, I write down the necessary steps, dictated by the doctor, in Spanish for the parents to keep. Overall, I facilitate the communication between the hospital and the patient to make the patients feel more comfortable.

In 1991, 1998, and 2007, steps were taken to try to bridge the language barrier. City and county officials in Baltimore held a forum in Spanish "to hear concerns of Hispanic residents and to tell them about free services."⁴ According to the Hispanic residents, the language barrier results in them being cheated and harassed. In addition, many of the Hispanic immigrants who are undocumented "do not seek help from the police for fear of being deported."⁴ The forum were meant to teach the immigrants about standing up for their rights, help the Spanish-speakers with education,

panic population in the U.S. is below the basic literacy line.⁵ Although non-English speakers are often, inaccurately, labeled as illiterate, I have noticed that some of our clients do have difficulty reading and writing in Spanish. This is a major impediment in accessing the resources available to them.

Unfortunately, Health Leads does not currently offer assistance that could help our clients learn to read and write in Spanish. Our most popular adult literacy resource was Baltimore Reads, but the organization recently published on their website that "after 26 years of providing adult literacy education, the Baltimore Reads' Board of Directors reached the difficult decision to cease operations on June 30th, 2014, due to challenges with funding."⁶ Health Leads could improve its resources by including not just English as a Second Language classes, but also Spanish classes for those who want to improve their literacy. A more complete scope of services would give clients a better list of resources they can choose from.

My time at Health Leads has taught me how difficult it can be to overcome a language barrier. I realize that our clients struggle to feel incorporated in their communities. More importantly, they struggle to receive the basic resources they need. Because they do not speak the primary language, they have difficulty obtaining food, employment, and education. This difficulty not only affects the individuals who visit our desk, but also their families. Health Leads should expand its Adult Education resources to give parents more options for achieving a higher education. Resources such as the Education Based Latino Outreach (EBLO), which brings together chil-

"Because [my clients] do not speak the primary language, they have difficulty obtaining food, employment, and education."

mostly Spanish.³ Although the Hispanic population that we work with does not usually come to us for long-term work, we can introduce them to the Spanish-speaking social worker at the CMP desk who can more readily aid our clients in this area.

The language barrier affects both parents and children in hospital settings. Doctors give directions to Spanish-speaking parents regarding the health of their children, but there is often poor comprehension on the parents' end. This confusion may lead to parents not giving medications to their children due to a lack of under-

employment, and legal/health issues, and give them a chance to voice their complaints and suggestions. More forums such as this one should be held to give the growing Spanish-speaking population a better understanding of the resources available to them and to give them an opportunity to express their concerns.

The language barrier, however, cannot be overcome without first addressing illiteracy. I have learned that some of our clients lack the ability to read and write in Spanish, which further hinders their ability to learn English. In fact, about 40% of the His-

dren and their parents in an academic setting, should be investigated and then advocated to our clients.

A major first step in helping our Spanish-speaking clients would be to have government forms translated to Spanish. Although we translate all Health Leads forms and letters to Spanish, it would be helpful if government services had their applications in other languages as well. For example, if the food stamps application were available in Spanish online it would ameliorate the process and comfort the clients; they would not have to rely as heavily on the advocates. Health Leads could contact the DSS and encourage them to make this change.

In addition, conversation with the Hispanic community is critical. Health Leads should reach out to city officials and encourage them to hold more forums like the one held years ago for the Hispanic community. This gives the Spanish-speaking population the chance to voice their concerns and receive feedback from government officials. Since the percentage of Hispanics in Baltimore is so low, the forums could be held in the communities where the majority

of the Hispanic population lives (for example, Montgomery County and St. Georges County).⁷

I look forward to my next semester with Health Leads where I can continue to make small, positive changes in the lives of my clients. The young mother and child who visited me for food stamps and job placement were just one of the many people that walk through the front doors of the Health Leads office every day. Although these past three semesters have already taught me about the Baltimore community's needs and the various government organizations that can address these needs, there is still much to learn. Working in conjunction with physicians, social workers, and clients has shown me the importance of leadership, teamwork, and organization—all of which are important aspects of public health.

* "Would you help me?"
+ "Thank you"
"Yes, please"

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Everything I have learned at Health Leads can be applied to communities beyond our desk at the Bayview Medical Center. In fact, we can use our experiences to aid our work in other hospitals, neighborhoods, cities, and even countries. There is no limit to the application of our education. At Health Leads we work with a small part of the larger Baltimore community, but our work can be translated to the global scale. Health care, food access, and shelter are all necessary for a healthy life regardless of where in the world a person lives. Across the globe, achieving these basic resources involves the individual, his/her family, neighbors, and politicians. Although we act locally, we think globally.

Raquel Serruya

Ubuntu

ELIZABETH CHEN | *Public Health Studies and Behavior Biology, Class of 2016*

“One of the sayings in our country is Ubuntu – the essence of being human. Ubuntu speaks particularly about the fact that you can’t exist as a human being in isolation... We think of ourselves far too frequently as just individuals, separated from one another, whereas you are connected and what you do affects the whole world. When you do well, it spreads out; it is for the whole of humanity.”

-Archbishop Desmond Tutu in 2008



Amritsar, India | Children in an orphanage come together.

