



EPIDEMIC PROPORTIONS

THE JOHNS HOPKINS UNDERGRADUATE PUBLIC HEALTH RESEARCH JOURNAL, VOLUME 14, SPRING 2017

compassion
in every
corner

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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Letters



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from the Editors-in-Chief

Welcome 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 14th volume of our journal, an effort made possible by the contributions of our talented and dedicated team of staff and authors.

The theme of this year's journal is Compassion in Every Corner, which highlights the many different challenges present in the many different parts of the world. Despite the diverse nature of public health, we are all united by common principles such as compassion. These principles define who we are as a community, as a nation, and as a world. Compassion has long guided our public health endeavors, and must continue to do so in the years to come.

Our newsfeeds, phone alerts, and cable news inundate us with videos and photos of traumatic scenes at home and

around the world. It has become so commonplace that we turn away from it, unwilling to deal with the gruesome issues.

We are at a time when we need to remember compassion more than ever, especially in public health. How, as a community, a nation, and a world, can we come together to alleviate the issues of our time?

As future leaders, we must be mindful of our dialogue concerning public health. Beyond that, as citizens, our actions and votes must show that compassion. Public health is meant to prevent sickness and disease. We need to separate our politics from helping the needy. We cannot let it stop us, as human beings, from helping each other, from being compassionate, or from caring for one another.

We hope that after reading this issue, you too are inspired to dedicate yourself to public health in a more compassionate manner.

Tiffany Le '18
Public Health Studies

Sincerely,

Lawrence Lin '18
Public Health Studies



from Dr. Mieka Smart

photo by
Calvin Qian

Over the course of my time teaching and advising public health students, I have witnessed talent and work ethic that continues to wow me in retrospect. I've witnessed a great deal of humility, gratitude, and heart among our students. Time and again students would arrive at my office door to share experiences and goals that shattered stereotypes of self-centered grade-grubbing undergraduates. I guess it is not surprising that public health students channel compassion for others in their quest for public health solutions. But it was always surprising when they (sometimes briefly, sometimes for too long) forgot to have compassion for themselves.

Things are going to be difficult when you get there. The summer research assistant position in the rural developing world, the bench in summer Orgo lab, or the consulting job in the big city you wanted with the amazing signing bonus... Wherever "there" is, difficulties will abound! From language barriers, to FOMO when you think about the other thing you didn't do, to homesickness. Things won't always go according to plan.

You are at Johns Hopkins because you rose to the top in an incredibly selective process. In terms of grades, scores and activities, you were the most measurably successful among

the best of your peers. You are here because Johns Hopkins selects students that demonstrate attributes like talent, drive, and audacity. So much is possible with what you have. But when you get "there" you'll need more. The students in my courses learn about countless public health "solutions" (engineering, medical, legislative, economic, social, etc.) that have fallen completely flat. Talent, drive, and a good idea are simply not enough!

For long-term success, two kinds of compassion will be necessary. First, make efforts to compassionately serve the people in your field. If you deeply connect with your population, you will stay at the cutting edge because your innovative solutions will actually work for the people you're serving! Second, through the difficulties you encounter, make efforts to treat yourself compassionately. Doing so will help you make self-improvements and generate the stamina needed to make a difference.

There is still so much work to do, but great examples of phenomenal strides in public health are all around us. If you take a look at the maps in the links you'll see examples of how JHU public health students and faculty have worked over the years to have compassion in every corner!

Sincerely,

Mieka Smart, DrPH, MHS
Lecturer, Krieger School of Arts and Sciences

Research

photo by
Grace Kwak

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The Stigma Surrounding HIV Prevalence Amongst Refugees in Sub-Saharan Africa

NASRIN AKBARI

Medicine, Science and the Humanities, Class of 2018

Nasrin's passion for relieving disparities amongst those affected by the HIV/AIDS epidemic expanded beyond Baltimore this past fall as she was exposed to the inequalities and stigmatization surrounding refugees' access to healthcare.

INTRODUCTION

Since the end of the Cold War, armed conflicts have shifted from primarily interstate (between multiple states) to intrastate (within a single state). Between 1990 and 1999, 85% of the 118 armed conflicts in more than 80 states worldwide could be defined as primarily or exclusively intrastate.¹ This shift in warfare has fueled the production of refugees, as intrastate conflicts generally lead to larger scale displacement than interstate conflicts.² Today, Sub-Saharan Africa is disproportionately affected by armed conflict as well as the HIV/AIDS epidemic. In 2013, Sub-Saharan Africa was home to 81% of the global population living with HIV who were also affected by humanitarian crises.³ The importance of addressing both the prevention and treatment of the HIV/AIDS epidemic amongst migrant populations has been widely recognized by the international aid community. In June 2001, the United Nations General Assembly Special Session on HIV/AIDS passed the Declaration of Commitment on HIV/AIDS, stating that "populations destabilized by armed conflict ... including refugees, internally displaced persons and in particular, women and children, are at increased risk of exposure to HIV infection."⁴

Though migrant populations, specifically refugees, are often more susceptible to HIV infection than host communities, there are factors which can both increase (such as the breakdown of social structures) and decrease (such as reduced mobility and accessibility) refugees' vulnerability to HIV contraction.¹ Furthermore, the eventual influence of these multiple factors is dependent on the HIV prevalence within the migrant population and the surrounding local population prior to conflict, as well as the interaction between the two populations.¹ As such, the assumption that greater vulnerability leads to greater HIV incidence amongst refugees is unsubstantiated. This claim, however, continues to permeate across Sub-Saharan Africa, leading to widespread stigma surrounding HIV prevalence amongst refugees and an ultimate discrimination and lack of effort to include refugees in host countries' HIV/AIDS prevention and treatment programs.⁵ This paper will focus on dispelling the myth that HIV prevalence amongst refugees is higher than that amongst host populations and addressing the impact that stigmatization of HIV prevalence amongst refugees has had on their inclusion in national HIV/AIDS programmes in Sub-Saharan countries of asylum. Fur-

thermore, recommendations will be made on how to improve the preventative and treatment services available to refugees in Sub-Saharan Africa.

THE STIGMA SURROUNDING HIV PREVALENCE

The stigma surrounding HIV prevalence amongst refugees has prevailed throughout Sub-Saharan Africa for decades. Unfortunately, this stigma shows no signs of subsiding amongst host populations or within refugee camps. A 5-year behavioral surveillance conducted by UNHCR in Kenya, Uganda, and the United Republic of Tanzania found that accepting attitudes towards people living with HIV declined in five of the total seven refugee camp/surrounding population sets surveyed. These drops in acceptance ranged from a mere 4.4% drop in a Ugandan refugee camp, to a startling 75.5% drop in Lukole, a surrounding host community nearby to a refugee camp in the United Republic of Tanzania.⁶

Furthermore, the mandatory testing of refugees conducted without pretest or posttest counseling and without any guarantee of confidentiality has been identified in numerous countries.⁷ The fear of being exposed



as HIV-positive in such a stigmatized environment may force many refugees to live in denial of their HIV status or even forgo testing, putting their health as well as the health of others at risk. Sudan remains the only Sub-Saharan country which bars refugees who are HIV-positive from entering on the basis of their HIV status.³ This is particularly worrying, as refugees who fear violence or persecution should they return home could seek to enter the country illegally, with limited or no access to healthcare in the future, including antiretroviral treatment for HIV.

CURRENT SCOPE OF HIV/AIDS PREVALENCE

The common misconception that refugees bring with them a higher HIV prevalence simply due to their increased HIV vulnerability, and that this prevalence then translates to more HIV infections in the host population, has led to widespread stigmatization. This is largely due to a gap in epidemiological data, leading host countries to come to their own conclusions rather than those rooted in fact. From data which has been gathered, however, it can be seen that in fact refugees often migrate from areas with lower HIV prevalence to areas

with higher HIV prevalence.⁸ During times of conflict, mobility and accessibility to different regions of the country deteriorate, simultaneously containing the spread of HIV. On the other hand, in a stable country, there is less isolation between populations, causing HIV to be disseminated more easily, which usually leads to higher prevalence rates. This is evidenced by HIV prevalence rates in Sierra Leone in 2002, (immediately following the 1991-2002 civil war), which were lower than the rates seen in surrounding countries, the majority of which had not been engaged in conflict.¹ Furthermore, of 29 Sub-Saharan African countries with greater than 10,000 refugees surveyed in 2003, countries of asylum demonstrated an HIV prevalence nearly 1.5% higher than that of the refugees' countries of origin.⁹

Beyond recognizing that the HIV prevalence rate in refugees' countries of origin is often significantly lower than those of the host countries, HIV prevalence rates amongst refugee camps are often significantly lower than those within the immediately surrounding communities. UNHCR studies surveyed refugee camp populations and their surrounding local populations in

DAILY LIFE IN A CLINIC

Men pushing a hospital rolling bed in Uganda. Photo by Grace Kwak.

