



# EPIDEMIC PROPORTIONS

THE JOHNS HOPKINS UNDERGRADUATE PUBLIC HEALTH RESEARCH JOURNAL, VOLUME 15, SPRING 2018

*baltimore &  
beyond*



A photograph of a child in a stroller being pushed by a person, with a chalkboard and other people in the background. The scene is outdoors, possibly at a school or community event. The child is wearing a white shirt and blue pants. The person pushing the stroller is wearing a white shirt with 'TAXI' written on it. In the foreground, there is a chalkboard with a drawing of a face. The background shows a blue car and a green structure.

# About

Johns Hopkins University's premier undergraduate public health research journal. Designed to highlight students' research and fieldwork in the realm of public health; combines research and scholarship; seeks to capture the breadth and depth of the undergraduate public health experience.

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Yvonne Yen





From the Month September 30 - October 2, 2016  
MADONNARI ARTS FESTIVAL  
L'LE ITALY BALTIMORE

Painting • Music • Theater  
Food • Wine • Beer





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# Letters

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photo by  
Indu Radhakrishnan

2017 BALTIMORE PRIDE  
APL ALLIES IN THE WORKPLACE · DIVERSE SEXUALITY AND  
GENDER ALLIANCE · THE EQUALITY STUDY · THE GERTRUDE  
STEIN SOCIETY · GQSA · JHM M&C EMPLOYEE ENGAGEMENT  
AND DIVERSITY COMMITTEE · JHM OFFICE OF DIVERSITY &  
INCLUSION · JHPRIDEGO · JHU PRIDE · THE LGBT WORKING  
GROUP AT THE BLOOMBERG SCHOOL OF PUBLIC HEALTH  
LIFE AT JHU · THE NETWORK · OUT FOR BUSINESS  
CAREY · OUT IN SCIENCE, TECH · POLYMER ENGINEERING  
AND MATHEMATICS · PRIDE · US PRIDE · SCHOLARSHIP  
MEDICAL CURRICULUM TEAM







# LETTER FROM THE EDITORS

# W

elcome to Epidemic Proportions!

The Epidemic Proportions Undergraduate Public Health Journal is designed to highlight student research, fieldwork, and interest in public health through a selection of diverse articles. Each article emphasizes a unique perspective or experience. This year we publish the 15th volume of our journal, an effort made possible by the contributions of our talented and dedicated team of undergraduate staff and authors.

This volume of the journal is centered around the theme **B'more and Beyond** to highlight varying public health challenges in Baltimore and their parallels across the world. Despite living in Baltimore, much of the Hopkins community fails to acknowledge the city as more than the undergraduate and medical campuses of Hopkins. From its diverse neighborhoods and rich history, Baltimore presents beauties and challenges known all too well in other parts of the world.

The public health narratives presented hope to take you on a journey from Baltimore City all across the world to China. They demand to be read by an audience willing to be citizens of the world. Issues like food scarcity, pharmaceutical politics, and substance abuse affect all our neighbors on this planet we call home.

It is important that now more than ever, we see different nationalities and ethnicity as tools to understanding humanity rather than differences to keep us apart. Our 15th edition hopes to share that no matter where you are or where you come from, similar public health circumstances seem to plague citizens across Baltimore and beyond and it is our duty to be educated and advocate for change.

Sincerely,  
Angela Hu and Manjari Sriparna  
Epidemic Proportions  
Editors-in-chief



ANGELA HU

MANJARI SRIPARNA





photo by  
Indu Radhakrishnan



LOOKS MUCH BETTER NOW!



photo by  
Indu Radhakrishnan



# INTERVIEW WITH SEN. MIKULSKI

A Baltimore native, Senator Barbara Mikulski served in the House of Representatives from 1977 to 1987, and then on the Senate from 1987 to 2017. She is a recent addition to the Hopkins faculty and now lectures on sociology and health policy. We were lucky enough to take a peek into her office and distinguished career as a senator who helped pass Obamacare, as well as numerous other major healthcare reforms.

**Q:** How did you go from being a child social welfare worker in Baltimore to politics?

**A:** I did not have a master plan or a way to get my ticket punched. I started off as an undergraduate major in sociology at a local Catholic woman's college. I went to work in the department of social services for protective services where families had been to court before children had been removed from their homes. The more I worked with families, the more I realized that problems were not necessarily individual, but more societal such as depending on economic inequalities and limited opportunities. The corrosive impact of poverty was the reason many families were unable to take care of their children and each step of my career led me into advocacy.

**Q:** What issues specific to Baltimore were influential to your career?

**A:** Many problems in Baltimore were big public health issues, one of them being lead paint. As a social worker working in the neighborhoods, I saw the damage that lead paint poisoning was causing to children including painful treatments which often had many limitations. I often speak of zip code determinism, in which certain zip codes were known to house kids with high rates of lung disease and asthma. While I could not help the poverty in these communities, I definitely was able to advocate for laws to remove lead paint, which in turn reduced a large financial strain on many families. I think of advocacy as a remedy, think of it as the right prescription to our society.

**Q:** What was the biggest challenge you faced in your career?

**A:** When I started to run for public office, this is in the early '70s for Baltimore city council, it was gender. There were not that many women who held ran or held political office. When we did run, women were treated like a novelty. To be taken seriously and viewed as someone who could do the job was rare for a woman then.

**Q:** What was your proudest moment?

**A:** One of them was myself and a couple other congressmen questioning the national institutes of health on why they did not have any women in their studies. We got some answers, but not enough to justify the lack of studies on women's health. When I got back to Congress, I instituted a new legislation to establish the Office of Women's Health. The legislation passed with bipartisan support. The director of the NIH calls me soon after to ask 'I need money for a longitudinal study on hormone replacement since there's substantial evidence that it may cause breast cancer in women.' This grant was obtained with bipartisan support and over the years, this one piece of legislation has ensured that women have been included in clinical trials, women-specific health issues have been adequately studied, and an entire change in the practice of clinical medicine. It truly shows how public health saves lives, millions at a time.

**Q:** What are the challenges associated with working with people on a different political spectrum than you?

**A:** This goes back to my training as a social health worker which was to first be a listener to have empathy, not so you can rebut. If I met with people of a different view, I would do my homework to find common ground. For example, when I met with a very conservative Republican individual, I researched his background and found that his wife ran a charter school for dyslexia. So, I complimented them on it and he told me he could not get a legislative hearing on dyslexia. I offered to help despite our very different political views. You might find people you disagree with on 95% but even if you find that 5% it can lead to progress.

**Q:** What do you think are the biggest public health issues in Baltimore and across the world today?

**A:** There continues to be racism which leads to limited or curtailed opportunity for people of color. Second, there seems to be extensive poverty, which should not only be helped by an increase in minimum wages, but also a reform of our educational system to prepare young people for the jobs of today and tomorrow. Impoverished communities are the ones facing major public health challenges not only here, but across the world.





photo by  
Calvin Qian





# Research

BALTIMORE, MARYLAND, USA: “Evidence suggests that pediatric patients who survive their critical illness in the PICU can experience significant and persistent changes in physical, cognitive, and behavioral functions along with stress-related symptoms in family members.”





# Sustainability of an Early Mobilization Program for Critically Ill Children: A Qualitative Analysis of PICU Up!

**RUCHIT PATEL; SAPNA KUDCHADKAR, MD**  
Neuroscience; MD

A culture of immobility has long been pervasive in the pediatric critical care community because of highly complex conditions in extremely ill patients. However, a novel initiative called PICU Up! at Johns Hopkins is working to flip the script and show that children can be safely and effectively mobilized while in the intensive care unit, a paradigm shift to help improve outcomes and drive patient recovery.

## ABSTRACT

**E**arly mobilization and rehabilitation programs in the ICU have shown to improve patient outcomes but there are a limited number of hospital systems that have adopted such programs in their pediatric intensive care units (PICU). The ‘PICU Up!’ program at Johns Hopkins represents the first program to systematically implement a multidisciplinary and streamlined approach to early mobilization in the PICU. Although an initial study demonstrated that implementation was feasible, little is known about the unique needs and factors that significantly impact sustainability of an early mobilization program in the pediatric setting. PICU Up! gives an unprecedented opportunity to rigorously evaluate components and specific changes that have facilitated or hindered program success. Semi-structured interviews through a standard qualitative process will be conducted with all staff and faculty in the Johns Hopkins Hospital PICU

as well as patients and family members who have engaged in early mobilization in the PICU. The Consolidated Framework for Implementation Research (CFIR) served as the foundation for de-

velopment of interview questions and subsequent thematic analysis. Results will yield major constructs and minor themes that are critical to the sustainability of PICU Up! from both patient and provider perspectives. Differences in group attitudes in staff based on job

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“This study will play a central role in transforming the current standard of care in PICUs to help improve short and long-term functional outcomes in critically ill children while also informing the broader scientific community on important steps for successful integration of novel evidence-based care programs in a complex setting.”

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development of interview questions and subsequent thematic analysis. Results

role in the PICU will also emerge. These results will not only guide the growth of



PICU Up!, they will also help to facilitate widespread implementation of early mobilization programs across PICUs worldwide. This study will play a central role in transforming the current standard of care in PICUs to help improve short and long-term functional outcomes in critically ill children while also informing the broader scientific community on important steps for successful integration of novel evidence-based care programs in a complex setting.

## INTRODUCTION

The pediatric intensive care unit (PICU) is a unique and multidisciplinary environment focused on providing care to critically ill children and young adults. Traditional care in the PICU geared towards resuscitation and stabilization of acute illnesses revolves around immobilization and sedation in order to ease pain and help children rest.<sup>1-3</sup> Restraints for patients and confinement to bed for extended periods of time are common practices as a result of perceived benefits such as patient safety, reduction in treatment interference, and hemodynamic stability.<sup>1, 4-6</sup> However, these current PICU practices may have detrimental short and long-term impacts with acute changes in children including negative changes in circadian rhythms and sleep structure, decrease in muscle mass and strength, and an increased risk of delirium.<sup>3, 7-11</sup> Additionally, evidence suggests that pediatric patients who survive their critical illness in the PICU can experience significant and persistent changes in physical, cognitive, and behavioral functions along with stress-related symptoms in family members.<sup>8, 12-15</sup>

Strong evidence and data from the adult intensive care unit (ICU) shows that structured early mobilization and rehabilitation programs improve patient muscle strength and cognitive functioning, reduce ICU and hospital length of stay, necessary sedation, instances of delirium, and time on mechanical ventilation.<sup>16-20</sup> Along with the significant benefits towards recovery in adults, studies have demonstrated the feasibility and safety of early mobilization in the adult ICU.<sup>21, 22</sup> In contrast, when considering

early mobilization in the context of the PICU, children and young adults add another layer of complexity because of differences in age, cognitive maturity, and sedation.<sup>13</sup> Although similar benefits in outcomes in critically ill children have been seen with early mobilization programs, unique challenges and barriers in the PICU have hindered widespread creation and implementation of such programs.<sup>1</sup>

The first program to systematically develop multidisciplinary and streamlined approach to early mobilization, termed PICU Up!, was created and successfully implemented in the Johns Hopkins Hospital PICU. Based on a structured QI model, PICU Up! provided a standardized, multi-tiered, evidence-based mechanism to safely mobilize and increase activity in children in the PICU while

Hospital PICU in order to scientifically assess positive outcomes and challenges that are still faced with PICU Up!, viewed from both sides in the delivery of care.<sup>13</sup> Qualitative semi-structured interviews will be developed and conducted based on the validated Consolidated Framework for Implementation Research (CFIR) model. Specifically, the CFIR outlines five critical areas that impact implementation: 1. outer environment (eg. hospital administration), 2. inner environment (eg. unit culture), 3. intervention characteristics (eg. resources needed, program goals), 4. individual characteristics (eg. education, personal beliefs), and 5. Process (eg. implementation strategies, execution).<sup>23</sup> This framework was developed by synthesizing several implementation theories and reducing overlap to provide consistent and well-defined areas

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“The pediatric intensive care unit (PICU) is a unique and multidisciplinary environment focused on providing care to critically ill children and young adults...”

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utilizing many different resources and healthcare teams. Structured protocols and changes in culture as a result of PICU Up! have been evident for a few years and the initial quality improvement study demonstrated that this program was feasible with no adverse effects.<sup>10</sup> However, little is known about the unique components that are necessary for successful implementation and long-term sustainability of a complex evidence-based pediatric early mobilization initiative.

The purpose of this study is to rigorously evaluate the complex dynamic of sustainability of the PICU Up! program and to identify the facilitators, barriers, cultural changes, and outcomes post-implementation from a multidisciplinary perspective. Departing from previous literature, this study will consider perspectives from staff along with patients and family members in the Johns Hopkins

to explore implementation of a specific program.<sup>24</sup> It has been applied in many health care contexts involving analysis of complex and multilevel programs including other hospital based interventions and mental health systems.<sup>25, 26</sup> This study will use CFIR guided interviews to qualitatively determine the factors that impact the sustainability of PICU Up! along with recommendations and best practices from provider and patient and family member perspectives when developing new PICU early mobilization initiatives.

## METHODS

### Participants and Recruitment

All staff in the PICU at Johns Hopkins Hospital along with core team members involved in designing and implementing the PICU Up! early mobilization program were contacted by e-mail and in-





**EARLY MOBILIZATION** Finding creative ways to engage toddlers in early mobilization one day after open heart surgery. Photo by Ruchit Patel.

erate an expanded sample. A purposive sampling process, common in qualitative research, was then used in order to ensure involvement of participants that represent a wide range of disciplines that are involved with sustaining PICU Up!.<sup>27</sup> From those identified, 45 individuals are expected to participate in a semi-structured interview process from February to April 2018.

Patients and family members in the PICU who have engaged in components of the PICU Up! program will be contacted in person by research staff to describe the study and assess interest in participating. A purposive sampling process was used to ensure participants represented a wide range of ages and involvement with specific early mobilization activities based on PICU Up! classification. Interviews with interested participants will take place from April 2018 to June 2018. All participants, staff, patients, and family members, will receive a \$20 gift card upon successful completion of the interview. The Johns Hopkins Institutional Review Board reviewed and acknowledged this study as a QI project.