Photo by: Riya Abraham

This past summer, I had the privilege of traveling to Cape Town, South Africa with a group of ten Hopkins students for the annual Johns Hopkins Public Health South Africa summer program. This seven-week trip consisted of taking a course called “Public Health in South Africa” at the University of Cape Town

(UCT), interning at various HIV organizations to complement the class, and exploring beautiful historical landmarks. This trip opened my eyes to a problem that was relatively unfamiliar to me due to its significantly lower prevalence in the United States: HIV/AIDS.

While the class at UCT was interesting, it was my internship that gave me the opportunity to see and be a part of the things we learned in class. I had the opportunity to intern three times a week at Ubuntu Africa Child Healthcare, an after school care program for HIV positive kids in the township of Khayelit-



Children Preparing for the Talent Show

Photo Courtesy of: Ubuntu Africa Child Healthcare

sha. Khayelitsha is the second largest township in South Africa, yet one of the poorest, where 70% of residents still live in shacks and the unemployment rate is 50%.¹

Ubuntu Africa Child Healthcare (UBACH) truly demonstrates the African meaning of Ubuntu – a concept about the reliance of humans on each other – and also a quality that includes the essential human virtues of compassion and generosity. UBACH was founded in 2007 by Whitney Johnson, a young American college graduate who noticed

the gap in services and sustained assistance for children living with HIV. In many areas of South Africa, there are few support services offered to children who are HIV positive, and they are often left to bear the burden of disease alone -- particularly those contending with the challenges of extreme poverty.

The organization's mission is to improve the health and wellbeing of HIV positive children through community-based health and support services in Khayelitsha. After school, its transport services deliver

the children to the facility, where they are divided into four classes based on age: ages 4-7, 8-11, 12-14, 15-18. They go to their respective classes and are provided one hot nutritional meal a day. UBACH's method to care is a four-pronged comprehensive program model that includes Psychosocial Support, Community Support, Life Skills & Education, and Health & Nutrition.

As interns, our biggest project at Ubuntu was creating a new computer lab. Fortunately, the most expensive items such as laptops and tablets were donated. The next step was

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African American women in Baltimore have an HIV infection rate five times the national average. Indeed, it's an alarming statistic but there are interventions shown to improve quality of life for those living with HIV/AIDS. My internship with Ubuntu Africa Child Healthcare in Khayelitsha, South Africa allowed me to see the development and personal growth of children living with HIV with a unique 4-pronged approach to HIV care covering all aspects of wellbeing: Psychosocial Support, Community Engagement, Life Skills & Education, and Health & Nutrition. Seeing how Baltimore also has a high HIV rate, hopefully more organizations can adopt this more comprehensive approach to HIV care.

Elizabeth Chen

to design and build the physical lab; another intern and I transformed an empty classroom into a full-functioning technology lab. We also designed technology class syllabi with various educational goals for each of the respective classes: to be a proficient typer, to hone their academic skills, to set up emails, and to learn how to create documents and resumes. Most of the children in the township did not have computers or working Wi-Fi at home or school; thus helping to develop these skills in the children was of utmost importance. At the end of the seven weeks, it was amazing to see that we made a tangible contribution to the organization. The class instructors shared with us that even the five-year-olds learned how to take selfies on their tablets within one minute of handling the device!

My most memorable experience at UBACH was a talent show. The kids had been practicing for months and many parents, grandparents, and other family members from the township came to proudly support the children in their performances. They performed songs, traditional Zulu dances, and skits emphasizing anti-bullying and self-protection.

During the few instances we were exposed to Khayelitsha outside of our facility, it seemed as if the city was broken and hostile. We witnessed random men on the streets pick on the young girls, thieves coming to steal laptops, and multiple break-ins to the facility. However, the talent show was one of the few events where I was able to see the love and support from the community. When the opportunity was present, the community members set their differences aside and came together to celebrate their culture.

Watching the kids perform made me appreciate UBACH even more. Aside from the education, nutrition, health benefits, and opportunities to showcase their amazing talents, the children also receive psychosocial support from the staff and each other to create a "home away from home." Most importantly, it made me realize the need for more programs like Ubuntu, both within South Africa and even in Baltimore, which has the 3rd highest HIV prevalence of any metropolitan area in the US. HIV drugs and technology have improved tremendously in the past decades to the point where a simple

pill a day can prolong life to about the average life span. Thus, while HIV status cannot be changed, quality of life can be changed with simple programs like Ubuntu.

One of the first things I saw posted in the UBACH facility was "I am, because we are" -- a quote that makes us ponder Tutu's interpretation of Ubuntu, see its necessity in the daily lives of people, and realize that it is possible to overcome differences and progress. After working there for a couple of weeks and seeing the daily joy and laughter from kids and staff, I got a better understanding of the African meaning of Ubuntu.