six Sub-Saharan African countries between 2002 and 2004. These studies concluded that refugees in six of the eight refugee camp/surrounding population sets had lower HIV infection rates than those of their host communities.¹⁰ The remaining two sets had similar rates.¹⁰ This phenomenon has been observed in other refugee camps as well as in other countries.⁵

Not only do refugees' countries of origin as well as refugee camps demonstrate generally lower HIV prevalence rates than their countries of asylum and surrounding host communities but also refugees do not demonstrate higher sexual risk behaviors (such as engaging in sex with multiple partners) than their surrounding host communities. In the same refugee camp/surrounding population sets mentioned above, where it was found that HIV prevalence rates were lower in 75% of the refugee camps, the refugees reported similar or lower levels of risky sexual behaviors than those in the sur-

rounding communities.¹¹ More recently, a 2014 study of 16 refugee camp/surrounding population sets found no evidence that refugees demonstrated higher levels of risky sexual behavior than the surrounding host populations.¹² In fact, the opposite was found in the majority of the camps.¹² Although rape is another major risk factor amongst refugees, especially amongst women and girls, evidence has concluded no clear link between increased rates of rape during conflict and increased HIV prevalence.¹¹

INCLUSION IN HIV PREVENTION/TREATMENT PROGRAMS

There are several guidelines from international agencies to help countries implement HIV/AIDS interventions, such as those issued by the Inter-Agency Standing Committee (IASC), 'Addressing HIV/AIDS Interventions in Emergency Settings,' and those described in the Sphere Handbook. Despite these guidelines, the stigma surrounding HIV prevalence amongst refugees has caused them to be consistently excluded from their countries' of asylum's National Strategic Plans and major grant proposals to fund HIV/AIDS related programs.¹³ A review of 33 African countries with greater than 10, 000 refugees found that over a 10 year period (1998-2008), 48% of the countries' National Strategic Plans did not reference refugees and only 28.6% of the plans referenced and included activities for refugees. Over 6 years (2002-2008), 61.4% of approved Global Fund proposals for these countries did not reference refugees, and a mere 11.4% of the proposals referenced and included activities for refugees.¹⁴ This study, unfortunately, did not state specific data for Sub-Saharan African countries, but these trends are likely reflective of behavior within the region. This can ultimately undermine the health of both the refugees and the host populations as the dynamics between the two populations are not yet comprehensively understood. Refugees do, however, remain in host countries for an average of 17 years, meaning that eventual contact, especially sexual contact, between the two populations is inevitable.¹⁵ In this regard, the local population's health

is inextricably linked to the health of refugees within the nation, as should be their HIV/AIDS prevention and treatment programs.

Aside from the constant discrimination within national plans and funding, HIV/AIDS awareness amongst refugees in refugee camps is extremely limited.¹⁶ Surveys from Kenya and Uganda reported limited awareness about condom usage amongst refugees, although transactional sex was a common practice in the surrounding community.^{17,18} This can again affect the health status of the refugees within the camps, as well as the health of the host population as communication and integration between the two populations increases. Furthermore, in host populations where transactional sex is common, women and girls (an already vulnerable population) who have poor knowledge of HIV prevention could become even more susceptible to contraction.

“In this regard, the local population’s health is inextricably linked to the health of refugees within the nation, as should be their HIV/AIDS prevention and treatment programs.”

Subregional approaches have been implemented in some parts of Sub-Saharan Africa in recognition of the fact that coordination and integration of HIV/AIDS programs for refugees across multiple regions is the only way to effectively combat the epidemic. For example, the Inter-Governmental Authority on Development (IGAD) Regional HIV/AIDS Partnership Program (IRAPP) was developed in 2007 to mitigate the effect of the HIV/AIDS epidemic across the eight IGAD member states (all of which are within Sub-Saharan Africa).¹⁰ Currently, the program is in the process of, or has already implemented HIV/AIDS prevention and treatment programmes in 48 IGAD supported cross-border, refugee, internally displaced persons, and returnee sites.¹⁹ Although a sub-regional approach such as this shows tremendous leaps forward in HIV

care for refugees, in 2010 it appeared that IGAD states were still paying limited attention to the HIV/AIDS needs of refugee populations. Thus, further work remains to be done with the support of not only all governments involved in these subregional approaches, but also local NGOs and international aid organizations.

FUTURE RECOMMENDATIONS

A number of recommendations can be made to improve the HIV/AIDS prevention and treatment efforts aimed at refugees in Sub-Saharan Africa. Firstly, it is vital that governments turn to programmes which are context-specific but also integrated within host populations. Context-specific programs should first focus on targeting refugee populations particularly vulnerable to HIV infection, such as urban refugees. Urban refugees, women, and children are three populations

that should be initially targeted. Urban refugees have a much greater initial interaction with the host population, which can be problematic when the country of asylum has a higher HIV prevalence rate than both that which is seen at refugee camps and in the refugees' country of origin. Further epidemiological studies into the sexual relationships between local populations and refugees are needed to more comprehensively understand these behaviors.²⁰ Furthermore, urban refugees are paradoxically often both excluded from well-developed urban HIV/AIDS programmes in host countries, as well as preventative services and treatments made available in isolated refugee camps by international aid agencies.⁸ In order to ensure urban refugees are properly linked to HIV care, funds and grants for refugee health care should sub-

sidize the cost of care (preventative and treatment) for urban refugees on a fee-for-service basis, as opposed to creating special treatment and prevention centers. In this regard, the care is integrated, thus de-stigmatizing HIV prevalence amongst urban refugees. This could also discourage refugees from returning to their homes immediately post-conflict, which would place them at higher risk for infection, as post-conflict HIV rates often increase with improved accessibility and mobility.²¹ This type of assistance, free of alienation, should be applied for other vulnerable groups, such as women and children.

In order to encourage countries of asylum to integrate refugee-specific HIV care into their national plans and funding, a policy which would require all countries with greater than 10,000 refugees to include specification of activities aimed at refugees in all HIV/AIDS grant proposals is suggested. This would hold countries of asylum accountable for caring not only for their native citizens but also for all those who reside legally in their country. Furthermore, this would encourage the inclusion of refugee-specific care into existing national HIV/AIDS care, thus again promoting de-stigmatization and assistance without alienation. Consequently, this approach would benefit both the host and refugee populations as studies have demonstrated that the inclusion of refugees in national HIV/AIDS strategies has reduced the risk of infection amongst both populations.¹¹

Finally, more sub-regional approaches are needed to support a collective, integrated approach to HIV/AIDS prevention and treatment amongst refugees. This is especially important to ensure continuity in treatment across borders. Furthermore, this will encourage cross-border epidemiological studies into the migration and behavioral patterns of refugees, allowing for future care to be improved. This will also likely encourage greater funding for cross-border initiatives by the international aid community. Current sub-regional approaches, such as the aforementioned IGAD IRAPP and the Great Lakes Initiative can provide guidance on how to implement these programs. They also provide

suggestions for improvement, such as the need for increased inter-governmental cooperation and international support.

CONCLUSION

In conclusion, the stigmatization of HIV prevalence has had a profound impact on the preventative and treatment services made available to refugees in countries of asylum. This stigmatization is sadly not rooted in fact, as HIV prevalence and risky sexual behaviors are often lower in refugees' countries of origin and in refugee camps than they are amongst surrounding host populations. The continued exclusion of refugee-specific programmes in national plans and grant proposals and lack of HIV/AIDS awareness amongst refugee camps will have lasting negative consequences on the health of both refugees and host populations. The eventual integration of these two communities is undeniable, thus the only way to properly address the HIV/AIDS epidemic is to provide preventative and treatment services to both communities. In order to improve access to care amongst refugees, context-specific programs integrated within the host communities should be implemented. Additionally, required inclusion of refugee-specific activities in national HIV/AIDS plans and funding proposals and further development of subregional initiatives is needed to properly meet the health-care needs of refugees. Ultimately, providing refugees with HIV/AIDS assistance free of alienation is a necessary approach, which will have a positive impact on the health of both refugees and host populations.

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How Maternal Substance Abuse Affects the Physical Health of Children

MILENA BERHANE

Public Health Studies, Class of 2019

Milena spent two months at Ohio State University working with a women's rehabilitation facility conducting home visit assessments.

ABSTRACT

An estimated 7.93 million women in the United States (6.5% of the female population) regularly use illicit drugs.¹³ Maternal drug abuse has negative effects on the health of both the mother and her children. Substance abuse can not only affect the psychological upbringing of the child but also the physical health and well-being of the child. Although there have been multiple studies focused on the mental health of children, few studies have explored the physical health of children of substance abusing parents. This study focuses on how children of substance using mothers report their physical health. Findings are reported from a sample collected in Columbus, Ohio comprised of mothers and their children who vary in age from 8 to 16 years old. When asked to report their physical health, the majority of the children did not believe that their physical health would decline severely or that their health was worse than that of other children. This initial study could motivate future studies to explore how the physical health of children is affected by their mothers' substance abuse.