#### **Interview Procedure**

Participants will complete a short demographic form and any questions or concerns regarding the study will be addressed. Research staff will then conduct a semi-structured qualitative interview based on written interview guides developed for PICU staff and patients and family members respectively. Interview guides were constructed from the five CFIR domains along with a literature review on implementation research and pertinent recommendations from faculty members and staff who have experience across PICU rehabilitation and implementation science. The CFIR model also served as the theoretical framework for conducting the interviews with an overall approach targeting beliefs, barriers, response, and cultural changes in the PICU after implementation of PICU Up!. All

“...when considering early mobilization in the context of the PICU, children and young adults add another layer of complexity because of differences in age, cognitive maturity, and sedation.”

vited to participate. Staff were asked to provide basic contact information and availability in order to schedule the in-

terview. Interested staff participants were also asked to name other key players engaged with PICU Up! in order to gen-



interviews will be conducted with a single trained interviewer who is independent of the PICU Up! early mobilization program. The interviews will be audio-taped and transcribed by research staff to enable data analysis. Transcripts will be reviewed by investigators after each interview in order to determine which themes require further exploration and interview guides will be modified in an iterative process to enable this.<sup>28</sup>

### Interview Analysis

Two independent raters involved with the study will read through the interview transcripts and code them using NVivo 11.0 Pro Software (QSR International Pty Ltd, 2015, Doncaster, Australia). Based on existing literature and thematic analysis, initial pre-set codes will be defined and two raters will independently code each transcript with discrepancies resolved through discussion with the principal investigator.<sup>29</sup> Any emergent codes found after data analysis begins will be added to the coding scheme. Coding between the two raters will be compared using percent agreement per transcript. A final review of each transcript will be performed and investigators will meet to identify and define themes by collapsing together common codes. A consensus will be reached between investigators in developing appropriate names and comprehensive definitions of the themes based on coded quotes. Identified themes will be grouped into larger constructs, also defined by the investigators, and the frequency of coded themes and constructs across participants will be determined.

## RESULTS

PICU staff participants will include the following disciplines: registered nurses (RN), nurse practitioners (NP), respiratory therapists (RT), physical therapists (PT), occupational therapists (OT), speech language pathologists (SLP), child life specialists, social workers, phar-

**VENTILATOR** The first patient to walk on a ventilator during PICU Up! implementation. Photo by Ruchit Patel.

“The purpose of this study is to rigorously evaluate the complex dynamic of sustainability of the PICU Up! program and to identify the facilitators, barriers, cultural changes, and outcomes post-implementation from a multidisciplinary perspective.”





macists, and physicians (resident, fellow, attending). Demographic information on sex, age, education, clinical role, time working in health care, time working in the Johns Hopkins Hospital PICU, and time engaging with PICU Up! will be reported along with mean duration of interviews and average percentage agreement between raters.

Patients and family members from all three levels of PICU Up! will be represented. Additionally, demographic information on sex, age, level of education, time spent in a healthcare profession, time spent by the bedside (family members), and number of PICU Up! mobilization activities observed will be reported. Mean duration of interviews along with average percentage agreement between raters will be determined.

### Staff Constructs

Broad constructs related to facilitators and barriers of utilizing the PICU Up! early mobilization program as well as changes that have taken place as a re-

sult of program implementation will be produced based on interview transcript analysis of PICU staff participants. Each construct will include several connected themes with a comprehensive definition, exemplar quotes, and participant response percentage.

### Comparing Staff Responses: Involvement with PICU Up! Development

Patients and family members from all three levels of PICU Up! will be represented. Additionally, demographic information on sex, age, level of education, time spent in a healthcare profession, time spent by the bedside (family members), and number of PICU Up! mobilization activities observed will be reported. Mean duration of interviews along with average percentage agreement between raters will be determined.

### Comparing Staff Response: Job Role in the PICU

PICU staff participants will be divided into groups based on their specific job role or discipline. Overall attitudes and perceptions based on data from identified constructs and themes will be compared across these groups to understand how effectively different teams in the PICU are integrating with PICU Up! protocol.

### Patient and Family Member Constructs

Based on transcript analysis from interviews with patients and family members, broad constructs and specific themes of perceptions towards PICU Up! and early mobilization activities will be determined. Specifically, the overall

studies have highlight barriers of early mobilization such as risk of endotracheal tube dislodgement and loss of indwelling vascular catheters and more barriers for implementation will be evaluated as part of this study.<sup>13</sup> Not only will results highlight the facilitators and challenges that this early mobilization program faces, but it will also allow for a thorough examination of changes in PICU culture and views towards immobilization and sedation post-implementation. Specific constructs and individual themes from staff as well as patient and family member perspectives will be identified to help determine areas where PICU Up! can improve and be more effective with both groups. Incorporating the patient and family member perspective is especially crucial as it gives the opportunity to compare with staff responses and determine how well PICU staff are involving family members and patients to optimize efficacy of PICU Up!

Additionally, key analysis will characterize the differences in staff perceptions towards PICU Up! based on their role in the PICU as well as their connection to the development of the PICU Up! program. Understanding the unique challenges that individual disciplines face at different stages of PICU Up! involvement will be critical for guiding changes to alleviate potential issues while increasing comfort and compliance with the protocol. Tracking staff attitudes and acceptance of the early mobilization initiative will enable more targeted engagement strategies while also understanding the link to changes in job satisfaction and burnout. High staff burnout and turnover in the ICU environment is a common problem and determining the changes in workload and new sources of stress as a result of PICU Up! is therefore critical.<sup>30</sup>

This study will have a few limitations, some of which are inherent to all qualitative studies. Semi-structured interviews may have influenced the answers certain individuals give in the effort to give a desirable response. Efforts will be made to reduce this potential bias by having an interviewer who is independent from the

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“By identifying challenges and a novel list of best practices, PICUs can use this data to help create early mobilization programs which can smoothly transition into the clinical environment.”

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response to the program will be assessed along with benefits and challenges patients or family members have experienced. Response percentages and themes will also be compared across patient and family member responses to determine changes in attitudes based on PICU Up! level and the corresponding activities.

## DISCUSSION

Through a qualitative process guided by the CFIR, this study will examine and establish the key components that have contributed to PICU Up! success as well as areas that need to be addressed for continued sustainability. Previous



PICU Up! program or the PICU at Johns Hopkins Hospital. An additional limitation may include discrepancies in coding transcripts and including certain themes that were not explicitly said during interviews. However, a second rater will be utilized in order to minimize differences in coding and ensure accuracy of identified themes. While there are limitations to qualitative research, this study will enable an in-depth analysis into all the complex components at play behind the scenes of PICU Up!

Determination and analysis of the constructs and themes related to integration of the PICU Up! program will have large implications for facilitating the implementation and sustainability of early mobilization programs in PICUs worldwide. It is true that each PICU has its own culture, different resources, varying patient populations, and administrative and procedural protocols. However, by identifying challenges and a novel list of best practices, PICUs can use this data to help create early mobilization programs which can smoothly transition into the clinical environment. Conclusions from this study will help ensure that PICU Up! and new pediatric early mobilization programs will continue to successfully grow, helping to comprehensively change the current culture of immobilization and sedation in the PICU.

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# MiCore: The role of technology in public health

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Vilariño has been on the Corrie team since the Spring of her sophomore year. She has had various roles on the team including consenting patients, deploying, reaching out to patients for iShare returns, and translating the app to Spanish so Spanish speaking patients can be included in the study.

**M**iCore, the research group that I am involved in, stands for Myocardial infarction, COmbined device, Recovery Enhancement (MiCORE) study. It aims to examine the role technology may play in helping patients interact with and better understand their health. Because this is a very general and lofty goal, MiCore, specifically aims to determine whether an iPhone app named Corrie can help patients that have suffered a heart attack lower their likelihood of being readmitted to the hospital within the first 30 days of being discharged. In order to do this, the MiCORE team focuses on two categories that often cause heart attack patients to be readmitted – the lack of early intervention & education and common recovery errors made by patients.

In terms of the early intervention, one of MiCORE's goals is to reach out to the patient as early as possible during the re-

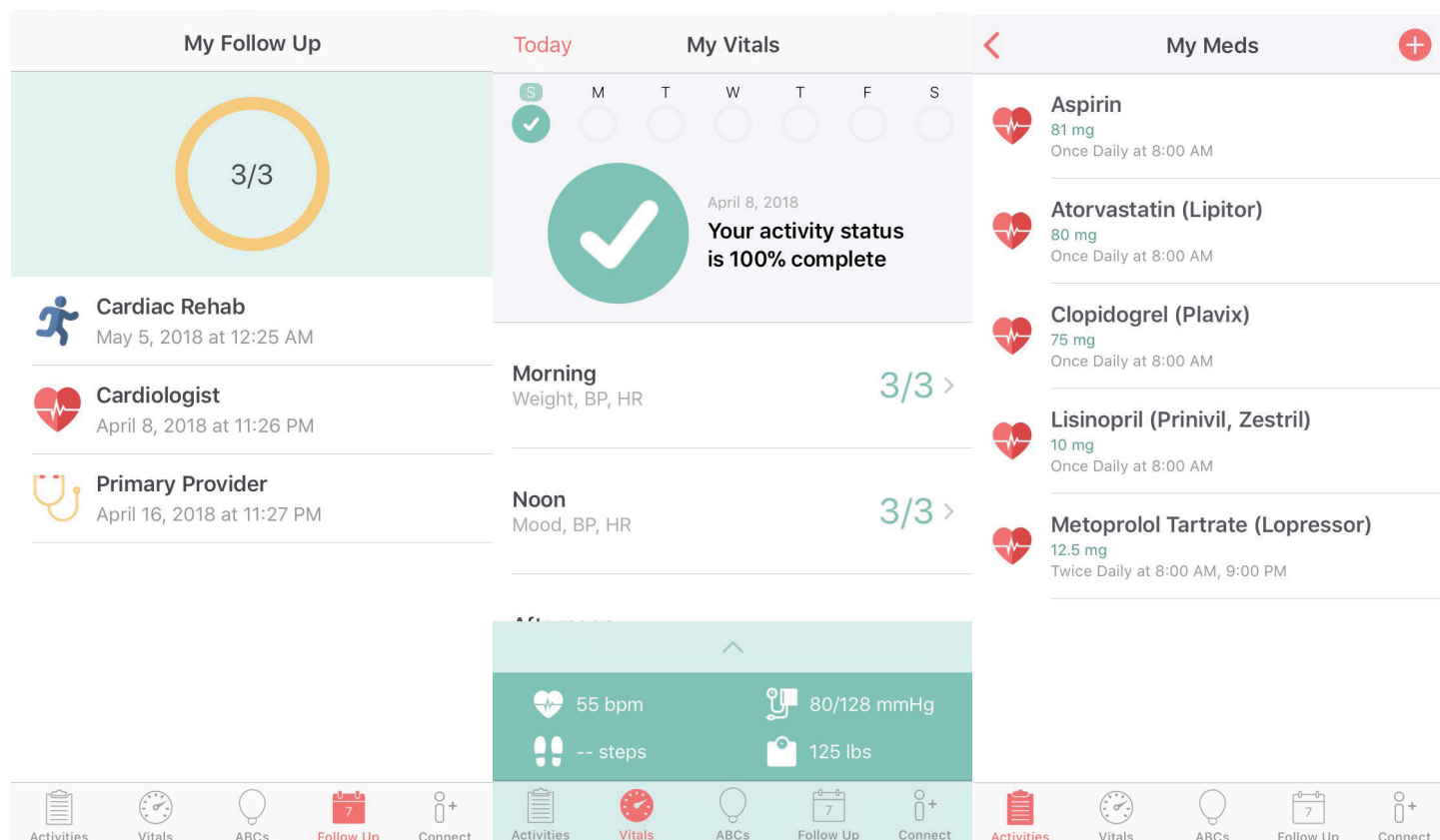
covery period. This will be used to determine whether early intervention makes a difference in the re-admittance rate. The idea is that the earlier patients have access to the information that they need to understand once they go home, the more effectively they can take control of their

own health once outside of the hospital. Education and information both play important roles in attaining this goal. Because of this, embedded within Corrie are educational videos and excerpts written by Cardiologists that help explain to patients everything from what may have

**THE TEAM** Vilariño and the rest of the team pose for a photo together. Photo by Valerie Vilariño.







**CORRIE** The Corrie iPhone app allows patients that have suffered a heart attack to track health-related information. Photos by Valerie Vilariño.

caused their heart attack, to how to prevent future heart attacks. These videos aim to have patients understand what lifestyle changes are necessary for their future health as well as why they need to take each of the medications that they do.

exercise, and proper follow up appointments. For example, when patients enroll in Corrie, a deploy-er (my role) teaches the patient how to enter all of his or her cardiac medications into the app. The app then generates daily reminders for

“...on a more Public Health policy related theme Corrie addresses the need for higher quality care at a lower cost. By preventing readmissions, Corrie not only improves patient health but also lowers the cost of healthcare.”

In addition to helping patients understand more about their Cardiac health, Corrie contains a multitude of features that help address common mistakes patients make when recovering at home – among these are medication adherence,

the patient to take their medication at the correct times. In this way, any re-admittance that would occur because the patient may have forgot to take their cardiac medication (more common than most would think) – would be avoided.

MiCORE is inextricably intertwined with Public Health. Both of its major goals are rooted in principles taught in almost all of my Public Health courses. For example, Corrie is the embodiment of using technology to afford patients more personalized medicine. Both personalized medicine and the use of technology to better health are themes that have been heavily emphasized by experts in Public Health in recent years. Moreover, on a more Public Health policy related theme Corrie addresses the need for higher quality care at a lower cost. By preventing readmissions, Corrie not only improves patient health but also lowers the cost of healthcare. Readmissions are one of the costliest scenarios in our healthcare system today, and one of its greatest deficiencies. They embody the reality that poor quality of care leads to both lower standards of health as well a greater healthcare spending. By lowering readmissions and bettering the quality of care for its patients, Corrie aims to provide a solution to this reality.





