



EPIDEMIC PROPORTIONS

Focus on the Future

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ABOUT THE JOURNAL

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

SUBMISSION POLICY

We encourage students and faculty to share with us their experiences in local communities and abroad. Research, volunteer work, and editorials contribute to the much-needed conversation on public health.



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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.

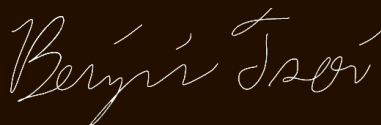
The middle spread of our journal shows a map of the world with photographs of people from various countries, and the inscribed message "Set Your Focus on the Future" is a call for greater international cooperation and support for public health initiatives. As the global population grows and becomes even 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,



Benjamin Tsoi



Victoria Huang

Cover LETTER

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.

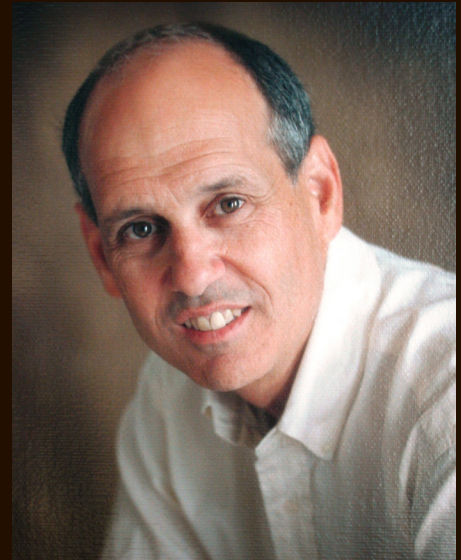
An interesting question in these interesting times is whether the biomedical and data science revolutions can drive dramatic improvements in health and reductions in the \$1 trillion annual waste? At Johns Hopkins, we are committed to demonstrating that the answer is a resounding YES.

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.

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





RESEARCH

A Step Towards Improving the Accuracy of Whooping Cough Diagnoses

JULIA HU | *Public Health Studies, Class of 2016*

INTRODUCTION

Public health laboratories serve to protect the public from various diseases and health hazards. There are public health laboratories operating at all levels of government ranging from national (Centers for Disease Control and Prevention) to state and local laboratories. They provide “clinical diagnostic testing, disease surveillance, environmental and radiological testing, emergency response support, applied research, laboratory training,” and many other services for their communities.¹ In addition to administering the typical health services, state public health laboratories also perform tests that are unavailable at smaller, local laboratories. Using information provided by local public health laboratories, the state labs will then be able to “formulate public policies, develop new methods to detect and combat infectious disease and environmental pollutants and toxins, [and] regulate private medical and environmental laboratories.”¹ The state laboratories also play integral roles in responding to “food, disease, environmental, and agricultural” national emergencies, efficiently utilizing the established hierarchy network of public health laboratories.¹ Although local public

health laboratories share many of the same responsibilities as a state laboratory, they differ in several ways. Local laboratories “provide testing at the site of patient care or address local environmental issues,” support local public health goals, track specimens, report results for surveillance, and work with investigators to provide quick responses for the community.²

BORDETELLA PERTUSSIS VERIFICATION STUDY

Although there are many different topics to explore in a public health lab, this paper will focus on the

verification of a confirmatory polymerase chain reaction (PCR) test for *Bordetella pertussis* performed in San Mateo County’s Public Health Laboratory. “*Bordetella pertussis*, the causative agent of pertussis, or whooping cough, is reemerging as a significant respiratory pathogen in many parts of the world.”³ “In 2010, 27,550 cases of pertussis were

reported — and many more cases go unreported. The primary goal of pertussis outbreak control efforts is to decrease the morbidity rate (the number of individuals infected) and the mortality rate (the number of infected who die) among infants; a secondary goal is to decrease morbidity among people of all ages.”⁴ Because pertussis outbreaks are often extremely difficult to manage and identify, public health labs need to solidify and verify their methods in detecting pertussis.⁴ Infectious disease PCR tests are typically administered to detect and amplify a certain gene sequence specific for the organism of interest. *B. pertus-*

“In 2010, 27,500 cases of pertussis were reported - and many more cases go unreported.”

sis culture is also used to identify the bacteria; however, because *B. pertussis* is very fragile, culture can be difficult and usually takes several days. Therefore, many laboratories only perform PCR to detect the presence of *B. pertussis* in clinical specimens.

The SMCPHL currently uses a PCR assay to test for *B. pertussis*.

This assay targets IS481, an insertion element sequence that both *B. pertussis* and *B. holmseii* (which causes pertussis-like symptoms) share. Although the prevalence of *B. holmseii* infections is low,⁴ the issue with this test is that it does not differentiate between *B. pertussis* and *B. holmseii*; thus, potentially leading to reporting of false positive *B. pertussis* cases. With this in mind, the lab sought to develop a second confirmatory assay to discriminate true *B. pertussis* infections from *B. holmseii* infections.

This is where the *B. pertussis* confirmatory assay comes into play. The *B. pertussis* confirmatory assay uses primers/probes that are specifically designed to detect only *B. pertussis*. This makes it more specific than the IS481 PCR assay. However, the IS481 PCR assay is much more sensitive because it targets an insertion element that is present in many copies (~100)/bacterial cell in *B. pertussis*.

Before the lab can begin using the confirmatory assay, it was essential to verify this new assay to establish its performance characteristics relative to the IS481 assay and ensure its reliability. It needs to be verified as a “laboratory-developed test” (LDT) and must be evaluated for the following: sensitivity (limit of detection), specificity (detection of true positives), precision (reproducibility), accuracy (comparison of methods), reportable range (quantitative assays only), and reference interval. However, sensitivity and specificity will only be discussed.⁵

SENSITIVITY

The first step was to confirm the quality of the reagents, primers, probes and to obtain a general sense of the sensitivity of the assay by test-

ing it with dilutions of an un-quantified *B. pertussis* positive control. The *B. pertussis* confirmatory assay worked well, and as expected, it was less sensitive than the IS481 assay.

the concentration in “colony forming units” (CFU)/mL, and DNA was extracted from each dilution. Knowing the CFU/mL provided an approximate measurement of the

“[...] having a more specific assay to differentiate these different types of infection will aid doctors in providing the proper treatment for their patients.”

Therefore, IS481 assay detected the *B. pertussis* dilutions ~4 cycles earlier than the *B. pertussis* confirmatory assay.

To determine the sensitivity of the assay, a limit of detection test (LOD) with a quantified *B. pertussis* control was administered. A sample of *B. pertussis* culture was created in saline. Ten-fold dilutions were made of the bacterial suspension, an aliquot was cultured to determine

LOD. For this test, the starting “undiluted” suspension had a CFU/mL of 1.6×10^8 CFU/mL. To compare the sensitivities of the PCR assay, the extracted DNA was then tested in duplicate for both the confirmatory and IS481 assays.

This part of the study found that the confirmatory assay is clearly less sensitive than IS481. For the same dilutions, the CT (Cycle Threshold value at which DNA is first de-

Sample No.	<i>B. pertussis</i> confirmatory assay CT Values (Lab Values)	IS481 CT Values (State Values)	Type
(-) Control	-	-	-
1	26.85	22	<i>B. pertussis</i>
2	-	-	-
3	-	28	<i>B. holmseii</i>
4	30.03	25	<i>B. pertussis</i>
5	-	-	-
6	-	34	<i>B. holmseii</i>
7	-	-	-
8	32.96	29	<i>B. pertussis</i>
9	-	-	-
10	-	33	<i>B. holmseii</i>
11	-	-	-
12	32.59	27	<i>B. pertussis</i>
(+) Control	30.61	-	<i>B. pertussis</i>

Figure 1: *B. pertussis* confirmatory assay CT values compared to those of IS481's. The confirmatory assay is only specific to *B. pertussis*, whereas the IS481 assay detects both *B. pertussis* and *B. holmseii*.

ected) for IS481 is less than the CT values for confirmatory assay (about 4-5 CT values difference). The study also found that the limit of detection for the confirmatory assay is between 10^{-5} or 10^{-6} (approx.160 - 1600 CFU/uL), whereas the IS481 assay's LOD of *B. pertussis* is at the 10^{-7} dilution (16 CFU/mL).

SPECIFICITY

The specificity of the *B. pertussis* confirmatory assay was assessed by testing IS481 negative and positive samples that contain *B. holmseii* DNA or other DNA that may cause similar illness (such as *B. parapertussis*).

Figure 1 demonstrates the results of previously tested proficiency test samples. Samples 1-12, including positive and negative controls, were run with the confirmatory assay. In terms of specificity for *B. pertussis*, samples 3, 6, and 10 were negative for the confirmatory assay, but positive for IS481. These samples contained *B. holmseii*, and only the IS481 assay was able to detect them. Also, the confirmatory assay CT values are higher than those of IS481, which again illustrates the sensitivity difference between the confirmatory assay and the IS481 assay.

HOW DOES MY RESEARCH BENEFIT MY LOCAL COMMUNITY?

B. pertussis is a reportable disease; thus, local health departments must report to the state, and from the state, the cases must be reported to the Centers for Disease Control and Prevention. Because our current assay cannot differentiate between *B. pertussis* and *B. holmseii*, this may result in over-reporting of true "pertussis" cases. Thus, having a second confirmatory assay (specific one such as the confirmatory assay) is preferred.

Because some labs cannot discriminate between the two, they may not know which type of treatment to administer. "The differential diagnoses of pertussis include infections caused by other etiologic agents, including adenoviruses, respiratory syncytial virus, *Mycoplasma pneumoniae*, *Chlamydia pneumoniae*, and other *Bordetella* species such as *B. parapertussis*, and rarely *B. bronchoseptica* or *B. holmseii*."⁶ Although pertussis awareness is increasing as a disease, its differential diagnosis is greatly overlooked. Thus, having a more specific assay to differentiate these different types of infection will not only contribute to the state's overall *B. pertussis*

surveillance, but also aid doctors in providing the proper treatment for their patients.

Acknowledgments

I would like to express my sincerest gratitude to Dr. Zenda Berrada, Dr. Bruce Fujikawa, and staff at the San Mateo County Public Health Laboratory for this wonderful, fruitful opportunity.

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Stellenbosch, South Africa | Surgery center located in Stellenbosch. Photo courtesy of Jessica Lee.



Assessing the Advisability of Presumptive Treatment for Syphilis Cases and Contacts Coinfected with Gonorrhea

CHRISTINA BASTIDA | *Public Health Studies, Class of 2015*

INTRODUCTION

San Joaquin County has been experiencing a syphilis outbreak since 2009. Seventy-five primary and secondary syphilis cases were identified in the County in 2012. This is a rate of 10.7 cases per 100,000 individuals, which is comparable to rates observed in jurisdictions such as Los Angeles and San Diego. Rates this high have not been observed by San Joaquin Public Health since a previous outbreak during the mid-1990s (Figure 1). The recently observed syphilis infections have largely occurred among men who have sex with men (MSM) (Table 2) who have engaged in high-risk sexual behaviors. These high-risk behaviors include engaging in unprotected anal intercourse and having anonymous sexual partners.^{1,2} High-risk behaviors are associated with a high sexually transmitted disease (STD) prevalence and a high risk of STD transmission.²

Gonorrhea, the second most frequently reported communicable disease in the United States, is also commonly diagnosed in San Joaquin County, with over 700 cases reported annually in recent years. Gonorrhea can cause serious repro-

ductive complications and facilitate the transmission of HIV if untreated or treated with ineffective antibiotic regimens.³ Efforts to control gonorrhea have become challenging because of the bacteria's ability to become resistant to antibiotic treatments, and/or go undetected.⁴ Asymptomatic gonorrhea infections are frequent, especially at cervical, rectal and pharyngeal sites.⁴ Undiagnosed and untreated infections are of particular concern for MSM given that most medical providers only perform urethral screening and little to no extra-genital screening. If MSM receive urethral-only screening, over 90% of gonorrhea infections may be missed.⁵

Presumptive STD treatment for asymptomatic individuals at high risk involves either treatment without screening or treatment before screening results are available. Presumptive STD treatment is an accepted public health intervention; it has been shown to reduce individual morbidity and partner reinfection rates. When applied across a high-risk population, it may reduce population STD prevalence as well. Presumptive treatment is recommended by the Centers for Disease Control (CDC) for sexual

partners of individuals diagnosed with STDs,⁶ and has also been used successfully among sex workers in developing countries.^{7,8} In recognition of the high rate of coinfection with Chlamydia among individuals with gonorrhea (approximately 20% in men and 42% in women),⁹ presumptive treatment for Chlamydia is recommended for individuals diagnosed with gonorrhea.

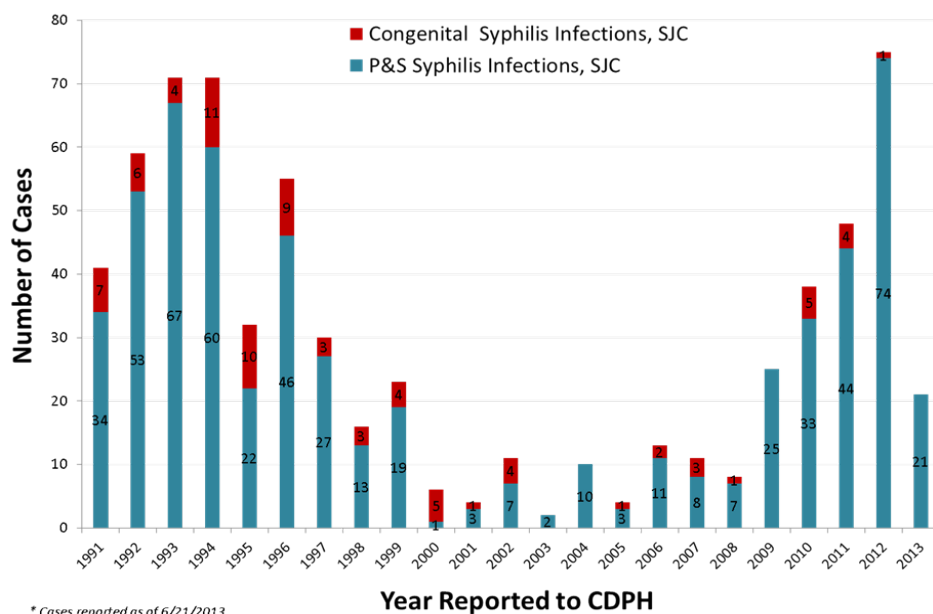
The prevalence of gonorrhea coinfection among individuals diagnosed with early syphilis has not been well studied, so an informed decision concerning the advisability of presumptive treatment for gonorrhea in this setting has not been possible. However, individuals diagnosed with syphilis or at risk for

Syphilis cases and contacts	22
Syphilis contacts only	34
Gonorrhea cases	8
Syphilis cases and contacts with Gonorrhea	42

Table 1: December 2012-May 2013 Syphilis and Gonorrhea Patients (SJCPH)

Note: * Syphilis cases and contacts (denominator). ** Gonorrhea cases that have been confirmed with Syphilis (numerator). Among the numerator 50% of cases were co-infected as well as 50% of contacts.

P&S and Congenital Syphilis Cases, SJC, 1991 - YTD 2013*



* Cases reported as of 6/21/2013

Note: Congenital syphilis includes confirmed, stillbirths and probable cases; 2012 congenital case based on preliminary data

Figure 1: Primary, Secondary and Congenital Syphilis Cases SJC 1991-YTD 2013*

syphilis are at particularly high risk for STDs in general and especially HIV. Therefore, treating gonorrhea in a timely manner among these individuals would have major potential benefits both to control the spread of gonorrhea and to prevent the spread of HIV.

METHODS

A [retrospective] data analysis was undertaken to address the advisability for a policy of presumptive treatment for gonorrhea among syphilis cases and contacts seen at the San Joaquin County STD Clinic.

All early syphilis cases (primary, secondary, and early latent) and contacts to early syphilis cases

treated for syphilis in the STD clinic from December 1, 2012 through May 31, 2013 were identified (Table 2). The cases and contacts were identified and confirmed using several overlapping data sources: the Clinic’s nursing treatment log, the STD Control Program’s syphilis line list, and individual chart reviews. If an individual was treated for syphilis but did not have an early case, the chart was reviewed to ascertain that he or she presented identifying as a contact to an early case.

Gonorrhea cases from the same time period were identified using a line list obtained from the San Joaquin County Public Health Laboratory. This list of syphilis cases and contacts was then compared to the

	N	# of MSM	% MSM
2009	25	25	100
2010	33	17	51.5
2011	44	24	54.5
2012	74	57	77.0
Dec. 2012-May 2013*	12	10	83.3

Note: ±Table includes syphilis cases only, excludes syphilis contacts. * These numbers are from preliminary internal SJCPHS STD data.

Table 2: Proportion of Primary and Secondary (P&S) Syphilis 2009-2012 and P&S Syphilis 2009-2012 MSM Compared to Proportion of Syphilis Dec.2012- May 2013 and Syphilis Dec.2012-May 2013 MSM±

list of gonorrhea cases in order to identify concurrent gonorrhea infections among syphilis cases and contacts and to calculate the coinfection rate. Chart reviews were also done to identify any additional individuals who were diagnosed with gonorrhea at outside medical providers who were subsequently seen at the STD Clinic for syphilis but did not receive additional gonorrhea tests. Chart reviews and the syphilis case line list were also used to compile demographic information concerning the study population (Table 3). MSM were identified in order to separately analyze coinfections in this subgroup.

RESULTS

The final study population included 20 early syphilis cases and 22 syphilis contacts for a total n =42. The group was racially diverse, and the median age was 24. 39 were male and 3 were female. Of the males 35, or 83.3%, were MSM. Of the 42 syphilis cases and contacts, 8, or 19.0%, were also positive for gonorrhea (Table 1). All 8 coinfections were diagnosed in MSM; among MSM, the coinfection rate was 23.5%. One infection was urethral, four pharyngeal, two rectal, and one both pharyngeal and rectal. Most notably, the average number of days from the initial clinic visit to treatment for the gonorrhea infection was 4.4.

CONCLUSION

This data analysis reveals an unexpectedly high rate of gonorrhea coinfection among syphilis cases and contacts treated at San Joaquin County Public Health STD Clinic from December 2012 to May 2013. Limitations of the study include the relatively small number of cases and

Race/Ethnicity	Cases (N)	Contacts (N)*
White (Non-Hispanic)	3	2
African American/Black	5	4
Asian (Includes Filipino)	2	-
Hispanic/Latino	9	5
American Indian/Alaska Native	0	-
Native Hawaiian/Pacific Islander	0	-
Multiple Race	0	1
Unknown	0	-

Table 3: Race/Ethnicity of Dec.2012-May 2013 Syphilis Cases and Contacts

*Not all N for race/ethnicity of contacts are included due to missing information.

unclear generalizability from San Joaquin County STD Clinic to other clinical settings. All the coinfections were observed in MSM, but perhaps if the study population had been large enough to encompass more females and heterosexual males, coinfection rates could be determined for these subgroups as well.

The syphilis and gonorrhea coinfection rate of 19% is comparable to the gonorrhea and Chlamydia coinfection rate for which presumptive treatment is the accepted standard of care. This analysis could therefore support a strategy of presumptive gonorrhea treatment for syphilis cases and contacts in San Joaquin County STD Clinic. Advantages of presumptive treatment would include decreased time to treatment and no loss to follow up, both of which would be expected to decrease gonorrhea transmission and HIV acquisition/transmission in certain cases. Disadvantages of presumptive treatment include uninfected patients receiving unnecessary antibiotic treatment and individuals declining to return to the clinic to receive their gonorrhea test results because they would have already received treatment. If individuals do not return for their test results, they miss the opportunity to receive counseling concerning partner referral and treatment, perhaps increasing their risk for reinfection and depriving their partners of the opportunity for testing and treatment.

The advantages and disadvantages of presumptive treatment need to be carefully considered in this high-risk group of STD Clinic patients; if a policy of presumptive treatment is established then targeted counseling to encourage patients to refer partners and attend results appointments may help minimize the potential negative impacts of same-day treatment. Further study may assess the effectiveness of a presumptive treatment policy in terms of decreased time to treatment, loss to follow up, and partner referral. In addition, a larger study population in the future would allow for assessment of gonorrhea coinfection in subgroups of syphilis cases and contacts such as females and heterosexual men in order to fine-tune the presumptive treatment recommendations.