INTRODUCTION

Maternal substance abuse is the most common cause of children referrals to Child Protective Services due to suspected neglect and/or parental abuse.⁴ Substance abuse is associated with low self-esteem, peer pressure and depression.¹² It not only affects the psychological and physical health of the mothers but also affects the physical health and development of their children. Children of substance abusing women have greater chances of developing mental health disorders such as Attention Deficit Hyperactivity Disorder (ADHD) and physical conditions such as asthma. In this study, the children's self-report of their physical health is described.

Previous studies have looked into parental substance use and how it causes maladjustment of the child.¹⁴ It has also been shown that parental warmth and communication lead to better child behaviors and overall upbringing.¹⁶ Other studies have shown how negative maternal parenting behaviors cause significant vulnerability in children.⁸ Among children of substance-abusing mothers, a lack of parental warmth and poor parenting behaviors have shown to be associated with symptoms of depression, stress, and other psychological disorders.¹⁵

Although it has been established that maternal substance abuse has been linked to insufficient parenting and potential psychological issues in the child, it is not yet understood how the

child's physical health is affected.

METHODS

Participants

Participants (N=183) included substance using mothers with at least one child in their care. These mothers were recruited from the Maryhaven Center in Columbus, Ohio. Eligibility criteria for mothers included receipt of outpatient treatment for their substance use disorder, meeting diagnostic criteria for an alcohol or drug use disorder as defined by DSM-IV, and having a child between the age of 8 and 16 years who either resided with the participating mothers at least 50% of the time in the past two years or 100% of the time in the past 6 months. These criteria ensured that the child had been in the care of the mother long enough to have been exposed to the mother's substance abuse. If more than one child was eligible, the child reporting substance use or other problem behaviors was selected as the target child.

The mothers ranged in age from 22 to 54 years old. They were primarily white non-Hispanic (53.6%) or African-American (42.6%). The majority of the mothers (85%) had a high school degree or less and only 19.1% of the women reported that they were married. Regarding income, 60% of the families had an annual income of \$15,000 or below and only 18% of families had an annual income of \$30,000 or greater. Mothers reported having between 1 and 11 children.

PERSPECTIVES

A Ugandan boy paying attention to a volunteer.
Photo by Grace Kwak.

Out of the target children, 51.9% of them were male.

Procedure

The community treatment center was used to screen the mother for eligibility and interest in the research. After parental permission was obtained from the eligible mothers, research assistants contacted target children and informed them about the research study. At baseline, both the mother and target child completed an assessment battery including standard individual and family measures, as a semi-structured substance use assessment. Assessment procedures for all research participants were identical.

Measures

The child's physical health was measured using the Short-Form-36 (SF-36), which is a multi-purpose health survey.¹⁹ This form was derived from the Rand Corporation's Medical Outcome Study (MOS).¹⁸ It can be used as a generic assessment of the child's health status and an outcome measure in clinical practice. The survey includes 36 questions that yield 8 subscales assessing physical health (physical functioning, role-physical, bodily pain, and general health) and mental health (vitality, social functioning, role-emotional, and mental health). For this study, the physical health portion of the survey was used. The questions were answered true/false, with a numeral system 1-5. An answer of 1 indicated "definitely true," 2 is "mostly true," 3 is "don't know," 4 is "mostly false," and 5 is "definitely false." The question regarding general health was answered on scale of 1 to 5, where 1 indicated "excellent," 2 is "very good," 3 is "good," 4 is "fair," and 5 is "poor." Reliability estimates ranged from .65 to 0.94 across scales (median = 0.85) and varied across patient subgroups.⁹ SF-36 scales achieved about 80-90% of their empirical validity in studies involving physical and mental health criteria⁹ and showed high validity and reliability in psychiatric assessments of mental health patients.¹⁹ It has been shown that the SF-36 is suitable for self-administration, computerized administration, or administration by a trained interviewer in person or by telephone.¹⁹

RESULTS

The health information of the children was obtained using the SF-36 self-assessment form. For the statements "I seem to get sick a little easier than other people," the majority of children responded false. This indicates that most children did not believe that they were more prone to sickness than others. For the statement "I am as healthy as anyone else," the majority of children also responded "false." This response shows that most children thought that their health is not satisfactory compared to others. For the statement "I expect my health to get worse," the majority of the children responded false, indicating that they did not believe that their health was at risk of getting any worse. When asked if the children thought "my health is excellent," the majority of children reported false as well. This response shows that the children did not think that their health was at its best, which could be explained by a number of reasons. Refer to Tables 1-4 for percentages. When assessing the general health of the children, 182 out of the 183 samples were valid. Most of the children reported that their general health was "good," reporting a score of 3. This response is also another indication of the children thinking that their health is not the best that it could be. Refer to Table 5 percentages.

In summary, the findings showed that children of mothers who are substance abusers rated their physical health positively. Although the majority of children did not say their general health was poor or significantly worse than others, most children believed that their health was not excellent.

DISCUSSION

Maternal drug abuse can pose a number of risks for the children under the mothers' care. Research has shown that maternal substance abuse affects the psychological health and well-being of the children.¹⁴ Maternal substance abuse has been linked to poor parenting behaviors, which cause maladjustment of the child.¹⁴ The effects of maternal substance abuse have yet

to be thoroughly investigated.

Most of the findings did not support the hypothesis of this study. Although the majority of the children did not believe that their health was "excellent," most believed that their health was "good." An outlier in the results was that when asked whether the children were as healthy as anyone they knew, the majority replied "false." This response shows that many children believe that their health is good enough for them personally, but do not believe that they are as healthy as others.

Future research might determine what health disparities can come about from maternal substance abuse. Using medical records and a self-assessment that is focused on physical health, more information can be obtained in order to do an in-depth study on the physical health of children under the care of substance-abusing mothers. Maternal drug abuse is just as much of a public health issue as it is a medical issue and data on how it affects the health of children can foster preventative measures to help these children avoid developing mental and physical health conditions.

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TABLES 1 to 5

Tables displaying responses to certain questions. In tables 1 to 4, the majority of children responded with a score of 5, which indicates "definitely false." In table 5, the majority of children responded with a score of 3, which indicates "good." Source: Milena Berhane.

Responses for "I seem to get sick easier than other people"				
		frequency	percent	valid percent
valid	1	12	6.6	6.6
	2	17	9.3	9.3
	3	29	15.8	15.8
	4	23	12.6	12.6
	5	102	55.7	55.7
	total	183	100	100

Responses for "I am as healthy as anybody I know"				
		frequency	percent	valid percent
valid	1	12	6.6	6.6
	2	10	5.5	5.5
	3	40	21.9	21.9
	4	52	28.4	28.4
	5	69	37.7	37.7
	total	183	100	100

Responses for "I expect my health to get worse"				
		frequency	percent	valid percent
valid	1	4	2.2	2.2
	2	7	3.8	3.8
	3	25	13.7	13.7
	4	22	12	12
	5	125	68.3	68.3
	total	183	100	100

Responses for "My health is excellent"				
		frequency	percent	valid percent
valid	1	6	3.3	3.3
	2	12	6.6	6.6
	3	25	13.7	13.7
	4	57	31.1	31.1
	5	83	45.4	45.4
	total	183	100	100

Responses for "In general, would you say your health is..."				
		frequency	percent	valid percent
valid	1	56	30.6	30.8
	2	52	23	23.1
	3	64	35	35.2
	4	16	8.7	8.8
	5	4	2.2	2.2
	total	182	99.5	100
missing	system	1	0.5	
	total	183	100	

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Comparison of Self-Reported and Measured Physical Activity in Older Populations

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Quantifying the amount of physical activity levels in older populations will help create a population based intervention and encourage older adults to be physically active.

ABSTRACT

Physical activity (PA) is an important factor in determining the risk of chronic diseases and functional performance. Individuals who are more physically active tend to lead healthier and longer lives. Higher amounts of physical activity are associated with a lower risk of chronic diseases and metabolic issues. Physical activity also helps prevent falling and improves mental health in older adults. Despite these benefits, however, it is believed that older populations tend to remain physically inactive. Quantifying the amount of daily physical activity in which older adults engage is crucial for developing strategies to increase longevity in older populations.

In clinical research, there are two ways to measure physical activity levels: self-reported questionnaires or device-based monitoring. It is known that device-based monitoring provides a more accurate assessment of total physical activity, yet the contextual relevance and perception of daily activities cannot be defined using these

devices alone. Previous research indicates differences between self-reported data and device-based data in quantifying physical activity levels using standard cutpoint thresholds to define light, moderate, and vigorous intensity activities. This research focuses on the comparison of self-reported and measured physical activity using data from the Baltimore Longitudinal Study of Aging. Standard physical activity questionnaires, objective activity, and heart rate monitoring were used to interpret weekly physical activity levels in older populations.