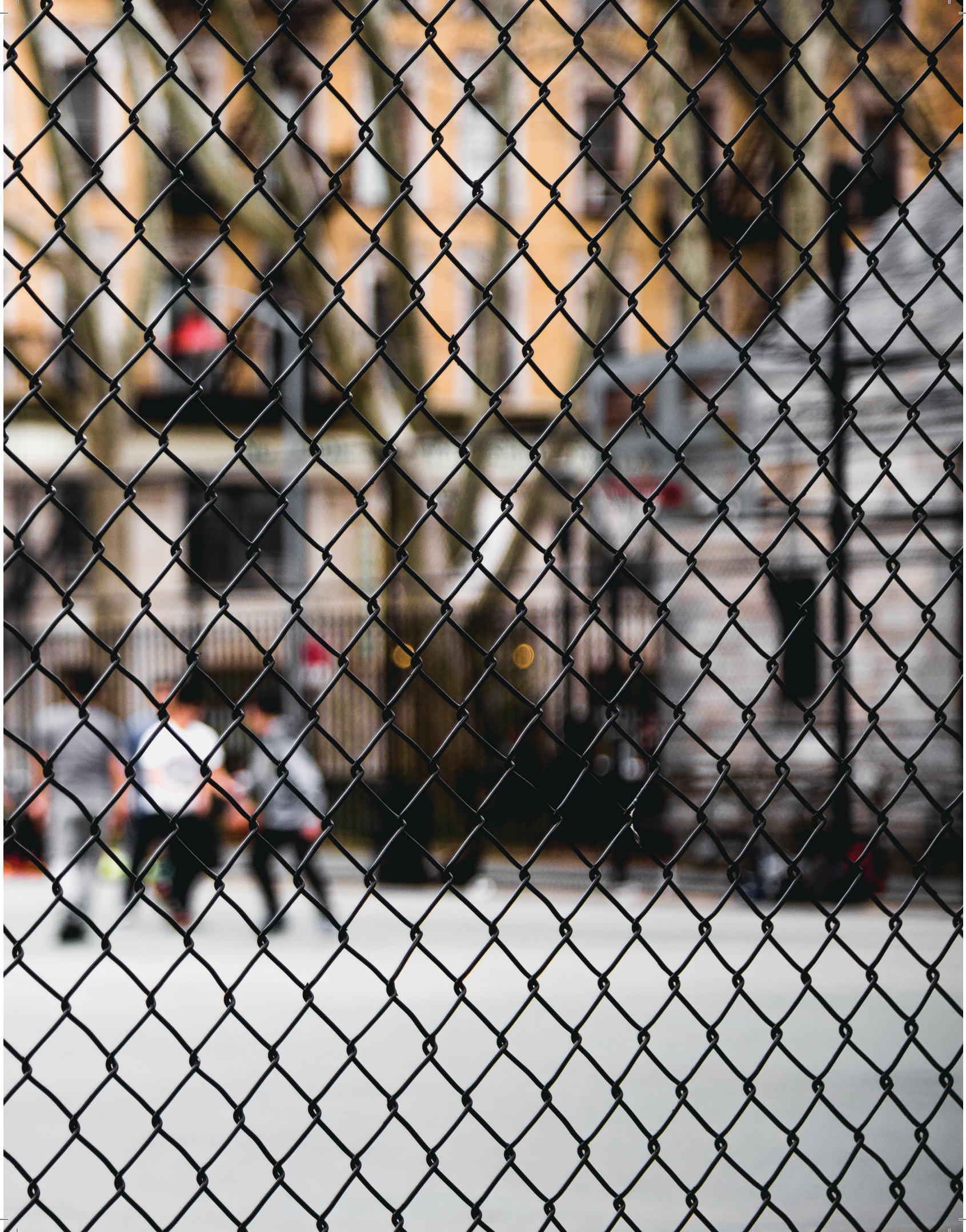
# Features

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CAPE TOWN, SOUTH AFRICA: “Women in poor settings are more likely to engage in high risk behaviors to find an immediate sense of security or to secure a better future. These risky behaviors may include early sexual experimentation or involvement in transactional/intergenerational relationships.”

photo by  
Calvin Qian









# The Rise in HIV among Adolescent Women in South Africa

**JASMINE OKAFOR**

**Public Health Studies, Behavioral Biology**

Okafor spent two months in South Africa working for the Desmond Tutu HIV Foundation on the Women of Worth Project. There she had the chance to engage with adolescent women who are battling challenges in their communities that often lead to risky choices.

In the days prior to leaving for South Africa, nothing felt real to me— not when I was in line for customs, not when I was 10 hours into my flight, not even when I touched down in Dubai. The gravity of being thousands of miles from home didn't hit me until I walked off the airplane into Cape Town, where a sign declared it the "World's Best City in 2016." I had arrived in Cape Town to work with an organization that addressed

the needs of young adolescent women, and could already feel the experience would be just as influential for me.

36.7 million people currently live with HIV worldwide, of which 11.8 million (32.15%) are women between the ages of 15 to 24, and that number is growing. 60% of all new infections in Sub-Saharan Africa occur in young females of South Africa, a problem that has grown to such dire proportions. These high HIV rates

among adolescent women in South Africa are largely correlated with generally low levels of education and high unemployment rates, as they lack the necessary knowledge and skills to protect themselves from HIV infection.

That summer in South Africa, I had the opportunity to intern at the Desmond Tutu HIV Foundation to work on the Women of Worth Project. WOW is an incentive and care research project





**SOUTH AFRICA** (top left) The Tree Ceremony which signifies the start of the women's journey in the program. (top middle) Okafor and the other interns with a few of the facilitators. (top right) Okafor and the other interns inside of Philippi Village. (bottom right) A weekend in Zwelet-hemba with the host family. Photos by Jasmine Okafor.

that serves approximately 10,000 women aged 19-24 who are currently not receiving schooling. Half the women receive 12-month long “empowerment” seminars, while the other half receive a cash incentive, in addition to the empowerment sessions. These sessions are geared towards preparing young women for the modern workplace, with topics ranging from writing a proper CV, dressing professionally, maintaining self-care, and identifying/addressing mental health issues. Both these types of services make up the “care” that the foundation provides, which also provides basic, adolescent-friendly healthcare for the young women in the program.





My role at WOW was very diverse. A large portion of my job involved logistics support, which dealt with missing participant information, mapping locations of schools closest to clinics, ensuring everything was set up for the sessions to run smoothly, and troubleshooting common issues that may arise. In addition, I evaluated the sessions and the facilitators who presented the information to make sure everything adhered to program policy. I also played a role in content development, primarily for new activities, which necessitated creating PowerPoints and sample CVs.

Research has shown that at an infrastructural level, young women are at greatest risk for HIV acquisition when their background reflects low socioeconomic status (SES), high levels of unemployment, and low access to an-

tiretroviral therapy. Poverty, for many in South Africa, is linked to the early death of adult family members, which leaves many children at the heads of their families. Many young women in this position therefore receive very few years of education, which precludes any effective knowledge on reproductive health and awareness of the many services available to them to counteract these problems. In addition, when these women are in these poor settings, they are more likely to engage in high risk behaviors to find an immediate sense of security or to secure a better future. These risky behaviors may include early sexual experimentation or involvement in transactional/intergenerational relationships.

The Women of Worth Project uses its 12 sessions throughout the year to combat these at-risk behaviors that young female

South Africans commonly engage in by helping them transition into adulthood and learn new skills. Many interventions have been and are being implemented to combat the rise in HIV infection, including preventing intergenerational sex, promoting formal education, prompting treatment for sexually transmitted infections, introducing employment programs to reduce poverty, preventing rape/sexual violence, and many others. We hope to reduce the incidence of new HIV infections among young South African women ages 19-24, in addition to combating teenage pregnancy, encouraging pursuit of higher education and employment, and increasing the utilization of health services. Our vision is to give these young women the guidance needed to find their next steps with confidence in their own abilities.





## FEATURES

**SOUTH AFRICA CONT.** (left) Located in Philippi, this is one of the satellite locations of the Desmond Tutu HIV Foundations where Okafor worked. (right) Okafor and the other interns at Table Mountain, a tourist attraction in Cape Town. Photos by Jasmine Okafor.

rative. In consequence, I am trying to be more aware of how it influences my thinking, and adapt accordingly to the appropriate setting I am in. Rather than dwelling on what distinguishes the cultures we cohabit, working with the women of Cape Town has taught me to focus on our commonalities instead - building these transcultural bridges only empower both sides to explore the other.

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Through my time in Cape Town, not only did I learn a great deal from my internship, but I also experienced invaluable personal growth. The things I saw, the conversations I had, and the people I encountered opened my eyes to the infrastructural differences of a world outside the familiarity of America. One instance when these distinctions became clear occurred when I was working on designing a session called “The Apprenticeship”, which was created to provide essential job skills. My responsibility was creating a PowerPoint of sample CVs, for which I drew on my experiences working at the Career Center back at Hopkins, where I help students build their own resumes and CVs. As I began preparing sample CVs that the young women of Cape Town could model theirs after, I was at once struck by the difficulty of tailoring

examples that I was familiar with, examples that students back home could relate to, for the women of Mitchells Plain or Philippi (areas of Cape Town). In many instances, I found myself comparing and attempting to translate my experiences to the young women of South Africa; it was difficult to shake the Western perspective that I had immersed myself in for my entire life. Though it was daunting at first to connect firsthand with these women and their individual experiences, I gradually became mindful of the futility of attempting to translate my life into theirs. The best solution, I found, to surmounting these differences can be as simple as extending a hand, starting a conversation, and listening to their stories.

This experience truly helped me realize that my perspectives tend to fall within the confines of a typical American nar-



# Asking the Difficult Questions: Healthcare Beyond Traditional Medicine

**MAGGIE VITALE**  
Public Health Studies

Vital has been working for Health Leads continuously since her freshman fall and interned with Health Leads during summer 2016. She began the quality improvement study at the Johns Hopkins Outpatient Center during summer 2017, which was presented by the gynecological oncologists involved in the project at the Society of Gynecologic Oncology (SGO) Annual Meeting on Women's Cancer in New Orleans, LA this past March.

**“H**ow are you feeling today?”  
“When did your symptoms start?” “Have there been any changes in your medical history since the last time I saw you?”

These are all prerequisite questions we have answered at doctor’s appointments, questions that we are familiar with and are comfortable answering.

But what if your doctor asked you if you had enough food to eat? Or whether you had a place to sleep at night and electricity in your home? For many of us, these questions may seem intuitive or gratuitous, but the reality is that social wellbeing directly correlates with health.

These are just some of the routine questions we ask at Health Leads, a national nonprofit organization committed to working with healthcare organizations to create sustainable social interventions. Stationed in the Johns Hopkins Harriet Lane Clinic, I was educated and trained on how to approach social health needs and how to access community based resources. As the Harriet Lane Clinic is a pediatric clinic who cater to patients receiving Medicaid, our client demographic mostly consists of young

adults, parents or grandparents caring for young children. Since my first semester at Hopkins, I have learned how to apply for Medicaid and food stamps, how to find food pantries, what the low income

Leads training to the Kelly Gynecologic Oncology Service at the Johns Hopkins Outpatient Center, working with Drs. Rebecca Stone and Stephanie Wethington. We met to discuss integrating

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“Since my first semester at Hopkins, I have learned how to apply for Medicaid and food stamps, how to find food pantries, what the low income housing options are in Baltimore, and more. Most importantly, I have learned how to ask our clients personal questions about topics often deemed as taboo...”

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housing options are in Baltimore, and more. Most importantly, I have learned how to ask our clients personal questions about topics often deemed as taboo or sensitive, and that comfort in communicating social health needs is a necessity for doctors and patients alike.

This summer, I brought my Health

my Health Leads experience into their clinics, and I discovered that the clinic did not have a dedicated outpatient social worker. A major disease like cancer tends to proliferate complex health-related social consequences for the patient. When asked what was the most unexpected lifestyle change they experienced,



many patients claimed they did not expect their subsequent inability to work, through which they often lose income and sometimes their insurance. Overall, it is imperative that cancer patients have access to social care support. After shadowing in the clinic a few times, I worked with Drs. Stone, Wethington, and gynecologic oncology fellow Anna Beavis to create a social health needs screening tool I could administer to patients. I met with the patients in the exam room, oftentimes observing the doctor-patient interaction. Following the appointment, I would sit down and ask the patient a number of questions regarding their current social health, including if they felt they had enough to eat, if they felt they had a good support system, and how often lack of transportation caused them to cancel appointments.

The patient population of the oncology clinic was very different from the Harriet Lane Clinic. The gynecologic oncology clinic is up entirely of women, most of them over the age of 40, but with a wide range of socioeconomic resources and health care literacy. The Harriet Lane Clinic, as a primarily Medicaid based clinic, serves a patient population of relatively similar incomes. While many families at the Harriet Lane Clinic are used to discussing social health resources, the variety of financial stability seen amongst the gynecologic oncology patient population led to an extremely varied response to the questions I was asking. For some, the idea of being without food or stable housing seemed almost comical; for others, my questions prompted long explanations of their current struggles and often hardships from their past. As I was speaking to one woman, she told me: “At the moment, I do not need anything. However, if you were to ask me these questions a year ago, I would have said yes to almost every single one of them. Being without assistance a year ago was one of the hardest things I’ve ever gone through.”

A patient’s social status and needs are imperative information for a provider to know, particularly for patients undergoing long, intensive treatment with radiation or chemotherapy, yet it is rarely

asked about during appointments. Just as every person responds to treatments and medications differently, every person is going to have a different social situation that may or may not easily fit into the current standard of care. As noted before, and especially for cancer patients undergoing chemotherapy, many are surprised to find that they need to take a break from working due to fatigue. For some patients, this causes a great financial struggle and a major stressor, which is problematic when someone is trying to fight a disease or heal from treatment. Social and environmental factors account for 70% of health, whereas direct medical care really only accounts for 10%; in fact, there is a direct correlation between income and premature death, lower education levels, and likelihood of smoking.<sup>1,2</sup> By understanding and supporting their patients’ social health needs, providers are able to treat their patients with equity. Health Leads has set up an excellent method of addressing social health needs in a way that is efficient to implement and effective at supporting patients’ social health needs, addressing the fear of

factors greatly influence a patient’s health and that the ability to address them is an important, yet not well emphasized, piece of the puzzle to achieving complete and comprehensive healthcare. My hope is that this knowledge and understanding will spread to more and more healthcare organizations. It is up to us as students to keep the importance of this aspect of healthcare in mind no matter what direction we go, and it is up to us as leaders in the public health field to promote such an effective method of promoting human health.

Many patients, regardless of whether they screened positive or negative for any social health needs, have expressed gratitude that the clinic is taking an extra step to help and support them. Overall, supporting a patients social needs reminds them that they are not facing life alone. Even something small like helping a patient receive a food basket at Christmas can make an incredible impact, and I myself am grateful for the opportunity to build relationships with patients and offer them as much support as we can provide.

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“The recognition that environmental and social factors greatly influence a patient’s health and that the ability to address them is an important, yet not well emphasized, piece of the puzzle to achieving complete and comprehensive healthcare.”

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some providers or health organizations that social need screening will slow down the flow of appointments. With the success of our initial screening, we are now in the process of rolling out social needs screening to all of the Gynecologic Oncology clinics, and other clinics have also expressed interest.

Medicine is constantly changing for the better, with new techniques and treatments identified every day. The recognition that environmental and social

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# Standardizing Digital Healthcare, Enterprise by Enterprise

**SAMI AYELE**

**Natural Sciences, International Studies**

Helium Health is tackling a critical issue in Nigeria's health systems infrastructure: lack of a reliable and streamlined platform for patient data. Ayele spent two months in Lagos working with the team, learning the ins and outs behind negotiation and strategy while expanding their partnerships.

**T**he question of strategy draws all figures in healthcare – investors, entrepreneurs, directors, and on-site staff – back to the drawing board. How best to approach an ecosystem as delicate as West Africa is not an exact science, and leading figures in the field are not publishing their secrets. Helium Health offers a potential solution - it is a platform for reliable and comprehensive health records, a major step towards opening the field to greater collaboration and progress.

Synthesizing thousands of records and data and making them available as public information through the platform

was only possible through the efforts of long-standing executives and nascent startups with visions of their own. Startups in West African cities like Lagos have been experiencing a time of great development, and I was eager to dive right in. My time as an intern with OneMedical, learning its origin story and working with its dedicated employees, revealed to me much of the Lagos start-up world and the intense efforts being made to improve the human condition in West Africa.

My experience stemmed from meeting CEO and Whiting School of Engineering graduate Adegoke Olubusi at fellow junior Peace Obi's birthday celebration

this past spring. The conversation we had allowed me to get to know him and the company better. As a result, I received an offer to intern in Lagos over the summer, and months later, I arrived at Murtala Muhammed International Airport on July 5<sup>th</sup>.