ACKNOWLEDGMENTS

I would like to express my utmost gratitude to San Joaquin Public Health Services for allowing me to participate in this research project of calculating the coinfection rate among syphilis cases and contacts who would also contract gonorrhea within their clinic. A special thank you to Dr. Cora Hoover for designing the research project, for allowing me to participate, and for guiding me throughout the project as well as assisting in the writing of the report. I would also like to thank the Epidemiology department, specifi-

cally epidemiologist, Jamie White, and epidemiology supervisor, Karen Pfister, for teaching me valuable statistical approaches, interpretations and for allowing the project to use preliminary clinic data.

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Slowing HIV Transmission in Baltimore City for MSM Through the Category-C Demonstration Project

MEGHA SHARMA | *Public Health Studies, Class of 2014*

BACKGROUND

This past summer, research conducted through the “Center for AIDS Research,” a HIV research conglomerate that includes the “Center for Child and Community Health Research,” showed that HIV is a much more prevalent problem in Baltimore than most people realize. In fact, the Baltimore-Towson area had the fifth highest estimate HIV diagnosis rate of any major metropolitan area in 2010.¹

infected individuals to uninfected individuals by focusing on those likely to transmit infection. This is a shift in thinking from previous approaches that focused on outreach to at-risk populations. One method of implementing targeted HIV control includes focusing on outreach testing in high HIV transmission areas or “hot spots.” Some examples of high HIV transmission areas include residential areas, sex partner meeting places, and primary care provider clinics.

within their respective population. Probable causes are social or sexual networks. While networks are composed of the interactions between people, social geography shows that networks are also strongly associated with physical places or social spaces. The Category-C Demonstration Project focuses on sexual networks since identifying sex partner meeting places nominated by many HIV+ persons can help inform the Baltimore City Health Department about potentially high transmission areas. Then, targeted control outreach efforts can be structured towards these areas.

Among the three key populations regarding HIV infection: injection drug users (IDUs), men who have sex with men (MSM), and high-risk heterosexuals (HRH), this research project focused on MSM which remains the group most heavily affected by HIV in the US. The CDC estimates that MSM represent only approximately 4% of the male population in the United States, but male-to-male sex accounts for 78% of new HIV infections among all men and nearly two-thirds (63%) of all new infections in 2010 (29,800). HIV incidence among MSM is still increasing.²

“Two things are needed [for HIV] to spread: a social or sexual network and the presence of the disease.”

Dr. Jacky Jennings’ Category-C Demonstration Project is taking a new and more comprehensive approach to reducing new HIV infection in Baltimore City. Part of the project includes a partnership with the Baltimore City Health department, which involves implementing targeted HIV control in Baltimore City. Targeted HIV control is an outreach method that aims to interrupt the transmission of HIV from

Sex partner meeting places seem to be an important focus according to transmission dynamics. Two things are needed in order for a disease to spread through a population: a social or sexual network and the presence of the disease within the population. Certain demographics tend to have persistent transmission, but only within their population, which suggests that something is enclosing the disease

Before this summer, the Cat-C team had taken new HIV diagnoses reported to the BCHD between 2009 and 2013 from one cross-sectional data set. We looked at the demographics of the participants and categorized their responses to typologies of meeting places. Some

then classified into typologies (e.g. bars and clubs, internet). Internet venues were further classified into specific typologies, including online dating websites, social networking sites, chatrooms, and phone applications.

The cross-sectional data on ty-

ogy because those showed the most significant trends over time.

RESULTS

As shown in Figure 1, while most of the typologies' reports maintained consistently low, the raw numbers of reported meetings at internet typologies increased while the number of reports for bars/clubs decreased over time. This trend is even more strongly reflected in Figure 2 when looking at the graphic for the proportional reporting levels for each typology.

Figure 3 shows the results when the bars/club typology is broken down into its top four specific venues, which comprised the top 53% of all reports. Some variability can be seen, with a peak in 2011.

Figure 4 shows the results when the internet typology is categorized into its top four specific venues: one online dating site, one chat room, one SMS service, and one specific phone application. We can see in reports over the last year that the popularity of the phone app is potentially increasing while others are decreasing.

“The primary focus of the work was to determine the extent to which reported sex partner meetings have varied over time among newly diagnosed HIV positive MSM[...]”

examples of typologies include bars and clubs, streets, parks, and web sites or apps. Then we took a closer look to identify specific venues.

My goal of the summer was to take the existing data about where HIV+ MSM meet their sex partners and analyze the trends over time so that informed decisions could be made about the direction future surveillance efforts should head towards. Essentially, cross-sectional data was taken and cut up into sections of time. The primary focus of the work was to determine the extent to which reported sex partner meetings have varied over time among newly diagnosed HIV positive MSM in Baltimore City from 2009-2013.

METHODS

There were 1,811 new diagnoses of HIV among MSM in Baltimore City from 2009-2011. Of those, 13% (230) had information about sex partner meeting places from case interviews conducted by the BCHD.

Sex partner meeting venues were

typologies were divided into 6 month intervals to analyze trends over time. Trends were analyzed in three groups: 1) overall; 2) specific bars/clubs accounting for at least 5% reports; and 3) specific internet venues accounting for at least 5% of reports. A threshold of 5% was chosen to eliminate venues reported only once or twice over the time period. I focused on the specifics of the bars/clubs typology and internet typol-

Figure 1:

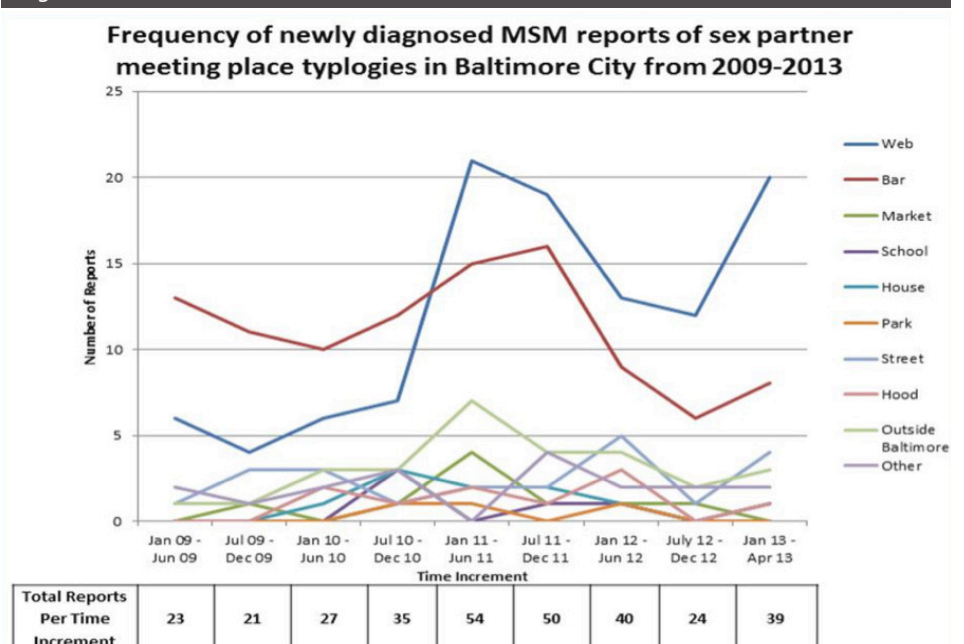


Figure 2:

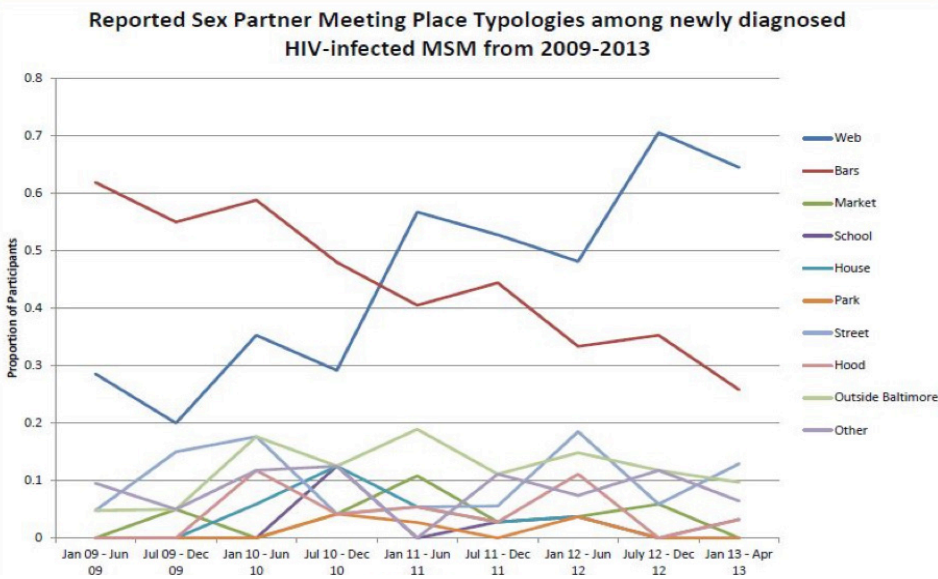
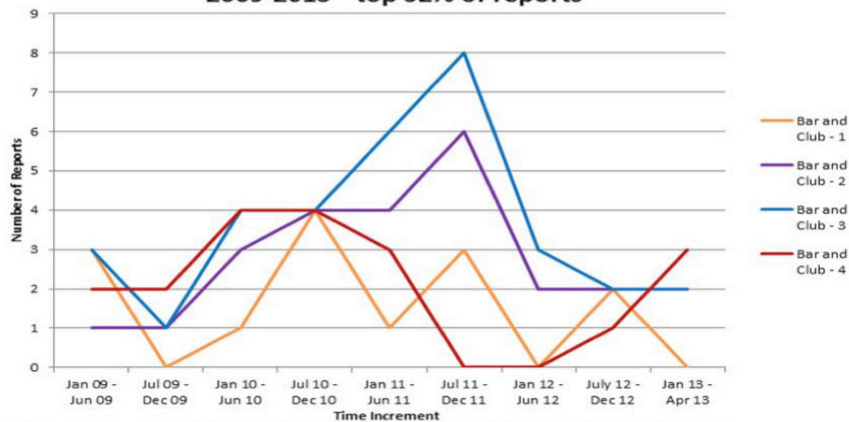


Figure 3:

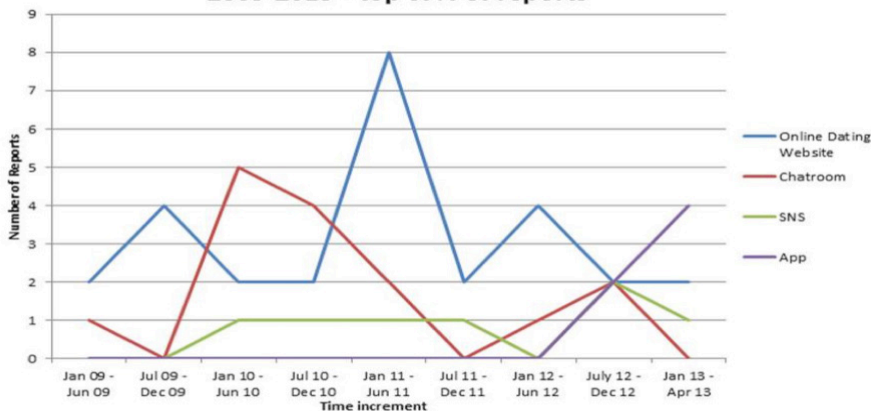
Frequency of newly diagnosed MSM reports of specific sex partner meeting places (bars/clubs) in Baltimore City from 2009-2013 - top 52% of reports



Total Reports per Time Increment	9	4	12	16	14	17	5	7	7
	Jan 09 - Jun 09	Jul 09 - Dec 09	Jan 10 - Jun 10	Jul 10 - Dec 10	Jan 11 - Jun 11	Jul 11 - Dec 11	Jan 12 - Jun 12	July 12 - Dec 12	Jan 13 - Apr 13

Figure 4:

Frequency of newly diagnosed MSM reports of specific sex partner meeting places (internet) in Baltimore City from 2009-2013 - top 67% of reports



Total Reports per Time Increment	3	4	8	7	11	3	5	8	7
	Jan 09 - Jun 09	Jul 09 - Dec 09	Jan 10 - Jun 10	Jul 10 - Dec 10	Jan 11 - Jun 11	Jul 11 - Dec 11	Jan 12 - Jun 12	July 12 - Dec 12	Jan 13 - Apr 13

DISCUSSION

The results suggest that there may be both stable and variable sex partner meeting venues over time. The most significant aspect of my results is the dramatic increase in the reporting of internet venues, which suggests a need for specialized targeted control strategies to address these venues and, in particular, phone applications. The issue is that targeted outreach for internet venues may need to be different from outreach for physical venues since it is not possible to drive a testing van to an online dating website.

The results of this project are all about informing interventions. They have important implications about the directions that interventions should take. These data can help the Baltimore City Health Department inform its future surveillance programs. Public health efforts need to keep up with the greater access to technology available to the general public. Without analyzing the cross-sectional data over time, we may not have realized that the internet could be the new battleground for HIV outreach.

Suggested next steps include learning more about the “journey” from meeting a sex partner on an internet venue to a sexual encounter and determining if there is variability in HIV transmission risk among internet venues. It would also be valuable to repeat this analysis for other key populations in Baltimore City, including injection drug users and high-risk heterosexuals.

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How Social High-Risk Venues Increase HIV Risk Among MSM Methamphetamine Users

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Using methamphetamine is one of the most significant health behaviors affecting new HIV infections in the United States among men who have sex with men (MSM).¹ The HIV epidemic has spread most rapidly through the MSM population and even more rapidly through the MSM methamphetamine community.¹ In fact, the incidence of HIV in MSM who use methamphetamine is more than double that of MSM who do not use methamphetamine.²

tion of HIV-positive individuals continue to engage in risky sexual behavior for at least a year after diagnosis,³ and methamphetamine use is said to have “profound effects on decision-making about sexual behaviors that increase risks for disease transmission in this already at-risk group.”⁴ Methamphetamine use goes back more than 60 years. It was designed during World War II and given to soldiers on the battlefield to increase aggression.⁵ After the

York and was quickly adopted by the MSM community across the country.⁷ While legislation, such as the Drug Control Act of 1974 and later the Comprehensive Methamphetamine Control Act of 1996, attempted to control and eliminate amphetamine use,⁵ methamphetamine labs continued to proliferate;^{8,9} but because amphetamines were illegal, methamphetamine users were forced to go underground. Social sex venues became one of the places where MSM, including those with HIV, could acquire the drug.

Methamphetamine-using MSM are a subgroup within the MSM community who are at particularly high risk for HIV transmission because of the health behaviors in which they participate while under the influence of the drug. Such behaviors include going to high-risk social venues—such as public sex venues—and participating in marathon sex, engaging in sex working, using other illicit drugs, and binging on methamphetamine.^{10,11,12}

Research shows that almost half of the men sampled from gay communities reported having sex in a public place during 2004.¹³ Public places for sexual encounters can be either at commercial locations or

“Social sex venues, where methamphetamine is readily available, have played a significant role in HIV transmission.”

Social sex venues, where methamphetamine is readily available, have played a significant role in HIV transmission to this population because the effects of the drug increase risky behavior even among men who know they are HIV positive. In fact, a substantial propor-

tion of HIV-positive individuals continue to engage in risky sexual behavior for at least a year after diagnosis,³ and methamphetamine use is said to have “profound effects on decision-making about sexual behaviors that increase risks for disease transmission in this already at-risk group.”⁴ Methamphetamine use goes back more than 60 years. It was designed during World War II and given to soldiers on the battlefield to increase aggression.⁵ After the

free public spaces.¹⁴ Commercial settings are venues with an entrance fee that have been established to accommodate sexual activity, such as gay bathhouses, saunas, sex clubs, and venues with more than one function, such as gay bars, adult bookstores, and pornographic movie houses.^{15,16} Free public spaces used for sexual activities are places like “cruising areas,” parks, and public restrooms.^{15,16} Both commercial settings and free public spaces often are used for risky sexual behaviors and methamphetamine use. Many recovering methamphetamine users say that the drug, set, and setting (the drug used, the circumstance, and location) were what drove them to use.¹⁷ In order to break an addiction to methamphetamine, drug users typically must stop associating with other meth users and avoid locations linked with meth use.

Methamphetamine use can greatly increase risky sexual behavior in social sex venues.¹ Methamphetamine-using, HIV-infected MSM are more likely than MSM who do not use methamphetamine (regardless of HIV status) to engage in higher instances of unprotected anal intercourse, group sex, and sex with multiple partners.¹ They also participate in sexual marathons (i.e., sexual activities lasting days or hours with one or more partners) because methamphetamine has a long half-life of 8 to 10 hours. They find sexual partners on the Internet, have sex with anonymous partners, and have sex with injection drug users while high or intoxicated during sex.¹ All these factors make MSM extremely vulnerable to HIV transmission because they are having unprotected sex with strangers who might not reveal their HIV status.¹ In her 2001 article in the *British Medical Bulletin*, Linda Mori-

son writes: “Sexual transmission is by far the most common mode of [HIV] transmission globally. Obviously the probability of a person being infected via sexual intercourse

that target drug-using MSM could reduce the incidence of HIV infection and even discourage methamphetamine use. Outreach to the methamphetamine-using gay com-

“Unfortunately, social sex venues can make sexually risky behaviors normative[,] thus creating spoken and unspoken peer pressure.”

depends on the likelihood of unprotected sex with an infected partner, so sexual behaviour patterns and the background prevalence of HIV are of major importance. Sexual transmission is by far the most common mode of [HIV] transmission.”¹⁸

Unfortunately, social sex venues can make sexually risky behaviors normative within that setting because many people are following these behaviors, thus creating spoken and unspoken peer pressure. This makes HIV-transmission rates extremely high in such locations because there is often no encouragement to protect oneself or others from possible HIV infection.¹

RECOMMENDATIONS

Because social sex venues are here to stay until cultural norms, social views, and laws and policies are more accepting of the MSM community, the best intervention would be to make social sex venues safer for MSM. Social sex venues do not need to be high-risk. Even minimal changes would help reduce exposure to HIV transmission through unsafe sex and used needles. Providing condoms, information, prevention interventions, and incentives

community could be successful because showing care might help them feel that they are important members of a larger society.

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France | Gardens located in a community food share establishment.
 Photo courtesy of Elizabeth Pfeffer.



PERSPECTIVES



Promoting Public Health System Resilience is Everyone's Job

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For the past four years, I have worked on planning, policy development, and legislative advocacy related to emergency preparedness in Baltimore City. During this time, the City has faced myriad disaster events, including blizzards, tornadoes, hurricanes, tropical storms, large fires, pandemic influenza, an earthquake, and even a derecho. The City's response to each of these emergencies has taught us valuable lessons on how to better fortify our government, community organizations, and citizenry.

We have developed emergency plans, invested in resources for protecting against, mitigating the effects of, and responding to disaster, and trained our responders in an effort to build a robust, city-wide emergency preparedness and response system. However, many of the challenges faced during a disaster are linked not only to gaps in emergency capabilities, but also to vulnerabilities in the systems and services accessed by citizens on an everyday basis. Dialysis, for instance, is a routine service that is both essential and time-sensitive. If dialysis centers could not maintain their provision of care during a prolonged disaster event, dialysis patients would likely start calling

911 and visiting emergency rooms. In the event of an emergency, the emergency medical service system, including ambulances and emergency rooms, is likely to experience a surge in patients with disaster-related injuries, illnesses, or panics. Moreover, these same systems may also experience staffing shortages due to personnel's inability or unwillingness to come to work and

cy-ready. The Rockefeller Foundation has defined resilience as "the capacity of individuals, communities and systems to survive, adapt, and grow in the face of stress and shocks, and even transform when conditions require it."¹

While the public health community has increased its focus on community resilience, or improving a community's ability "to with-

"We must [...] focus attention on public health system resilience."

resource shortages due to increased use or interrupted supply chains. Thus, the concurrent influx of patients seeking routine care can place a catastrophic burden on the emergency system, potentially preventing patients with true emergencies from receiving the care necessary for survival. Ensuring the systems that mitigate everyday vulnerabilities – and not just the emergency-response system – are fortified, sustainable, and adaptable is essential to meeting population-level health needs during an emergency.