METHODS

Study Population

Participants in this research were derived from the Baltimore Longitudinal Study of Aging (BLSA). The BLSA is a study of normative human aging, conducted by the National Institutes on Aging Intramural Research Program.¹⁵ Most participants are from the Baltimore- Washington Area and are well-educated with higher income.¹⁸ Each participant signed an informed consent and passed a

	Total	SD	Male	SD	Female	SD
Mean Age	68.38	11.8	69.73	12.38	66.89	10.96
Mean BMI	26.87	4.33	27.08	3.65	26.64	4.98
Mean Maximum Heart Rate	125.42	17.52	124.09	18.45	126.88	16.34

FIGURE 1

Population characteristics.
Source: Kyu Hee Lee.

MET Values	Intensity of Physical Activities	BLSA Questionnaire Classification
<3	Light	PA01 = Walk up flights
		PA02 = Walk down flights
		PA06 = Light housework ex) washing dishes, making beds, straightening-up, dusting or light cleaning, cooking, baking
		PA07 = Shopping for groceries
		PA08 = Doing laundry
		Light Walk from PA09 and PA10,
		PA 12 = Yoga, Pilates, flexibility training
		OACT01A = Work, regular jobs
		OACT02A = Volunteer work
		OACT03A = Regular care/assistance to a child or disabled patients
4 to 7	Moderate	PA03 = Outdoor work ex) washing/waxing a car, or yard work like mowing or raking the lawn, weeding, gardening, cleaning gutters, shoveling snow
		PA04 = Household updating, maintenance or repair activities ex) painting, scraping, sanding, caulking, hanging wall paper, laying tile, building walls or shelves
		PA05 = heavy or major chores ex) scrubbing windows, walls or floors, sweeping, vacuuming
		PA11 = Weight or circuit training
		PA14 = recreational activities ex) golf, bowling, social dancing, skating, bocchia, table tennis, hunting, sailing, horseback riding, or fishing
		Brisk Walk from PA09 and PA10
>8	Vigorous (Heavy)	PA13 = vigorous exercise activities ex) bicycling, swimming, running, aerobics, basketball, soccer, rowing, racquet sports, stair-stepping, elliptical, or cross-country ski machine, exercycle

FIGURE 2
Classification of physical activity. Source: Kyu Hee Lee.

(caloric expenditure) of activities. The activity classification and the program coding were obtained from the “Compendium of Physical Activities: Classification of energy costs of human physical activities”.¹ All activities were assigned MET values based on the activity-specific estimated rate of energy expenditure. Metabolic rate for each specific activity was divided by the resting metabolic rate.¹ Activities were classified according to their metabolic rates: sedentary (MET ≤ 1), light intensity (MET 2-3), moderate intensity (MET 4-7), and vigorous intensity (MET > 8). Sedentary behaviors were not quantified in this research because there were not enough questions from the self-reported data to accurately quantify sedentary physical activities. All activities were translated into minutes per week.

In order to calculate the total time spent walking, questions PA09 and PA10 from the BLSA questionnaire were used. Unlike other categories, walk time was categorized into two intensities. Out of total walk time, only brisk walking was considered “moderate-intensity activity,” while others were considered “light-intensity activities.” Light-intensity walk time was measured by subtracting brisk walk time from the total walk time.

Measurement of Cardiorespiratory Fitness

For this analysis maximal, the BLSA treadmill test was used to derive individual estimates of maximum heart rate. To estimate resting heart rate, the average heart rate during short periods of time (approximately 5-10 minutes) in the early morning, when heart rate is typically the lowest, was used. Heart rate reserve was calculated by subtracting the resting heart rate from the maximum heart rate. Participants were asked to wear the Actiheart monitor continuously

Health and Functional Screening Evaluation prior to enrollment. Participants were also free of significant cardiovascular diseases, chronic diseases, orthopedic limitation, as well as cognitive and functional impairment at the beginning of their enrollments. A total of 4,134 older adults participated in the BLSA self-reported questionnaire. Out of 4,134 participants, 654 observations also had objectively measured-data. There were 343 observations in male participants and 311 observations in female participants in this study. Participants wore Actiheart, an activity monitor that measures their heart rates and activity levels of individuals for seven days after leaving the BLSA clinic. The study protocol in BLSA was approved by the Internal Review Board of the Medstar Research Institute.

Study Procedure

During clinical visits, nurse practitioners assessed age, education, height, and weight of each participant. A health history interview was also conducted to

assess the history of chronic conditions. “Physical Activity” and “Other Activity” sections in the BLSA self-reported questionnaire were used to quantify perceived physical activity. The age range of the study sample was 24 to 102. The physical activity questions were asked based on the past two weeks. Questions specifically regarded type of activity, distance and amount, as well as the main reason of performance. All the information above was used to categorize physical activities into sedentary, light, and heavy intensity levels. Missing or non-responsive answers were calculated as zero in quantifying physical activity levels.

Measurement of Physical Activity

In order to convert and classify the self-reported questionnaire into intensities of physical activities, MET (Metabolic Equivalent) values were assigned on each questionnaire. MET values are estimates of the energy cost

for 7 days, except when bathing. Heart rate and accelerometer counts were measured during 7 days in the free-living environment. At the end of the 7 days, the monitors were returned to the clinic and the Actiheart data was downloaded using Actilife software to quantify physical activity counts per minute.

Using the heart rate reserve data from the Actiheart monitor, physical activities were categorized into four states (sedentary, light, moderate and vigorous) based on target heart rate thresholds using the Karvonen Formula.² The target heart rate was calculated using the equation, $[\text{Maximum Heart Rate}-\text{Resting Heart Rate}] \times \% \text{ Intensity} + \text{Resting Heart Rate}$. % Intensity was classified into Four states: sedentary [0.0, 0.2), light [0.2, 0.4), moderate [0.4, 0.6), and vigorous [0.6, ∞). To derive intensity cutpoints, minutes with activity counts between 11 and 69 were considered as light intensity, minutes with activity counts between 70 and 162 were considered as moderate-intensity, and minutes with activity counts greater than 162 were considered as vigorous intensity.

RESULTS

In this research, Statistical Analysis was performed using the software, R studio, version 0.99.491. Paired t- tests were performed for each intensity of physical activities to compare two population samples to see if they are correlated. Two population samples were total physical activity minutes per week in the self-reported data and total physical activity minutes per week in the measured data. The p-value for light intensity activities is $2.34e^{-14}$ and the mean difference for light intensity activities is 458.18. The p-value for moderate intensity activity is 0.05 and the mean difference for moderate intensity activities is 55.24 The p-value for vigorous intensity activities is 0.00059 and the mean difference for vigorous intensity activity is -34.83 Based on the above information, the following conclusion can be made: Older people tend to overestimate their light and moderate intensity activities, but they underestimate their vigorous intensity activities. There were greater variations in light intensity activities than in moderate or vigorous intensity activities.

Vigorous intensity activities had the smallest mean difference and variation. Given that p-values for light, moderate, vigorous activities were smaller than 0.05, there is a significant difference between self-reported and measured data for all physical activity levels.

DISCUSSION

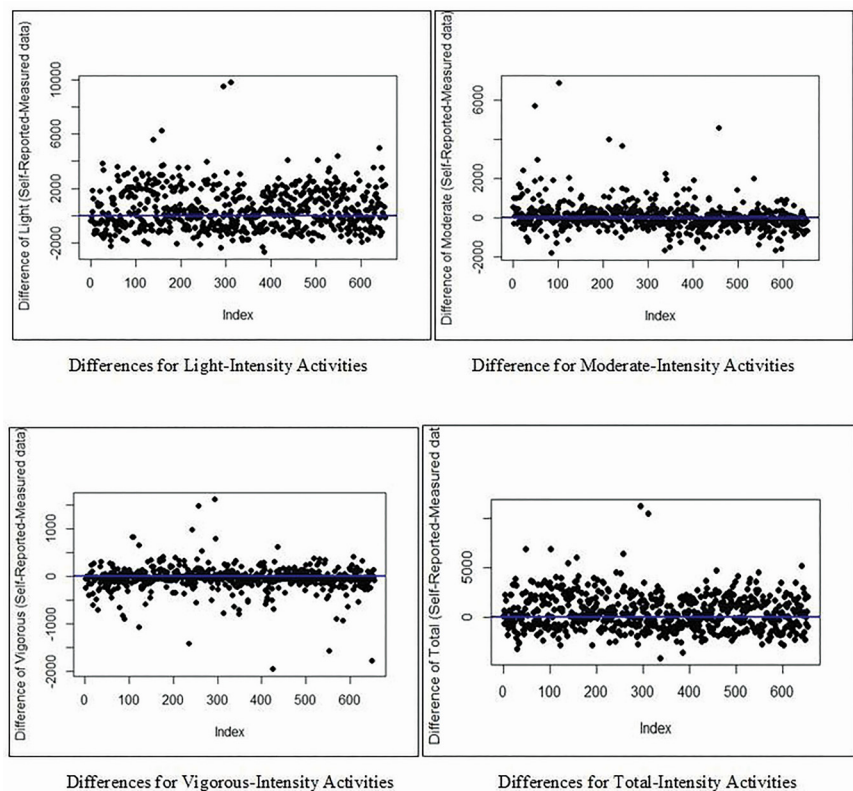
The purpose of this research is to summarize different methodologies of measuring PA levels and to analyze the validity and accuracy of self-reported data. This research concludes that there is a statistically significant difference between self-reported data and measured data, regardless of different intensity levels. Older populations tend to report less physical activity minutes in vigorous activities, and generally report more physical activity minutes in light and moderate activities. There is a larger mean difference in light intensity activities than in vigorous intensity activities. The smaller mean difference suggests that there is a smaller variation and more consistency between self-reported and measured data. One of the potential expla-

nations for this result is the frequency of physical activities: Older adults are more likely to accurately remember and recall vigorous activities. The histogram of light intensity activities shows that the difference is comparatively equally distributed compared to other activities, thus in general, the accuracy and consistency between self-reported and device-based data are higher in vigorous intensity activities and lower in moderate intensity activities. This is contrary to previous findings.¹³

Limitations exist in this research. Classification for the self-reported data may not be perfectly accurate. For example, PA08 (Activity = Laundry) in the BLSA questionnaire was classified into “light intensity” according to the compendium of physical activities. However, doing laundry may be a moderate intensity activity for older populations in terms of physiological

FIGURE 3

Scatter-plots comparing the differences in different intensity activities. Source: Kyu Hee Lee.