When I arrived, I quickly learned that the state of Lagos's health records was in dire need of repair; although clinical staff could track down patient files for regular consultations, the established system failed to produce real-time health data. Towering stacks of folders with patient information could be found abandoned in decrepit hallways or rooms occupied solely by bookshelves. While attempts may have been made to order patient files by name and schedule visits, standardizing the quality of record management efficiently remains highly difficult.

Obviously, thousands of hospital staff in Lagos – in institutions both large and small – have not overlooked the effectiveness of electronic health records (EHR). However, distrust towards EHRs and the companies that make them remains high among medical directors and board investors in West Africa. They are suspicious of a panacea, a “one solution” to all their record-keeping problems, which EHRs claim to be; they have seen several failed initiatives come and go, and they have become (rightfully so) doubtful of



**THE TEAM** The team behind Helium Health. Photo by Sami Ayele.





any further attempts.

In hopes of addressing these issues, Helium Health is currently undergoing a period of great transition. In its first year, the company has partnered with 16 healthcare facilities, ranging in specialty and size, in addition to signing contracts with University College Hospital, Ibadan (UCH, Ibadan) and Muhammed Murtala Teaching Hospital in Kano State. Expansion also continues with enterprise-grade entities, such as Zenith Bank and Hygeia Insurance. What is important to note is that Helium Health's services are not advertised as a "one-step" solution for all of Africa's healthcare infrastructures. It is a tailored product for conditions the hospital staff is accustomed to, a set of opportunities and constraints Helium Health works within.

Challenges, of course, continue to persist, especially when tailoring customizations to the system for each facility. As these preferences are communicated, it takes time for programmers to develop the changes on the platform. It can take up to several days for these same edits to appear bug-free. From my short time in Lagos, I also noticed that calls for customizations do not end with just a few—as the facility grows with Helium Health, so do the number of customizations. This

theoretically means the company's platform will continuously grow to meet the up-and-coming needs of future facilities.

Teaching users and instilling confidence in the system still remains a sizeable hurdle; the public health system in the past has been inundated with attempts at achieving streamlined care. Training staff in their respective capacities on the platform can take days. For example, a pharmacist may be shown how a prescription may appear in her inbox, how to complete the form, and how to properly dispense the medication. Nursing staff, on the other hand, needs to be familiar with how to communicate with individual staff members and "grouped" physicians and specialists alike. Covering a full-scale hospital may take weeks, especially due to specific ways of management seen in some clinics. The product certainly allows for changes of this nature, but these changes take time.

Despite the growing challenges of the project, Helium Health delivers promising impact for data retrieval in Nigeria. Cholera, lassa fever, and meningitis are just three recent outbreaks that have taken place in various states across the country. How different would the public health system look like with verified records of millions of people? He-

**LAGOS LAGOON** A sunset look over Lagos Lagoon. Photo by Sami Ayele.

lium Health allows us to collect precise numbers of incidences, their geographic locales, health vitals, past medical history, and other information of statistical importance. What resources could be redirected for other health initiatives given these improvements? Again, Helium Health is not the "Holy Grail" of healthcare data, nor is it claiming to be. Helium Health is stepping into private sector territory to target, address, and resolve a public health vacuum that has been going on for far too long.

The overarching highlight of my internship was the ability to work closely with a number of like minded partners who are heavily involved in healthcare technology, healthcare management, or financial technology investment in Lagos. During my stay, I was fortunate enough to have met many individuals that may continue to serve as my mentors. I am eager to see how the company continues to grow as it makes strides in the sports management field and partners with the upcoming Lagos City Marathon in 2018.





photo by  
Eric Chen





# In focus

Read a few stories of Baltimore that we have compiled from our staff members.



Through volunteering in health disparity-focused organizations like Health Leads, I've learned how crucial it is to know one's own community to be an effective healthcare provider. In the scope of public health, for instance, the difference of a few neighborhood blocks in Baltimore could mean decades off the average life expectancy; similarly, when patients are assigned a dietary plan as part of their health treatment, such nutrients may not be readily available to them because of the presence of food deserts where they live. Baltimore has forced me to recognize that anyone in the city could really be a potential patient- and in that sense, these intracity variations in living conditions prove an essential factor to consider as a health provider.



My first winter volunteering at Hopkins' hospital, I was surprised by the sudden increase in the number of patients from the fall. Many of them would come in saying they simply did not know what was wrong and needed to see a doctor. They would often ask me for blankets and sheets. Eventually it was evident many patients were homeless and in need of a warm place to rest. It truly emphasized how more facilities should be made available to help get the homeless off the streets, particularly in the brutal Baltimore winter months.

I volunteered one summer at a STEM summer camp for students at Barclay elementary/middle school and at the end of the entire camp, my students made me a colorful friendship bracelet. I lost the bracelet, but will forever remember the students' names and how grateful I felt to have spent my summer with them.



**baltimore an**






Volunteering at MERIT Baltimore has made me really fall in love with working in Baltimore's community. It always fills me with inspiration and excitement when I see the MERIT scholars hard at work - every Saturday, without fail, they come in to work on a multitude of things, like improving their SAT scores, working on their college essays, gaining exposure to research, to name a few. Their dedication to their goal of one day working in health care makes me wonder what I can do better myself, not only as a volunteer but as someone who also aspires to enter the health care field. I hope that I can help to the best of my ability to empower these students to achieve their dreams.

I was attempting to stuff a crumpled dollar bill into a vending machine at a local eatery in order to stuff my face with some chips. The machine completely sucked up my dollar bill with no snack in return. Livid and hungry, I rolled my eyes and angrily kicked the bottom of the machine. A kind man saw me in the midst of my tantrum and without word, inserted enough quarters to buy me a bag.

When I say I'm from Baltimore, people sometimes ask me, "Is it like the Wire?" It's upsetting because what the news show about our city - the violence, the crime - they don't show the love that's also there in our community. Baltimore is a good place, and it has a bad rap. We just need to reach out to each other because we're all humans.



There's so many different people here from different walks of life, all the way from Upton to Charles Street. I really like the community here, and the more time I spend in Baltimore, the more it starts to feel like home.



nd beyond





# Policies

SHANGHAI, CHINA: “Pharmaceutical sales representatives developed close relationships with many doctors, leading to an alignment of interests between drug manufacturers and doctors who benefit financially from these partnerships.”

photo by  
Calvin Qian







# Addressing Lead Exposure Among Foreign-Born Youth In Baltimore City

**RAIHAN KABIR**

**Molecular & Cellular Biology**

Kabir has worked closely with Baltimore City youth through various service-oriented endeavors for the most part of his undergraduate career. Where factors beyond an individual's control shape their long-term health and future in society, policy may be the most effective treatment.

## PROBLEM OVERVIEW

**H**ow a nation upholds the well-being of its vulnerable populations through policy takes precedence in outlining the foundation of equality and general welfare. Both age and immigrant status are characteristics that confer vulnerability onto an individual.<sup>1,2</sup> Considering the large and growing population in Maryland characterized by the latter—immigrants, refugees, and other displaced persons—this paper addresses the sources of vulnerability and the mechanisms that construct a disproportionate risk of negative health and social outcomes for individuals at the intersection of these sub-populations: foreign-born youth ages five through nineteen residing and attending school in Baltimore City.<sup>3</sup>

Children of immigration, displacement, and refuge not only have greater biological and social sensitivities to environmental exposures and familial circumstances, respectively, but they also (1) bring prior exposures and experiences unique to their backgrounds, and (2) face barriers in assimilation that may compete with their past and are exclusive to their experience as minors; factors within these outstanding categories aggregate and precipitate as an array of physical, psychological, and social burdens.<sup>4</sup> Health

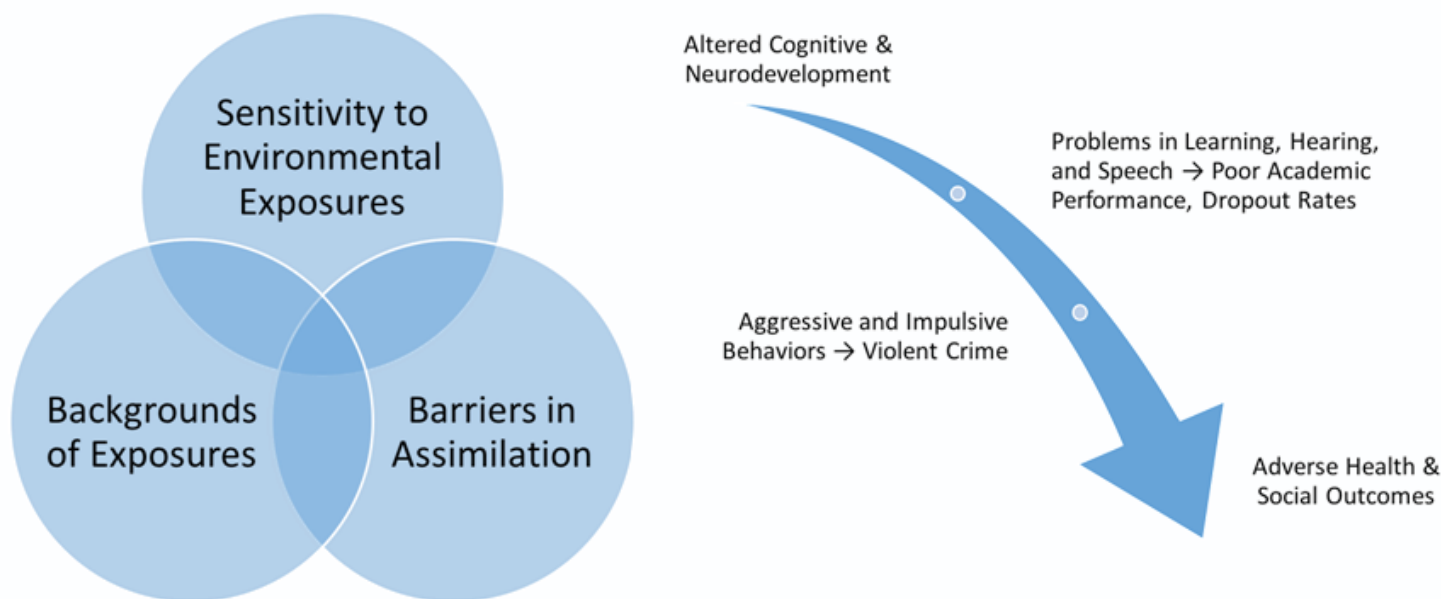
profiles of refugee children in the nation reveal elevated blood levels (EBLs) as a major concern for individuals from major countries of departure, which compounds with lead already found in Baltimore.<sup>5,6</sup> Evidence thus draws attention to environmental health among foreign-born youth as a concern that should be prioritized for policy intervention.

Children who have immigrated to Baltimore City, whether by choice or by necessity, are shown to endure disproportionate burden by toxic environmental exposures and psychological distress. According to the Agency for Toxic Substances and Disease Registry, low levels of lead exposure in children are evidenced to affect neurodevelopment such that no dose is safe; these biological changes are expressed as a reduced growth rate, which causes problems in learning, hearing, speech, behavior, and downstream academic achievement.<sup>7,8</sup> Children are made vulnerable not only by their sensitive, immature biology, but also by their unique behaviors including (a) environmental intake patterns greater than that of the average American adult, as children drink more water, breathe more air, and eat more food pound for pound of body weight, and (b) social and play patterns that prolong their confrontation with environmental elements.<sup>1</sup> Coupling the vulnerabilities associated with biolo-

gy and behavior, lead exposure presents a significant burden on children, especially for foreign-born youth who immigrate with prior exposure to lead.<sup>1</sup> Lifelong effects of childhood exposure to lead have thus been justifiably correlated to dropout rates, which have been demonstrated a seven-fold increase in likelihood, as well as poverty rates, and criminality in adulthood.<sup>10</sup> Further consideration of psychological traits that arise from childhood lead exposure, shown to correlate with aggressive behavior, paired with the psychological stressors of immigration, substantiates the characteristics of vulnerability among foreign-born youth and the mechanisms leading to disproportionate risk.<sup>4,10</sup>

Considering that the advantages of addressing these vulnerabilities extends to greater populations of Baltimore City, the burdens imparted by intervention are assuredly outweighed. Policies targeted at reducing lead exposure among youth in the city would benefit a greater range of vulnerable populations, including the one in six children found to have EBLs in Baltimore and biologically vulnerable women of reproductive age, mitigating not only physical health concerns but also psychological stressors and the social issues that emerge.<sup>6,9</sup> Historically, efforts to reduce lead exposure, such as the removal of lead from gasoline by the Clean





R. Kabir, Johns Hopkins University (2018) for *Epidemic Proportions Undergraduate Public Health Journal*

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Air Act (CAA), have directly prevented the development of cognitive deficits associated with aggressive and impulsive behaviors. By targeting an upstream determinant to health and behavior, the CAA was responsible for not only a majority of a decline in violent crime, but also a restoration in intelligence quotient (IQ) by 2.8–4.9 IQ points, which raised worker productivity by 4.9–11.7%, and yielded an economic benefit of \$110–319B, empowering the overall population.<sup>7,10</sup>

## POLICY OPTIONS

Maryland Department of Education may establish a blood sampling requirement for all new students entering the Baltimore City Public School system to determine pre-existing lead concentrations. By having newly-arrived children test their blood lead levels and report the values, attention would be brought to the health implications of lead exposure, which would confer caution regarding exposure and ultimately deter further accrual of lead among foreign-born youth. Additionally, institutions would not only receive novel data associating blood lead levels with location of departure, which may reveal detailed trends between local and foreign-born populations, but they

would systematically adopt a greater awareness of the developmental challenges among children with EBLs, which would promote an eventual adjustment of education and counseling to better suit affected groups.

Expanding upon the existing statewide requirement to screen for hearing and vision for students entering the school system, entering fourth, fifth, or sixth grades, and entering ninth grade, Baltimore City Public Schools may also call for regular lead screening of drinking water to safeguard foreign-born youth from further negative impact. By (1) testing water in fountains and sinks in schools for lead at stricter levels than nationally enforced, and (2) requiring them to display informative signs should elevated levels be detected until addressed within a certain period of time, foreign-born youth would avoid accumulating more exposure than allowed for an individual born in the country, and the displays would deter immigrant parents and refugee case managers from enrolling children at the institutions until adequate filtration is installed.

Ultimately, Maryland State legislation has the option to directly combat a major source of lead exposure facilitate

the financing of lead abatement on the basis of financial accountability. Considering that lead hazards found within building infrastructures such as paint were utilized until the nationwide ban in 1978, manufacturing agencies such as Sherwin-Williams, a major industrial entity in Baltimore City, may be attributed with liability for remediation.<sup>11</sup> Requiring these lead paint manufacturers to finance a lead restitution fund for municipal renovations and preventative intervention, part of which would be allocated for foreign-born youth, would remove financial barriers and promote lead exposure reduction.

## RECOMMENDATION

Baltimore City Public Schools should enact district-wide policies requiring (a) regular testing of drinking water with (b) standards more stringent than enacted by the Environmental Protection Agency (EPA) and (c) signs to be prominently displayed at locations of any hazard until tests show insignificant levels of lead. Screenings of newly-arrived children would yield beneficial data, but intervention would be reliant on institution-side changes in educational methodology with barriers that may render the policy



# Baltimore City should regularly test drinking water with higher standards in public schools, requiring *public display of non-compliance* until tests show insignificant levels of lead.