A resilience-oriented approach attempts to ensure that our everyday systems and services are emergen-

stand and recover from adversity,"² we must also focus attention on public health system resilience. In other words, we need to examine and develop the ability of our public health system to quickly rebound and transform its service provision capability in the face of crisis. We must ensure that all sectors are thinking about the challenges of today and the exigencies of tomorrow when developing strategic plans, making investments, and solving problems.

In 2011, the Centers for Disease Control and Prevention (CDC) defined the fifteen public health preparedness capabilities as: com-

Vision for the Future

Nicole Errett

Disasters are only going to increase in number and severity. The public health community must be ready, willing, and able to respond.

munity preparedness, community recovery, emergency operations coordination, emergency public information and warning, fatality management, information sharing, mass care, medical countermeasure dispensing, medical material management and distribution, medical surge, non-pharmaceutical interventions, public health laboratory testing, public health surveillance and epidemiological investigation, responder safety and health, and volunteer management.³ These capabilities are not disaster-specific. For example, public health surveillance and epidemiological investigation occur everyday; we are constantly tracking health and wellness indicators, such as incidence and prevalence of disease. As such, we need to adapt and expand our existing public health surveillance and epidemiological capability to better handle emergencies. While ongoing efforts to create a prepared healthcare infrastructure are underway, syncing ongoing operational strategies with preparedness requirements will allow for adaptability and utility of existing, critical systems during a disaster.

While applying a resilience perspective to ensure uninterrupted service provision, public health professionals may want to consider training personnel to perform additional roles during disaster events, investing in extra resources, and creating redundancies in communications systems and supply chains. In a world where the improbable has

become the inevitable, all sectors of public health must acknowledge and embrace the reality that their everyday functions lend themselves to responsibilities during and after disasters. Self-efficacy, or knowledge of and perceived ability to perform one's role, has been identified as a top predictor of emergency response willingness among local public health department workers, hospital workers, and Medical Reserve Corps Volunteers.⁴⁻⁷

Public health professionals can contribute to a resilient public health system by being cognizant of the need for system continuity, and even expansion, during an emergency event.

During an emergency, all public health professionals must be ready, willing, and able to continue to perform their essential roles in vaccination, research, environmental safety, occupational hazard prevention, healthcare service provision and access, outreach, and education. Concurrently, they must be prepared to take on additional event-specific roles, such as provision of care in instances of medical surge, risk communication, enhanced laboratory and surveillance responsibilities, and disaster-specific occupational-hazard prevention.

Accepting and understanding the need for system-wide resiliency is the first step to creating a system that can meet the challenges of today while ensuring the availability of trained and capable staff, supplies, and networks to maintain

public health and safety during an emergency.

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Turner Station and Environmental Injustice

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In 1994, President William Clinton issued Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.¹ This order states “that there be equal protection from environmental and public health hazards for all people regardless of race, income, culture and social class”.¹ Unfortunately, in the Baltimore area, there are many communities located near sources of environmental hazards. One of these communities is Turner Station, located east of Dundalk on the water’s edge in southeastern Baltimore County. To the immediate west of Turner Station is the Dundalk Marine Terminal, where ships come from around the world to unload their cargo. To the immediate east is a BGE power station and an old coal-powered power plant. Further east is Interstate 695 with its daily traffic of cars and trucks traversing the Key Bridge. On the other side of I-695 is the site of the former Sparrows Point steel mill. The geographic relationship between these locations is shown in the map (Fig. 1).² In 1888, Joshua Turner built a station so that workers traveling to Sparrows Point on the Baltimore and Sparrows Point Railroad could be protected from inclement weather. Subsequently,

the area took on the name Turner Station.³ Turner Station grew as a community as the Pennsylvania Steel Company and the Bethlehem Iron Company expanded Sparrows Point. The steel plant became the largest in the world and at one point employed 31,000 workers.⁴ Over the years, steelmaking at Sparrows Point dramatically declined. In 2012, it permanently ceased operation and is now a 2,300 acre toxic brownfield. Sparrows Point is the largest available commercial property on the East Coast.

Turner Station has a rich and proud community tradition of producing many influential, visionary, and prominent citizens, including

Henrietta Lacks. However, decades-long exposure to toxic hazards from past and current industrial pollution has impacted the health of Turner Station residents. The Sparrows Point area and surrounding communities, including Turner Station, is the number one cluster in the state of Maryland for diseases including asthma, leukemia, cancer, birth defects, miscarriages, and

developmental disorders.⁵ It is also the 26th worst disease cluster in the United States.⁵

Steelmaking is a dirty business that requires burning coal to make coke for steel. In fact, there is a section of Sparrows Point referred to as Coke Point. The soil and water there are heavily contaminated with toxic metals, carcinogenic polycyclic aromatic hydrocarbons, and leukemia-causing benzene.⁶ Similarly, the fish off of Coke Point are heavily contaminated with these toxicants, rendering them inedible. Over the years, many of these toxicants have become airborne, resulting in exposure to the nearby communities.

“Turner Station has a rich and proud community tradition[...]”

Nearby residents have also been exposed to an airborne, silvery-black gritty dust known as “kish.”⁷ Kish is a product of molten iron and is composed of graphite and iron oxides with associated metals, including chromium and manganese.

Exposure to chromium VI results in lung cancer and exposure to manganese results in a Parkinson-like condition.⁸ While Sparrows

Point is no longer operational, these materials are likely still in the soil and can be transported through the air and tracked into homes. Turner Station residents are not only concerned about kish-associated chromium, but also about chromium as-

out receiving satisfactory answers. These community concerns have led to several consent decrees between the U.S. Government, the State of Maryland, and Bethlehem Steel Corporation. Bethlehem Steel undertook obligations to minimize

“If justice truly existed for communities, such injustices would not exist in [...] Turner Station.”

sociated with the Dundalk Marine Terminal. Chromium processing at the former Baltimore Chromium Works plant in Fells Point produced a chromium ore-processing residue (COPR). COPR from the Baltimore site was used as a fill material at 148 of the 580 acres of the Dundalk Marine Terminal.⁹ At the time, such fill operations were a common and legal practice in Maryland. Under current environmental laws, chromium in COPR is currently being addressed.⁹ Turner Station residents are concerned that the blacktop covering the COPR has developed cracks, which could allow for the release of chromium VI, and thus could expose the residents of Turner Station to the substance. This has been observed near chromium waste slag sites in New Jersey.¹⁰ Dr. Ana Rule from The Johns Hopkins Bloomberg School of Public Health has engaged the residents of Turner Station to examine the presence of chromium VI and potential routes of exposure in their community.

The question that arises is how such exposures exist when we have regulations, such as the Clean Air Act and Safe Water Act, meant to protect human health and the environment. The residents of these communities have been asking the same question for many years with-

the emissions of kish, clean areas affected by landfill activity, dispose of waste materials, and monitor groundwater.¹¹

However, since these decrees were passed in 1997, no comprehensive assessment has been conducted to determine the extent to which present toxic contaminants are a risk to human health despite such assessments being deemed necessary in these same decrees made sixteen years ago.

It has now been nineteen years since President Clinton issued Executive Order 12898. This begs the question of whether the residents of Turner Station are receiving the equal protection required by this executive order.

It appears not. What would happen if the EPA declared Sparrows Point a Superfund site (an uncontrolled or abandoned place where hazardous waste is located)? Recent articles on Superfund sites indicate that the communities surrounding Sparrows Point would probably not fare any better that they do now under Executive Order 12898.^{12,13} If justice truly existed for communities, such injustices would not exist in 2013 for communities like Turner Station.

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Low Testosterone in Young and Aging Men: Is It Really A Problem? Is There A Cure?

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In recent years, men have begun to pay considerably more attention to the signs and symptoms of low serum levels of testosterone (T), also known as hypogonadism or low T, and to its treatment with T replacement therapy.^{1,2} Hypogonadism is believed to affect about five million American men. Its common symptoms include decreased lean body mass and bone mineral density, increased visceral fat, fatigue, reduced cognition, decreased libido, decreased muscle mass, depressed mood, and sexual dysfunction.¹⁻³ Hypogonadism is common in aging men, with 20-50% of men over the age of 60 reported to have serum T levels significantly below those of 20 to 30 year-olds.⁴⁻⁶ However, this condition is not restricted to aging men. For example, among the 15% of couples who seek infertility-related medical appointments, male factor effects contribute to 40-50% of the infertility/subfertility, and about 20% of these men are reported to be hypogonadal. There are also fertile young men who suffer from hypogonadism.⁴⁻⁶ In short, many men, both young and old, suffer from symptoms of low T.

To understand the causes and treatment of hypogonadism, it is necessary to understand how T is produced and regulated.^{7,8} Leydig cells of the testis produce T in response to luteinizing hormone (LH) from the pituitary gland. In response to high enough levels of T in the serum, LH is transiently

sperm in the testis requires very high concentrations of T that can only be produced locally by the Leydig cells. Therefore, men who take T can have diminished sperm production because the exogenous source cannot replace the high local production by Leydig cells. Indeed, suppression of endogenous T production by ad-

“Hypogonadism is believed to affect about five million American men.”

suppressed. This is referred to as negative feedback: T, the product of LH stimulation, suppresses LH, the hormone that stimulates it. Thus, in all men, pulses of LH are followed by pulses of T. If a man is administered T exogenously, pituitary LH production is continuously suppressed, and therefore the Leydig cell T production is suppressed. In this scenario, most or all of the T in a man's serum as well as in his testis would come from the exogenous T that is administered instead of from the Leydig cells. The production of

ministering exogenous T is the basis of male hormone-based contraception.^{9,10}

The primary objective of T therapy is to raise serum T levels in order to reduce the symptoms of hypogonadism. Ideally, serum T concentration within the physiological range of young adult men is the target. There are a number of T preparations in use that are capable of elevating serum T levels, including injections and transdermal patches.^{11,12} With injections, serum T levels initially are high and

then are reduced over time. In some men, this commonly used mode of T delivery requires the inconvenience of frequent adjustment of serum T levels. Perhaps more importantly, the initially high T levels may pose a risk for aging males, including the possibilities of prostate (benign prostatic hyperplasia; prostate cancer) and cardiovascular consequences.^{11,12} T administered by gels and other transdermal methods produce more constant serum T concentrations, but such methods have the potential for T transfer to women and children via inadvertent skin contact. Importantly, the administration of exogenous T by any means can suppress LH by negative feedback and thus result in low sperm counts, making this therapy inappropriate for men wishing to father children.^{13,14}

In collaboration with a colleague at McGill University, Dr. Vassilios Papadopoulos, my laboratory in the Division of Reproductive Biology Department of Biochemistry and Molecular Biology of the Bloomberg School of Public Health recently turned its attention to the possibility of developing therapies that would successfully increase serum T levels without having to administer T exogenously. We reasoned that such an approach would be of great benefit not only to older men, but also to the many men with hypogonadism who wish to father children. For over a decade, we have been working with the Papadopoulos laboratory on the regulation of Leydig cell T formation in aging males. When we began studies of the aging cells, we knew that Leydig cells synthesize and secrete T under the control of LH, and that the acute stimulation of Leydig cells by LH results in cholesterol transfer from intracellular stores into the mitochondria (Fig.

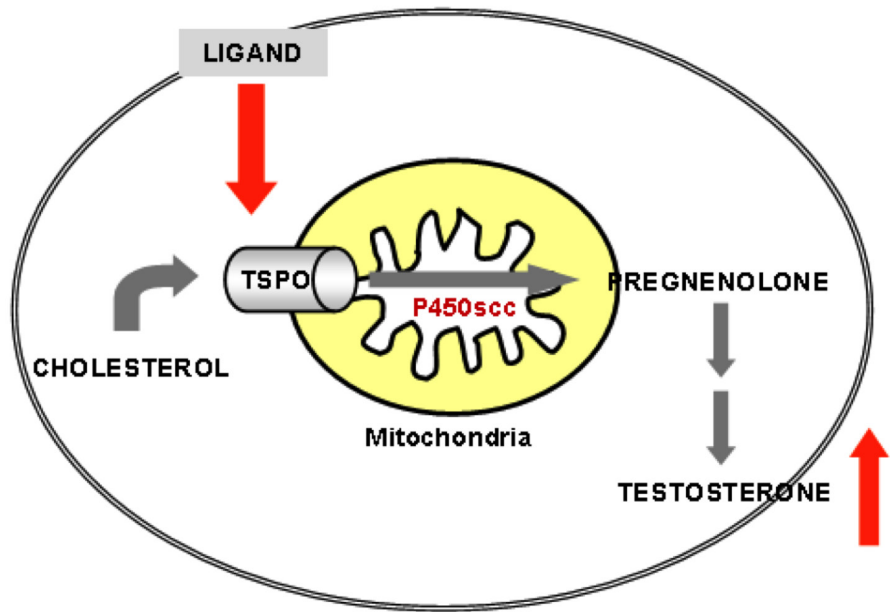


Figure 1: Leydig cell steroid biosynthesis. In response to LH, cAMP stimulates the transport of cholesterol into the mitochondria. Cholesterol is the precursor of all steroids and is delivered by STAR and TSPO to the inner mitochondrial membrane where it is cleaved into pregnenolone. Pregnenolone freely diffuses out of the mitochondria and is used for the biosynthesis of testosterone

1). This is the rate-determining step in steroid formation in all steroidogenic cells, including Leydig cells. Cholesterol is converted to pregnenolone within the mitochondria, and pregnenolone then undergoes enzymatic transformation in the smooth endoplasmic reticulum to produce T. We found that in response to LH, the Leydig cells of aging rats produce less T than the Leydig cells of young rats, resulting in reduced serum levels of T in the aging rats.¹⁵⁻¹⁷ We also found that there is decreased cholesterol transfer into the mitochondria in aging Leydig cells.¹⁸

Translocator protein (TPSO) is a protein that is considered to play a critically important role in the transfer of cholesterol into the mitochondria. Dr. Papadopoulos has shown that TPSO can be stimulated by drug ligands,¹⁹⁻²¹ which are drugs that specifically bind to TPSO, and that these drug ligands are able to induce the translocation of chole-

sterol into the mitochondria of Leydig cells and thus stimulate T formation (Fig. 1). This finding gave us the idea to examine the effect of TPSO ligands on T formation by aging Leydig cells. We hypothesized that although the aged cells produce less testosterone than young cells in response to LH, the direct activation of TPSO might increase T formation by the aged Leydig cells. If this is the case, this approach could be used to elevate serum T levels without administering T itself.

The results from our initial studies in this area were recently published.²² As we hypothesized, treatment of Leydig cells isolated from aged Brown Norway rats with TPSO drug ligands resulted in significantly increased T formation (Fig. 2). Indeed, T formation by the TPSO ligand-stimulated old cells was at the level of ligand-stimulated cells isolated from young rats. Most importantly, we found that administering a TPSO ligand to old rats resulted in

increases in serum T comparable to the levels in young rats (Fig. 3).

These results are exciting because they suggest that it might be possible to treat hypogonadism by stimulating the otherwise hypofunctional Leydig cells themselves to produce additional T, rather than administering exogenous T. Before going on to clinical trials, it will be necessary to show that the approach of using TSPO drug ligands is not only effective, but is targeted specifically to Leydig cells and is safe in practice. If so, there could be a paradigm shift in the clinical treatment of hypogonadism in both aging and

young men.

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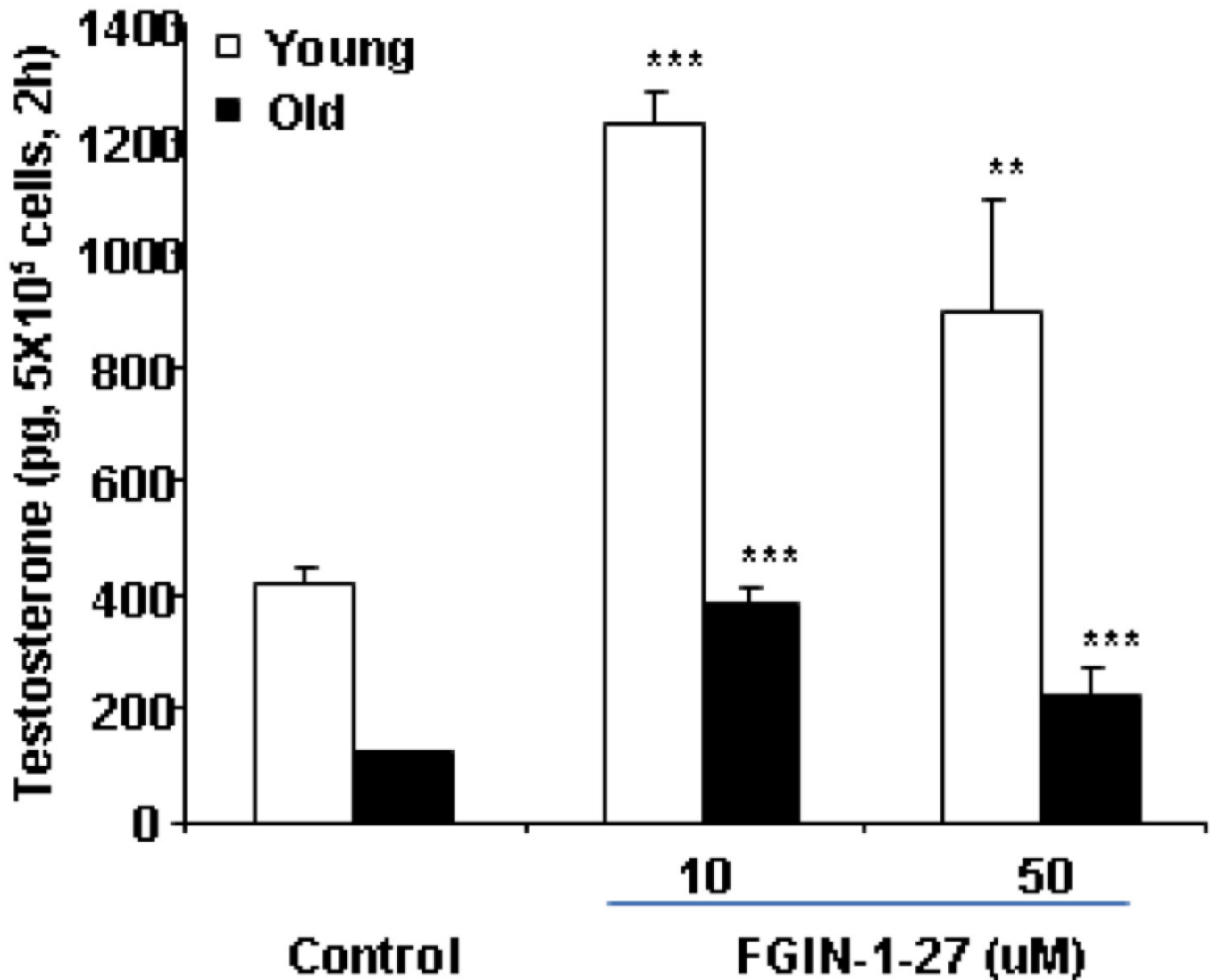


Figure 2. Effect of TSPO drug ligand FGIN-1-27 on Leydig cell T production. Cells were isolated from young and aged rats and treated with or without FGIN-1-27.