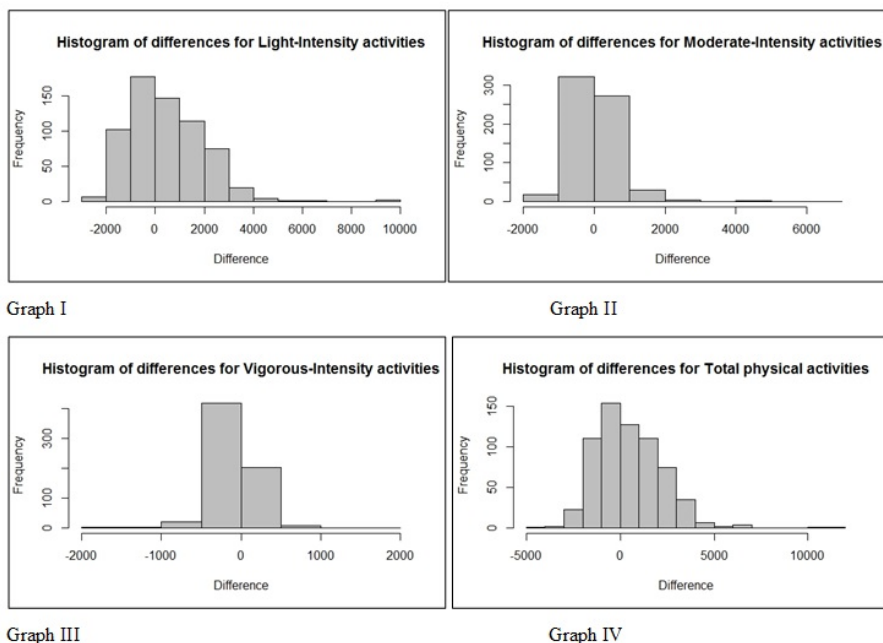


FIGURE 4

Histograms comparing the differences in different intensity activities. Source: Kyu Hee Lee.

effort. Depending on how researchers categorize the self-reported data, the results may differ. Individual differences should be considered when classifying the self-reported data.

Another limitation is the duration of wearing Actiheart device. Participants do not wear the device when they are bathing and swimming; thus, total physical activity minutes may be slightly underestimated. Individual differences are one of the biggest limitations and concerns in this research due to differences in BMI, chronic disease conditions, sex, and age. Simply comparing total minutes of physical activity from the self-reported data and measured data may not be useful to quantify the number of activities and relate it to functional performance of older populations. More research is needed to further investigate differences caused by these individual factors.

A different approach is necessary to quantify physical activity levels in older populations. The integrated self-reported and device-based methods is the most powerful collection approach.²⁰ Overall, this research is not only useful to older populations but also is a great reference for younger generations. It will help younger generations to understand the importance of physical activity and may encourage them to increase their PA levels, which can lead to evidence for future lifestyle interventions.

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Deficiency in Mfge8 Accelerates Mortality and Organ Injury in Neonatal Sepsis

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For 8 months, Tracy worked full-time with Dr. Laura Hansen at the Feinstein Institute on a protein often found in breastmilk called MFG-E8. Her team concluded that MFG-E8 has protective properties that can significantly attenuate the severity of sepsis in infant mice and thus can be a possible treatment.

INTRODUCTION

Neonatal sepsis is caused by a systemic inflammatory response due to a proven or suspected infection in neonates below the age of 28 days. The incidence of neonatal sepsis in the US is 0.77 to 1 per 1000 live births.^{1,2} In 2010, among the 3.7 million deaths reported in neonates by the World Health Organization, 37% of them had an infectious origin.³ While Gram positive infection is much more prevalent, Gram negative or *E. coli* infection is the most common cause of mortality in newborns. Antimicrobial agents are the first line of defense against neonatal sepsis. Aggressive fluid resuscitation and vasoactive and inotropic supports are among a few of current neonatal sepsis treatment strategies. Despite advances in management and supportive care, *E. coli* infections have been increasing over the years, especially in low birth weight infants. Severe sepsis in neonates is characterized by persistence and prevalence of proinflammatory mediators within the third day of diagnosis. High levels of proinflammatory cytokines, TNF- α , IL-1 and IL-6 were observed in human neonates with sepsis 4-10 and uncontrolled proinflammatory responses lead to morbidity and mortality in neonatal sepsis. Therefore, understanding the mechanism underlying the exaggerated inflammatory response will aid in the development of therapeutic strategies in neonates.

Milk fat globule-epidermal growth factor-factor VIII (MFG-E8) is a protein commonly found in human breast milk.

The most remarkable function of MFG-E8 is its ability to promote the clearance of apoptotic cells by forming a tether between phagocytes and apoptotic cells.^{11,12} The expression of phosphatidylserine on the surface of apoptotic cells is considered as an “eat me” signal which can allure distinct opsins (e.g., MFG-E8), to recognize and bring apoptotic cells to the vicinity of phagocytes.¹³ MFG-E8 has a strong binding affinity to the exposed phosphatidylserine of apoptotic cells and facilitates phagocytic engulfment via $\alpha_v\beta_3$ or $\alpha_v\beta_5$ integrin. The binding of MFG-E8 to the integrin triggers a conformational change in the integrin receptor that recruits various signaling cascade proteins and transforms the macrophage into a phagocyte capable of engulfment.^{14,15} MFG-E8 is differentially expressed under various pathological conditions.¹⁶⁻¹⁹ Decreased expression of MFG-E8 has been observed in disease conditions including experimental models of adult sepsis, acute *E. colitis*, and advanced atherosclerosis.^{16,17,20-23}

However, the mechanism underlying the exaggerated inflammatory response observed in neonates has not been completely understood. In this study, we examined whether the deficiency in MFG-E8 could be responsible for the increased inflammatory response leading to a rise in morbidity and mortality in neonates.

MATERIALS AND METHODS

Experimental animals/ Mouse model

C57BL/6 wild-type (WT) neonates aged 5-7 days (3-4 g body weight) and MFG-E8 knockout neonates (MFG-E8^{-/-}) were used for all experiments. Neonatal sepsis was induced by a cecal slurry (CS) method adapted from Wynn et al with some modifications.²⁴ Cecal slurry was prepared from six adult mixed-gender, house-bred mice (aged 11-13 wks). To administer the CS, neonates aged 5-7 days were separated in groups from their mothers, placed on a 37°C heating pad, and anesthetized using 2.5% inhalational isoflurane. Neonates were then injected intraperitoneally (IP) with 0.9 mg/g body weight CS. Subsequently, they were returned altogether to their respective cages with their mothers for recovery from anesthesia. Experimental procedures were performed in accordance with the National Institutes of Health Guidelines on the Use of Laboratory Animals.

Measurement of Serum Organ Injury Marker and Cytokine Levels

Blood samples were centrifuged and serums were then collected and stored at -80°C. Serum samples were measured by enzyme-linked immunosorbent assay (ELISA) kits specific for TNF- α , interleukin (IL)-6 (IL-6) and IL-1 β .

Histological Examination

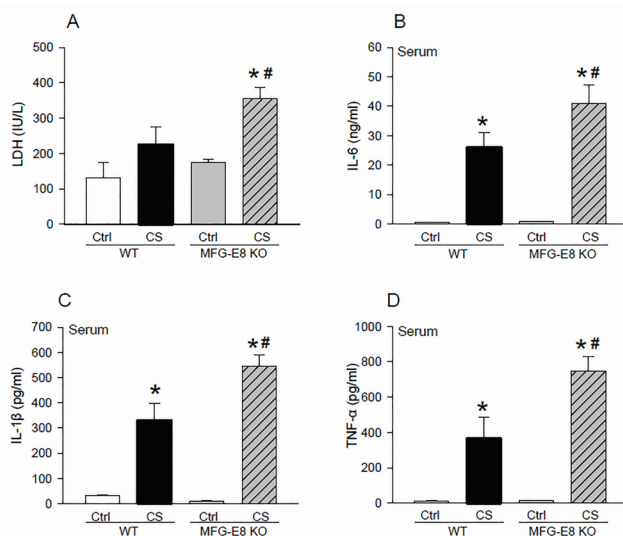


FIGURE 1: LDH and serum cytokines are increased in MFG-E8-/- neonates.