R. Kabir, Johns Hopkins University (2018) for *Epidemic Proportions Undergraduate Public Health Journal*

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ineffective, especially considering that damages from lead would have already been committed. Although resources may be allocated to the abatement of lead hazards, specifically by requiring lead paint agencies to contribute to funds financing intervention, it is difficult to retrospectively establish liability of lead paint to a specific entity, and the capital garnered by such policy would be outweighed by economic returns obtained by efforts targeting prevention. Holding schools accountable for lead in drinking water at a standard higher than that held nationally takes the prior lead exposure of foreign-born youth into consideration. Additionally, by systemically recognizing and conferring importance to lead exposure as a major environmental concern that influences health and behavior, children and families are ultimately empowered with both a better understanding of the toxin and the ability to make informed decisions regarding exposure when choosing a school for enrollment. Altogether, these requirements not only prevent further accrual of lead and its negative health outcomes but also promote a positive social narrative and institutional attribution of the developmental challenges associated with childhood exposure to lead.

School officials may suggest that labeling lead-tainted water would both (1) financially burden and (2) inconvenience schools to obtain third-party services. Whereas Baltimore City now spends ~\$500K each year on bottled water in addition to the costs incurred by outsourcing lunch due to their lack of access to clean water, with teachers reporting that staff attention is directly diverted when elevators are out-of-service, current efforts to circumvent installing direct solutions to lead-contaminated water are counterproductive. Additionally, considering that the latter long-term, preventative measures have a return of \$17 to \$220 for every dollar invested, the effective course of action as a result

of this policy would be to renovate water outputs with filters, which have a yearly cost less than that of bottled water services alone.<sup>13,14</sup>

## CONSIDERATIONS

Implementation of school-wide policy addressing lead exposure among foreign-born youth is contingent upon not only political sentiment towards both immigration, refugees, and the environment, but also upon stakeholder concern and support for the primary source of vulnerabilities (lead exposure) and the disproportionately affected population. Attitudes toward immigration translate into public backing of any policy targeted to particularly benefit foreign-born individuals; should sentiment remain isolationist or anti-immigration, the recommended policy would face greater barriers to pass and effectively implement. Additionally, separate from the national sentiment towards non-U.S. citizens, attitudes towards the gravity of environmental considerations such as lead exposure and its downstream effects are a major factor of policy implementation. Should there be limited concern for the environment, perhaps as a result of limited public awareness of risk attributable to lead, even full public support for foreign-born youth may prioritize other sources of vulnerability and sidestep the outstanding issue of lead exposure. Ultimately, the effectiveness and success of policy implementation relies on support from the school. As a major stakeholder in this recommendation, they're at liberty to divert attention to other vulnerabilities within the school system, but must take initiative upon the identification of non-compliance (demonstrated lead in drinking water) and act as intended by both installing filters and/or replacing lead piping and acknowledging the significant adverse health and social effects of lead exposure as an institution.

Successful intervention targeting the adverse health and social outcomes of

lead exposure among foreign-born youth should consider collaboration between (a) local, state, and federal agencies and philanthropic organizations, (b) state and federal health agencies and insurance programs, and (c) schools and the parents of lead-poisoned children. Schools that participate in the National School Lunch (NSLP) and Child and Adult Care Food (CACFP) programs must provide children with free potable water as a requirement of the Healthy, Hunger-Free Kids Act, overseen by the U.S. Department of Agriculture. Both federal and state government agencies such as the U.S. Departments of Health and Human Services (HHS) and Education and the Maryland State Department of Education would organize a task force to regularly test and enforce compliance of screening policy. Baltimore City Health Department, Maryland Health Care Commission, and other health agencies would coordinate with Baltimore City Public Schools as well as Medicaid and the Children's Health Insurance Program to provide financial resources facilitating the testing and reporting of lead levels as required by the proposed policy. Concurrent with the screening policy, schools would ideally provide targeted academic and behavioral interventions to lead-exposed children to decrease the likelihood of the vulnerable population engaging in destructive practices and increase that of them earning a high school diploma. Assessment of psychological and developmental needs may be facilitated by the Centers for Medicaid and Medicare Services and education and care programs may be financed by HHS as well as federal and state departments of education. Granted the structural and financial resources to execute the recommended policy, its overall success may be measured in the short-term by reduction of schools with lead-contaminated water and in the long-term by the attributable increase in academic performance via standardized test scores and graduation rates.



# Conservative Estimates Justify “Financial Burden”

“Public health and housing policy has been slow to address these remaining lead poisoning risks, moving incrementally with targeted, more reactive policies. If the cost of proactive and universal lead hazard control is seen as prohibitive, the costs of inaction have proven to be significantly greater. **For every dollar spent on controlling lead hazards, \$17–\$221 would be returned** in health benefits, increased IQ, higher lifetime earnings, tax revenue, reduced spending on special education, and reduced criminal activity.”<sup>1</sup>

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R. Kabir, Johns Hopkins University (2018) for *Epidemic Proportions Undergraduate Public Health Journal*

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## FUTURE DIRECTIONS

Baltimore City Public Schools may implement both the policy and the means necessary to regularly test lead in drinking water, but additional policy measures are necessary to improve adverse health and social outcomes among foreign-born youth in the context of lead exposure. Housing policy encouraging the removal of lead from infrastructure carrying drinking water to urban residences, which are disproportionate to low-income families, especially those with foreign-born children, would target another major origin of lead risk for youth. By identifying and remediating these lead-containing pipelines that service low-income homes built before the ban on lead in construction, the acting policy would facilitate the reduction of a significant source of lead and the downstream health and social outcomes. Educational policy may facilitate access to education and care programs, financed by the HHS and U.S. Department of Education, that utilize an evidence-based approach for academic and behavioral intervention targeted towards children with EBLs. Consideration of the developmental challenges of children with EBLs, especially among foreign-born youth who may need additional specialized attention, would circumvent unjustified attribution of negative performance to the individual as opposed to environmental predisposition. Nutritional policy may expand upon the services provided by U.S. Department of Agriculture food programs such as National School Lunch Program and the Supplemental Nutrition Assistance Program such that beneficiaries

of nutrition-related services also receive advice concerning lead reduction in the home; within experimental implementation, children in the intervention group exhibited improved educational achievement and reduced antisocial behavior.<sup>15</sup> Considering that these additional policy measures systematically target a major source of vulnerability, provide equity to those already made vulnerable through education, and avoid further vulnerability through behavior change, the primary policy recommendation is only a stepping stone in upholding health and general welfare among foreign-born youth in Baltimore City and beyond.

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# Sinopharm's New Initiatives – Helping to Control the Scourge of ‘Hongbaos’ in the Chinese Medical System

**JIA YAO KUEK**

**International Studies, Public Health Studies, East Asian Studies**

Kuek, a senior, is an avid globetrotter who looks forward to serving in the Singapore Armed Forces upon graduation. He loves reading and horse-riding in his spare time. After graduating in May, Kuek is headed to Harvard for a Master's Program in 'Regional Studies: East Asia'. This article is based on 1) A sharing by Ms Emilie Yang (Assistant General Manager, Sinopharm Group Co. Ltd) on 19/10/17, at Fudan University's International Cultural Exchange School, and 2) A visit to Shu Guang Hospital in Shanghai on 27/10/17.





**MEDICAL SYSTEM** (left) A customer pays for her medicine at a pharmacy. (right) The exterior of Shuguang Hospital in Shanghai. Photos by Jia Yao Kuek.

The regression of China's health-care system since the 1980s, as well as various healthcare reforms designed to stem the decline, has mostly revolved around a debate between market-led privatization and government-led health systems. The breakdown of pre-1980 Maoist health insurance system and failure to rebuild an effective health safety net in the 80s and 90s contributed to an enormous growth in demand for affordable health-care. This failure of reforms during the 1980s and 1990s was in part due to inadequate attention to key aspects in health governance, such as strategic interactions among government, providers and users, as well as incentive structures shaping their preferences and behaviour. A corresponding weakening in government financial commitments to the health sector have undermined the capacity and capabilities of public hospitals in China to provide affordable healthcare - precipitating a transition towards hospitals run on commercial lines, as opposed to the previous system of socialized medicine.

China's existing public healthcare system centers on three national healthcare

insurance schemes - the Urban Employees Basic Medical Insurance in 1998, New Rural Cooperative Medical Insurance Scheme (NRCMS) for the rural population launched in 2003, and the Urban Residents Basic Medical Insurance (URBMI) for urban migrant workers, children, students, elderly, and disabled, in 2007. Despite the above-mentioned decline in quality of healthcare, China has made great strides in the area of health insurance coverage - by 2014, over 97% of the rural population had joined NRCMS, while 60% of the target population had joined URBMI. These national health insurance schemes were supplemented by a wider push in 2009 by the Chinese Ministry of Health - encapsulated in the Healthy China 2020 vision - to provide universal healthcare access and treatment by 2020, centered on chronic disease prevention and promotion of healthier lifestyle choices.

Such efforts are set against a backdrop of existing and serious deficiencies in China's primary care system - further aggravated by rampant bribery and kick-backs colloquially referred to as 'hong-baos' or red packets. Despite their status

as government-run institutions, public hospitals have traditionally received little government funding. Market-oriented economic reforms, and corresponding health system reform implemented in the early 1980s gave more autonomy to hospitals that lacked public finance funding, but in turn also encouraged these public institutions to cover their expenses with medical care profits. This health system reform diluted the welfare and social service nature of public hospitals by profit-seeking motives. Healthcare reforms during the 1980s and 1990s also enhanced the position of providers vis-à-vis other actors, which allowed them to exploit users and evade accountability to the government. As such, pharmaceutical sales representatives developed close relationships with many doctors, leading to an alignment of interests between drug manufacturers and doctors who benefit financially from these partnerships (for example, as investigators in clinical



## POLICIES

trials or speakers at industry-sponsored seminars). Depending on the volume of specific drugs that the doctors managed to sell, they would gain a commensurate commissions or kickbacks. Research indicates that when doctors incomes are linked to drug sales, as is the case in most clinics and hospitals in China, this leads to higher drug expenditure per capita.

An established system of kickbacks and illicit payments tapped into the aforementioned pervasive pattern of underfunding (hence, hospitals' excessive dependence on drug sales for income), and low pay for doctors. Despite its socialist foundations, China has gradually allowed more private insurance players to enter the market. In 2015, the private health insurance sector in China was worth RMB 241 billion (\$36.7 billion). While still much smaller than the almost \$600 billion US private health insurance sector, the high growth rates (of around 36% annually since 2010 in the Chinese market) point at the enormous growth potential of the Chinese market, as well as an emerging two-track model for healthcare provision (and accompanying diagnosis-related groups) in China emerges: a basic government-managed healthcare insurance system, as opposed to a private insurance-funded (or directly out-of-pocket) provision of additional treatment, procedures, and medications. One example is cancer treatment: Citing the example of Ms Yin Jinding from a rural part of China and diagnosed with cervical cancer in 2015 - the government covered a large proportion of her chemotherapy fee (70% reimbursement of her chemotherapy and radiotherapy), although she had to bear the full cost of her hospitalization expenses, bed fee, in-dwelling needles, as well as heating and cooling fees.

Facing these challenges, a new round of health system reforms were implemented in 2009 by the Chinese government - to ensure an equitable distribution of healthcare resources, and a general improvement in healthcare accessibility. In this piece, I use the specific example of Sinopharm's recent pilot project in taking over the management of several hospital pharmacies in Shanghai as well as streamlining the procurement process for hospital pharmaceuticals. These proj-

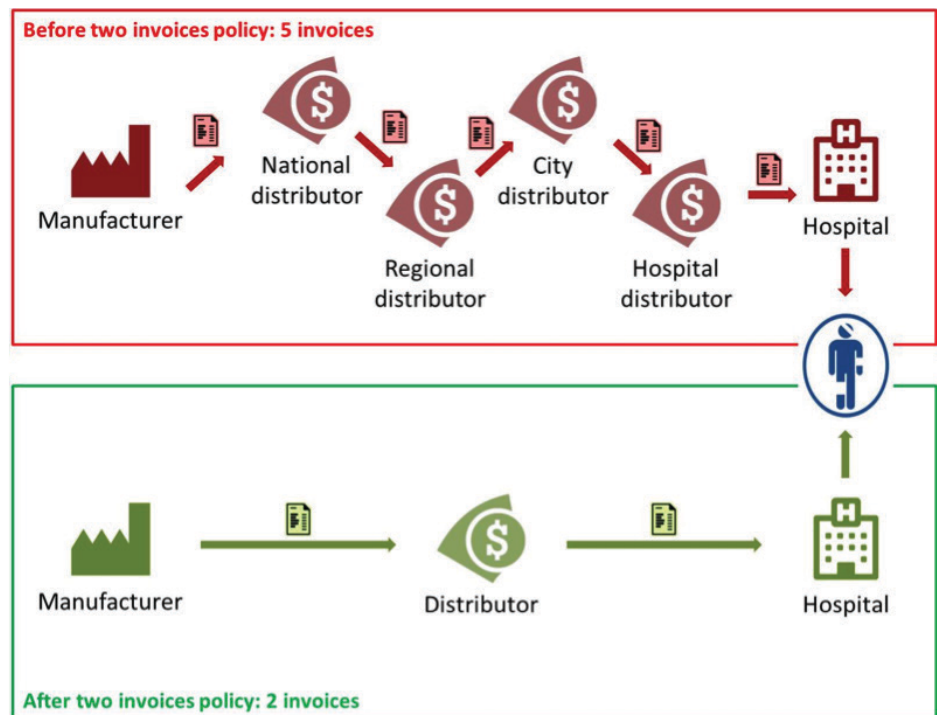
ects were initiated in alignment with the national government's larger goals for healthcare reform in China, to improve and reduce inequalities in population health, and were part of larger, national-level efforts.

As such, part of the 2009 medical reforms in China included a pilot project to divert the management of several Shanghai hospitals' pharmaceutical departments to be under the direct control of Sinopharm. Under this new arrangement, Sinopharm staff and management would oversee the manufacturing, ordering, and distribution of drugs directly to patients in these hospitals, rather than going through hospitals' in-house pharmacies. Sinopharm is already the largest operator of retail pharmacies in China in terms of revenue with a network of 3,268 pharmacies as of end-June 2016. These pharmacies are run under Sinopharm's 'Guoda Pharmacy' subsidiary - selling over-the-counter drugs outside of hospitals.

This new model (where pharmaceutical departments are run by Sinopharm) necessitated a huge investment by the company. The total investment by Sinopharm was to the tune of approximately 20 million RMB (\$3.2 million) - run-

ning the gauntlet of technical and procedural improvements. Changes have involved both technical and theoretical expertise. On the technological end, new automated drug dispensing machines have been introduced. I witnessed these new automated systems on a visit to Shu Guang Hospital - the automatic dispensing machines had been imported from the US, and worked without a hitch while we were there. In the procedural sphere, Sinopharm has leveraged upon, and improved, their own vast and well-developed domestic logistics network; with strategic plans focused on establishing county-level markets and strengthening Sinopharm's existing pharmaceutical distribution network layout.