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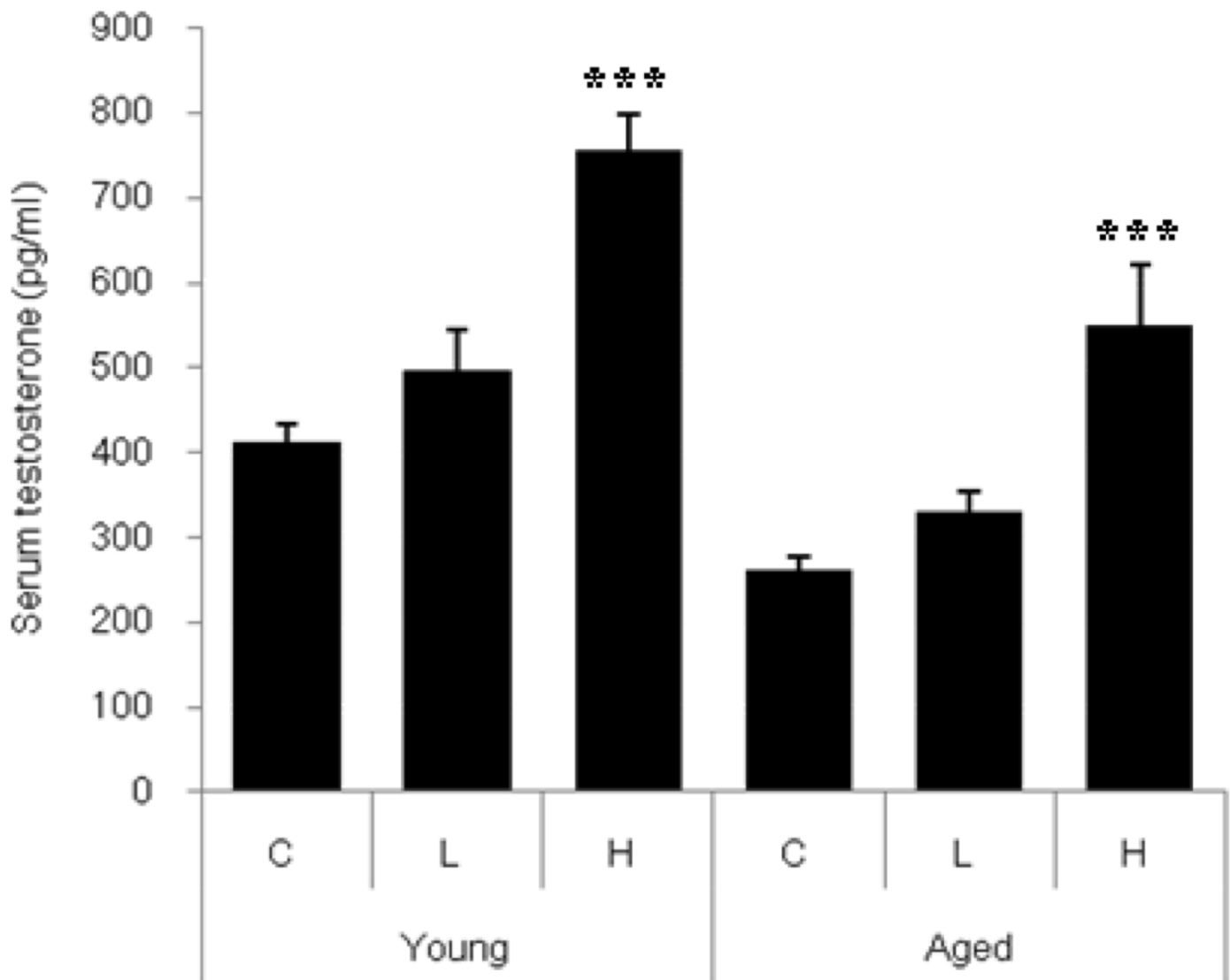


Figure 3. In vivo effects of FGIN-1-27 on serum T levels in young and aged rats. The rats received low (L, 0.1 mg/kg bw) or higher (1 mg/kg bw) FGIN-1-27.



A scenic view of a rocky coastline with lush green vegetation and clear blue water. The image is oriented vertically, with the text 'FEATURES' written in large, white, bold, sans-serif capital letters on the right side. The background shows a steep, rocky cliffside covered in dense green foliage, overlooking a body of water with gentle ripples. The lighting is soft, suggesting a calm, possibly overcast day.

FEATURES

Road Safety in Vietnam: A Perspective From the Streets

CHRISTINA MEYER | *Public Health Studies, East Asian Studies, Class of 2015*

In Hanoi, the roads are cluttered and disorganized; motorcycles weave through cars and blatantly ignore street signs and lights. During rush hour, the noise from the roads penetrates the city's private spaces. Filled with the sounds of engines running, horns honking, and motorcycle drivers chatting, there are very few quiet homes left. Despite the oncoming traffic of the street, pedestrians will often nonchalantly walk through the sea of vehicles. The first time I tried to cross a road in Hanoi, I ended up

a reality of daily life.

When looking at the state of a country's development, one of the more telling signs is the type and number of vehicles on the roads. Years ago, throngs of bicycles made their way through the streets of Hanoi, the capital city of Vietnam. Today, motorcycles have replaced those bicycles. Motorcycles are the most frequently used form of transportation in the country, representing nearly 95% of the 33 million registered vehicles in Vietnam.¹ An even more recent

development, there is a cost to the increased number of motor vehicles. In 2013, road traffic injuries (RTIs) were the eighth leading cause of death globally. RTIs are now, and have been for nearly the past decade, the number one leading cause of death for 15-29 year olds.¹ In Vietnam, road traffic accidents are one of the top 10 causes of death and cost the country nearly 2.45% of its gross domestic product (approximately \$885 million USD).⁴ RTIs are a daily threat to all those who travel the roads.

“[...]a small sense of uncertainty and nervousness followed me each time I stepped into the streets.”

having to walk another half-mile before very cautiously shadowing an elderly man as he made his way through the motorcycles and taxis that hurtled towards him. While I would later learn to navigate the roads myself, a small sense of uncertainty and nervousness followed me each time I stepped into the streets. For foreign visitors like me, the roads in Hanoi are considered a spectacle and a topic of conversation. Unfortunately, for those living in the city the roads are neither of these two things; they are

change residents have seen on the roads is the increasing number of privately owned cars. According to the World Health Organization's 2013 report, as of 2010, there were over half a million registered cars.² While the government has placed high luxury taxes on cars, nearly doubling the price, the greater number of automobiles indicates that more individuals within the country's increasingly affluent society can now afford to pay the exorbitant prices.

As in so many other cases of

The threat posed by RTIs can easily be seen when visiting the crowded emergency room of Viet-Duc Hospital, Hanoi's preeminent surgical hospital. Surrounded by their family members, incoming patients would listlessly lay on their gurneys with their bodies covered in bruises and their heads wrapped with bloody bandages. According to physicians at the hospital, nearly three people die every day from a traumatic brain injury received in a traffic accident. The day before I first visited, 14 out of 17 patients admitted to the most severe of the hospital's three emergency rooms had been in road accidents.

To address these issues, in 2010, Bloomberg Philanthropies initiated the Global Road Safety Program—a project implemented by a consortium of partners including the World Health Organization,



Ninh Binh, Vietnam | A local field research team member using a tablet to interview a motorcycle driver on her knowledge of, attitude towards, and practice of road safety laws. *Photo courtesy of Christina Meyer.*

Global Road Safety Partnership, Johns Hopkins International School of Public Health, World Bank Global Road Safety Facility, Association of Safe International Road Travel, and the World Resources Institute (EMBARQ). The project targets the ten countries with the highest rates of morbidity and mortality from RTIs worldwide. Among these countries is Vietnam. The current objective of the program in Vietnam is to help implement and support a variety of road safety interventions that address drinking and driving and helmet use.

Prior to the project, Vietnam's legislators set up a blood alcohol content (BAC) restriction for drivers in 2001. It was later revised in 2008, limiting motorcycle drivers to 50-mg/dL blood and establishing a zero tolerance policy for automobile drivers.³ Although the policy is stricter than the drinking and driving policies found in the United States, the laws are rarely enforced and many drivers break the limit.² A "Knowledge, Attitude and Practice"

survey done by the Johns Hopkins International Injury Research Unit (JH-IIRU) showed that even though a majority of the population surveyed knew drinking alcohol could lead to traffic accidents, few knew the BAC limitations and most ignored the consequences.³

The second risk factor the program chose to address was helmet use among motorcyclists. According to research, helmet use is highly effective against head injuries, such as traumatic brain injuries (TBIs), from road accidents. Some studies have indicated that those wearing helmets are three times less likely to sustain head injuries; in 97% of less serious accidents, helmets have mitigated the severity of the accident by preventing head injuries and death.⁵ Additionally, the price of hospitalization for RTIs is likely to be more expensive for non-helmet wearing motorcyclists. Thus, with a majority of the population on motorcycles and 51% of all non-fatal RTIs (733.5 per 100,000 population) resulting from

motorcycle accidents,³ Vietnam's legislators consolidated their efforts and began a massive campaign to prepare for the implementation of a mandatory helmet law in 2007.⁵

Compared to past attempts, the instigation of the helmet law was highly successful with a 99% compliance rate in some provinces.⁶ Three months after the application of the law, a study done by the Ministry of Health showed that the helmet law had decreased the risk of head injuries by 16% and decreased the risk of death by 18% in hospitals surveyed throughout the country.⁶ However, since the initial implementation of the law, helmet use has decreased over the past few years and continues to fluctuate. Another major issue with the helmets used in Vietnam is their poor quality.

Although standardized helmets are sold, many prefer the cheaper and more lightweight plastic cap helmets. According to a WHO official, while cap helmets are not seen as legitimate helmets under

the law because of their lack of padding, the use of cap helmets is too prevalent for police to enforce the helmet law against them. There may be a variety of reasons for the proliferation of the cap helmet, but two common anecdotal reasons given by Vietnamese for choosing the cap helmet over the standard bicycle helmet is the expense and the cap helmet's convenient, light weight.⁶ The price for a standard

JH-IIRU has been tasked with monitoring and evaluating the progress and impact of the program. Through the Johns Hopkins Center for Global Health's Established Field Placement program, I was able to join the JH-IIRU's monitoring and evaluation team. As a part of the team, I worked out of the program's local partner's office at the Hanoi School of Public Health to organize the variety of data the program

challenging for the authorities to enforce the law to its fullest extent. Another major problem, the lack of resources, limited funding allocated for the procurement of essential enforcement equipment such as breathalyzers used for enforcing drinking and driving laws.

The second approach is public education through social marketing campaigns. While informally discussing the issue and my work with the local Vietnamese, it was common for them to be indifferent to my arguments. Friends gave me looks of dismay or confusion and laughed when I declined their offer to give me a ride home because they could only offer me a cap helmet. However, despite the concerns I voiced, they ignored my words of caution and continued to insist that the cap helmet was sufficiently safe to use.

When it comes to drinking alcohol and wearing helmets, public education is vital to improving the safety of drivers and passengers on the roads, as it is the individual's choice whether or not to drink and drive or to wear a proper helmet. One method of ensuring that the individual carefully considers his or her decision is to inform the person of the severe social, economic, and health consequences associated with drinking and driving or not wearing a helmet. Even though laws can be highly effective at protecting the safety of those driving, it is preferable for drivers and passengers to know and understand the health consequences their actions could have. Without an understanding of the consequences, drivers and passengers are less likely to invest in and practice road safety habits in the absence of law enforcement. If citizens are made aware of the consequences and comprehend the

“Living in the country[...]provided me with new insight on the success of interventions and the difficulties they faced.”

helmet is approximately \$10 USD while that for a cap helmet only ranges from \$1-2 USD. Standard helmets were at one time known as “rice cookers” because of their heavy padding, but cap helmets offer a lightweight option.⁷ Because a majority of Vietnamese only wear helmets to avoid the fines and do not appreciate the safety benefits standard helmets provide, many choose the more inexpensive and convenient, but less safe, cap helmet option.

As these two risk factors are critical to preventing RTIs, the consortium developed a comprehensive intervention approach. The approach included social media campaigns to educate the public on helmet use and the dangers of drinking and driving, support for road safety legislation, and increase in law enforcement capacity to encourage drivers to abide by the current road safety laws.

To examine whether or not the interventions have worked to alleviate the public health threat,

collected from police, provincial hospitals, and roadside surveys. Since I was based in Hanoi, every time I left work for the day, I was able to see the data come to life. Living in the country I was studying provided me with new insight on the success of interventions and the difficulties they faced. I was also able to better understand the two major approaches to improving road safety that were being applied in Vietnam as part of this program.

The first and primary approach used is enhanced enforcement of the existing laws on drinking and driving and helmet use. The implementation of the law has had mixed results in Vietnam. Outdoor bars selling large tankards of beer are popular amongst men who, soon after drinking, will jump onto their motorcycles and drive away. The prevalent use of cap helmets (non-standard helmets) indicates that while the law specifies a standard for helmets, logistics and other issues, such as counterfeit certification stickers, have made it

severity of RTIs, they are more likely to reform their own habits.

While some studies have suggested that enforcement-based approaches are more effective than those based on public education, my experiences and interactions in Vietnam have led me to believe that for issues such as the prevalent use of cap helmets (which provide protection from the law, but very little protection from road accidents) and Vietnamese society's social drinking practices, public education has the potential to bring about lasting change. Adequate and consistent enforcement is the principal way to ensure that laws are effectively implemented in the short-term. However, public education is more conducive to the internalization of knowledge and practices, which in turn can change public opinion regarding certain behaviors. Even ad-

ressing important risk factors such as road infrastructure is reliant on public education and people's understanding of how to drive safely. It is also important to note that public education on legislation is also vital to law enforcement.

Observing Vietnam's roads has taught me that writing and enforcing legislation is difficult in developing countries. There are usually competing priorities, and politicians frequently disagree over what policies to make. Law enforcement capacity is also an issue, especially in lower middle-income countries that have limited government budgets but face increasing numbers of vehicles. However, the issue that seems most paramount in respect to road safety is public understanding of the problem.

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Bac Giang, Vietnam | Non-standard helmets are commonly used to skirt mandatory helmet laws in Vietnam as depicted by these two motorcyclists. *Photo courtesy of Christina Meyer.*

Global Brigades and Health Care in Rural Honduras

JELYCA ORMOND | *Public Health Studies, Class of 2015*

Honduras, with an estimated 61.9% of the population living below the poverty line in 2011, is the second poorest country in Central America.¹ The majority of the poverty is concentrated in the rural areas of Honduras,

where the main source of income is agriculture.² Unsurprisingly, the lack of wealth coincides with a lack of health care access. In Honduras, the best health care is available in the wealthier urban centers of the country; however, even the care

provided in the urban centers is not always satisfactory. For rural Hondurans, the long distance and the mountainous, unpaved terrain make receiving proper health care a difficult task.



San Lorenzo, Honduras | A hygiene station next to a typical home. *Photo courtesy of Jelyca Ormond.*

Vision **Future** for the

The education, primary care, and infrastructure of public health are all necessary to the healthcare system in Honduras. My hope for Honduras is that the overall health conditions improve greatly in the next decade from the many organizations working to integrate a public health framework. With the growth of organizations such as the Global Brigades, it is clear that a people are concerned and willing to provide assistance.

Jelyca Ormond

GLOBAL BRIGADES

In July 2013, I had the privilege of working with Global Brigades in a global health internship stationed in rural Honduras. Global Brigades is a student-led organization that focuses on global health and sustainable development.³ I was intrigued by its goal to not only provide short-term medical services but also encourage sustainable practices within the communities.

That month, I focused on learning about the health status and health care of rural Honduras. My group spent valuable time interacting with the Hondurans, both rural residents and healthcare providers, and got a honest grasp of the health situation in Honduras. We also participated in various activities to further my understanding of the Global Brigades' holistic approach to shrinking the apparent health and economic disparities.

Global Brigades' (GB) holistic approach in Honduras consists of six different sub-brigades: Medical, Dental, Water, Microfinance, Public Health, and Architecture. Medical and Dental Brigades assess health needs and provide physical check-ups and medications, along with dental care. The treated patients were required take a basic health class about proper sanitation practices, first aid, and common ailments.

Water Brigade assesses water access and the quality of the community's running water system (if it has one). If necessary, the brigade will implement a new water system. Microfinance helps to set up a caja, a bank, to benefit the community by distributing loans and helping to fund community projects. Public Health builds concrete floors, eco-stoves, and hygiene stations, which consist of a shower, latrine, and a water storage unit. Families that

ternship, the Medical subsection of GB informed us of the most common ailments it sees in the rural Honduran population. Malnutrition, diabetes, hypertension, respiratory conditions like bronchitis, parasites, and skin infections were among the list. A major focal point for GB is educating the Hondurans. Through the household surveys that we conducted, we discovered that the highest level of education achieved by the majority of rural

“How I am supposed to care for our community if I don't have the supplies necessary to do so?”

receive public health infrastructure are required to pay 10-20% of the costs to help instill a sense of ownership and responsibility for maintenance. Finally, the community decides what kind of community structure would best suit its needs. Through the funds in the caja, the project, which can be a health center, a secondary school, a community center, or something else, can be built by Architecture Brigade.

HEALTH

Within the first few days of the in-

Hondurans is sixth grade. This education does not include an adequate instruction in safe health practices, sanitation, or disease prevention. To combat the deficiency of health education in schools, we created various lesson plans, called charlas, aimed at teaching parents and children about various health practices and how to prevent some of the most common ailments.

In addition to insufficient education, there is a lack of sanitation in rural Honduras that leads to the high prevalence of skin infections and parasites in children. We examined the parasites in children's feces



Cofradilla/Zarzal, Honduras | Dental DMF Indexing: counting the number of decays, missing teeth, and fillings in children. *Photo courtesy of Jelyca Ormond.*

and found that the majority of the studied population of children was infected. To decrease the incidence of parasites, we presented charlas about sanitation and parasite prevention to the parents and their participating children.

Another issue is that for many areas in rural Honduras, water access is scarce. Water plays a crucial role in sanitation, so once they have water, they can more readily wash their hands, shower, and clean. The Water Brigade constructs a water system for communities that do not have proper access to the natural resource. Once the water system is implemented, the community celebrates with a huge water inauguration. The ceremony I witnessed involved various depictions of progressing from the toils of collecting river-water to having the blessing of running water.

HEALTH CARE

The governmental health care system in rural Honduras consists of two basic options. If one needs medical attention beyond the household, he or she can go to either a local community health center or a city hospital. However, neither option was quite up to par.

There is usually one community center per community, but each community can be composed of neighborhoods that are far from one another. It could take a half-hour to an hour to walk from a neighborhood to its nearest community health center. The two community centers we visited were small and consisted of a waiting room, a general examination room, a maternity room, and a scantily stocked pharmacy. Each community center is staffed with only one employee, who

is either a nurse or, more commonly, a nurse's assistant.

We interviewed a few of the community center nurse's assistants (NAs), and they expressed their honest feelings about their jobs. Both NAs, unfortunately, gave similar, dismal accounts of their time at work. They complained about being the only employee and not having enough help. The government is supposed to send shipments of medicines and supplies every three months, but this does not happen. One NA complained of a lack of government support and funding and stated that she felt neglected and powerless: "How am I supposed to care for our community if I don't have the supplies or tools necessary to do so?" On top of all this, the community health center job does not provide good pay. But the NAs stick with their job because they are



honored to have the duty of caring for the people of the community. They know they are probably the most qualified health care providers that community members will get to see and take pride in what they do.

Health centers are not open all day, which poses a problem for people who need help during closed hours. GB has developed a system involving community health workers (CHWs) that are “on call” 24/7. The CHWs go through a six month training session with a GB doctor and learn basic first aid and prevention tactics. We even provided charlas about various basics concerning skin infections, respiratory conditions, chronic disease, pregnancy, first aid, and anatomy. The CHWs take pride in their work, and it was fantastic to see them so eager to learn, take notes, and showcase their knowledge during our charlas. CHWs are

volunteers, but just like the NAs in the health centers, the CHWs truly care for their communities and revel in the responsibility. As accessible as CHWs are, they are not professionals, so the extent to which they can provide care is heavily limited.

If a patient needs more serious health care attention, he or she must travel to a city hospital that operates with doctors of different specialties and provides overnight care when possible. The hospital in the city of Danli that we visited was about a two-hour drive away from the community health center closest to our lodge. The hospital has a capacity of one thousand patients, but on average sees two thousand patients per day. Patients complain about long the wait times and cramped spaces. Employees complain about deficiencies in supplies, medicines, and equipment. The linens of the entire hospital were cleaned with only one working washing machine. One of the most discomforting realities showcasing the absence of funding and government support is the lack of simple first aid equipment such as gauze and wraps. It is a major issue that patients who need gauze or wraps have to bring in their own or risk being turned away for treatment.

CONCLUSION

During the internship, my favorite part was the Public Health weekend. We worked in San Lorenzo in Southern Honduras. We were outside the building, mixing cement, stacking cinderblocks, and smoothing out concrete floors in the hot and humid weather; nevertheless, it was a fun and fulfilling time. Public Health Brigade works with families to build

cement floors to improve general health and reduce the risk of chagas disease caused by “kissing bugs” that burrow in the dirt. Eco-stoves are built to improve the air quality of the home and reduce the incidence of bronchitis in women and children who spend the majority of their time in and around the home. The hygiene stations are built to improve sanitary practices and encourage cleanliness. During the brigade, we conversed with local family members and workers, learned about their lives, and realized how appreciative they were of our help.