Serum samples from wild type (WT) and MFG-E8^{-/-} (MFG-E8KO) neonates of control (Ctrl) and at 10 h after CS injection (CS) were measured for LDH (A), IL-6 (B), IL-1β (C) and TNF-α (D). Source: Tracy Chen.

The lung and gut were segmented into 5 μm sections, placed onto glass slides and stained with hematoxylin-eosin (H&E). Morphological examination of lung injury was analyzed using a scoring system adapted from Matute-Bello and his colleagues.²⁵ The extent of lung injury was evaluated from 0 to 2 based on the presence of neutrophils in the alveolar space, neutrophils in the interstitial space, hyaline membranes, proteinaceous debris filling the airspaces, and alveolar septal thickening. The sum of the scores was weighted using a modified formula described by Matute-Bello et al. for a maximum grade of 100 per visual field.²⁵ The severity of gut damage was graded in 5 fields per section using modified scoring criteria as described by Feinman et al.²⁶ Scores per visual field were assessed with 0 as normal, 1 as development of vacuoles and epithelial space at the villus tip, 2 as extension of the epithelial space and lifting of epithelial layer, 3 as vacuolization from tip to middle of the villus, sloughing, and greater epithelial lifting, 4 as epithelial lifting and vacuolization from top to bottom of the villus, and 5 as mucosa ulceration and disintegration of epithelial layer.

Myeloperoxidase (MPO) activity assay

Lung and gut tissues were homogenized with a sonic dismembrator in potassium phosphate (KPO₄) buffer. Samples were centrifuged and the supernatant was diluted in reaction solution. To calculate MPO activity, the rate of change in optical density was measured at 460 nm for 2 min.

TUNEL assay

Lung and gut tissue sections were deparaffinized and processed with 20 μg/ml proteinase K for 20 min at room temperature. Sections were then stained with green fluorescent, terminal deoxynucleotidyl transferase dUTP nick end labeling (TUNEL) kit and counterstained with blue, 4',6-diamidino-2-phenylindole (DAPI). TUNEL-positive cells were counted per villus in the guts and number fields per section in the lungs at 200x magnification under a fluorescence microscope.

Quantitative real-time PCR

Lung and gut tissues were homogenized in TRIzol reagent with a sonic dismembrator to extract RNA. The total RNA was then reverse-transcribed into cDNA by using murine leukemia virus reverse transcriptase.

A PCR reaction was carried out in 25 μl final volume containing 0.08 μmol each forward and reverse primer, complementary DNA, and 12.5 μl SYBR Green PCR Master Mix. Amplification was performed in an Applied Biosystems 7300 real-time PCR machine under the thermal profile of 50°C for 2 min and 95°C for 10 min, followed by 45 cycles of 95°C for 15 s and 60°C for 1 min and 72°C for 1 min. Mouse β-actin mRNA levels were used to normalize samples and relative expression of mRNA was quantified by the 2-ΔΔCt method. The results were expressed as fold change in relationship to control group.

Survival Study

Mixed gender WT (n=14) and MFG-E8^{-/-} neonates (n=15), aged 5-7 days, received IP CS injection as above. Neonates were closely monitored every 12 h for the first 24 h and then every 2 h until the 48 h mark, and then twice a day for a total of 7 days.

RESULTS

MFG-E8 deficiency increases organ injury and serum cytokines

To assess whether cell death is increased in the MFG-E8^{-/-} neonates, serum samples were measured for LDH and cytokine levels at 10 h after CS injection. Serum LDH levels increased by 72.0% in WT neonates whereas in MFG-E8^{-/-} neonates, the levels were increased by 172% which was equivalent to a significant 57.7% increase from CS WT neonates (Fig 1A). To assess MFG-E8 influences on the extent of systemic inflammation in neonatal sepsis, serum levels of various pro-inflammatory cytokines were measured. Serum IL-6, IL-1β, and TNF-α levels were significantly increased by 38.4-, 10.0- and 28.9-fold in CS WT neonates whereas in the MFG-E8^{-/-} these levels were increased by 60.7-, 15.6-, and 60.2-fold, respectively from WT control (Fig 1B-D). These levels were equivalent to significant increases of 56.5%, 64.6% and 104.7% in the MFG-E8^{-/-} mice in comparison with CS WT mice (Fig

1B-D).

MFG-E8 deficiency increases lung injury, neutrophil infiltration and apoptosis

To further assess the severity of organ injury to specific tissues, tissue histology was evaluated by H&E staining of the lung tissues collected from WT and MFG-E8^{-/-} neonates. In MFG-E8^{-/-} neonates, increased presence of neutrophils in the alveolar space and the interstitial tissues, appearance of the hyaline membranes, and increased alveolar thickening were observed and compared with WT neonates after CS injection (Fig 2A). The lung injury scores in the WT and MFG-E8^{-/-} neonates after CS injection were increased by 4.0- and 12.0-fold respectively, which was equivalent to a significant 162% increase in the MFG-E8^{-/-} neonates as compared to the CS WT neonates (Fig 2B). To quantify neutrophil infiltration into the lungs, MPO activity was assessed. Although there was no significant increase in MPO activity in the WT neonates after CS injection, MPO was significantly increased by 88% in the MFG-E8^{-/-} neonates (Fig

2C). To measure apoptosis, the lungs were examined by TUNEL staining (Fig 2D). While TUNEL positive cells were significantly increased 5.4-fold in the CS WT neonates, there was an 8.4-fold increase in TUNEL positive cells in MFG-E8^{-/-} neonates which was equivalent to a significant 72.6% increase from the WT CS neonates

MFG-E8 deficiency increases intestinal injury

(Fig 2E).

The intestinal integrity was evaluated by H&E staining of the gut tissue collected from WT and MFG-E8^{-/-} neonates. Although the intestinal barrier in the CS injected WT neonates appeared normal with no sign of villi disintegration compared to WT control, the intestinal barrier appeared damaged in the CS MFG-E8^{-/-} neonates with clear indication of sloughing, epithelial lifting and vacuolization from tip to midsection of villi (Fig 3A). While the intestinal injury score increased by only 8.1% in WT mice after CS injection, the gut injury score in the CS MFG-E8^{-/-} was in-

creased by 210.7%, compared to CS WT neonates (Fig 3B). There was no significant increase in MPO activity in the gut between groups in the WT neonates. Surprisingly a 2.0-fold increase in the gut MPO was seen in the MFG-E8^{-/-} control neonates as compared to WT control neonates. However, a significant 240.8% increase was observed in MFG-E8^{-/-} neonates from WT ones after CS injection (Fig 3C). To measure apoptosis, gut tissues were examined by TUNEL staining (Fig 3D). While there was no significant increase in WT neonates in TUNEL positive cells after CS injection, there was a significant 17.0-fold increase in CS MFG-E8^{-/-} neonates, which was equivalent to 12.3-fold increase from CS WT neonates (Fig 3E).

Mortality is increased in MFG-E8^{-/-} neonatal mice after neonatal sepsis

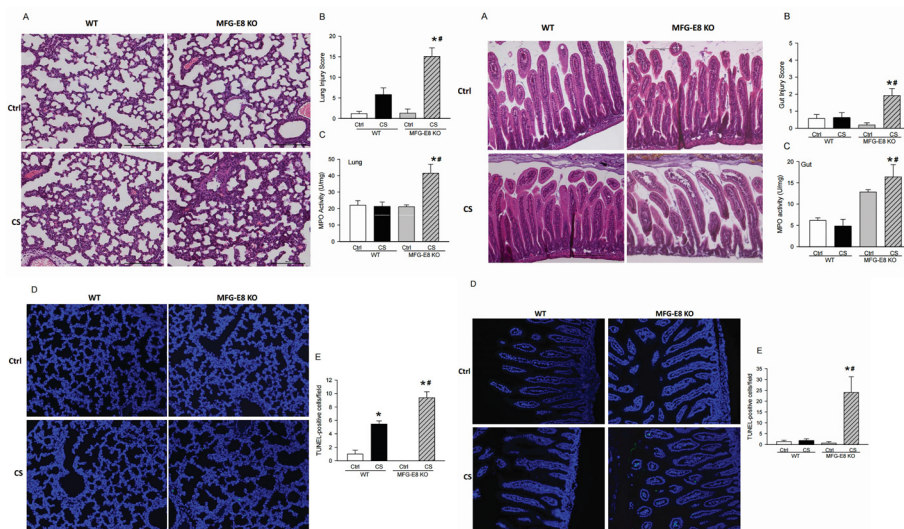
A survival study was conducted to investigate the effects of MFG-E8 on survival in experimental neonatal sepsis. Within 7 days of CS injection, while the mortality rate was only 29% in the WT neonates, 80% of the MFG-E8^{-/-} neonates died in the same time period, with the majority of mortality occurring within 48 h (Fig 4). This suggests that MFG-E8 deficiency was more vulnerable to sepsis-induced mortality in neonates.