These new reforms drastically reduced the likelihood of corruption and hongbaos by mandating a removal of the 15% markup that hospitals used to place on any drug or medicine orders they sold to patients, as well as removing entirely the role of any intermediate pharmaceutical sales representatives. The Chinese government further enforced the removal of middlemen in original pharmaceutical sales and distribution channels by introducing a two-invoice system. With only two legal invoices issued from man-



**FIGURE 1** Before and after the introduction of a two-invoice system.<sup>20</sup>  
Photo by Jia Yao Kuek.



ufacturer to hospital, any additional intermediate transaction would thereby be considered illegal. The government introduced this change on the rationale that fewer distributor layers would lead to more transparent and smaller distributor margins, more compliant business conduct, and an eventual consolidation of the distributor landscape

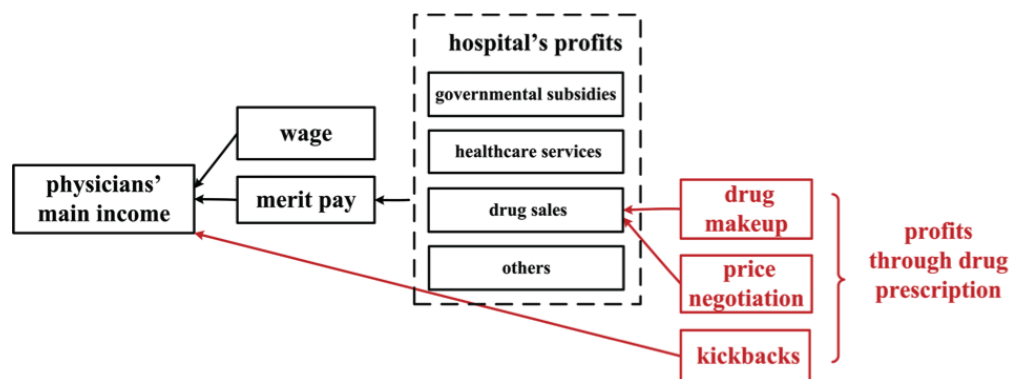
However, removing the 15% markup on drugs has made it harder for hospitals to cover their operating costs. As aforementioned, the budget sheets of public hospitals are already under heavy stress due to a lack of funding. Since a majority of Chinese citizens are covered under public insurance schemes, the Chinese government has to ultimately reimburse public hospitals for resulting medical costs. Hence, in order to push down national healthcare expenditures, the government sets a cap for public hospitals on how much they can spend on healthcare provisions. Any excess spending has to be covered by the hospital's own budget. The above issues are reflective of tensions between the national government's efforts to rein in healthcare costs in the national budget while keeping healthcare affordable for patients, versus the reality of limited budgets for hospitals on the ground. While helping to combat the problem of corruption on one hand, this solution places further pressure on hospitals, challenging them to maintain financial stability and high quality of care for patients.

Aware of this wide gap between hospital revenues and expenditure, the Chinese government has also pursued other avenues to ameliorate hospitals' budget shortfalls, or increase the operating efficiency of public hospitals. In particular, the government supports hospitals' efforts to develop new areas of biomedical technology and medical provision quality, for example with investment in technology for online healthcare products, and information sharing on cloud systems. Alternatively, hospitals sought to find alternative sources of revenue, for example from new, capital and technology-intensive departments – providing treatments not included under the basic national healthcare insurance plans – leading to the aforementioned two-track model of diagnosis-related groups. For

example, Shu Guang Hospital has set up an IVF centre for robotic-treatment surgery. Such procedures (or even drugs) are not included in the three public health insurance plans.

Another potential way to supplement hospital revenue is by raising doctors'

on a national level often seems at odds with the ground-level reality of cash-strapped public hospitals, in institutions such as Shu Guang Hospital. That being said, China's healthcare achievements in improving health insurance coverage under the three public health insurance



**FIGURE 2** Different ways for hospitals and physicians to profit from drug prescriptions.<sup>21</sup> Photo by Jia Yao Kuek.

consultation fees. All these new initiatives serve as a form of optional and additional out-of-pocket services that help hospitals balance their already strained budgets, while still maintaining the core basic healthcare services that can be covered under the national insurance schemes. These initiatives are still in their nascent stages, and the jury is still out on their success in improving the financial viability of public hospitals such as Shu Guang Hospital.

Sinopharm's initiatives are just one aspect of much larger reforms within China's healthcare system. The Chinese government's efforts, or indeed any discussion about healthcare reform in China, taps into a common theme of China's 'national condition' with challenges that are different from other countries. It would be difficult in any healthcare system to combine socialism and healthcare equity with the quality and efficiency of healthcare that often comes about in market-driven economies such as the United States. This, without even taking into account the sheer scale of China's population, geographic spread, and systemic healthcare challenges. There are multiple interest groups all while the tension between central government healthcare aims to control expenditure

schemes thus far, have been significant.

In sum, the reforms since 2009 in promoting healthcare infrastructure development, reducing costs and broadening insurance coverage, as well as catalysing new areas of investment, set out an ambitious vision for China's healthcare sector in 2020. However, the fundamental problem of a power imbalance between the government and users, vis-a-vis medical providers, remains. The reforms will not be successful if more attention is not paid to the strategic interactions among government, providers and users, as well as incentive structures shaping their preferences and behaviour, and governance arrangements are not improved. Furthermore, the national government's efforts to control spending on the public insurance schemes have contributed to high deductibles and copayments, with relatively low total reimbursement rates, thereby running counter to the core premise of the national health insurance schemes in aiming to improve healthcare affordability and equity.

In the wider picture, many of these initiatives are not curative – simply serving as a temporary panacea to much more long-term trends and demographic burdens such as an ageing population, transition from communicable to



non-communicable diseases, and spread of unhealthy living habits (tobacco smoking, unhealthy diets etc). It remains to be seen how China will account for these future challenges in shaping the development of its public healthcare system – specifically, to build in excess capacity for healthcare provision.

Ultimately, when placed in a uniquely Chinese context (world’s largest population, increasing wealth inequality, a stark urban-rural divide), these problems call for creative solutions. Amidst a call from the Chinese government in promoting twin goals of entrepreneurship and innovation, there still remain obstacles in how China will systematize a culture of innovation in its healthcare sector – implementing useful funding and care provision models on a scale that would be unprecedented anywhere else in the world. In addition, considering President Xi’s call for China to move up the global economic value chain, the efforts of Chinese hospitals’ efforts to offer greater quality of care (specifically, the cutting-edge, high-cost services mentioned above, that would help supplement hospitals’ revenues), and the larger Chinese pharmaceutical industry’s efforts to expand the domestic pharmaceutical R&D sector, will be a key driver in this rebalancing of the Chinese economy.

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12. A Diagnosis-Related Group (DRG) is a statistical system of classifying any inpatient stay into groups for the purposes of payment.

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15. As highlighted in the aforementioned Healthy China 2020 program. In 2009, China’s Xinhua news agency reported on the State Council Healthcare Reform Leading Group’s order for all provincial-level administrations to select several cities that would carry out state-run hospital reform pilot projects. Nonetheless, in relying on this single case-study, I acknowledge the limitations to the wider applicability of my research. The geographical specificity of my case study precludes any conclusions about China’s wider public healthcare network.

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23. Shu Guang Hospital in Shanghai, affiliated to Shanghai University of Traditional Chinese Medicine, is spread over two campuses, providing 1320 beds in total. The hospital has more than 70 departments employing over 1900 staff, and provides both western and traditional chinese medical services.

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27. <https://www.mckinsey.com/industries/healthcare-systems-and-services/our-insights/private-health-insurance-in-china-ifnding-the-winning-formula>

28. Moving up the global economic value chain involves an industrial transformation and rebalancing within the Chinese economy, shifting away from the current labour-intensive, low-skilled manufacturing base, to more value-added, capital and technology-intensive manufacturing and services sectors. [http://www.iisd.org/pdf/2010/sts\\_3\\_moving\\_up\\_the\\_value\\_chain.pdf](http://www.iisd.org/pdf/2010/sts_3_moving_up_the_value_chain.pdf)

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30. In China’s 12th Five-Year Plan (2011-2015), the Chinese government highlighted services, specifically Trade in Services (TIS), as strategic focal points. One of the sub-sectors that China is keen to develop, is its healthcare services sector. <http://www.internationaltaxreview.com/Article/3511735/Moving-up-the-value-chain-greater-access-to-R-D-incentives.html>

**INSIDE THE PHARMACY** Behind the scenes at a pharmacy. Photo by Jia Yao Kuek.







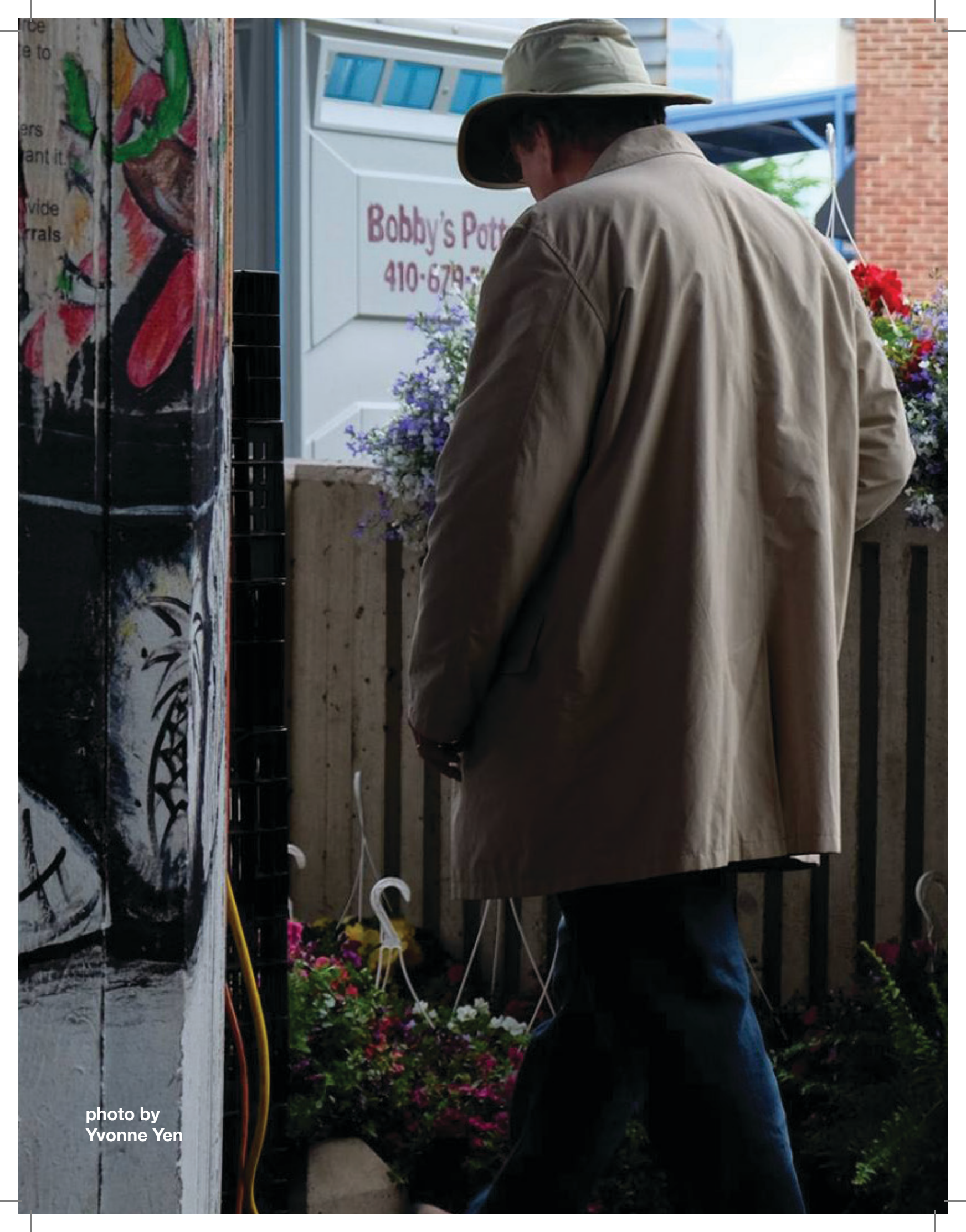


photo by  
Yvonne Yen





# Editorials

LOS ANGELES, CALIFORNIA, USA:  
“Many of the [substance] users I spoke to were wary of interacting with physicians, citing perceived stigma as a large reason as to why they didn’t see their physician as much as they wished.”



# Spring is the Season for Change

**IVORY LOH**

**Public Health Studies**

Loh is a senior, who is passionate about fighting for a just and sustainable food system and promoting individual and population health alongside environmental health. After graduation, Loh is pursuing a Master's in Public Health and a Registered Dietitian license.

**F**ood trucks lined up on Freshman Quad for Spring Fair, the sweet aroma of grilled corn in the air, dates of upcoming barbecues and parties marked -- Spring is everyone's favorite season! It brings us out of our winter slump and energizes us into a new routine. Spring is the time for outdoor festivals, sporting events, and most

importantly, food. Many of us choose to turn a blind eye to how much we consume on these lively occasions (justifiably so, because who wants to be the party pooper?), but what we may not realize is that we almost always ignore how much food we waste.

Why can we simply throw out the rotten milk that we forgot to drink at the

back of our fridge, or discard a discolored apple without batting an eye?

The first nationally representative consumer survey on wasted food in the U.S. found 52% of respondents are bothered "a lot" when discarding food.<sup>1</sup> However, more participants were bothered "a lot" by letting the faucet drip and leaving the lights on. Furthermore, 73% of





survey participants believed they discard less food than the average American, matching the high percentages of public self-reporting also found in international surveys.<sup>1</sup> This survey not only highlights that most Americans are not cognizant of how much they waste, but also that they view food waste as concerning but not as a priority.

But is it simply concerning when Americans throw out \$165 billion worth of uneaten food each year?<sup>2</sup> In order to get food from farms to our dining tables, we use 10% of the total U.S. energy budget, 50% of U.S. land, and 80% of all U.S. freshwater consumption.<sup>2</sup>

**WEIGH YOUR WASTE EVENT**

(left) Volunteers at the annual Weigh Your Waste event. (right) Food is separated into edible, non-edible, and liquid waste. Photos by Ivory Loh.