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Esperanza Health Center Experience

YARITZA I. RODRIGUEZ | *Public Health Studies and Entrepreneurship and Management Minor, Class of 2016*

During the fall semester of 2014, I decided to seek out an opportunity to actively serve the local Baltimore Hispanic and Latino population. As a bilingual public health studies major, I felt it was appropriate for me to find a way to directly address health disparities by becoming a volunteer Spanish-English translator; a role that allows me to address the problem of the language barrier in medicine. The language barrier is a result of the lack of cultural and linguistic competency in health care and mental health care that particularly affects diverse patient populations.¹

In the United States, the combined cost of health disparities and subsequent deaths due to inadequate and/or inequitable care has been estimated at 1.24 trillion dollars.² Culturally and linguistically appropriate services are increasingly recognized as effective in improving the quality of healthcare.¹ The United States Census Bureau reports 54 million Hispanics in the US as of 2013, making them the nation's largest ethnic or racial minority.³ In Baltimore City, the Hispanic/Latino community remains a relatively

small proportion of the overall population; yet, the rate of population growth is unmatched by any other ethnic group.⁴ In 2000, the United States Census reported 11,061 Latino individuals residing in Baltimore. by 2012, that number more than doubled to 27,571.⁴ Despite the population growth, Latinos in Baltimore City have a considerably higher risk of being uninsured, with 35.9% reporting no health insurance coverage in 2012 compared to 3.8% of Whites and 27.9% of African Americans.⁴ At the national level, Latinos are the least likely to have health insurance and the most likely to encounter barriers to health care access.³

In response to these inequities, the Baltimore-based Esperanza Center Health Services Clinic provides free medical and dental services to immigrants in the metropolitan region who do not qualify for health insurance and without the income to pay out-of-pocket for health care services.⁵ A majority of patients served are Spanish speaking or of Hispanic origin, most of who have little to no command of the English language. The

Esperanza Clinic is the first Volunteers in Medicine (VIM) Clinic in the State of Maryland. The goal of VIM, in conjunction with clinics like Esperanza, is to promote and guide the development of a national network of free clinics.⁶ These clinics emphasize the participation of retired medical and administrative volunteers from the community to improve access to health care for America's underserved - particularly the uninsured.⁶ In 2012, the Center cared for 355 patients who would not otherwise have access to health care services.⁵ Notably, of the 355 patients, 66% now have care management plans, a vital part of providing comprehensive healthcare.⁵ Nearly a third of the 553 patient visits were urgent care/walk-ins who decreased emergency room utilization, thereby saving city hospitals and taxpayers a considerable amount of money and facility stresses.⁵ The success of the clinic speaks volumes of its impact on the Baltimore community.

Addressing the language barrier is part of my role as a bilingual interpreter at the clinic. I learned of this opportunity through the Hop-

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Immigrants to the U.S. bring with them a rich and history and culture. As a nation, we must take the time to address issues that might keep them from meeting their health care needs. In doing so, we can better support those who continually contribute to the growth and progress of our communities.

Yaritza Rodriguez



Location | Caption

Photo by: Eric Kang

kins student group Programa Salud (Health Program, in English), a student-run health initiative for the Latino community in Baltimore. Programa Salud is a group of students committed to helping those in need by utilizing our Spanish-speaking abilities. I translate between Spanish and English for health care providers and patients to ensure efficiency and accuracy of communication. On Monday mornings, my usual shift, the clinic provides women's preventive health services in conjunction with a VIM obstetrics and gynecology doctor who generously takes the time to consult and care for patients. Prior to meeting with the VIM doctor, patients are asked for their basic information and medical history by a volunteer nurse, whom I usually accompany. Women visit the clinic for a variety of reproductive and maternal health reasons. Many of these women have never been to a gynecologist; many more are recent immigrants to the United States - having left their home country only weeks before.

From my personal experience, I can say that the clinic continually plays an integral role in its patients' lives. Some of the women who seek care at

Esperanza often travel hours to arrive at the health center to receive care they would not otherwise be able to access due to their low-income or immigrant status. I can often understand and relate to the everyday struggles these women face because I too, was once an undocumented immigrant. When I go in to help translate information between patients and health care providers, I am reminded of the hardships that my family had faced due to our lack of understanding of the English language. Growing up in a bilingual environment, I frequently accompanied my own family members to their hospital visits and sometimes aided them in making sense of what doctors and nurses tried to communicate. My past experiences sparked my passion for helping and advocating for the immigrant community. I have a deep admiration for all that the Esperanza Health Center does and I hope to continue to be of service here in the Baltimore and also throughout my career as a public health professional.

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Since sugarcane is covered in many leaves that can harm the cutters, and may harbor snakes and other dangerous animals, farmers in Honduras use a controlled flame to clear out a field that's ready for harvest, after which any remaining stalks are cut down. In this section, authors present exposes on what hard-won knowledge and insights they have gleaned in the field of public health.



: EDITORIALS

Perilous Messages Promoted in Pop

TAYLOR WISEMAN | *Public Health Studies Major, Class of 2015*

“ I like us better when we’re wasted, / It makes it easier to fake it / The only time we really talk, / Is when our clothes are coming off / I like us better when we’re wasted ... ”

-From “Wasted by Tiesto”

Over the past four years of college I have witnessed many of my peers throwing up from hangovers and telling stories of how they do not remember the night before because they were “wasted.” I have seen many of my friends come home from a night out, worried they may have been taken advantage of, so they rush to the clinic to get the morning-after pill.

I am sickened by the catchy tune accompanied by degrading lyrics in “Wasted” and other songs with similar messages. These songs portray the idea that it is okay even preferable to use alcohol in excess to escape from reality. Why can’t singers and songwriters use their influence, which is great, to promote healthy lifestyles? I believe music has power—the power to change the world for the better or for the worse. Positive rather than to degrading musical lyrics, could help alleviate the issue of alcohol abuse prevalent in our generation. Public health advocates need to address the urgent issue of binge drinking promoted in pop.