DISCUSSION

In the current study, which uses an established CS model that simulates neonatal sepsis, MFG-E8 deficiency significantly increased mortality in neonates. This suggests that those neonates are more susceptible to infection than their wild-type counterpart. Severe sepsis in neonatal infants have been characterized as persistent and prevalence of proinflammatory mediators within the third of diagnosis. High circulating levels of cytokines are observed in neonatal sepsis in infants.⁴⁻¹⁰ In this regard, serum levels of IL-6, IL-1 β and TNF- α were significantly increased in wild-type neonates at 10 h after CS injection, indicating that our model mimics the neonatal

FIGURE 2 (left column) + FIGURE 3 (right column)

Lungs (left column) and intestines (right column) were harvested from WT and MFG-E8^{-/-} neonates, fixed and stained with H&E. A. Representative photographs at 200X magnification are shown. B. Histological lung injury score was calculated. C. Lung (left column) and intestinal (right column) lysates were measured for myeloperoxidase (MPO) activity. D. Lung (left column) and intestinal (right column) tissue sections were analyzed for TUNEL staining. E. TUNEL positive cells per field were calculated. Source: Tracy Chen.



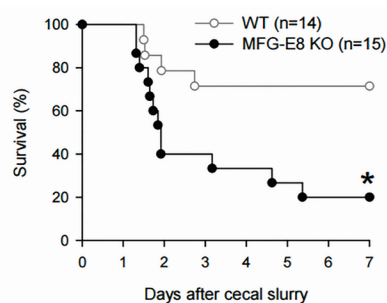


FIGURE 4

Total RNA extracted from lungs were analyzed by real time reverse transcription-polymerase chain reaction (qPCR) for IL-6 (A), IL-1 β (B) and MIP-2. Source: Tracy Chen.

sepsis in infants. Interestingly, the serum levels of those cytokines were significantly elevated in the MFG-E8 $^{-/-}$ neonates. Histological assessment of the lung by H&E staining demonstrated significant damage of the lung architecture in the CS MFG-E8 $^{-/-}$ neonates. In addition, lung neutrophil infiltration and TUNEL positive cells were also increased in the CS MFG-E8 $^{-/-}$ neonates. Similarly, histological staining of the gut also revealed significant tissue damage in the gut in the CS MFG-E8 $^{-/-}$ neonates. TUNEL positive cells in the gut were also significantly elevated in CS MFG-E8 $^{-/-}$ neonates. These data collectively suggest that MFG-E8 deficiency could be responsible for the observed exaggerated inflammatory response and mortality due to sepsis in the newborns.

Previous studies indicated that MFG-E8 exerts its effects by acting as a tether between phagocytes and apoptotic cells.¹¹ This interaction is facilitated by the binding of MFG-E8 to integrin $\alpha_V\beta_3$ or $\alpha_V\beta_5$ on the phagocyte and phosphatidylserine on the apoptotic cell. Deficiency in efficient clearance of apoptotic cells can be potentially harmful to the host and those apoptotic cells also release inflammatory and toxic mediators and exaggerate the inflammatory response.^{11,12} In addition, there is evidence that MFG-E8 directly interacts with the integrin receptor and inhibits LPS-induced TNF- α and IL-1 β production in macrophages.²⁷ Our data showed that MFG-E8 deficiency in neonates exaggerated the inflammatory response leading to high levels of proinflammatory cytokines IL-6, IL-1 β , and TNF- α in circu-

lation. The increases in circulating levels of proinflammatory cytokines is a hallmark of systemic inflammatory response syndrome (SIRS). Increased IL-6 and TNF- α in combination is considered as a highly sensitive marker of sepsis in the immediate postnatal period.¹⁰ Therefore, the observed increase in proinflammatory cytokines in neonates with MFG-E8 deficiency could be caused by the deficiency of apoptotic clearance and/or the lack of direct interaction of MFG-E8 on the phagocyte.

In summary, our data demonstrated that the increases in systemic, gut, and lung proinflammatory cytokines, neutrophil infiltration, and the excess of apoptotic cells caused by the deficiency of MFG-E8 could be responsible for the increased morbidity and mortality in neonatal sepsis. These data further suggest that MFG-E8 could serve as a novel therapy for neonatal sepsis.

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Features



photo by
Grace Kwak



Resilience in the Face of Adversity

JIA YAO KUEK

International Studies, Class of 2019

Jia Yao spent a month volunteering at Ritsona Refugee Camp, near Chalkida, Greece. His work involved both construction and engagement efforts with the community. This work included liaising with overseas donors and Greek contractors to carry out projects, including the purchase of electric stoves for all of the camp's residents, and the construction of street signs, while supporting the individual efforts of many dedicated individuals in the camp.

According to various accounts from my migrant friends and fellow volunteers, it costs each refugee, adult and child alike, approximately \$4000 for people smugglers to transport them across the Aegean Sea in any manner of watercraft, many of them barely even seaworthy. For many families, this constituted almost all of their collective life savings. Those lucky enough to reach the shores of Europe alive are quickly processed and then housed in one of around 30 camps scattered across Greece. Amidst the continuing spate of Islamist attacks around Europe and accusations that migrants from the Middle East and Africa pose a serious public security risk to their host communities (with the spread of such sentiments manifested in the rapid political rise of far-right parties such as the AfD in Germany), my experiences encapsulated a differing view of the lives of migrants in Ritsona refugee camp, providing a more grounded, realistic, and compassionate view of the continuing refugee crisis.

This past summer, I spent a month at one of these so-called “hotspot,” the Ritsona refugee camp near Chalkida, Greece. Though I have physically left Ritsona, it'll never be possible to mentally move on from that experience. Whether you were a volunteer or resident, the

camp presented a sobering reality of the European refugee crisis. I saw firsthand the array of difficulties faced by residents of Ritsona, and the ways that they have risen to the challenge with an adaptable spirit of endeavor.

Many media outlets paint a bleak picture of the current situation in Aleppo and other war-torn Syrian cities, where starvation and deprivation are rife. As such, the food supplied three times a day by the Hellenic Air Force at the Ritsona refugee camp may almost be seen as a luxury, vis-a-vis the grave supply situation in other refugee camps within Greece and the surrounding area of the Syria-Jordan border.

Yet, the reality of the situation proved otherwise. The meals provided not only lacked sufficient nutritional content, but also offered little to no sustenance for the famished and struggling families. As time progressed, it became increasingly common to see plastic boxes of cold spaghetti noodles being distributed, accompanied by a small block of feta cheese. Such insufficient nutrition often drove many to either simply discard the boxes or recook it, using makeshift mud-brick stoves and simple open fires just adjacent to their tents. The ever-present smoke was not only a health hazard



but also served as a reminder of Ritsona's consistently poor quality of food. To the residents' credit, they adapted to the situation with undeniable tenacity; the sturdy mud-brick stoves and handcrafted furniture were but a few of the homemade household implements I observed.

“Water had to be brought in by a lone water tanker every day, and this finite supply would almost always run out by around noon, after which there was no water to wash clothes, take showers, or clean dishes.”

Furthermore, it was the Islamic holy month of Ramadan, in which most Muslims (excusing the young, aged, or unfit) fast from dawn to dusk. Such require-

ments put an added strain upon the physical fitness and health of residents. Ultimately, the relatively simple diet they were provided was inadequate. Thankfully, the weekly donations of food from kind Greek residents and other parties (e.g. the United Arab

Emirates embassy, which donated several hundred kilograms of dates) helped provide temporary relief.

However, a much graver problem

surfaced in the camp's water supply and sanitation situation. The situation on my arrival at the beginning of June was bleak: there were only four public taps throughout the entire camp for residents to conduct their daily chores. Water had to be brought in by a lone water tanker every day, and this finite supply would almost always run out by around noon, after which there was no water to wash clothes, take showers, or clean dishes. It came as little surprise, then, that after the installation of mandatory fire hose reels

INSIDE THE CAMP

Giving out some electric stoves in camp, courtesy of several donors from Singapore. Photo by Jia Yao Kuek.





IMPROVISATIONS

(left) A fire hose reel in Ritsona; they were positioned wherever convenient - in this case, on a tree trunk by the side of the road. The hose has been unreeled and stuffed back into the box.

(right) An improvised mud stove in the camp; note the interesting use of scavenged materials, such as the PVC pipe that acts as a chimney.

Photos by Jia Yao Kuek.

throughout the camp, residents were found breaking into the hoses and tapping into that abundant water supply to wash their clothes. By my departure, a private group of donors had contributed to the installation of a \$13,000 water supply system taken from a disused underground well. Unfortunately, trace levels of arsenic were found within the water supply, rendering it unusable. Such problems were commonplace, and highlighted the many logistical and ecological challenges that the Air Force, NGOs, and volunteers faced in improving the camp's ad hoc nature. There were fewer than 20 portaloos and only a handful of shower cubicles for all of the camp's 800 residents, a sad reflection of the sordid hygiene situation in the camp.