Evidently, food production comes at a price, yet 31% to 40% of the U.S. post-harvest food supply is wasted.<sup>3</sup> Food waste itself both demands additional resources to process and incurs additional

to reduce more greenhouse gas emissions than technological interventions.<sup>4</sup>

Clearly, the U.S. food supply system is plagued with efficiency losses. But the true tragedy is that food waste coexists

“In order to get food from farms to our dining tables, we use 10% of the total U.S. energy budget, 50% of U.S. land, and 80% of all U.S. freshwater consumption.<sup>2</sup>”

environmental burdens. For example, uneaten food contributes most to U.S. municipal waste, the largest source of U.S. methane emissions.<sup>2</sup> Halving our global food waste by 2050 was projected

with food insecurity. In 2015, 23.2% of the Baltimore City population (144,360 individuals) was food-insecure, meaning that they lacked sufficient resources to acquire enough food to meet their needs.<sup>5,6</sup>







**WEIGH YOUR WASTE EVENT CONT.** Students dump their leftovers into bins at the Weigh Your Waste event. Photos by Ivory Loh.

The first way to reduce your food waste is to recognize your waste. Do you know how much food you waste in a week, or even in a day? We frequently waste food throughout the day without noticing, contributing to our tendency to underestimate our personal food waste and minimize our responsibility in the global food waste problem.

I challenge you to recognize your waste. Quantify it. Track the amount of food you throw away with a Food Waste Diary every day for at least a week. This can be done using pen and paper on a template (Table 1) or through an App like Food Waste Diary. Record the type and amount of food you discard and why you are throwing it away. This exercise will not only increase your awareness of how much food and money you wasted, but will also help you to identify your eating and spending habits to target for change. For example, through your weekly Food Waste Diary records, you realize that you throw away two to three overripe bananas every week. Consequently, you make the informed decision to buy fewer bananas when grocery shopping, helping you save money and future guilt!

The use of diary logs to increase awareness and support behavior change is empirically supported in other settings, especially social psychology and clinical health.<sup>8</sup> A 2010 study introduced a Food Waste Diary to 580 participants and reported that users were highly engaged with the diary. Participants noted



When examining food wasted solely at the retail and consumer levels of the US food supply in 2012, researchers calculated that 1,217 kcal and 33g protein were wasted per capita per day.<sup>3</sup> When we throw food away, we are wasting essential nutrients—nutrients that could have nourished another individual.

A 2016 survey of household food waste found that over three quarters of respondents felt at least somewhat guilty when throwing away food.<sup>7</sup> Feelings of guilt are understandable, considering that wasted food is hurting not only our wallet, but also the national economy and environment.<sup>2</sup> We usually feel guilty because we are upset with a situation that we cannot change. But most incidenc-

es of food waste are not inevitable and can be prevented at the household level with simple measures, such as improved planning to prevent the overbuying and over-preparing of foods.<sup>7</sup>

“The first way to reduce your food waste is to recognize your waste. Do you know how much food you waste in a week, or even in a day?”



DAY	FOOD	AMOUNT	COST	REASON

**TABLE 1** An example of a food waste template for recording what was thrown out each day. Photo by Ivory Loh

that the diary was “not difficult at all” to use, suggesting that it is a feasible exercise that can be easily incorporated into one’s daily routine.<sup>8</sup> Through the use of a Food Waste Diary, study participants were able to identify their top categories of waste and individualized ways for reduction. While one participant commented, “I throw away more leftovers” another realized, “I find I don’t throw out food when I make it.”<sup>8</sup>

Choose not to ignore your role in this collective problem by seeking to under-

stand why and what foods you waste. But individual awareness and action are simply the first steps. They prime you to lead by example and fight for more impactful social and structural changes within our food system to reduce inefficiencies, waste and food insecurity. Spring is the season for change -- towards a sustainable and equitable food system.

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**WEIGH YOUR WASTE EVENT CONT.** The amount of edible food waste after just 2 hours at the Fresh Food Cafe during the dinner service. Photo by Ivory Loh.



# The smoking ban: an effective way of controlling the impact of smoking on the campus population

**JEYANI NARAYAN**

**Chemical and Biomolecular Engineering**

Narayan is a junior, who will be the president of the Hopkins chapter of Global Medical Brigades, an organization that brings medical care to underserved areas in Honduras. She has conducted research in the Chen Lab in the mechanical engineering department since her freshman year, and won the STAR Award, a summer research stipend. She currently writes for the Hippocrates Med Review as the co-head of the Domestic Health section. She enjoys playing violin and reading in her spare time.

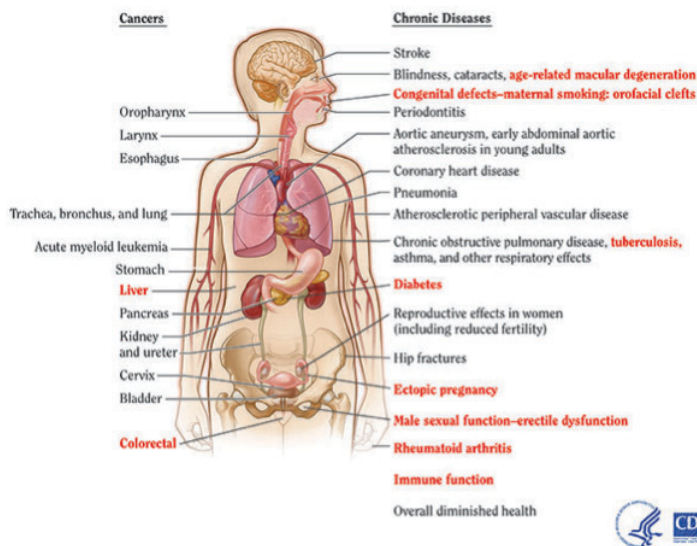
**T**he detrimental effects of smoking on health are well known: strokes, coronary heart disease, aortic aneurysm, cancer of any

kind, COPD, diabetes, pneumonia, birth defects, miscarriage, and the list goes on.<sup>1</sup> These risks are not only presented to smokers but to anyone around them, as

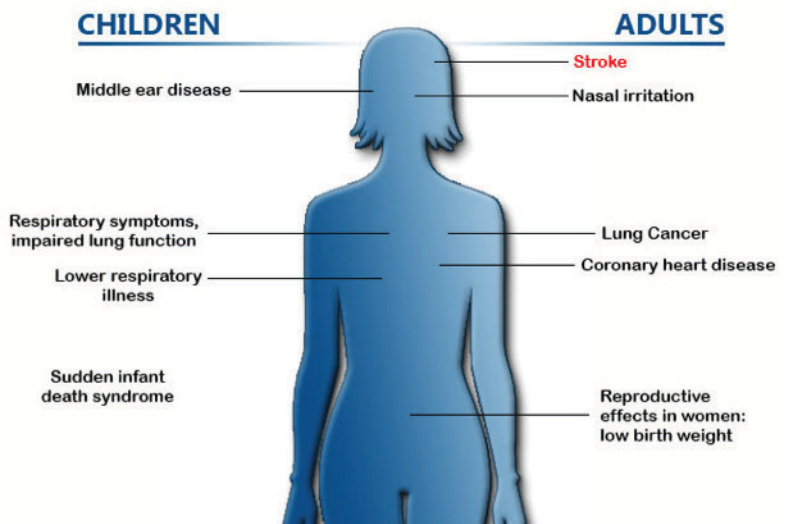
well. According to the Centers for Disease Control and Prevention (CDC), “there is no risk-free level of exposure to secondhand smoke.” Briefly inhaling

## Risks from Smoking

Smoking can damage every part of your body



## Risks of secondhand smoke



**SMOKING RISKS** (left) Smoking poses risks to every organ in the body and correspondingly increases susceptibility to a range of diseases. (right) Exposure to any amount of secondhand smoke has a measurable effect on the body in both children and adults. Photos by CDC.



secondhand smoke can cause immediate effects – damage to blood vessel linings, stickier blood platelets, and interference with normal heart function, all of which greatly increase the risk of a heart attack.<sup>2</sup>

The movement to end smoking has taken root in the United States. Organizations like Truth Initiative have acknowledged that smoking habits develop when people are 18 to 26 years old and that youth who begin smoking are more likely to continue into adulthood.<sup>7</sup> These organizations are accordingly targeting younger generations in order to lead the smoking cessation movement. The Homewood campus is an ideal place to apply this concept, being a college campus with demographics consisting largely of those aged 18-26. The efficacy of smoke-free policies on college campuses has been studied extensively.

A study at Indiana University demonstrated that a smoke-free campus showed a statistically significant decrease in smoking behavior from 16.5% to 12.8%.<sup>4</sup> Another study compared the effectiveness of smoke-free policies of varying strengths as measured by the number of cigarette butts found at building entrances. After studying fifty-eight community colleges

in North Carolina, it was concluded that 100% tobacco and smoke-free campuses saw the most drastic reduction in number of cigarette butts outside of buildings

Understanding the demographics of a student population is crucial to formulating the most appropriate legislation for a campus.

“The efficacy of smoking legislation is also largely determined by the attitudes of students towards smoking bans...Understanding the demographics of a student population is crucial to formulating the most appropriate legislation for a campus.”

compared to policies controlling only indoor air and policies prohibiting smoking only within fifteen feet of a building.<sup>6</sup>

The efficacy of smoking legislation is also largely determined by the attitudes of students towards smoking bans. A state-wide smoking ban implemented in Minnesota was the focus of a study recording

In addition to receptivity, the study surveyed other attitudes. Students were asked if the ban affected how often they visited restaurants or bars and if the policy had an effect on student quality of life and learning. Just under 70% reported that there was no difference in the frequency of attending restaurants or bars.



**THE VULNERABLE POPULATIONS**

Some populations in the US have a higher rate of smoking. Smoking-related legislation should take into consideration the needs of these populations and how new policies affect them. Photo by CDC.

the attitudes of students from different demographics and backgrounds, including age, gender, socioeconomic class, smoking status of the parents, and length of the secondary education program. The study found that increased receptivity to smoking correlated with being older in age, being female, and enrolling in a four year university, among other factors.

Sixty-three percent reported a positive impact on quality of life. A combined total of 87% reported either a positive or neutral impact on learning, and 12% reported a negative impact. While 12% may represent the minority in this survey, it is important to acknowledge that smoking bans may discourage student smokers from entering campus and





**A SMOKE-FREE CAMPUS** Smoke-free campuses have statistically lower rates of smoking; however, smoking bans should be implemented as a joint effort by all populations on campus and should have provisions for all affected populations, including resources for those who would like to quit. Photo by Elvert Barnes from Flickr Creative Commons.

utilizing campus resources. Smoking policies must, therefore, be tailored to

to the ethical dilemma between public responsibility and individual right. Of-

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“...to what extent can legal restrictions be placed on individual freedom? This question arises when individual interests compete with those of the general public.”

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minimize this behavior, perhaps by designating areas, be it limited, for students to smoke.

Despite the statistically proven benefits of a smoking ban, critics of a smoke-free policy claim that it poses an infringement on individual rights, giving rise

ten, policymakers focus too heavily on a policy’s overall effect in an attempt to minimize risk to a population’s health or to minimize healthcare costs. In the process, individual freedom is overlooked. Then to what extent can legal restrictions be placed on individual freedom? This

question arises when individual interests compete with those of the general public. Although it can be argued that the cessation of smoking is beneficial to both the individual and to the general public, an individual’s healthcare choices are their own right and cannot be tampered with by legislation. To mediate this conflict, an analysis of benefits and drawbacks to the involved parties should be performed. In such an analysis, the effects of the policy on the individual should be weighted and compared against those on the public.<sup>3</sup> Country-wide, many have deemed that the exposure to dangerous chemicals in cigarette smoke overshadows the right to smoke.

In interviews, students have also criticized smoke-free policies for their disproportionate effects on campus workers, such as construction workers and dining hall employees. Because the rate of



smoking is higher in these populations, the ban would negatively impact these individuals. This group of employees is not part of the student or faculty body. They have no say in the policy put forth by the college, but are still subject to it. According to interviews, more international students smoke, as well, and they make up a significant proportion of the student body. To ensure that the policy satisfies the needs of each individual on campus, attempts must be made to communicate with all affected populations. In addition, the most beneficial resources for those who seek smoking-cessation assistance can be found. Several community members stated that a smoking ban would be presumptuous of student government association and ignorant of the culture of the city and its citizens, in addition to the aforementioned campus worker and international student populations. In response to these claims, polls should be conducted with smokers to determine the limit to which regulations could be accepted. Perhaps a campus-wide ban is unacceptable to campus smokers, and designated smoking areas would be a more realistic compromise. The support program installed by the policy should be available to all Hopkins members, including the students, faculty, and workers, as well as their families. Smoking cessation must be a joint effort that is achieved with the assistance of all

affected parties.

Currently, the Student Government Association (SGA) is leading the smoke-free effort at Hopkins. SGA has realized that the health risks to the public due to secondhand smoke are significant and must be addressed, and they have proposed a smoke-free campus by August 2018. Their policy is two-part, involving the implementation of the ban itself as well as the formation of a support system for those who would like to quit. SGA has assessed the demographics present on campus and attempted to form a policy after communicating with representatives from each one, which involved interacting with employees, students, and dining hall workers. Currently, regulations are in place that prohibit smoking within twenty-five feet of a building; however, these regulations are difficult to enforce and are often violated. An “umbrella” ban or one that encompasses the entire campus would be easier to monitor and enforce. A violation of a campus-wide policy is easier to define. The smoker responsible can be identified, reminded of the policy, and, perhaps, given a penalty for repeated behavior. If this ban is too extreme in smokers’ perspectives, designated smoking areas may be provided instead.

The smoking ban is intended to educate smokers about the severity of secondhand smoke, to provide resources to help those who quit, and to create a

safer campus. All members of the Hopkins community have the right to choose whether they will accept the risks due to tobacco exposure. According to SGA, the proposal does not attempt to impose on an individual’s choice or right to smoke, but rather to control the effects of that choice on the larger population of students, faculty, and employees of Hopkins.

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“The smoking ban is intended to educate smokers about the severity of secondhand smoke, to provide resources to help those who quit, and to create a safer campus. All members of the Hopkins community have the right to choose whether they will accept the risks due to tobacco exposure.”

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# An Ecological Perspective of Substance Use

**MICHAEL ONTIVEROS**  
Public Health Studies

Michael is a junior studying public health. He spent the last summer as an intern at a syringe exchange located in Los Angeles.

Over the last couple of decades, syringe exchanges have become synonymous with harm reduction, a public health approach that focuses on mitigating the negative consequences that emerge from unhealthy behaviors. This approach has proven to be extremely effective in reducing the transmission of bloodborne pathogens such as HIV and HCV among injection drug users,<sup>1</sup> and is constantly echoed across campuses as an example of public health proper. As a student of public health myself, I wanted to see how this approach was practiced—how academia influenced the world. So I undertook a position as a summer intern at a Los Angeles syringe exchange.

The terms of the internship were straightforward. Show up on time. Stay as long as you would like. Don't forget to take your lunch break. I, in light of those terms, expected the obvious: the

syringes, their accompanying conversations, and the anonymity that stood as a foundation for each. But what I found was much more.

The exchange I worked at was very effective at connecting its participants to pertinent services provided by neighboring institutions. A staff member at the exchange had developed many of these relationships, and this proved to be a very effective method for streamlining the referral process. On a typical day, he alone would refer about half of our participants to free or otherwise very accessible services offered at local organizations. However, after much structural change at the exchange's parent organization, he was relocated elsewhere, and with him went his twenty years' worth of relationships. As the only intern at the syringe exchange—which now had one employee—I was made to temporarily assume the then-vacant role.