According to the National Institute on Alcohol Abuse and Alcoholism, binge drinking is a pattern of excessive alcohol consumption in a short amount of time. More specifically, binge drinking is when men

consume 5 or more standard-sized drinks, or when women consume 4 or more, within two hours.¹ More than 90% of alcohol consumption by youths under the age of 21, meets the definition of binge drinking.¹

Binge drinking has many dangerous consequences. The National Council on Alcoholism and Drug Dependence (NCADD), a health organization providing education and information,

reports that consuming alcohol before the brain has fully developed, typically by age 25, dramatically increases the risk of

future addiction. Those who start binge drinking before the age of 15 are five times more likely to develop dependence compared to people who start at 21 years or older. Dr. Linda Gorman, the director of undergraduate studies and teaching professor in the Department of Psychological and Brain Science at Johns Hopkins University, explained that alcohol is a very small molecule, which can interact more easily with neurons than other larger drugs thereby limiting cell-to-cell communication, and impairing judgment. The more alcohol consumed the more dramatic the effect.³

Binge drinking is life threatening. It can lead to alcohol poisoning, which impairs an individual’s involuntary reflexes, like breathing. It can

interfere with the gag reflex, which is needed to prevent a person from choking to death while vomiting. Impaired judgment also results from binge drinking, which may lead to risky behaviors, such as having unprotected sex—increasing the risk for sexually transmitted diseases (STDs) and unplanned pregnancies. Studies also show that students who binge drink throughout high school, are

more likely to be overweight and have high blood pressure. This type of drinking has mental health consequences, because it disrupts sleep

patterns, which can make focusing in school difficult. Medical experts have found that students who binge drink have a harder time studying and concentrating and can lead to worse grades.²

Before any intervention can be identified and carried out, we must know how and why youth binge drink. People may choose to drink alcohol for various reasons, which can differ depending on age or gender. Drinking alcohol however is not the problem, here; the problem is drinking in excess, which results from becoming less aware and not knowing when to stop. Adults often drink alcohol for fun and to socialize with less inhibition. Men may drink to portray a dominant or macho image. Some-

“Those who start binge drinking before the age of 15 are five times more likely to develop dependence compared to people who start at 21 years or older.”



Baltimore, Maryland | Kanye West at the Baltimore Arena 2/14/14

Photo by: Christine Situ

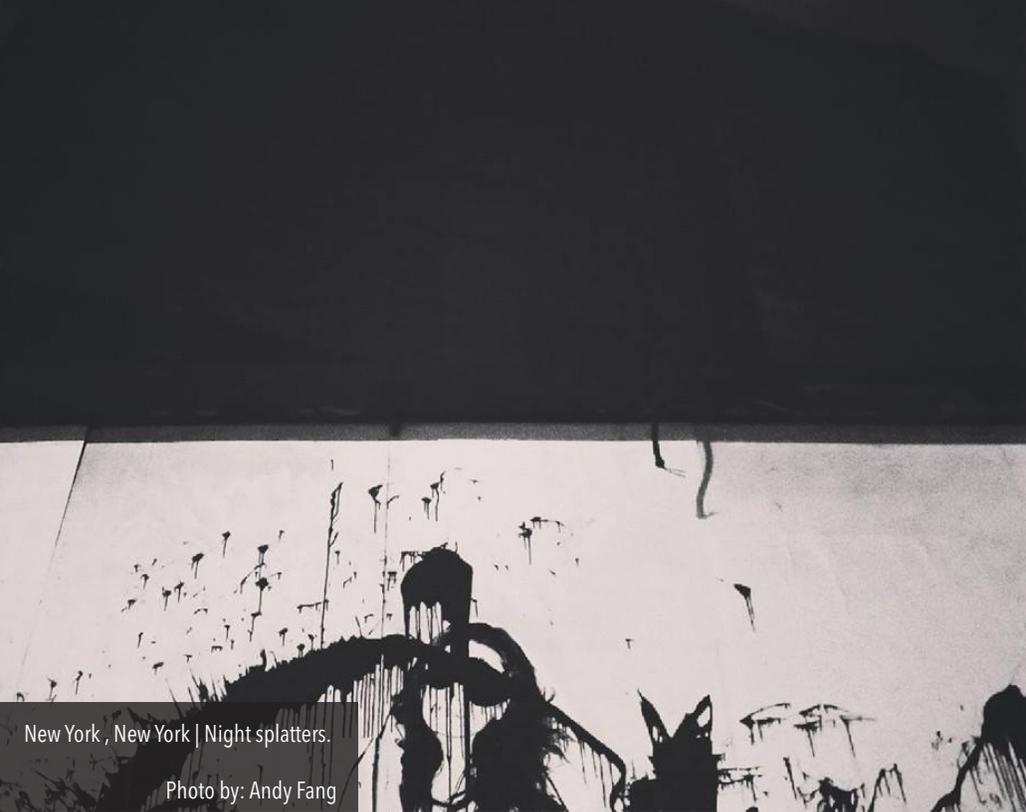
times adults drink to forget their problems. Teens often drink for this reason, as well. In some cases, teens drink to rebel or because they feel peer pressure.⁶ I believe music plays a role in the peer pressure aspect of the problem of binge drinking because youths spend a vast amount of time plugged into headphones and listening to music with their friends.