Throughout the month, I reached an overarching conclusion about the health situation in rural Honduras. Education is a major factor in the health and development of community. The government, as we heard from the community members, is corrupt and not adequately supporting rural Hondurans. As a consequence, education is not properly administered. In addition, health care centers and hospitals are insufficiently stocked and suffer from over-capacity, which leads to sub-standard administration of care. Global Brigades is working towards improving healthcare with a sustainable, education-focused model and is collaborating alongside community members instead of taking a simply managerial approach.

1. The World Bank. Honduras. <http://data.world-bank.org/country/honduras>. Updated 2013. Accessed November 3, 2013.
2. IFAD. “Rural poverty in Honduras”. <http://www.ruralpovertyportal.org/home/tags/honduras>. Accessed November 3, 2013.
3. Global Brigades. “Vision and mission”. <http://www.globalbrigades.org/vision-mission>. Updated 2013. Accessed October 30, 2013.

China's Health Care System: A Summer Experience

MIKE HE | *Public Health Studies, Earth & Planetary Sciences, Class of 2014*

This past summer, I had the opportunity to go back to China through the China-STEM program at JHU, a specialized language intensive program with a focus on the health sciences. In addition to coursework in language, the program integrated a large number of workshops, lectures, and tours that greatly increased my knowledge of the Chinese health care system. As a result, this article is dedicated to providing an overview of the pros and cons of this fascinating yet complicated system.

For a country with 1.35 billion people (and growing), the Chinese health care system is very well structured. The entire employed urban population is covered by some form of health insurance, and, as of August 2013, 99% of the rural population is covered by the New Rural Cooperative Medical Scheme (NCMS), one of China's newest policies in attaining universal health care.¹ The medical facilities of Level 3 hospitals (the highest ranked hospitals) are superb; facilities are modern and on par with medical technology in developed countries, offering efficient service at affordable prices for the majority of citizens. All individuals covered by health care have an annual pool of funds that covers basic medical costs from check-ups to over-the-counter medicine. The system is fast and

efficient compared to its American counterpart; no appointments are necessary and most issues can and will be resolved in the same day.

Despite the numerous advantages to the system, there are still a few shortcomings. Due to the immense amount of patients each hospital receives, doctor-to-patient interaction is severely limited. A typical session lasts no more than 5 minutes. There is also no such thing as privacy in Chinese hospitals; patient information, including one's full name and age, are displayed on large, electronic bulletin boards in waiting areas. Furthermore, there is an "open door policy," which requires a doctor to leave his or her office

door open while interacting with a patient to ensure that the patient does not get any "special treatment," such as an extra minute talking with the doctor. In fact, during my observations, I noticed that waiting rooms for many hospitals actually extend into a doctor's office, giving each individual patient little to no privacy.

Another issue is that highly

ranked hospitals are concentrated in large cities, and smaller cities and rural areas are often left with very basic health care facilities that use outdated technology. The NCMS covers a large portion of the rural population, but still leave individuals with very high co-payments that do little to alleviate financial burdens for large medical procedures.

Health care policies also vary significantly from province to province and even from city to city; there is no federal baseline for minimum health care. In turn, this creates an extremely localized health care system, very similar to health maintenance organizations in the U.S. In addition, Civil

“There is no such thing as privacy in Chinese hospitals[...].”

Service workers, a "rank" that can be obtained through national examination, receive far superior health care coverage than average citizens. For example, an average retired citizen in the municipality of Tianjin receives 75% coverage at a Level 1 hospital (lowest), 65% coverage at a Level 2 hospital, 55% coverage at a Level 3 hospital, and 75% coverage at specific pharmacies,

while retired Civil Service workers receive 90% coverage in all hospitals and pharmacies.² In essence, the quality of health care is determined by social position, not age or health condition.

This summer opened my eyes to a health care system that I previously knew little about. China's health care policies might be inflexible and

unfair in certain aspects, but overall, it serves the needs of most citizens. I have gained an appreciation for this system that I previously looked at with a hint of disdain. Yet at the same time, I know that what I learned and experienced this summer is only the tip of the iceberg; health care in China is as complex as it is intriguing.

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Yangzhou, China| Most Chinese urban workers reside in apartment complexes. Photo courtesy of Yuqing Zhu.





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A Change in Perspective: Finding Beauty in the Rubble

BRITTANY TUSING | *Molecular & Cellular Biology, Class of 2013*

Almost every morning, I hike up my skirt, throw a bag of medical supplies over my shoulder, and swing my leg over the left side of a motorcycle, avoiding the hot muffler below the right foot stand. Locals loiter around our property and that of our neighbor's. A bathroom-sized pink hair salon plays Haitian konpa music non-stop on full blast. One of Hinche's only blan, or white, residents is out to run her morning errands, usually including a stop at the hospital, the photocopier, and an occasional trip to the bank.

I've taken the five-minute motorcycle ride to the hospital every day for months now, yet I still hear the ever-familiar blan yelled at my back, as if I've forgotten my skin color and what it represents here: wealth. When I enter the maternity unit, I thrust my chin into the air and dismiss any stares with my learned bonjou, executed precisely in the sing-song Creole with which Haitians greet each other.

Hinche's Hôpital Ste. Thérèse is the only government-run hospital in the Central Plateau of Haiti. With an estimated catchment area of 600,000, the hospital is considerably understaffed and underequipped; only five of the hospital's 200 beds are in the labor and delivery room. In a culture where having six siblings means your family is small, five L&D beds are simply not enough. Women are frequently resigned to

laboring, and at times delivering, on the hallway's concrete floor in front of everyone, calling out to God, "mwenn pa kapab," "I can't." Furthermore, the hospital has no laundry or food services to offer, so families camp out in the hallways, scraping together what little money they have to feed their loved ones. Newborn babies are both dried and wrapped in the sheet on top of which their mother gave birth. When water isn't available, the beds and floors aren't cleaned. Mothers deliver into bloodstained plastic garbage bins next to their own

organization whose primary goal is to save the lives of mothers and babies in Haiti. The organization focuses on running a midwifery school, which graduated 23 students in 2013, a mobile clinic, which sees over 600 women per month in 20 remote villages, and a matwon (midwife) training program with 60 male and female graduates from rural communities. These traditional midwives, or community birth attendants, offer their patients the compassionate care that is frequently lacking in low-resource hospital settings. To accomplish

“Newborn babies are both dried and wrapped in the sheet on top of which their mother gave birth.”

waste that is held in buckets that have been used all day. They spend a day or two in the post-partum room and leave on a motorcycle or on foot with their new bundle wrapped tightly in their arms.

The hospital maternity ward would be even worse off and consist of nothing more than a day nurse and a cleaning lady if it weren't for Midwives for Haiti. Midwives for Haiti is a small US-based non-profit

this, they bring in and house up to 13 volunteer nurses, midwives, and OB/GYNs each week from the US to help train midwives at the hospital. The organization staffs the hospital's maternity ward and purchases nearly all supplies and medications used by the ward. My official title is "In-Country Coordinator." My job is to organize, facilitate, troubleshoot, and serve as hostess for the American volunteers. As a

result, I am the liaison between the volunteers and the local Haitians.

Hospital cases range from eclampsia, a mysterious pregnancy-related condition consisting of high blood pressure and seizures, to a transfer patient with an arm presentation, in which only the baby's arm has been delivered and an emergency C-section is required to pull the arm back through the vaginal canal to deliver the baby through the abdominal incision. Mothers here need serious obstetrical care, but they are hindered by a multitude of obstacles. Even if a woman lives close enough to get to the hospital, multiple barriers can stand in her way of receiving the care she requires. She needs family to take her, transportation (many laboring mothers come in on motorcycles, riding directly behind the driver and supported during contractions by someone seated directly behind her) or money to pay for it, and people and money to stay with her to care for her during her hospital stay. If the beds are full, she has no bed in which to labor; if the anesthetist isn't at work that day, there are no C-sections; and if the hospital has run out of Cytotec, the nurses cannot stop her post-partum hemorrhaging.

With a small Haitian elite controlling nearly all of the country's wealth, average Haitian families do all they can to keep their heads above water. Any money earned is instantly spent; money saved is money owed to those less fortunate. If someone's immediate need is greater than yours, you feel obligated to give them what you have. And in my time here, I've come to learn that even though they have very little, Haitians are extremely generous and thoughtful.

The World Health Organiza-

tion (WHO) has scattered statistics on maternal and infant health in Haiti, most likely because research is so difficult to obtain and analyze. Existing statistics are generally outdated or poorly estimated. While it may seem difficult to fathom, the majority of Haitian lives are simply not "accounted for" – meaning that those individuals do not have birth certificates, hospital records, identification cards, bank accounts, educations, or any other means of documenting their existence through a paper trail. It seems as though more remote families simply don't see the point in keeping such records.

A part of my job is to collect data on births that take place at Sainte Thérèse Hospital. The birth record is a tattered book with a half-torn cover taped on with old Band-Aids. Each log is handwritten, and entries are rarely complete. Frequently, the staff mark down the birth as being both vaginal and cesarean, making it difficult to use the information. As hard as we try, our own data often turns into rough guesses based on what can be gathered from the scrawled cursive and missing information in our birth log. We think the hospital delivers 240 births per month with a 30% cesarean rate. Surprisingly, maternal deaths are relatively few and far between; we have had only four recorded maternal deaths in all of 2013, an impressive figure for a country whose maternal mortality ratio is estimated to be some 350 per 100,000 live births (for comparison, the same ratio in the US is about 13 per 100,000).¹ Of course, Midwives for Haiti cannot take full credit for this remarkable accomplishment, but I have had the fortune of seeing first-hand that educational programs can and do make a real difference for those

who are fortunate enough to benefit from them. Before our program, the maternity staff only consisted of a single daytime nurse. Any babies born after 4 pm were caught by the cleaning lady.

My photos are just the same as those of other young people who have gone abroad to developing countries: my grin pressed against the apathetic expression of a wide-eyed, dark-skinned child in tattered clothing, tin-roofed huts with goats and pigs mulling through the garbage out front, and busy village scenes complete with rusty bicycles and women balancing massive fruit baskets on their heads. Haiti is not too different from countries such as Ethiopia or Bangladesh; the population is impoverished, the living conditions are squalid, and the health care is almost nonexistent. For me, this experience in Haiti was not about how numb I've become to human suffering but the change in perspective that has resulted. When I stopped concentrating on the garbage, hunger, and illness, I began to see the beauty in a place that is so different from everything I've always known.

Haiti is not and never will be defined by the abject poverty that follows years of oppression in a country built from a slave colony. Rather, Haiti is a country crafted by powerful, moving history. Its culture is built on the constant struggle between survival and guarding dignity and spiked with pride and unity. And most importantly, despite its problems, Haiti is a beautiful place full of color and emotion that I feel privileged to experience.

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Saúde Criança: Brazilian Public Health at its Best

ARIE GRUNBERG | *Public Health Studies, Class of 2015*

As I looked down, I realized there were two thin parallel lines of ants quietly marching to their communal beat. I could not even perceive where this incredible highway of ants began or ended. Then, as I looked up, I saw a bright red and blue bromeliad resting on a tree

branch. To my left was a prominent nest filled with hundreds of hungry termites ready to devour the nearest decomposing branch. There were hundreds upon thousands of different species of flora and fauna around me in the Amazon rainforest, and each seemed to

worry exclusively about their own. From a myopic point of view, they were merely fighting to survive. However, if the entire ecosystem can be seen as a connected whole, one would immediately realize that, in fact, unity was the main factor at play. I concluded that this “untamed

Rio de Janeiro, Brazil | Mother and child receive nutritional care counseling from a physician.
Photo courtesy of Arie Grunberg.



harmony” was the norm in the Amazon, and strangely enough, I could not help but recognize how much it resonated with Saúde Criança’s holistic approach to public health.

Saúde Criança, the NGO based in Rio de Janeiro with which I had volunteered with for four months is “a social organization that works to improve and maintain the well-being of children who live below the poverty line by fostering the economic and social self-sustainability of their families.”¹ This nonprofit organization’s main goal is to view the practice of medicine from a broader perspective. Its objective is to focus on five separate social aspects, which, at first glance, are seemingly unrelated to health. Only once the entire process is viewed as a united whole will its impact be appreciated. In the urban jungle of Rio de Janeiro, Saúde Criança displays the same “untamed harmony” by working together with the community, health professionals, and the government to achieve their values: “social responsibility, integrity, solidarity, transparency, and social justice.”²

In 1991, Dr. Vera Cordeiro, amongst other doctors, nurses, and members of the public sector, realized that something was not working about the way the health system was treating patients. For various reasons, patients continued to come back to the hospital after they were treated. Indeed, sick patients and children sometimes went through a distressing cycle of hospitalization, discharge, and re-hospitalization. Since there were many potential factors involved in this cycle, it was difficult to discern the cause of re-hospitalization. In some cases, children returned home with a prescribed treatment from the doctor but were not able to carry through with it be-



Rio de Janeiro, Brazil | Clinic staff member provides a vocational course on beauty to a mother.
Photo courtesy of Arie Grunberg.

cause their homes were inadequate environments for the treatment to effectively take place. For instance, the home might have lacked acceptable air ventilation, clean water, or even adequate roofing. As a result, patients were readmitted to the hospital in worsened conditions or died before readmission. For these reasons, Dr. Cordeiro and other health professionals in Rio de Janeiro decided to create Saúde Criança.

According to its mission statement, Saúde Criança wants to “promote the biopsychosocial well-being of children and families who live below the poverty line, approaching health in an integrated way and as a social inclusion instrument.”³ To achieve this, Saúde Criança follows its pioneering methodology called Plano de Ação Familiar (PAF), or Family Action Plan, which guides and monitors eligible families for

Vision **Future** for the

Arie Grunberg

I believe Public Health organizations will continue to grow since they utilize the most honest, intelligent, and holistic approaches to combat health issues. By focusing on the causes rather than the remedies, Public Health is making a real difference.

two years even after the medical treatment has ended.

Furthermore, the PAF includes five specific areas: Health, Income Generation, Housing, Citizenship, and Education. The Health portion of the PAF is a vital service and resource. Saúde Criança goes beyond what hospitals typically offer and provides families with free food, medicine, and equipment. Additionally, since many of the families that Saúde Criança aids come from very poor homes and backgrounds, the organization makes sure to provide psychiatric support and nutritional and physiological guidance. Lastly, the Health aspect of the PAF includes unmistakably crucial “courses on hygiene, family planning, substance abuse, violence, domestic abuse, and child development.”⁴

In addition to Health, one of the aspects that makes Saúde Criança stand out is its Income Generation feature that focuses on social integration. This program allows the families of sick children, who are mainly single mothers, to gain a new sense of dignity through acquiring profitable skills in vocational training programs. Each institution provides different types of training based on the parents’ abilities and interests. For instance, the institution where I volunteered in Rio de Janeiro teaches the mothers vocational courses on beauty, cooking, and baking. The idea is that a higher income later on will eventually

make these families self-sufficient. In fact, a recent study by Georgetown University illustrates how “the economic well-being of Saúde Criança’s families improved substantially. Beneficiaries’ incomes almost doubled, and they were nearly 12 percentage points more likely to be employed than adults from similar families not exposed to SC.”⁵

Health and Income Generation are essential, but that is not where the methodology ends. The next part of the PAF is Housing. Readmissions to hospitals are often caused by terrible conditions at home that interrupt or impair one’s treatment. Saúde Criança helps the families repair their homes and provides them with building materials. The main focus is to ensure that the homes meet the minimum standards of shelter: “running water, sewage, tiled walls and floors, and a

“The hope is that when the children of these families grow up, they will be able to support themselves and grow out of poverty[...]”

roof, among others.”⁴ In the end, a cleaner and better environment can help the children recover faster and provide the family with more confidence to move forward.⁴

The fourth aspect of the PAF is Citizenship. Surprisingly enough, many of the families that receive help from Saúde Criança do not have official documents of identification and thus do not always know about their rights or receive the government benefits they are entitled to. Although this seems to be something that is easily overlooked, Saúde Criança understands Brazilian society and thus emphasizes this aspect of the PAF. Saúde Criança’s legal team makes sure each family receives the necessary documents and government benefits they should be receiving such as the “Bolsa Família,” a form of governmental financial aid.⁴ Additionally, these documents allow the parents to find jobs later on and the children to go to school once they recover from illness.

Lastly, the Education focus of the PAF makes sure the children en-

roll in and attend school. Education is a key component in Saúde Criança’s goal in fighting poverty. The hope is that when the children of these families grow up, they will be

able to support themselves and grow out of poverty by using the skills and knowledge they learned in school. Saúde Criança not only makes sure the children go to school but also provides them with textbooks and other school supplies.

Saúde Criança has proven to be very successful through its five step methodology. This famous methodology has now been adopted by 23 institutions across Brazil, spanning six Brazilian states. Belo Horizonte, the third largest city in Brazil, has even adopted the methodology as the city's public policy. In fact, the methods have reduced re-hospitalization by 62% and have increased the families' incomes by 38%.⁵ Additionally, the researchers from Georgetown University also "discovered that the hospitalization days of a child enrolled in the Saúde Criança program decreased from an average of 62 days in the year prior to entering the project to nine days in the 12 months preceding the research; this represents a reduction

of about 90%."⁶ Most importantly, the research confirms that the methodology has a "long-term impact in the five areas of our work in health, education, housing, income, and citizenship."⁶

If the Amazon rainforest is viewed from the narrow perspective of a single bromeliad or a colony of ants, it would be hard to figure out how the Amazon can survive as a united whole. However, when one takes a step back and views the Amazon as an entire ecosystem, one will understand the real meaning of "untamed harmony;" each species truly needs and benefits from others and cannot be successful on its own. Similarly, Saúde Criança's methodology harmonizes Health, Income Generation, Housing, Citizenship, and Education. Implementing just one of these factors in order to help these children and families through their difficult times is not sufficient. These components of society may seem unrelated on the surface, but when combined, they can effectively

combat poverty and pressing public health issues. Using this innovative approach, Saúde Criança echoes the Amazon's "untamed harmony" to save thousands of lives every year.

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4. "Overcoming Illness and Poverty." Associação Saúde Criança. <http://www.saudecrianca.org.br/wp-content/uploads/2013/10/Saude-Crianca-Brief-English-Final-1.pdf>. Accessed October 28, 2013.
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Rio de Janeiro, Brazil | Children of beneficiary families coloring at one of Saúde Criança's events for children. Photo courtesy of Arie Grunberg.



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Disaster Mapping and Data Analysis with Geographic Information Systems

GAIDA MAHGOUB | *Public Health Studies, Class of 2014*

During the shooting at a mall in Nairobi, Kenya, Ushahidi Crowdmap, an open source digital mapping platform, helped users find their loved ones, and another Ushahidi tool facilitated blood drives in response to the crisis.¹ Google's Person Finder tool served a similar purpose during the Boston Marathon bombing. In both cases, digital maps and the option to make them open source, where anyone can add to them and reuse data, were the driving forces

past few decades, mapping itself has been around for centuries and is a classic tool in Public Health practice. For example, in 1854, John Snow, a prominent English physician, discovered the source of a cholera outbreak in London using epidemiology and spatial analysis. Figure 1 shows John Snow's cholera map reproduced using ArcGIS online (the blue star is the Broad Street pump, which was discovered to be the source of the cholera outbreak).²

Through a multitude of tools, GIS has allowed for ease of data analysis and visualization of non-geographic data layered on top of spatial features. Rather than the long, complicated tables or charts of information seen before pertaining to certain locations, new technologies have made digital mapping a visually compelling way to tell the story—one that transcends language barriers (most of the time). This paper articles the various tools offered by GIS and the advantages, differences between, and limitations of GIS software and regular online maps.

In the midst of a disaster, collecting information on a digital map simultaneously logs surveillance and disseminates the information to those who need it to carry out relief efforts. Publishing maps online and using open source maps save time and allow the sharing of consistent, extensive needs assessment information to users during a crisis, where individual organizations do not have to duplicate efforts.³ The reported trends are useful to government emergency agencies and relief organizations. Post-disaster analysis, risk assessment, or even pre-intervention planning is facilitated through the use of GIS. Whereas general digital maps can be used to

“[Mapping] tools played integral roles in crisis mapping and information collection from locals and anyone who could give vital information.”

that enhanced collaboration. These tools played integral roles in crisis mapping and information collection from locals and anyone who could give vital information. Similar tools were recently used to assist in locating survivors of Typhoon Haiyan in the Philippines.