With his relocation, the syringe exchange had lost its main point of contact with neighboring institutions. Participants could no longer be given a large proportion of the referrals and services that were previously offered. I lived nearby and knew the area well, but still was in no way equipped to connect participants to the services they often sought, and neither was the exchange's now only employee. Turning to the internet and those we knew, we had to improvise.

Many of the services we would normally link participants to were not available in the surrounding area, and many of the institutions that did offer them highlighted several barriers to accessibility that made sustaining a relationship with them very difficult, as few of our participants would find their services financially or physically accessible. After about two weeks of attempting to rebuild our directory, we had developed only a single sus-



**STARTER PACK MATERIAL** Among the supplies in the starter pack is a packet of triple antibiotic ointment. Photo by Michael Ontiveros.

tainable relationship with someone at the AIDS Health Foundation (AHF), which was headquartered about 10 miles away and amid some of LA's most traffic-ridden streets.

Like many other syringe exchanges, this particular exchange's participants were not immune to the disproportionately high rates of HCV associated with intravenous drug use. Although HCV is now curable, significant financial barriers to treatment still remained for our participants. Fortunately, the single relationship we had developed proved to be very helpful in this regard. Under our new contact's guidance, five of our participants who tested reactive for the HCV antibody had their treatment paid for. Had that relationship not been developed, access to life-saving treatment would have been inconceivable for these five individuals. Still, these relationships were difficult to attain because the organizations that we could work with were hard to identify and few in number.

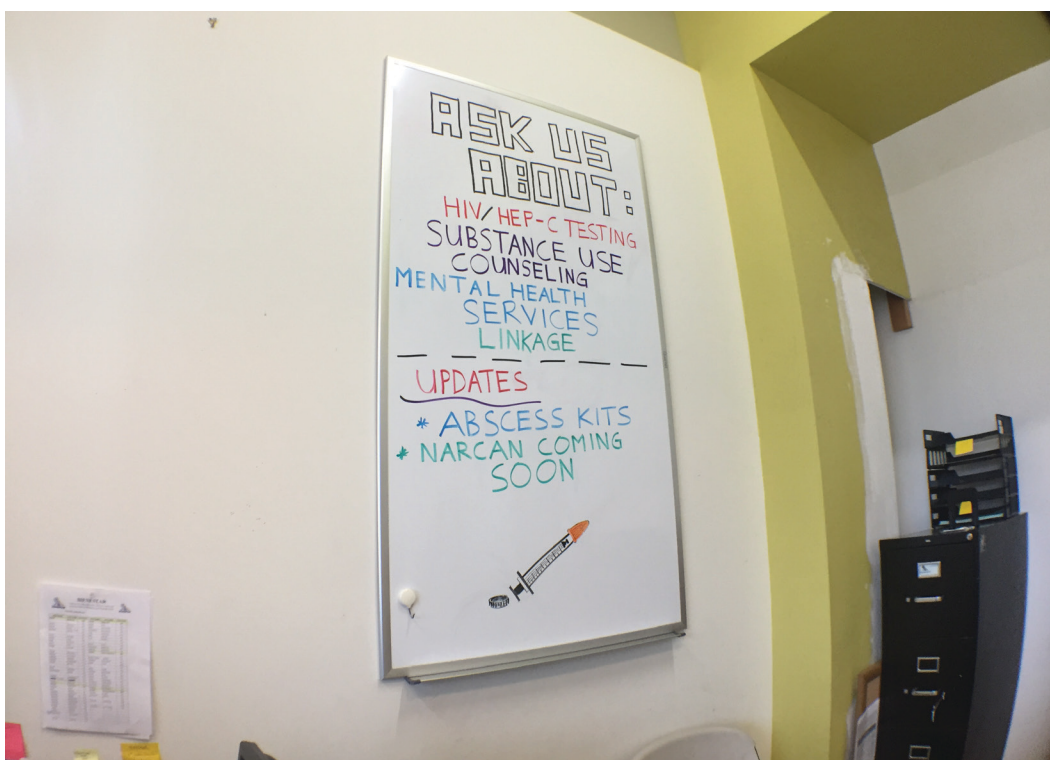
While at the exchange, it was very apparent that a considerable disconnect existed between users and health professionals, at least in that part of Los Angeles. Many of the users I spoke to (those who were insured, that is) were wary of interacting with physicians, citing perceived stigma as a large reason as to why they didn't see their physician as much as they wished. Interestingly enough, this was fairly consistent with findings by studies of health professionals' attitudes towards patients with substance use disorders.<sup>2</sup> But painting such a narrative without further context is misleading. There are many other variables that fuel this disconnect.

Many of the services sought after at this exchange were often unnecessarily provided outside of the primary care system. Recall the five individuals who received treatment under the guidance of our contact at AHF. In that case, treatment was only possible because the

exchange's parent organization was able to quickly test those individuals at the exchange and refer those with HCV to our partner at AHF. In other words, a test that would normally be ordered with a clinician's pen was being outsourced to the not-for-profit sector. Essentially, the organization acted as a safety net when all else failed. From several informal conversations I had with the syringe exchange's parent organization, it seemed like a large proportion of grants they received were for that very purpose. Although this trend is not unique to organizations that deal with substance use, it certainly underscores the current state of our health

put into dangerous situations after being detained in a correctional facility for some time, where evidence-based practices are ironically sparse. While current policy states that at its core its purpose is to defend the "health and general welfare of the American people",<sup>3</sup> it has not been revisited to suit these purposes with suggestions made by the latest policy research. As a result, tensions often emerge between these goals and the laws implemented to achieve them. Unfortunately, these tensions are not uncommon.

A woman once came through the doors of the syringe exchange looking for a starter pack, a lunch bag discrete-



**SYRINGE EXCHANGE PROGRAM** The interior of the syringe exchange program in Los Angeles. Photo by Michael Ontiveros.

care system. Its failings left large voids, and the not-for-profit sector often pointed to where these voids were.

It is important to note that many of these failings existed beyond the health care system. The illicitness of drug possession often made efforts to improve the well-being of participants rather difficult. Many of our participants who were actively trying to quit using were often

ly filled with injection equipment and a few hygiene products. At first it seemed to me like a fairly normal exchange: a new participant had heard about the exchange from a friend and wanted enough syringes to last her several days so that she could return without spending a large portion of her day commuting from afar. It wasn't until she disclosed to me that she had just completed a prison





**SYRINGES** A plastic container filled to the brim with syringes. Photo by Michael Ontiveros.

term of several years and wanted to start using again that I realized how different this exchange was going to be. Fentanyl, the synthetic painkiller responsible for the increase in fatal overdoses in recent years,<sup>4</sup> had recently been introduced into heroin sold across Los Angeles County<sup>5</sup>. And there I was, about to give injection equipment to someone who, just out of prison, was several times more likely to experience a fatal overdose.<sup>6,7</sup> I was quite unnerved by the whole situation, and made the slow decision to ensure that she was aware that her next fix may have fentanyl, and that shooting slowly would be the safest way to begin using again newly out of prison. After this discussion, she shook my hand—as many other participants did to one another when giving their farewells—and left.

By then I had gone through hundreds of exchanges with participants. I thought I had come to know it all: the abscesses, the withdrawal symptoms, the busted veins. But never had it occurred to me how entwined they were with the surrounding environment. The woman

I had spoken with had been sober for several years, and immediately worked towards ending that period of sobriety once free from the physical confines of a Californian prison. Even now, I still ask myself: after all those years, what brought her to the doors of that particular syringe exchange? She had a story, and within its blank spaces I had come to revisit the way I understood substance use.

In public health, the socioecological model resonates in most discussions surrounding health promotion. It proposes the following idea: that because individuals are inarguably in constant contact with an affective environment, modifications to environmental factors can help individuals transition away from unhealthy behaviors. The individual, although a major vehicle for change, is rarely the sole determinant of a health outcome<sup>8</sup>. Instead, it is the configuration of a various elements surrounding the individual that must be considered.

It is with this very model that we should try to understand substance use. Rather than point solely at our govern-

ment or at users, we should instead reflect on the multiple factors in between that also play a major role in health. By doing so collectively, we can break the cultural barriers that prevent us from moving forward toward becoming a nation that truly understands substance use as the complex issue it is. Whether it be by changing how we comprehend the structure of our health care system or the way we view and treat users, we have the agency to revisit our presumptions, and that agency can make society better configured for what comes its way.

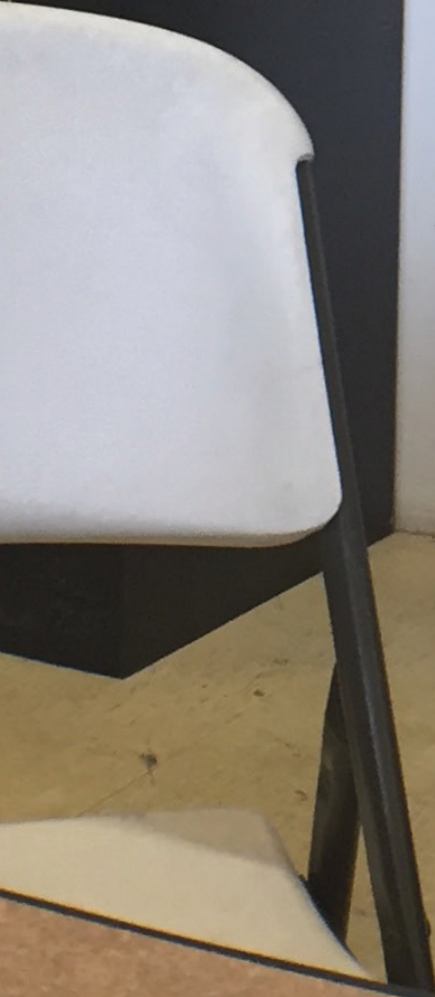
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**SHARPS BIN** A large sharps bin for disposing of used syringes. Photo by Michael Ontiveros.



SHARPS







# Submit

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

photo by  
Eric Chen







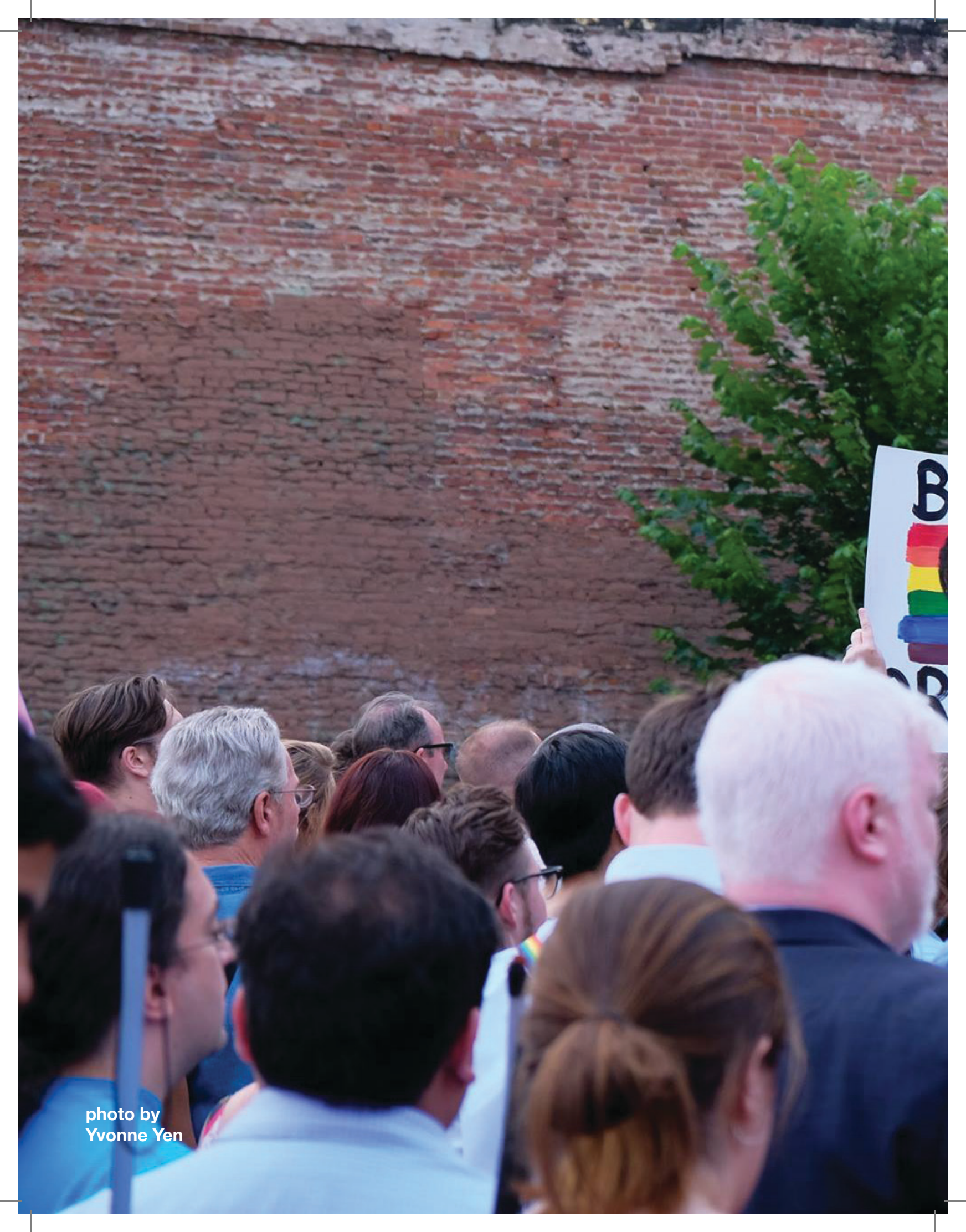


photo by  
Yvonne Yen



# Thanks

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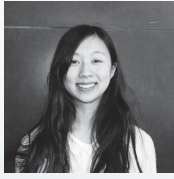
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Meet the talented and dedicated team behind the journal.

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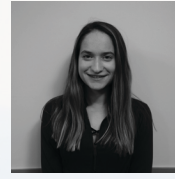
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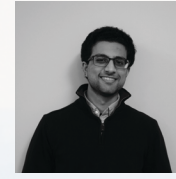
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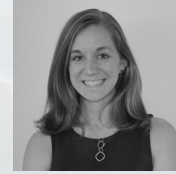
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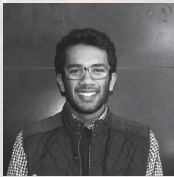


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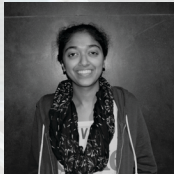
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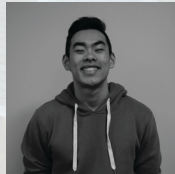
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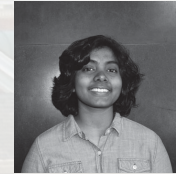
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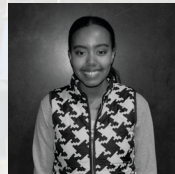
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