According to the American Academy of Pediatrics, youth spend four to five hours a day listening to music, much of which is promoting risky behaviors including binge drinking.⁵ According to a Carnegie Foundation study, America's young people spend about 20 minutes a day in conversation with their mom and less than five minutes with their dad, who may try to discourage risky behaviors.⁵ I believe many Americans today are unaware of the impact some of the messages these songs could be having on our youth. In fact, today over a thousand studies have concluded

that musical lyrics with violent content do lead to aggressive behavior in adolescents. One study by Dr. Steven Martino, a behavioral scientist at the RAND Corporation, looked at the effect of exposure to degrading versus nondegrading music lyrics and sexual behavior among youth.⁴ The results revealed that youth who listened

“Music and lyrics are their own form of escape from the everyday, but so is alcohol. In fact, they often work in tandem as alcohol has inspired music, and music has inspired consumption of alcohol.”

to more degrading sexual content were more likely to initiate sex subsequently, yet those who listened to nondegrading sexual content were unaffected.⁴ Given the evidence regarding sexual and aggressive behaviors resulting from degrading lyrics, it is not a stretch to say that the glamorization of binge drinking alcohol in music could be negatively impacting behavior as well. Raising awareness of the dangerous impact songs with these types of messages is the first step towards helping our youth. I spoke with Dr. Daniel Webster on the subject. Professor Webster teaches a Bloomberg School of Public Health course I am taking called “Understanding and Preventing Violence” and he serves as the Director for the Johns Hopkins Center for Gun Policy and the Deputy Director for the Johns Hopkins Center for the Prevention of Youth Violence. I told him how I felt about some of the detrimental effects of



New York , New York | Night splatters.

Photo by: Andy Fang

popular culture on youth behavior and asked him his thoughts on the matter. He explained that studies have linked degrading lyrics in music and violent messages in the media lead to violent behavior. Though he acknowledges this, he said he has not worked more on this issue because he feels his “hands are tied.” Under the First Amendment, granting the freedom of speech, artists have the right to say what they want to say through music. He said he believes the only way a change can be made is if there is some sort of movement against the

music and media that could be harming America’s youth.

But is this feasible? The reality is that kids and teens aren’t learning about binge drinking in school, but they are singing songs they hear on the radio about getting wasted, which only perpetuates the issue. Music and lyrics are their own form of escape from the everyday, but so is alcohol. In fact, they often work in tandem as alcohol has inspired music, and music has inspired consumption of alcohol. That may never change.

However, I propose a public health movement to use the power of music to educate our youth on the dangers of drinking and other risky behaviors rather than turning a blind eye to its current accepted portrayal.

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College and high school students, who statistically mostly binge drink when consuming alcohol, listen to music. Music can have a strong influence on this population’s actions. When songs are written and performed by famous artists that promote excessive alcohol consumption--the public health issue of binge drinking is perpetuated. If music can promote healthy living (or at the very least not promote binge drinking) globally, I believe a positive impact will be made in local communities with high rates of alcohol abuse.



Traditional Healing and the Importance of Patient-Centered Care

SIMON MARSHALL-SHAH | *Public Health Studies, Class of 2016*

At virtually any medical institution within the United States, the care that one receives is likely to be based on biomedical evidence derived from clinical trials. This research and growing body of knowledge is constantly revised and disseminated among both established and aspiring physicians to better diagnose and treat patients who fall ill to a number of possible diseases. Clearly a biomedical approach, whose foundation is evidence-based research, is successful: throughout the last few centuries, we have made great strides in treating a host of infectious diseases and currently researching the most effective treatments of the chronic diseases that plague us. Within the accepted healthcare system, a biomedical approach may vary—however drastically—when compared to another culture’s beliefs about the causes of and cures to diseases.¹

Many health practices and beliefs that are popular around the world do not center on biomedicine to the same degree as in the United States. For example, consuming a combination of medicinal herbs and plants, repairing a connection with one’s ancestors, and practicing certain types of stress-relieving activities are integral and foremost to many cultures’ approaches to medicine and healing. In these cases, the biomedical approach upon which the United States’ healthcare system is based could seem more foreign than other curative systems. Doctors trained in biomedicine, as most are in the United States, should

be not only aware of but also open to the idea that some patients might belong to a different medicinal realm of thought; notably, physicians should encourage dialogue to better assess a patient’s needs. These needs might include navigating different or unfamiliar healthcare systems. Similarly, physicians should communicate with their patients to better understand a patient’s cultural experience and values, emphasizing the importance of context when dealing with health interventions.² With the provisions of the Affordable Care Act (ACA), which focus on patient-centeredness and satisfaction³, becoming effective just over a year ago in January 2014, it is vital that both policy-makers and physicians explore and incorporate traditional medicinal values, biomedical medicine and policy, and overall patient health.

My interest in traditional health care and healing and its deep roots in cultural systems developed over this past summer while studying and working in Cape Town, South Africa. Through a class I took at the University of Cape Town, entitled “Public Health in South Africa,” I learned not only about the history of the country, but also about the complex relationship between South Africa’s citizenry, economy, politics, and social climate. All of these factors contribute to the public health system of South Africa, interacting with another critical component of the healthcare system in the country: the presence of traditional

health practitioners and traditional healing. The traditional practices are especially important in many of the black African cultures that make

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up a part of the melting pot of South African citizenry. Coming from an American culture in which biomedical diagnosis and treatment is so engrained (which is only reinforced by attending a research institute like Johns Hopkins) I initially found the presence of traditional healing—and acknowledgement and consideration of its presence and importance in articles we read or discussions we had—to be a foreign concept. Yet, after spending a few weeks in the country, I found the diversity of the health practices to be more familiar, intriguing, and important to better understand.