Although new digital mapping technologies have emerged in the

Mapping continues to be used in Public Health practice to analyze and disseminate information. This article will focus on digital mapping, particularly Geographic Information Systems (GIS).

Like digital maps such as Crowdmap or Google Maps, Geographic Information Systems (GIS) helps portray useful information.

share current information (such as crime maps), GIS software is more analytical and places more emphasis on accuracy.

Conventional paper maps cannot be edited easily like online digital maps.⁴ Digital maps are also easy to share and facilitate collaboration. Incorporating local knowledge is key to greater insight about geography, norms, and more, especially in disaster mapping.⁴ Data collected from handheld GPS devices can be linked to digital maps or GIS software. The benefits of digital maps such as Google Earth and GIS are vastly increasing as new technologies develop.

The difference between Google Maps and GIS is that GIS is designed to facilitate analysis of non-geographic and geographic data. Google Maps is better known for giving directions. Google Maps and Google Earth do have some GIS features, such as making a custom map

with icons and drawing on top of maps; however, they are not as extensive as the many tools and extensions GIS offers to statistically and spatially analyze non-geographic

For decision-making, public health monitoring, and evaluation of interventions, the more extensive, standardized, and accurate data available, the better. More extensive

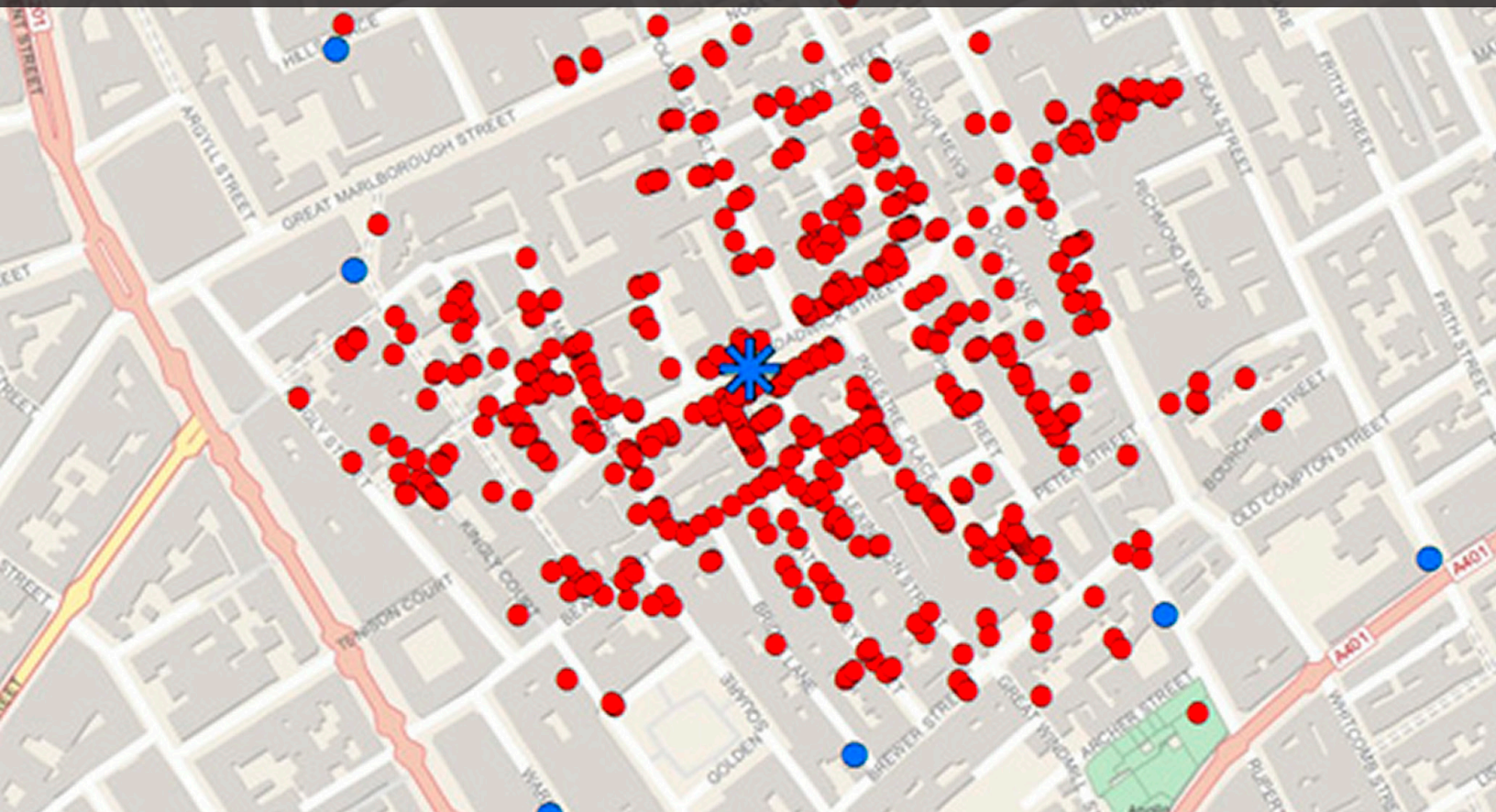
“For decision-making, public health monitoring, and evaluation of interventions, the more extensive, standardized, and accurate data available, the better.”

data. Google maps and other digital maps are usually more useful than GIS when it comes to detailed atlas-type maps. One can zoom in to Google Earth or Google maps as far as their front porch. However, with GIS, the focus is more on the user to use tools to analyze data they have imported.

analysis can be done which in turn helps portray more useful information for specific projects. GIS is the standard norm in municipalities and administrative data management offices worldwide.

Serving as a GIS intern, then as a Geospatial Analyst Intern at Catholic Relief Services (CRS), for

Figure 1: Blue markers indicate the locations of water pumps and red markers indicate the locations of cholera deaths due to the cholera outbreak in London in 1854.



two summers has exposed me to the many tools and services offered by ESRI's ArcGIS platform. ESRI is a leading GIS software manufacturer that created ArcGIS, a prominent GIS application in the world of GIS. ArcMap allows users to carry out in-depth statistical analysis using queries, spatial analyses of all sorts such as density and heat maps, and incorporate raster data that can be imported from remote sensing applications or generic image files. ArcGIS Online allows users to share maps within groups or publicly on the web. There are limitations with ArcGIS Online compared to ArcGIS Desktop such as a thousand-feature limit for shapefiles. That is, a layer with more than a thousand points (or features) in the attribute table would be rejected as too large. There are ways to get around this, such as using ArcGIS servers to host larger data files.⁵ There are other extensions that allow users to create and upload maps to ArcGIS Online straight out of Microsoft Excel or share maps via Microsoft Sharepoint. With a simple spreadsheet of table entries tagged with an address or latitude and longitude points, one can manipulate and display his or her data on a map. Latitude and longitude points may be readily available or can be manually imported from GPS devices.

All of this is useful when it comes to mapping, collaborating, and sharing. However, it does come with a price. For a single user, the basic version of ArcGIS costs about \$1,500, and for concurrent or multiple users, the cost is about \$3,500. ESRI offers grants to non-profits such as CRS. ESRI's ArcGIS has competitors such as QGIS, which is a free GIS platform. Other than the cost of the software, there is also the cost of data to use in the software.

Sometimes, privately owned data costs anywhere from \$30 to thousands of dollars. This is often satellite imagery. A user can collect his/her own data, or find free data that unfortunately may sometimes be limited and outdated.

There is a level of GIS literacy and training required to use the software. Additional knowledge of more advanced programming is useful, though not completely necessary, in order to know how to best take advantage of the tools offered. There are other downsides to GIS and digital maps other than training and cost in certain circumstances. Just as maps are easily understood, they can also be easily misunderstood. Displaying tabular data in map format is just as accurate the table itself. But with added features of GIS, there may be small nuances that can misrepresent data. In my experience with using GIS, I have faced some challenges, which I will now describe further.

At CRS, I used GIS to display and spatially analyze Sierra Leone Malaria Indicator Survey data. I realized there was more to GIS than

end, however, it is obvious that the scale is significantly larger in the 2013 projected population map. The imagery used is very compelling and one has to be very sensitive in regard to the use of graphics. Also, comparing two maps made separately, though using the same colors, does not guarantee that the shades of colors will be most appropriate for the associated data. Standardization in the colors used for the two maps is one step. It would also be more appropriate for the 2013 map to have the darker tan and brown colors in order to signify increased population in all districts.

Another disadvantage is that the data needed may not be readily accessible. Often, old data is available, such as the 2004 Sierra Leone Census, but up-to-date free data is not. Other times, data is simply not collected. If it is, the updated versions may be all in paper format and not accessible through the web. Data entry is time consuming despite the usefulness of having data secured in digital formats. These barriers may restrict the use of GIS in some developing countries.

“ArcMap allows users to carry out in-depth statistical analysis using queries, spatial analyses of all sorts such as density and heat maps, and incorporate raster data.”

simple clicks to create a map. In Figure 2, what is wrong with the maps shown here? The top map (2004) has darker colors than the map below. It could give off the impression that some districts in Sierra Leone lost population. Looking at the leg-

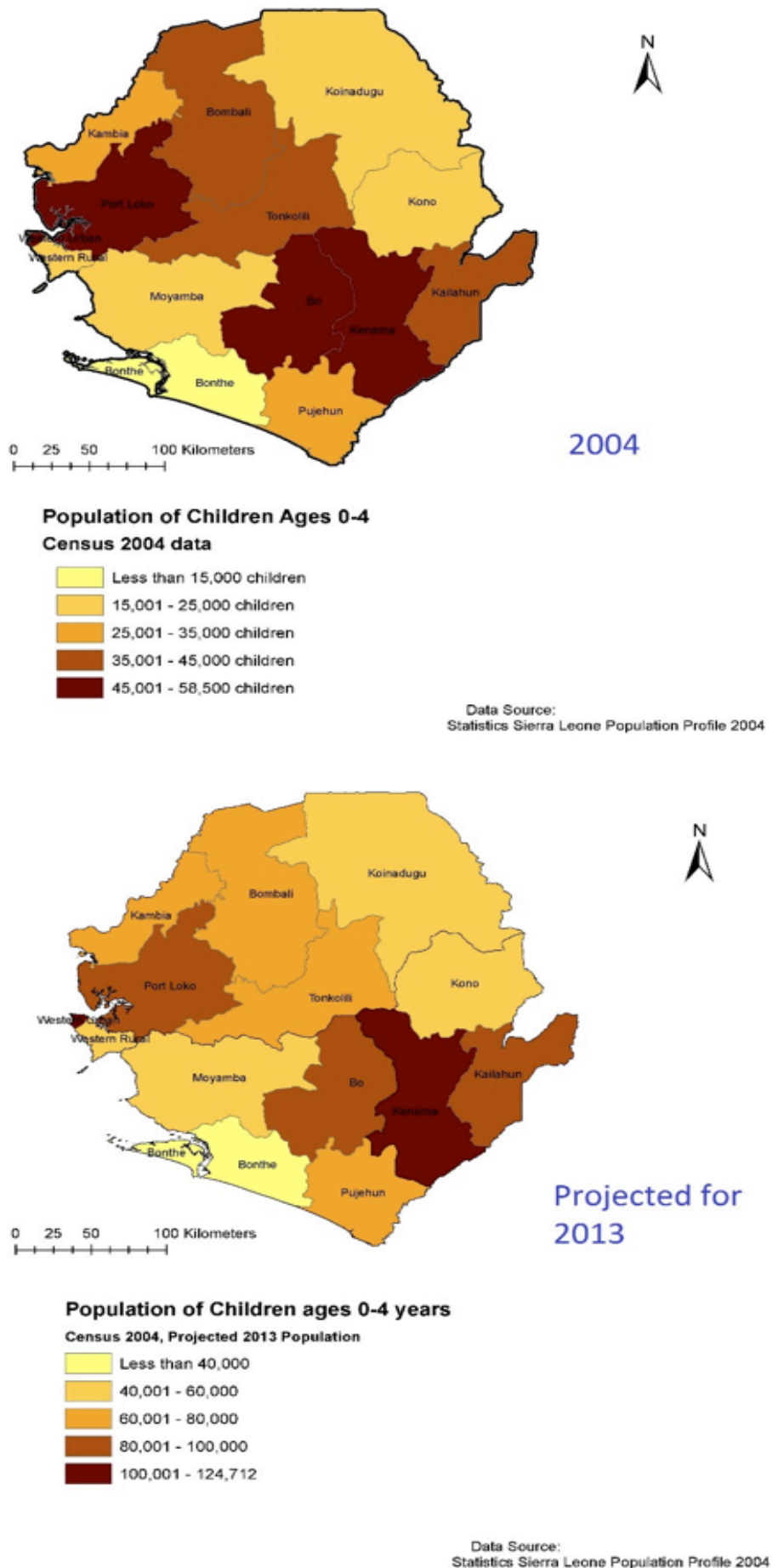
Standardization in collected data is another issue when it comes to mapping. For smaller administrative districts, such as chiefdoms in Sierra Leone, translating the names into English leads to variations in the spelling. Though GIS

makes it very simple to join two data tables such as population data with disease prevalence data, it does not help when the two columns to be matched contain elements that are not identical in spelling. It may sound like a minor issue, but when there are hundreds of names and multiple entries that are spelled differently, spelling becomes a bigger issue when using digital as opposed to paper forms. Fortunately, as GIS has become more popular due to data integration features, more pressure has been put “on statistical offices to produce high-quality spatially referenced information for small geographic units.”⁶ More extensive data on counties and smaller roadways is becoming readily available—for free!

To summarize, digital mapping is a powerful tool that facilitates data analysis and information collection, particularly during a disaster. Mapping comes with its limitations as well. Currently, cost is a factor in having accessible data and mapping software. Data collection and entry into digital forms is another issue with many barriers such as lack of infrastructure, feasibility to access and use technologies, and unfamiliarity with new methods compared to conventional paper methods. Despite the barriers, the usefulness of GIS is proven.

With Global Positioning Systems (GPS), Geographic Information Systems (GIS), and satellite imagery (remote sensing) technologies being integrated in various health and safety topics, Public Health students benefit from learning these technical skills. Infiltrating Public Health courses with technology skills will better prepare today’s students for career opportunities that are adapting to fast-paced technological advances, not only in GIS-

Figure 2:



Vision *for the* Future

Caida Mahgoub

Public health in the future will be even more interdisciplinary, especially considering the increasing overlap between the fields of computer science and public health.

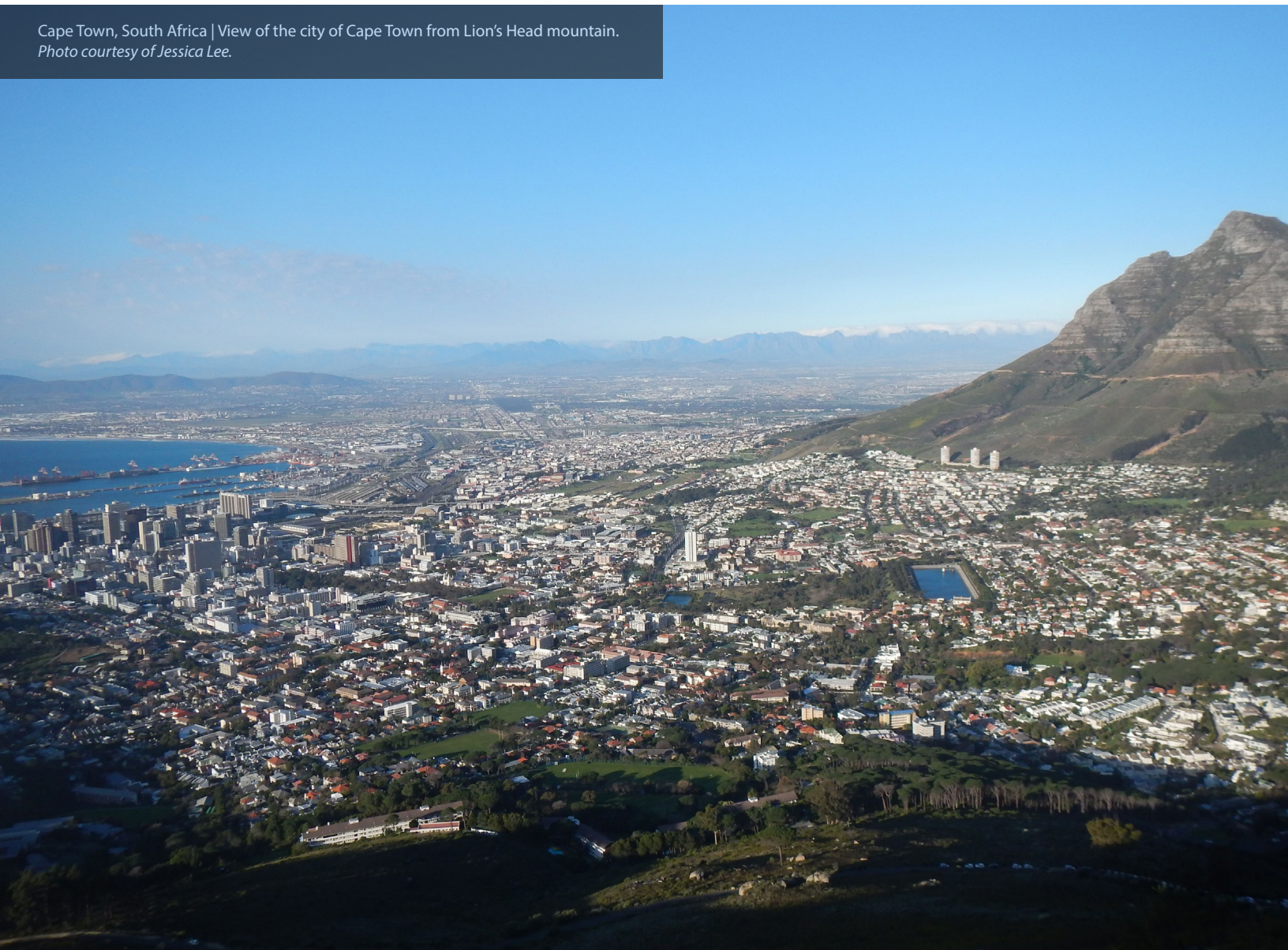
specific fields but also fields such as mHealth and digital humanitarian assistance.

ACKNOWLEDGMENTS

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Cape Town, South Africa | View of the city of Cape Town from Lion's Head mountain.
Photo courtesy of Jessica Lee.



Advances in Tobacco Taxation in Southeast Asia

HYUNJU KIM | *Public Health Studies, International Studies, Class of 2013*

Although tobacco use remains one of the leading causes of preventable deaths, tobacco consumption is still prevalent worldwide. World Health Organization (WHO) estimated that more than 6 million tobacco-related deaths occur each year, and around 80% of smokers live in middle- and low-income countries.¹ Reports said that 10% of world's smokers are in the ASEAN (Association of Southeast Asian Nations, which includes the countries Brunei, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Thailand, Singapore and Vietnam) region, where approximately 30% of all adult males are smokers.² However, tobacco control activists, public health professionals, and government officials have not given up on curtailing this unhealthy lifestyle. In the past few years, there have been major strides in tobacco taxation in Southeast Asia.

After early graduation, I took part in a six-month internship at Southeast Asia Tobacco Control Alliance (SEATCA), a regional public health organization based in Bangkok, Thailand. SEATCA's research and advocacy activities are primarily based on articles and recommendations provided by Framework Convention on Tobacco Control (FCTC), a first global treaty set forth by WHO to fight the tobacco epidemic. SEATCA works on issues

ranging from tobacco taxation and trade to the political economy of tobacco control in Southeast Asia. During the internship, I worked on the Southeast Asia Initiative on Tobacco Tax (SITT) and was able to get hands-on experience in advocacy in developing countries within Southeast Asia. The internship taught me how research and scaled-up policies can reduce harms and save millions of lives. However, I also learned that it can often be challenging to counteract interest groups' lobbying activities. For example, even though the majority of research has shown the effectiveness of tobacco taxation, a strong presence of transnational tobacco companies in the

increases in prices reduce smoking prevalence, prevent initiation, and encourage cessation, especially among children.⁴ However, tobacco products are currently very affordable, even for the poor in Southeast Asia. In most Southeast Asian countries, tobacco tax burdens remain far below the World Bank's recommendation of 66-80% of retail prices.⁵ Thailand (70%) has the highest tobacco tax burden as a percentage of retail price, followed by the Philippines (53%), Malaysia (52%), Indonesia (46%), Vietnam (41.6%), Cambodia (20-25%) and Lao PDR (16-19.7%).⁶ Prices of popular cigarette brands are also affordable in Thailand (\$2.16), the Philippines

“In most Southeast Asian countries, tobacco tax burdens remain far below the World Bank's recommendation of 66-80% of retail prices.”

region have either successfully delayed or prevented the governments from increasing tobacco taxes.

FCTC Article 6 recognized prices and tax measures as effective tools to decrease tobacco consumption.³ Research showed that

(\$0.47), Malaysia (\$3.32), Indonesia (\$1.29), Vietnam (\$0.83), Cambodia (\$0.58), and Lao PDR (\$0.75).⁶ These data reveal the need for Cambodia and Lao PDR, countries with the lowest tax rates to increase tax rates. Also, research has pointed

Hyunju Kim

Developing countries are emerging as major markets for tobacco companies. Unlike high-income countries with strong tobacco control legislation and enforcement, low- and middle-income countries have much weaker laws. Establishing more stringent tobacco control policies through higher tax rates can stall industry expansion, decrease tobacco consumption, and improve public health in the ASEAN region.

out that countries such as Indonesia need to raise not only taxes but also simplify their tax structures since complex, multi-tiered structures create loopholes for the tobacco industry.⁷ Considering that ASEAN countries' economies are growing and incomes are rapidly rising, tobacco products will become even more inexpensive without tax increases. Although many recognize that raising prices of tobacco is a useful way to deter smoking, political and economic issues in each country make it difficult for governments to increase tobacco taxes.

Despite the many obstacles, Thailand has been an exception to the trend. Over the course of ten years from 1990 to 2000, Thailand raised cigarette excise taxes ten times; taxes rose from 55% to 85% and smoking prevalence dropped more than 10%.⁸ In addition, Thailand started a health promotion foundation, ThaiHealth, with funding from two percent surcharge from alcohol and tobacco excise taxes.⁹ For the past decade, ThaiHealth has engaged in different areas of health promotion activities, from nutrition to HIV education, where the hands of the Ministry of the Public Health do not reach.⁹ Efforts of tobacco control advocates, funding from domestic and international organizations, and local research produced this achievement.

Thailand has active non-governmental organization communities, including many public health-related groups. The presence of tobacco control advocates such as ASH Thailand (Actions on Smoking and Health Thailand) and SEATCA seem to provide effective checks against the tobacco industry's influences. Funding also plays a crucial role; Thai tobacco control advocates are able to secure funding for local research from domestic and international organizations. Organizations based in Thailand collaborate with international agencies to increase research capacity.¹⁰ Ultimately, research on local and national levels show how an increase in tobacco tax can lead to a rise in government revenues and a decline in health care costs. This provided a rationale for policymakers to raise excise taxes. Thailand's success story serves as a unique example to low- and middle-income countries that are trying to improve their research capacities and policy advocacy.

Recently, Thailand's neighbors also started to show progress in raising tobacco taxes. The Philippines passed a Sin Tax Reform Law in December 2012. Although the reform is not without flaws, the law is remarkable in that it simplifies a multi-tiered tobacco tax system to a unitary system and requires subsequent increases in tobacco excise

taxes after 2016.¹¹ Lao PDR set up a tobacco control fund that receives two percent of tobacco companies' profits.¹¹ This is an impressive outcome considering that the Lao government has a contract with the tobacco industry that obstructs the increase of tax rates.¹² The Lao government worked around this by adopting specific taxes, for example, a tax levied on the quantity of tobacco, which raised taxes to 500 Lao kip (8,000 LAK \approx 1 USD). The country is planning to increase this specific tax again to 1,200 kip, where 200 kip will be given to the tobacco control fund. Moreover, Vietnam approved a comprehensive tobacco control law and established a tobacco control fund. The tobacco control fund in Vietnam will be used for smoking prevention, cessation, and research. Cambodia has also been showing an increased interest in tobacco tax reforms. In 2011, government officials at the Ministry of Economy and Finance established the Tobacco Tax Working Group.¹² With funding from international and domestic sources, public health advocates have been able to move tobacco taxation forward in Southeast Asia. As with the case of Thailand, increased funding and technical support from domestic and international agencies will be essential to sustaining these successes.

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Shackling Incarcerated Pregnant Women in Maryland

LIDIANA TERESA ECONOMOU | *Public Health Studies, Class of 2014*

The number of women incarcerated in the United States drastically increased by 153% between the years 1990 and 2009.¹ The rate has slowed in recent years (-2.3% from 2011-2012) but remains alarmingly high.² The majority of these women have been convicted of nonviolent crimes related to drug use and property offenses.³ It is estimated that 6 to 10% of this growing population is pregnant and mostly held in local jails.⁴ Many of these pregnancies are unplanned, high-risk, and marred by poor nutrition, mental illness, alcohol and drug abuse, domestic violence, and an absence of pre-natal care. All these factors contribute to incarcerated pregnant women's status as one of the most vulnerable populations in U.S. society, making their plight a worthy Public Health concern.⁵ For these incarcerated pregnant women, a major concern is that they face inhumane conditions such as shackling. Shackling is the practice of physically restraining pregnant women with handcuffs, leg shackles, and belly chains before, during, and after labor. Women are also shackled during transport and medical appointments and examinations. Currently, shackling in local detention centers and the jails is not regulated in the state of Maryland.⁶

Shackling imposes health risks and complications that can harm both the woman and the fetus. Shackling pregnant women hinders their physical movement, placing them at an increased risk of falling or tripping, which may cause serious injury to the fetus and potential

ternal hemorrhage or abnormal fetal heart rate patterns.⁹

Sadly, shackling does not only cause physical harm but can also leave long-term emotional scars. A large number of women in the criminal justice system are survivors of intimate partner violence and sexual

“The Eighth Amendment to the U.S. Constitution is intended to protect persons convicted of a criminal offense from cruel and unusual punishment.”

miscarriage. Women who are shackled during labor endure unnecessary anxiety and pain, which may also stress the fetus.⁷ Research has demonstrated the benefits of walking, moving, and changing positions in reducing labor pains, labor time, and the need for pain medications during pregnancy.⁸ Restraints also impede the ability of health care providers to assess and evaluate the women and the fetus and can complicate the delivery process and hinder lifesaving interventions in emergency situations, such as ma-

assault. Shackling can further traumatize these women by paralleling the feelings and circumstances of rape and abuse, which include the fear of harm, physical restraint, loss of control, loss of privacy, and humiliation.¹⁰ Shackling is physically dangerous, emotionally traumatizing, and profoundly cruel.

The Eighth Amendment to the U.S. Constitution is intended to protect persons convicted of a criminal offense from cruel and unusual punishment.¹¹ Shackling is a manifestation of a collective indiffer-

ence towards the health needs and dignity of the incarcerated population.⁹ By expanding the punishment of detainment and imposing the unnecessary practice of shackling, the state is engaging in cruel and unusual punishment and is negatively impacting the health outcome

existence on unfounded fears that these women, if not restrained, would surely attempt to escape or attack correctional officers, medical staff, or themselves, despite the lack of any documented reports of such behavior by unshackled pregnant detainees.¹³ It is also worth noting

do so by a health professional, and left it to the discretion of the health professional to determine when it is safe for the women to return to prison after childbirth. This bill would apply to all prisons and local correctional facilities and required that all instances in which physical restraints were used be recorded, retained for five years, and reported to the Governor and the General Assembly.

Unfortunately, the bill did not gain enough traction and failed, confirming a lack of urgency by the Maryland government to protect this population. It is shocking that this bill did not pass considering it is known that shackling pregnant woman directly hinders the rehabilitation process and negatively affects the mental and physical health of both mother and child. How is it that we can so haphazardly jeopardize such a sensitive population? While the answer to this question is complex and must be viewed in the context of a strong history of racism and sexism that has become institutionalized, it is clear that Maryland has failed to protect its most vulnerable population. Maryland must become more invested in the health and well-being of its most sensitive population.

“Shackling is a manifestation of a collective indifference towards the health needs and dignity of the incarcerated population.”

of this vulnerable population. It is aggravating an already precarious and risky health scenario. For these reasons, the American Congress of Obstetricians and Gynecologists (ACOG), the American Medical Association, and the American Public Health Association have condemned shackling. The United Nations’ Human Rights Committee and the Committee Against Torture, Amnesty International, and the Council of Europe’s Committee for the Prevention of Torture and Inhumane or Degrading Treatment or Punishment have also condemned shackling.⁹ The United Nation’s Committee Against Torture publicly expressed, in its concluding observations issued in 2006, concerns about standards of treatment in regards to gender-based humiliation and shackling of incarcerated women during the labor process.¹²

Despite opposition from these respected groups and clear medical evidence regarding the harms of shackling, the State of Maryland has failed to adopt statewide legislation banning the practice. Proponents of the practice justify its

again that the majority of incarcerated women have been convicted of nonviolent crimes or are awaiting trial and have yet to be convicted. While no pregnant woman deserves to be shackled regardless of criminal history, it is particularly problematic that the state shackles those who have yet to be convicted. In the 2013 legislative term, House Bill 829 was presented to the Maryland House of Delegates and State Senate; it set out to regulate and standardize the treatment of incarcerated pregnant inmates in all detention centers across the state.¹⁴

The bill would strictly prohibit the use of any physical restraints during labor and delivery, and the use of physical restraints after the first trimester, unless it was previously determined that a detainee was a substantial flight risk or the inmate, staff, or public safety could be compromised. It would proscribe the use of any leg or waist restraints in the second or third trimester and require that any restraint used must be the least restrictive possible. HB 829 required that correctional staff remove all restraints if requested to

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Uganda | A woman stands outside of a classroom. Photo courtesy of Clint Hall.

therapy, and adhering to their treatment.⁴ At the bottom of the cascade, only about a quarter of all people living with HIV reach undetectable viral loads. Therefore, interventions at the first step of the cascade can affect outcomes at the bottom and are critical to reducing the number of new HIV infections.

However, the lack of funding is a major obstacle to the implementation of prevention efforts. BCHD did not allocate additional funding to organizations for the Baltimore initiative. Instead, BCHD is focusing on collaborations with community partners such as non-profit organizations, schools, businesses, and academic and medical institutions to spread their prevention messages. The Director of Policy and Planning at BCHD, Sarah Morris-Compton, oversees policy issues and works closely with the Cross Agency Health Task Force (CAHT), an intra-agency group of non-health city department leaders. From 2011 to 2012, CAHT has worked on issues such as obesity reduction and physical activity promotion, but they have not yet focused on addressing HIV prevention.

Therefore, existing neighborhood groups must rely on other methods of funding. However, taking federal funding for HIV/AIDS as an example, we can see that very little funding goes directly towards prevention interventions. Of the \$29.7 billion for FY 2014, 55% goes towards treatment (e.g. antiretroviral therapies), 22% to global programs, and only 3% is directed towards prevention programs.⁵

Thus, we have a paradox. Prevention is perhaps the most important but least funded point of intervention. By relying solely on treatment as a form of prevention without investing in diagnostic and

prevention, only small progress towards incidence reduction can be made. Therefore, it is not clear if the Healthy Baltimore initiative goal can be met.

Women Accepting Responsibility, AIRS, and Chase Brexton. I began to appreciate the importance of committing to local action because HIV is as present in Baltimore as it is in parts of Africa.

“[...]the number of new [HIV] cases decreased from 544 cases in 2009 to 406 in 2011, a reduction of 25.4%.”

MY INVOLVEMENT ON THE GROUND LEVEL

Around the same time that the Healthy Baltimore 2015 initiative was published, I heard Dr. Nathan Wolfe's presentation on the transmission of viruses between nonhuman primates and bushmeat hunters in Africa, and I gained a basic understanding of the historical and scientific background on the subject.

Afterwards, I participated in the Exploring the Impact of HIV/AIDS in Baltimore Alternative Winter Break program, which exposed me to a variety of activists and non-profit organizations working to achieve the goals of Healthy Baltimore 2015 and NHAS. One guest speaker, a man who was infected in the 1980s, spoke about the realities of “attending a friend's funeral every week” and the difficulties of taking multiple nausea-inducing pills daily when he began antiretroviral therapy in the early 1990s. He is now a healthy member of the community who enjoys playing organ at church, gardening, and educating young people about HIV/AIDS. Through the program, I also met clients and staff at local organizations such as

Currently, I provide HIV Counseling, Testing, and Referral services at Chase Brexton Health Care. I am lucky to be working at a non-profit organization that has a friendly relationship with the Baltimore (and especially the LGBT) community. I have yet to give someone a positive test result and am hopeful that this speaks to lower prevalence and incidence of the disease.

WHAT'S NEXT?

In October 2013, an interim update was released. In an Op-Ed piece in The Baltimore Sun, the Baltimore City Health Commissioner, Dr. Oxiris Barbot, suggested that there has been some success of the initiative by stating that “fewer people [are] contracting and dying from HIV.”⁶ Data regarding rates of HIV infection stated that the number of new cases decreased from 544 cases in 2009 to 406 in 2011, a reduction of 25.4%. However, there was no evidence that rates of testing in those time periods were comparable, so a conclusion about overall incidence reduction should not be inferred. The report also showed that racial health disparities may be widening; between 2009 and 2011, the propor-

Vision *for the* Future

Chumin Gao

Although there has been proof of concept HIV cures, for example, the Berlin Patient and the Mississippi baby, we must still encourage tried-and-true methods in HIV treatment and prevention such as medication adherence and safe sex behavior. In Baltimore and elsewhere, collaborative, preventative efforts are what will alter the current course of HIV.

tion of new African-American cases increased by 1.5% while the proportion of new White cases decreased by 28.2%.⁷

It is clear that more work must be done to address the HIV epidemic in Baltimore and the U.S. as a whole, particularly in regards to health disparities. Without additional funding, existing organizations must get creative and collaborate to meet common goals. After health outcome data has been collected and analyzed, a final report on the initiative will likely be completed by 2016. Morris-Compton has stated that there are plans to extend similar initiatives to improve the health of all Baltimore residents

if the initiative goals are met.

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Kampala, Uganda | Man standing outside a fisherman's village outside Kampala. Photo courtesy of Saachi Nangia.







EDITORIALS

Social Networks of African American MSM in a Sexual Health Intervention in Baltimore, MD

ANASTASIA PIERRON | *Public Health Studies, Class of 2014*

Since the beginning of the HIV epidemic in the United States, there have always been groups of individuals who have been disproportionately affected by the virus. One such group is men who have sex with men (MSM). In 2010, MSM accounted for 63% of estimated new HIV infections in the United States.¹ Gay, bisexual, and other MSM are affected by HIV at a much greater proportion than any other group, with African American (AA) MSM bearing a disproportionate burden.

According to the 2010 HIV Surveillance Report, Maryland, as a state, had the second highest HIV diagnosis rate (30.0 per 100,000, almost double the national rate).² Baltimore City-Towson metropolitan area in Maryland was ranked 5th among all metropolitan areas in the U.S. for the highest rate of HIV diagnoses at 35.4 per 100,000.²

In particular, MSM accounts for 24% of HIV/AIDS prevalence and represents the only transmission category in Central Maryland for which HIV incidence is increasing.³

This past summer I was accepted to an internship program, the Baltimore HIV/AIDS Scholars program, through the JHU Center

for AIDS Research (CFAR). I was matched with a mentor from the JHU Bloomberg School of Public Health. My mentor is a principal investigator at the Lighthouse, a community-based research center within the Department of Health,

of a network-oriented sexual health intervention as compared to an equal attention control on recruiting networks for HIV testing and reducing sexual risk behavior. HIV testing and counseling were provided as part of the standard of care

“[In 2010,] Maryland, as a state, had the second highest HIV diagnosis rate.”

Behavior, and Society at Bloomberg.

Community-based research (CBR) focuses on social, structural, and physical environmental inequities through active involvement of community members, organizational representatives, and researchers.⁴ In an attempt to collect more accurate data, the researchers and staff at the Lighthouse engage with the community to ensure that their research is as sensitive as possible to the community and its needs. During my summer internship, I worked on two different studies at the Lighthouse. One of the studies was the Social Network and Prevention study (SNAP), a randomized clinical trial designed to test the efficacy

for every study participant. SNAP was divided into two phases, with phase one consisting of two parts. The first part is the focus group. The goal of the group was to find out what issues were being discussed by AA MSM. The second part of phase one was the component testing. The curriculum for the group sessions of the component testing was based on the results from part one and was divided into three areas of focus: management of health, prevention, and pleasure. The goal of part two was to educate the men and change their perspectives on sexual health.

The second phase of SNAP was the actual intervention. The two conditions were ‘My Sexual Health’



Rio de Janeiro, Brazil | Women receive consultations at one of Saúde Criança's events.
Photo courtesy of Arie Grunberg.

and 'Diet and Nutrition,' which was the control condition. Each cohort goes through seven group sessions, with an individual session in between the 4th and 5th group sessions. There was a 30-day reunion after the last group session.

The SNAP intervention aims to teach AA MSM skills and resources that will reduce their sexual risk behavior, as well as the sexual risk behavior of their social network members. It is important to explain how a social network is defined in this context. A social network is "an actor or set of actors, usually com-

"The SNAP intervention aims to teach AA MSM skills [to] reduce their sexual risk behavior[...]"

prised of individuals but can include organizations, such as an AIDS service organization, HIV medical care facilities or other entities, who are linked to a focal person by a behavior or interaction (e.g., sexual contact, drug sharing)".⁵ As suggested by several social behavior theories, if the men in the groups are within each other's social networks, they

will be more likely to utilize those skills, especially after the completion of the intervention.

Based on this information, I was curious about whether or not social networks were created among the study participants exposed to the experimental condition after the completion of the SNAP intervention. I hypothesized that new social

Vision Future for the

The public health field is currently exploding with innovation and progress, and I hope that the trend continues. Since the 1980s, there has been a lot of progress with HIV/AIDS, and yet, there is still a great need for effective and successful interventions that target populations who are disproportionately affected by the virus. With the new developments in public health, hopefully such interventions will follow.

Anastasia Pierron

networks would develop among the study participants and that these individuals would be more likely to reduce their sexual risky behavior.

The data I sampled had a total of four participants and included their demographic information: age, education level, living situation status/length of stay, relationship status, sexual orientation, employment status, criminal record status in the past six months, and personal income from the past six months. The three main data sources were audio files from all the sessions (group, individual, and 30-day reunion), responses to the six-month follow-up survey questions with descriptive demographics as mentioned above, and facilitator notes from all the sessions.

Based on the responses from the six-month follow-up survey questions, participants did not form social networks with others from the group. However, my observations from both the facilitator notes and the audio files show that the men did familiarize themselves with one another enough to open up and actively participate in the sessions. As one participant shared in his individual session, “I was nervous at the start of the group, especially since personal stuff would be coming up[, but] by the end of the very first session, everyone in the group began

opening up.”⁶

Since the results indicated that men did not form social networks with the others in their cohorts, I questioned what these men gained from the intervention. Did the intervention promote better friendship? This is an interesting question to address in future studies. It is also important to take note of certain limitations in my research. One of these limitations was that my research was based off of a pilot study. Another limitation was the recruitment process of the study population, which also affected the sampling of data. These factors could have skewed my research. The SNAP study is still running, and participants are just beginning to return to the Lighthouse for their six-month follow-up. As more participants return, there will be more data available to better answer my original research question. For now, it is too early to determine whether my findings are accurate or demonstrate a trend.

Needless to say, my internship experience this summer taught me many things, not only about HIV/AIDS but also about my interests for the future. This internship experience provided me with the opportunity to learn and utilize different skills that will help me in my future endeavors in the public health field,

which is where I hope to be in next year.

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The Importance of Education and Community-Building to Prevent Mental, Emotional, and Behavioral Problems in Refugee Youth

REBECCA RIMSKY | *Public Health Studies, Class of 2016*

In numerous countries around the world, refugee children are affected by trauma, war, and conflict, and these experiences can lead to mental, emotional, and behavioral issues. According to a 2009 report, 42 million people around the world are refugees or displaced persons, with 45% of refugees under 18 years old.¹ A study published in the UK journal, *The Lancet*, stated that “[refugee youth] are at high risk of mental-health problems, because they are likely to have been exposed to violence, which is the strongest predictor of poor mental-health outcomes.”² These statistics indicate that failure to address the mental health of refugee children is a significant public health issue because it can lead to the impairment of a large group of people worldwide.