Although the overall use of traditional healing practices in South Africa has declined in recent history, tra-



El Zurzular, Honduras | A dentist at the Health Brigades clinic.

Photo by: John Jiao

ditional healers remain an important facet of the public health system, social strata, and racial dynamics within the country. In South Africa, the term “traditional healing” or “traditional healer” often refers to either a *sangoma* or an *inyanga*, who works through divination or work with herbs, respectively.⁴ According to a 2007 study conducted by Nxumalo et al. surveying nearly five thousand respondents, since 1990 there has been a decline in the utilization of traditional healing in South Africa (fewer than two percent surveyed reported having visited a traditional healer in the last month); this is possibly due to the advances of biomedical treatment and understanding of chronic diseases, or perceived stigma associated with seeking traditional medicinal treatment, which could influence the number of those reporting traditional medicine use.⁵

This same study notes two pieces of sociological data as well: first, black Africans are more than twice as likely to use traditional healers and second,

the use of traditional healers increases as overall wealth decreases.⁵ The two populations that most frequently seek traditional healers in South Africa are therefore historically marginalized both racially and socioeconomically within the country; this marginalization has an impact on the opportunity to access affordable and quality biomedically informed health care. However, the reasons that families visit traditional healers certainly vary and are often not based on necessity due to socioeconomic circumstance. Instead, the researchers found that the primary motives for using traditional healing practices were the efficacy of the care and the continuity of such care.⁵ This reveals that although it is often considered a treatment method reserved for the marginalized groups of the country, South African traditional medicine is a successful form of treatment for many; biomedical physicians, especially, should take note in understanding the reasoning behind a person’s—or a family’s—decision to

seek traditional health care treatment. Perhaps, as is sometimes the case with the patients of a *sangoma* I spoke with in the rural township of Zwelethemba, the client is attempting to cure a disease naturally, or even within a healthcare system that he or she is most familiar with. Understanding a patient’s previous decisions and why he or she has taken specific steps to attempt to cure himself or herself is vital to understanding a patient’s own needs and expectations from the care he or she would receive in a biomedical setting.

South Africa is not the only country in which people practice traditional healing; in fact, often grouped with such “unconventional healing practices” is much of the alternative medicine that has become more popular and is more widely practiced in the United States.⁶ Since the late 1990s, there has been an increase in the presence of alternative

medicine in the United States—a 2008 study conducted by the National Center for Complementary and Alternative Medicine (NCCAM) and the National Center for Health Statistics (as part of the Center for Disease Control) discovered that over thirty-eight percent of adults use some form of complementary and alternative medicine (CAM), which is more than a two percent increase from 2002.^{6,7,8} It would therefore be ignorant to assume that a biomedical system is the only one operating within the United States. Instead of defining a single approach to healing, it is more fruitful to understand that medical pluralism—people utilizing healing practices that are not biomedically focused, even with biomedicine available—exists in all health systems including the United States; doctors and policymakers must take this into account when treating patients or refining healthcare law.⁶

Open discussions between healthcare professionals and their patients about the healthcare system and the care he or she is most familiar with, as well as the cultural fac-

tors related to health that are most important to him or her, can help unite potentially different schools of thought and create a healthy dialogue about care. Dialogue should occur early and often between patient and provider, and such conversations should address the issues that surround traditional healthcare and less conventional healing practices. Such issues include culture and what could be defined as the “local world” that a patient is a part of—what Kleinman and Benson describe as a “specific setting in society” that the patient is privy to, and could be different from the healthcare provider’s own “local world” (perhaps, in this case, the use of biomedicine).² Essentially, a doctor who can use the patient as a resource to understand the ailment afflicting him or her is allowed access to the patient’s “local world” as far as health systems and health beliefs are concerned; the provider can then use this information to tailor treatment or direction to this specific patient, ideally providing not only better care but also a better experience for the patient.

One interview technique that em-

phasizes the importance of discussion with patients is the Explanatory Model Approach, whose questions help unravel the intricacies of the way culture affects illness.² Developed by Kleinman (1988), this model uses the patient as the primary source of information in helping to define his or her ailment and its root cause. A series of questions asked through the Explanatory Model Approach might look like this: *What do you believe is the cause of this problem? What do you think this problem does inside your body? What do you most fear about your condition?*² Questions should be asked at the start of the consultation so that the provider can learn the most about the patient and his or her health belief systems quickly—and often a patient and a biomedically inclined doctor will have aligning views. Yet healthcare professionals should be competent at navigating the conversations about alternative medicine and traditional healing practices that might arise through such interviews. A patient’s responses and explanations can alert the interviewer to different views about illness and how best to provide care, likely based on the patient’s own



cultural upbringing,² which should be considered throughout the entire treatment process.

From a health provider's point of view, considering and understanding that a patient could feel he or she would receive better care with an approach that is not necessarily

biomedical (or biomedically researched) constitutes patient-centered care. "Patient-centered care" refers to a combination of different tenets relating to putting the patient first in medical decision-making. In the 2001 Quality Chasm report, the Institute of Medicine (IOM) broadly defined patient-centered care as respecting a patient's "preferences, needs, and values."⁹ Respecting patients' beliefs, and understanding when to accept or challenge such beliefs in order to provide the best possible care for a patient, is another important facet of patient-centered care,¹⁰ which is often dealt with when diagnosing and healing patients for whom biomedicine is not frequently the method of treatment. Another very important concept of patient-centered care when interacting with all patients—yet this population specifically—is working *with* the patient to form a trusting relationship so that concerns can be expressed if need be.¹⁰

The ACA, signed into law in 2010 and whose effects have thus far had a year to be seen, has the power to transition healthcare in the United States to a service that is indeed much more patient-centered. A number of objectives are outlined by the Department

of Health and Human Services (HHS) and refer to goals that aim to put the patient first, such as ensuring patient safety and emphasizing prevention.¹¹ As a part of the broader push for patient-centered health care, however, current health professionals and policymakers should also consider the benefits of training healthcare pro-

“Essentially, a doctor who can use the patient as a resource to understand the ailment afflicting him or her is allowed access to the patient’s ‘local world’ as far as health systems and health beliefs are concerned.”

fessionals and providers about the degree of medical pluralism in the United States; while traditional healing or alternative medical practices are less openly discussed across the United States, they are widely used, even in a Western setting where biomedicine is largely the treatment method of choice. Doctors who understand that their patients may not always hold the same beliefs about medicine, ailments, and treatments—and are able to discuss with their patients, using tools like the Explanatory Model Approach, the patient's own beliefs—will be providing care that is more tailored to the patient and his or her needs. Care that is more patient-centered has demonstrated an improvement in the quality of overall care, yielding a higher quality of life for the patient.¹⁰ Healthcare providers dramatically affect the quality of care of each patient they treat, and therefore it is crucial that cultural beliefs about health and healing are not only openly discussed but also thoughtfully considered when caring for a patient.

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Understanding My Role Abroad: a Discussion of the Ethical Implications of International Aid in Low Resource Settings

NATASHA FLETCHER | *Public Health Studies Major, Class of 2016*

One of the greatest challenges that I encountered upon my return from my study abroad adventure last spring semester was how to succinctly articulate my experience without resorting to the oft-repeated claim that it was “truly life changing” or that I simply “learned a lot!” Such responses oversimplify the innumerable experiences that I was afforded during my time abroad, and frame my trip as a single, static event that could be summarized by a few off-handed words. In reality, my time abroad was one of the most challenging experiences of my life. Upon my return, I grappled with balancing wonderful memories and the perplexing experiences that challenged my previous notions about what international service work entailed. My time abroad afforded me the opportunity to reflect on my position within the globalized world, and what role I can, or rather should, play within it.

Before traveling abroad, I had been very determined to pursue a career in global health. I dreamt of traveling to foreign lands, learning about unique populations, the environments that they live in, and making an impact on mitigating the health issues that arise from the interactions between the two. I am no longer as certain in my desire to pursue a career in global health, and my change in perspective is due largely in part to

my better understanding of the implications of foreign development in developing countries.

As a student within the School for International Training’s International Honors Program, I spent a semester divided into six week segments, the first of which I spent in Hanoi, Vietnam, followed by Cape Town, South Africa, and finally São Paulo, Brazil. My adventures abroad included whizzing through narrow alleys on the back of a motorbike in Hanoi, performing a traditional gum-

“Many communities are rendered powerless against adverse external influence simply because they do not have the resources to be anything but compliant recipients.”

boot dance at a community celebration within a township in South Africa, and learning about sustainable agroforestry techniques within a rural town in Brazil. The curriculum of the program focused on health, culture,

and community, and the coursework consisted of four classes taught by two traveling faculty members and a diversity of guest lecturers. My instructors stressed critical thinking and experiential learning over lectures and graded exams. This education structure was a refreshing change from the traditionally lecture-dominated education at Johns Hopkins University.

One of the greatest lessons that I took away from my experience abroad was the importance of assessing personal privilege in a geographic and cultural context. In an effort to be both conscientious and vigilant about our role abroad, my peers and I constantly stressed our catchphrase concept of “checking our privilege.” The phrase served as a reminder that we were American-educated students paying a sizeable fee to have a prearranged cultural experience, and that we should not have the same expectations abroad that we had at home; rather, we should be welcoming of these changes. This included not complaining about having to clean ourselves using buckets and cold water as opposed to steaming hot showers, accepting that Wi-Fi accessibility would be intermittent throughout most of the journey, and surviving without Starbucks for the next four months.



South Africa | Travelers (tourists) at the airport.

Photo by: Andy Fang

We were persistently challenged to unpack our metaphorical backpacks filled with preconceived notions that might hinder our perceptions of each new population and culture that we encountered. This enabled the group to appreciate our present experiences with an unbiased perspective. Furthermore, in regards to international aid and development, my peers and I were regularly challenged about the roles that we desire to play within the global health arena. We engaged in fruitful discussions in which we critically analyzed the necessity of foreign assistance and the prioritization of certain populations and concerns over others. Never before had I been challenged to acknowledge the ways in which my environment and background as an American citizen influence how I perceive others and the issues with which I have no first-hand experience.

Throughout my travels it became quite apparent that the interests of foreigners do not always align with those of the local communities. However, many communities are rendered powerless against adverse external influence simply because they do not have the resources to be anything but compliant recipients. I vividly remember a guest lecture in South Africa

during which an international health worker highlighted a Gates Foundation competition that challenged individuals to develop sustainable toilets in under-resourced communities. One contender created a system by which human waste could be filtered and used to treat crops. Though the idea was undoubtedly innovative and cost-effective, the lecturer argued the case that a community may only desire to have an adequate sanitation system rather than a device that would transform their bodily fluids into nourishment for their agriculture. This discrepancy between local and foreign interests was enlightening, and demonstrated to me how measures such as this may be effectively silencing the voices of those that they aim to benefit.