The World Health Organization explains “traumatic experiences, such as killings, material losses, torture, sexual violence, harsh detention and uprooting, all adversely affect people’s behavior for generations. Poor quality of life in overcrowded camps and its deprivations, uncertainty over the fu-

ture, and disruption of community and social support networks lead to psychosocial dysfunctioning.”³ Mental issues can be difficult to diagnose in refugee youth, but it is estimated that the prevalence of post-traumatic stress symptomatology varies from 10 to 90%, where many youth experience anxiety disorders such as post-traumatic stress disorder (PTSD) and other psychiatric morbidities.⁴ Sources of anxiety for refugee youth include reunification with a parent, language barriers, and social expectations of the host country.

How can cultural and social tendencies from refugee children’s native countries be integrated into their new lives in foreign country? This issue becomes apparent when dealing with reward and punishment for supposedly right and wrong behavior. Corporal punishment, or physical punishment, is accepted in almost all of the native countries of refugee students, creating a difficult barrier for refugee families once they relocate to new countries.

In 2005, Fatima, a 16-year-old

female Iraqi refugee, showed signs of abuse when she arrived at school. The school faculty called child protective services, and Fatima was subsequently removed from her house following a court order mandating no further contact with her parents. Fatima had serious adjustment problems in foster care, became severely depressed, and went so far as to attempt suicide.⁵ In this situation, misunderstandings between cultures led to both mental and behavioral issues. Without a relatable community, Fatima felt isolated in foster care and did not have anyone to turn to for help. Therefore, community building can be a lifeline to refugee youth who are in a new country and have not yet learned the language or cultural expectations.

For refugees of all ages, there is a discrepancy between the idea of life in America and the reality of it. There are an immense number of refugee camps throughout the world. The UN Refugee Agency reported that four-fifths of the world’s refugees are hosted by developing countries, and only about 17% of



New York City, USA | Kids playing in Upper West Side Park of New York City.
Photo courtesy of Rebecca Rimsky.

refugees live outside their region of origin, with most fleeing to neighboring countries.⁶ This information provides a greater understanding of what is known about refugee youth nationally and globally. The refugee and humanitarian organizations in America that are dedicated to supporting refugee youth are great resources, but their efforts only extend to the relatively small refugee population that relocate to the United States. In refugee camps, many refugees are disillusioned with life in America. Hollywood movies often portray America as consistently wealthy, with every citizen having a stable job, large house, car, and swimming pool. Once relocated to the United States, refugees may experience overwhelming disappointment and confusion when they are sent to live in cramped apartments with high rent. Without support from organizations or local communities, refugees may struggle to maintain a happy and healthy lifestyle for themselves and their children.

For refugee youth, there are critical steps that host countries can take to prevent or minimize mental, emotional, and behavioral issues. An early 2013 study proved the importance of education and community building. In the study,

30 Somali youths participated in community resilience building and school-based early intervention groups to help with acculturation and socialization. As a result of the study, students across all tiers of the program demonstrated improvements in mental health and resources. Researchers concluded that “resource hardships were significantly associated with symptoms

“[...] resource hardships are significantly associated with symptoms of PTSD [...] the stabilization of resource hardships coincided with improvements in depression [...]”

of Post Traumatic Stress Disorder over time, and the stabilization of resource hardships coincided with significant improvements in symptoms of depression and PTSD for the top tier of participants.”⁷ Due to conflict in native countries, refugee youth have either little to no education or disrupted education. For this reason, providing a stable educational environment allows for

successful learning and improved mental health of refugee youths.

However, in recent years, there has been a debate over the importance of education for refugees. Education has not been considered an official sector for humanitarian assistance, and therefore, organizations have not allocated funding for it when emergency situations arose. For example, one donor for a major humanitarian organization declared that her agency did not “fund education because it’s not relief. It’s developmental activity.”⁸ However, positive results from studies have offered reasons to oppose this view, and agencies such as CARE, the International Rescue Committee, and Save the Children, have supported educational programs for children.⁹ Regarding this issue, an Australian study concluded that “one of the major challenges for recently-arrived young people is to identify with a

community to which they can safely belong. For many young people, schools provide a primary place of belonging.”¹⁰ Ultimately, providing education and community building opportunities to refugee youth is important because these programs help prevent debilitating mental, emotional, and behavioral issues.

Vision *for the* Future

Rebecca Rimsky

I expect there to be immigration reform in the U.S. in near future that addresses issues such as creating effective paths to citizenship. Uniting spouses and especially children with their families already in the United States will diminish separation-induced mental and emotional issues.

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Stellenbosch, South Africa | A region of informal settlements located. *Photo courtesy of Jessica Lee.*



Identifying Barriers to Breast Cancer Screening Guideline Adherence Among Minority Women in Rural Geographic Regions

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Breast cancer is defined as a proliferative disorder in which malignant, rapidly dividing cells form in the tissues of the breast.¹ According to the World Health Organization's International Agency for Research on Cancer, breast cancer is the most commonly diagnosed cancer among women globally.² The disease affects women residing in countries at all levels of modernization.³ In 2008, 1.4 million women worldwide were diagnosed with breast cancer.² Epidemiological statistical analyses conducted by the International Prevention Research Institute estimated that this figure will increase to 1.6 million women worldwide in 2015 and 2.2 million by the year 2030.³

According to the National Cancer Institute, a woman residing in the United States has a 12.5% chance of developing the disease over the course of her lifetime.⁴ The American Cancer Society estimates that approximately 232,340 new cases of invasive breast cancer will be diagnosed in the United States

in 2013. Approximately 39,620 of the women diagnosed will die due to complications associated with the disease.^{4,5}

Breast cancer incidence and mortality vary considerably with race, ethnicity, and geographic location in the United States. Incidence rates are highest for Non-Hispanic White (NHW) women who reside in large, non-rural populations in California and the District of Co-

underserved, rural and inner-cities in the Midwest and Southern regions of the nation.^{4,5} This inverse relationship between disease incidence, mortality, and geographical location is defined by the Center for Disease Control's Office of Minority Health and Health Equity as a health disparity.⁶

Literature suggests that several different factors contribute to the increased number of breast can-

“Breast cancer incidence and mortality vary considerably with race, ethnicity, and geographic location in the US.”

lumbia. Despite higher rates of incidence, mortality rates are generally lower in NHW women as compared to their African American and Hispanic counterparts. Moreover, mortality rates among African American women are generally highest in

cer deaths experienced by African American women residing in rural communities.⁶ These factors include, but are not limited to, low socioeconomic status, the presence of multiple co-morbidities, and the frequent diagnosis of more aggres-

sive breast cancer subtypes (e.g., triple negative, breast cancer type 1 and 2 (BRCA 1/2) mutated) that respond poorly to therapy.^{4,7} Additionally, late detection of the disease is a key contributing factor.

Due to late detection, African American women who reside in rural geographic regions are generally diagnosed with higher rates of distant-stage (locally-advanced/metastatic) breast cancer. This stage is characterized by the presence of large primary tumors (greater than 5 centimeters in diameter) with aggressive gene expression profiles (i.e., lack of receptors that can be targeted by available Food & Drug Administration approved therapies). Conversely, their NHW female counterparts are diagnosed earlier. Generally, they harbor smaller (less than or equal to 2 centimeters in diameter), less aggressive tumors that are well contained.^{5,6,7} These observations suggest that African American women do not consistently adhere to nationally recommended screening guidelines generated by the U.S. Preventative Services Task Force.

In an effort to identify the barriers associated with non-compliance to recommended breast cancer screening guidelines by African American women, researchers identified and surveyed a rural, medically-underserved population with breast cancer incidence and mortality rates similar to the national averages. This observational analysis was supported by the Oncology Coalition Division of the Rural Healthcare and Education Access Initiative (RHEAi), a non-profit organization based in Dallas, Texas.

Analysis of the Texas Cancer Registry, U.S. Census Bureau, and Survey Epidemiology and End Results databases identified various

counties in Texas as having a significant disparity in breast cancer screening and mortality rates when comparing NHW, African American, and Hispanic women. From a statewide perspective, female breast cancer mortality in Texas from 2003 to 2007 was lower than the national average (23.9/100,000) for Non-

the panel developed a relevant and culturally sensitive survey using the 5-point Likert scale to identify the perceived barriers to breast cancer screening in the general minority community. A total of 115 surveys of African American and Hispanic women were planned. The sample size was calculated based on the

“Due to late detection [...] women who reside in rural [...] regions are [...] diagnosed with higher rates of distant-stage breast cancer.”

Hispanic White (NHW) women (23.3/100,000). However, African American (AA) women residing in Texas had a higher rate of breast cancer death (35.3/100,000) as compared to NHW women living in Texas who had a higher rate of incidence.⁸ Of the 11 Health Service Regions within Texas, spatial analyses of geographic patterns showed that the incidence/mortality gap was significant in a number of counties located within the eastern division of Texas Health Service Region 4. Based on these observations, a barrier identification assessment was initiated in Cherokee County, Texas.

To gauge this disparity, an advisory panel of thirteen key stakeholders of the Cherokee County community conducted frequent roundtable meetings. The panel consisted of breast cancer survivors, religious leaders, a community leader, a local hospital employee, and educators. Based on the collective opinions of the panel and research-based health disparity literature,

percentage of African American and Hispanic women residing in Cherokee County with a 95% level of confidence and a +5% margin of error.

Surveys were completed online via Facebook Survey (n=62) and in printed form (n=53) between June 2012 and March 2013. The median age of participants was 49 years (range 28-64), 73% were African American women and 27% were Hispanic women residing in rural Cherokee County. A combined analysis of the completed surveys showed that the lack of breast cancer educational/awareness programs, limited transportation access, and lack of mammography facilities were barriers associated with decreased adherence to breast cancer screening guidelines. Identified barriers varied based on participant age, familial breast cancer history, and education level.

Younger survey participants, who are 30 years old or younger and have some college experience and previously cared for a parent or

Eliminating disparities in quality of health and health care for specific populations in regard to disease and access to health services is a public health concern and a high priority for the United States federal government. I believe that the Patient Protection and Affordable Care Act and the Health Care and Education Reconciliation Act, together known as the 2010 Affordable Care Act, contain provisions that could reduce health inequality in the U.S. These provisions allow for adequate access to care and appropriate quality of care for all Americans.

Monique Carter

sibling diagnosed with cancer, were the most knowledgeable about the national screening guidelines. Additionally, they were significantly more aware of breast cancer patient advocacy organizations and how to

voiced that they would be willing to comply with recommended screening guidelines if they had access to appropriate educational tools and screening facilities. Based on the results generated from this study,

accessibility for socioeconomically and geographically-challenged minority groups.

“[...]they would be willing to comply with recommended screening guidelines if they had access to appropriate educational tools and screening facilities.”

obtain information about free or reduced mammography screening than other participants. Women older than 60 were the least knowledgeable about the risks associated with breast cancer and preventative screening. On average, this cohort of participants had a high school level education, worked jobs with rotational shift patterns, and had resided in Cherokee County for more than half of their lifetime.

Overall, the surveyed population as a whole was very interested in learning more about breast cancer and how it affects African American women. They adamantly

RHEAi has forged collaborative efforts with public health and social policy advocates within rural Cherokee County to improve access to these resources.

RHEAi-sponsored organizations are currently working with community stakeholders in rural Cherokee County to design and initiate a region-wide, culturally-relevant breast cancer screening and prevention educational/awareness program. Efforts are also being made to initiate collaborative relationships with public health and social policy advocates within rural counties to improve healthcare

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Investigating Health Care Management and Evaluation Systems in Zhengzhou City, Henan Province, China

ANGELA ROLLER | *Public Health Studies, Computer Science, Class of 2016*

MEDICAL RELEVANCE OF HEALTH CARE MANAGEMENT

Rising trends in health care expenditure present major challenges for many countries including the United States and China. In the case of the U.S. and China, aging populations create increased demand and expectations for higher quality and range of medical services provided by health care organizations. On the part of governments and health care providers, meeting the needs of their citizens by offering quality affordable care will define trends toward systematically improving delivery of care to citizens. Improving the quality of programs and management personnel may dramatically increase the success of initiatives to bring quality services to patients. These changes may also inspire innovative solutions to international health issues which currently consume large, and increasing portions of national income: 5.2% of GDP in China (from 4.6% in 2008), and 17.9% of GDP in the US (from 16.6% in 2008).¹

The effectiveness of individuals

in health care management roles is the product of many elements including education, business skill, workforce environment, and autonomy, among others.² Management structures and styles are critical features that not only impact the logistical functioning of health care centers, but also ultimately determine the level of patient care they are capable of providing. Therefore, noting the importance of health management in expanding the quality and breadth of medical care provided by Community Health Care Centers in Zhengzhou City, China, the Municipal Health Bureau of Zhengzhou pioneered the Sino-US Health System Summer International Cooperation Program to understand similarities and differences between the two countries' approaches to and concerns about health care as well as to establish Zhengzhou as a destination for international education among other Chinese cities.

This editorials article focuses on health care evaluation systems as a central indicator of management and patient care and draws conclusions from data collected from ob-

servations, documentary analysis, and in-depth interviews with specialists or advanced practitioners and managers working in hospitals and Community Health Service Centers (CHSCs) under the charge of the Zhengzhou Municipal Health Bureau.

PRIMARY HEALTH CARE AND THE CHSC MODEL

In China, health care providers are separated into categories based on whether or not they are hospitals or clinics, urban or rural centers, and publicly or privately funding, among others. There are three levels of certification for health centers, where the third level is the hardest to achieve and is typically reserved for the most specialized hospitals; for example, Zhengzhou maintains hospitals with specializations such as orthopedics, traditional Chinese medicine, and cardiology. On the other end of the spectrum are CHSCs which are considered primary centers that focus on preventive care and typically employ the least trained doctors and provide



Zhengzhou, China | Pian Hu (community nurse) records the blood pressure of a patient on a Mahjong table in the middle of a community square. Photo courtesy of Angela Roller.



Zhengzhou, China | Pian Yi (community doctor) verifies medication for an elderly patient during a bi-yearly community check-up. Photo courtesy of Angela Roller.

the most basic services. These centers employ Pian Yi (community doctors) and Pian Hu (community nurses), most of whom have minimum education and training, to provide consultations, immunizations, gynecological and family planning resources, and physical rehabilitation services.

The Pian Yi model of patient care has seen widespread implementation in Zhengzhou in the last three years, although it isn't very well known and is typically met with public distrust due to the perceived lack of skill of the doctors, the poor insurance coverage rate of services provided, and the common language pronunciation of "Pian Yi" which sounds like "cheater" in the dialect most spoken in the Henan province. One commonly referenced issue during interviews with health care professionals was the over-utilization of tertiary health care centers and under-utilization of primary health care centers for basic procedures such as ultrasounds and sprained ankles. Most Chinese citizens would choose to visit a hospital rather than a community center because they believe they will receive better treatment there. Another interesting reason patients typically choose hospitals over CHSCs is that health insurance is more likely to cover inpatient procedures over outpatient procedures. However, for services such as chronic disease management, house visits for elderly or chronic patients, immunizations, and basic physical exams, the Pian Yi system meets basic market needs because government funding covers the majority, if not the entire cost of the service. Also, although the Pian Yi often face resistance from locals who do not trust their services, many persist in developing relationships with those in their designated

Angela Roller

Two Chinese characters comprise the Mandarin word for management: “Guan li”: “Guan” meaning command or control, and “li” meaning bright or ideas. A medical manager in Zhengzhou discussed that while health care managers in China practiced “guan”, they did not focus on “li”, meaning that they had basic training to manage day-to-day operations but rarely implemented new strategies. A shift in policy framework to incorporate more physician opinion, expertise, and passion would help achieve growth and eliminate health care disparities in community health care centers.

community through communal means. One method of community-building involved setting up a mah-jong table outdoors in the courtyard of an apartment complex while archiving and providing blood sugar and blood pressure screenings and passing out CHSC newsletters with preventive care information to people who walk by the apartment.

DISCUSSION OF EVALUATION SYSTEMS

Given the extent to which evaluation systems are used in the United States to establish credibility, gain patient confidence, establish protocol for procedures, and develop cohesive targets for improvement, the evaluation systems in each of the 16 hospitals and CHSCs investigated during the internship were analyzed. Blank evaluation forms, used to assess the performance of medical professionals, were requested from HR departments and upper-level management to better understand their expectations of doctors, nurses, and public health professionals. Of the 16 hospitals and CHSCs visited during the course of the investigation, nine of which were hospitals and seven of which were CHSCs, 8 provided

blank personnel evaluation forms for further analysis.

Prior to analysis, it was hypothesized that these forms would demonstrate a priority for quantitative measures of care rather than qualitative performance indicators. This hypothesis was confirmed by interviews with Human Resources managers, many of whom stressed meeting quotas for funding. Graphical analyses of the blank evaluations are provided in the Appendix.

The evaluations showed a strong focus on qualitative measures, especially with regard to the number of patient files established for the growing archive of citizen’s health information. Other quantitative measures stressed in evaluation cards included the number of government patients seen, the number of free clinic patients seen, the number of chronic disease screenings performed, the number of physical exams organized for elders, and the number of signed family health care agreements. The high comparative weight placed on organization of health lectures and community outreach is important to note. Overall, these measurements indicate continued efforts of CHSCs to establish themselves within communities and

provide preventive care to patients. In the evaluations, points given to teams of doctors and nurses for organizing community outreach, lectures, or examinations are typically associated with higher levels of autonomy. However, this is hard to substantiate or gauge when only a number value is associated with the evaluation rather than an in-depth analysis of the efficacy or efficiency of the initiatives. While the data provide valuable information for research, such as patient volume and amount of health events, the evaluations lack the extensive measurements and analyses necessary to determine the characteristics and reasons for the successes and failures of initiatives.

RECOMMENDATIONS

A clear opportunity exists for medical organizations in Zhengzhou, China to develop more pointed and comprehensive evaluation systems, and to enact more indicative measures of performance, more productive meetings, and more valuable feedback for doctors. CHSCs serve a niche community and are uniquely suited to respond to the specific needs of their region. Therefore, it

seems most pertinent that health-care organizations define their own target areas for improvement and organically develop measures of performance in addition to the qualitative performance indicators stressed by the Zhengzhou Municipal Health Bureau. Establishing this approach to evaluating medical personnel requires transparency of management goals and comprehensive testing to determine the best indicators of progress. Once these indicators are established management personnel can analyze aggregate data to determine the areas of success of goals and areas that need continued improvement in order to improve the quality of patient care.

None of the health evaluation systems discussed in interviews provided information regarding changes in health indicators or reasons for the success or failure of different programs or interventions. Rather, health managers only cited patient satisfaction data regarding these programs. Measuring patient

satisfaction is important to ensure physicians are meeting patient expectations, and it is also important for government workers who seek stability or public praise; however, patient satisfaction is not necessarily an indicator of the quality of care the patients received in terms of their health needs and cannot reliably demonstrate improvements in provided care.

Future evaluation systems will need to monitor health care systems and look for improvement opportunities. Aggregate data analysis will help determine relevant patient outcome-specific trends. It is also important that the process is defined, objective, equitable, timely, and helpful. Regarding the data collected, all of the directors interviewed indicated that the evaluation system used at their organization provided feedback for providers, yet none of the evaluation systems indicated that results were used in a reflective manner to improve evaluation procedures.

There are numerous benefits to an organic approach of evaluating medical personnel. Chief among these benefits is that all personnel must inherently be involved in defining target improvement areas and the specific indicators that will measure goal achievement. Additionally, this system enhances the performance dialogue between management, physicians, and patients by communicating goals and expectations through continued development of the evaluation and improvement process. Over time, these improvements should decrease the economic burden of poor, inefficient, or non-impactful programs and practices.

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Zhengzhou, China | Community nurses consult their electronic records prior to making a home visit to a patient. Nurse, doctor, and health official teams travel in eco-friendly vehicles with the community center logo imprinted for marketing purposes. Photo courtesy of Angela Roller.





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Please send your advice, criticism, and other thoughts to the Editors at ep@jhu.edu.

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