Yet despite the aforementioned differences, it became evident to me that the demographic characteristics of the marginalized populations within the countries that I visited in regards to race, gender, and sexual orientation, specifically within Brazil and South Africa, are similar to many of the marginalized populations within the United States of America. The adverse health outcomes and socioeconomic hardships experienced by the individuals within these com-

munities are strikingly similar. It is ironic that it took travelling overseas for me to truly realize how inequitable the conditions within my own country are. At the conclusion of the program, many of my peers and I declared that we were having existential crises because we realized that among us, there is an insistent desire to affect change on a global scale, yet we do not know the most effective, ethical methods of pursuit.

Thus, my time abroad was a process of tremendous enlightenment and growth. I now have a clear understanding that local populations, both within the US and abroad, are subject to measures that are imposed on their communities by external influences, and that the best way to address this concern is through mobilizing the local population and prioritizing their voices above all else.

My advice to students who pursue studies abroad would be to actively engage in conversations with local individuals, and to familiarize themselves with the local customs, traditions, and culture. Having this unique insight and perspective will not only enhance experiences abroad, but will also provide invaluable information regarding the social, political, and economic dynamics at play. This aspect of my experience was definitely the most rewarding. I would encourage each student to “unpack their backpack” of preconceived notions about the destination(s) to which they are travelling, to reflect on how these predetermined beliefs change throughout their time abroad, and to assess what impact these ideas have on their understanding of their global roles and responsibilities.

The Need for Adequate Trauma Surgical Care in Low- and Middle-Income Countries

JOHN JIAO | *Department of Biochemistry & Molecular Biology, Bloomberg School of Public Health*

Traumatic injury is a seriously overlooked epidemic in nearly every developing country, resulting in an estimated 5.8 million deaths annually worldwide.¹ This number is approximately equal to the number of deaths resulting from HIV/AIDS, tuberculosis, and malaria combined. Of these deaths, 90% of them occur in low- and middle-income countries (LMICs).² Injury is also the leading cause of death of individuals between the ages of 5-45 in LMICs. Further, for each person who dies from trauma in LMICs an estimated 3-8 more individuals are permanently disabled.³

Despite these alarming figures, there is a decided lack of political

and academic attention given to the prevention or the treatment of injury in LMICs, while a significant amount of resources are directed toward the control of communicable disease. As a result, though considerable strides have been made in many countries around the world in the treatment of communicable diseases, health care systems in LMICs are gener-

ally ill-equipped to handle the burden of trauma care.

A prime example of an LMIC fac-

“...though considerable strides have been made in many countries around the world in the treatment of communicable diseases, health care systems in LMICs [Low- Middle-Income countries] are generally ill-equipped to handle the burden of trauma care.”

El Zurzular, Honduras | On the road. Where to?

Photo by: John Jiao





ing tremendous disparities and inequalities in healthcare funding is the nation of Honduras. Despite being home to approximately 8 million people, Honduras lacks a dedicated trauma center within its borders, at best offering “general care including trauma”.⁴ Of these eight “general care” hospitals, five are located in the capital of Tegucigalpa and the remaining three in various cities. Thus, more

than 80% of Hondurans must travel anywhere from a few hours to over a day to reach a center that offers trauma care. This dearth of resources correlates with a disproportionate 48% of all male deaths in Honduras being injury-related.⁵ Additionally, at least four in every five deaths of Honduran males aged 12 to 49 were injury-related, a trauma mortality rate that is a staggering 450% higher than that of

the United States.

There is little doubt that injury is a significantly neglected health care burden in LMICs. In addition to the serious lack of timely access to treatment for traumatic injuries, which by their nature often require expedience, numerous assessments have also reported trauma training and crisis preparation in LMICs to be severely lacking.⁶⁻¹⁰ Greater attention from

El Zurzular, Honduras | "She took care of the other little orphan and carried her everywhere."

Photo by: John Jiao



the global public health community is needed, particularly on training physicians in LMICs on standardized trauma protocols and on the establishment of more readily-accessible trauma care in these countries. It has been estimated that approximately two million patients could be saved each year from relatively basic improvements in the quality of traumatic injury care in LMICs.¹¹ Additionally, though no data exists on how many permanent disabilities such measures could prevent in addition to lives saved, it is reasonable to speculate that the impact would be very significant. A great deal of research, planning, and implementation lies ahead in order to ensure such change is effective, sustainable, and long-lasting.

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THINK: GLOBAL::ACT: LOCAL

I became interested in the issue of injury and trauma through my training in college as an EMT. Things like broken bones and fractures are almost a non-issue here in the States; in general, we don't ever doubt that someone who suffers that kind of injury here will return to work or survive, we simply assume they will recover fully. But after just a few days in the developing country of Honduras, I realized just how serious an issue injury is for many people around the world. The burden caused by injury-related death and disability was enormous, far larger than I had ever imagined.

This is an issue I feel deserves much more global attention because of how many potential lives could be saved with relatively little intervention. Simple things like training local volunteers at an EMT level to splint injuries or organize transport to nearby hospitals can have huge effects. In countries like Honduras, this kind of infrastructure simply doesn't exist--but we have the potential to bring this kind of basic knowledge from our world to theirs, and in doing so significantly reduce the burden of injury at a global level.

John Jiao

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