On a more positive note, the situation regarding the supply of potable water was much less dire. Potable water

was provided in 1.5 L bottles to all residents from large, filled pallets lying in our warehouse, evidence of the ample and uninterrupted supply of drinking water in the camp. Nonetheless, Ramadan raised other challenges as well. Given the scorching summer heat and lack of ventilation within the tents, cold water was a highly valued and scarce commodity amongst residents. Each family was limited to 1 bottle of cold water a day (that came from massive coolers within the warehouse). Indeed, June temperatures often exceeded 42°C in the camp; the lack of a reliable electricity supply left most families without even the most basic fans.

The overbearing heat added to the psychological and emotional stress of the residents, leading to increased disputes among refugees and an om-

nipresent atmosphere of desperation within the camp itself. Of the approximately 800 residents living in Ritsona when I arrived, many had left by the end of my stint. Some families were so desperate that they paid people-smuggling syndicates for help in crossing the borders of the Balkans states in an attempt to reach Central and Western Europe. Many of those without the necessary funds still made their way northwards, in the vain hope that the border controls along Greece's northern border (specifically near Idomeni) would be relaxed. Though illegal attempts had become exponentially more risky in the months since the beginning of the refugee crisis, many residents, driven by extreme desperation and a general lack of faith in the refugee management process, still choose to leave.

Amidst such adversity, the spirit of adaptability displayed by the residents of Ritsona left me hopeful that my friends would eventually find their way out of this challenging situation to a better future. By my departure, a resident had set up a stall near the camp's entrance selling all sorts of provisions, from butter to biscuits, and



DIRECTIONS WITHIN CAMP

Street signs in camp, one of our minor projects. The signs were painted by several amazingly talented Yazidi friends of mine: Ismael, Salam, and Jason. Photo by Jia Yao Kuek.

even instant noodles. Another resourceful resident started a makeshift barber's stall in the camp's communal tent (one of the few places with a reliable electricity supply), charging two dollars for a simple haircut and shave.

Despite the inevitable hardships that accompanied their day-to-day life in Ritsona, all the families in Ritsona never deviated from their firm support for our respective NGOs efforts in establishing basic educational facilities for their children. This ranged from the Lighthouse Relief's Child Friendly Space, which provided a safe kindergarten and child-care facility for kids, to I AM YOU's school and library, which provided classes for more advanced learners in everything from English to German. Such widespread support for our efforts reflected a consistent theme that emerged during my stay, through conversations with var-

ious friends and families, of how most adults in Ritsona cared not for themselves and their futures, but rather the future prospects of their children and grandchildren. The self-sacrifice and unconditional love of these parents attests to the collective resilience and humanity of the refugees thrown up by the Syrian conflict, many of whom have been through truly horrific conditions. Indeed, the sobering reality of the horrors of war were clearly manifested in Ritsona- it consists of multiple amputees who live from one cigarette to the next, or even of children who play with such joy around camp, blissfully unaware that their father was killed in a bombing raid back home in Syria.

In the months since my departure, periodic updates on social media have given me a glimpse into where my friends and colleagues are headed. Volunteers and staff have switched to other careers, while some of my resident friends have had their refugee applications successfully approved. Within the camp itself, modular isobox housing units have started arriving, and children have now begun attending local schools.

Despite being physically far-removed from the refugee crisis itself, I don't believe that we, as casual observers, need necessarily only view the unfolding events with a detached air of curiosity. There are many ways to help out that do not necessitate an air ticket to Greece. From fundraisers, to working remotely for an NGO, I would urge any individual who feels strongly for these migrants to take positive action, and make an actual change beyond their next Facebook like. Ultimately, our shared humanity is the most powerful motivator we have for collective change.

Give Water, Give Hope, Give Life

MICHAELA BARTHELMASS

Latin American Studies and International Studies, Class of 2017

Michaela, in response to the world water crisis, has raised over \$20,000 and has built three water wells in the Dominican Republic through her non-profit Change for Children.

I have walked over 3,000 miles. My eyes are bloodshot, and my hair is frizzy from the humidity of the tropical weather. My back hurts from sleeping on a broken cot the night before. I have a headache from being jostled continuously in the van while driving on a bumpy unpaved road. I step out of the car and am suddenly swarmed by little Haitian girls grabbing and hugging me. Instantly, I find myself recharged with energy, and the Spanish quickly begins rolling off my tongue. The little girls, fascinated with my camera, insist on having a mini photo shoot. Yolanda, the oldest girl out of the group, asks if she could see the pictures. When she sees the first picture she cries out at the top of her lungs, “¡Soy bellissima!” Stunned, I realize these young girls have never seen their own faces before.

How did I end up here? I was motivated by a globalization class to get out of my comfort zone and become a global citizen. A speaker in the class informed us about the large numbers of Haitian migrants, mostly ex-sugar cane slaves that cross the border to the other side of the island to live in squatter villages called bateyes. Currently, Haitians are crossing the border simply as a consequence of economic and political deprivation caused by a long history of corrupted government and catastrophic natural disasters that have thrown their lives into disarray. The constant flow of Haitians into the Dominican Republic

has resulted in increased racial discrimination and hostility amongst the two countries, and yet, the extreme racial prejudice is not enough to prevent the Haitians from crossing the border. This reality produces a migratory pressure that no frontier can contain. Thus, the movement across the border is not by choice but by necessity.

Regardless of gender or age, Haitians are forced to work on Dominican sugar plantations by military personnel and brought to live in appalling hygienic conditions in the bateyes. With virtually nonexistent wages, they are coerced to live in extreme poverty without access to clean water, and are forced to drink from sources contaminated by trash, chemical plants, and human and animal waste. In consequence, children often suffer from parasitic, skin and respiratory diseases with no access to medical attention. Women and children on their way to collect unsanitary water are often sexually abused. With limited access to food, they constantly suck on sugarcane for energy to work. To add insult to injury, the Haitian migrants understand that both governments are complicit in their continued subjugation and that they are paid off by the sugar companies to continue their quasi-slavery system without interruption. This aggravates the migrant workers whose labor feeds the Dominican economy, though for many of

them the work, however difficult, still trumps living in the collapsed nation of Haiti. Learning about these devastating circumstances truly touched my heart; I felt that this was my opportunity to make a difference in someone's life, so I followed my inspiration and created a non-profit organization called Change for Children.

Change for Children is dedicated to building water wells to provide clean drinking water in the Dominican Republic. By building a water well in the middle of the batey we eliminated the risk for disease, illness, and sexual abuse. Change for Children is unsponsored, and yet through the years we have managed to raise over \$20,000 through fundraisers such as dances and change jar collections and have been able to successfully build three water wells in the bateyes Proyecto Juan Bosche and La Lechería. Unlike many charities that simply donate funds, Change for Children takes matters into its own hands by flying down to the Dominican Republic to personally meet with engineers and Haitian refugees. I traveled around the Dominican Republic and visited several bateyes. It was highly difficult choosing a batey, especially after seeing the extreme destitution and speaking with many deprived yet joyful children. The impact of the children and their stories, recounted in Spanish, transported me into their shoes in

a manner a mere translation could never have. Having that personal connection with these impoverished children fueled me, making the hard work to raise funds worthwhile.

The first well was built in Proyecto Juan Bosche, which had the greatest need for clean water. This batey was situated on coral rocks, which, combined with the lack of clean water, made it impossible to grow subsistence crops. The families lived in shacks made of thin, patchy sheet metal with dirt floors and one cotton sheet dividing the kitchen and bedroom.

I met with the head of Proyecto Juan Bosche, an elderly woman named Felicia, who was donating her land for the construction of the well. She kindly invited the six of us into her home, a cramped seven-by-seven-foot shack. She showed us pictures of her recently deceased son, the victim of a shooting, who had pro-

vided the only source of income for the household, leaving her responsible to care for her grandson in the aftermath. I examined her kitchen, which occupied a small corner of her shack. The amenities consisted of one pan, a small tin cup, some salt and pepper, dried beans and ketchup. She then took us outside to show us her garden of tomatoes, pointing out several dried twigs on the ground that, to me, looked like weeds. When I realized this was her garden and main source of food, my heart sank. I was in utter awe of this woman's strength and ability to endure these hardships; she not only greeted us with a warm smile, but showed off her simple home with pride.

“It is astonishing to see how providing a community with a basic human necessity...has created such dramatic change in the quality of life for these children.”

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Since the construction of the well, Proyecto Juan Bosche has changed drastically. Change for Children has not only managed to eliminate the risk of sexual abuse and disease in the batey, but has also helped foster a flourishing agricultural landscape. I spoke with Felicia a

couple of months after the completion of the well, and she was excited to share that she now has a real garden to be proud of. The access to clean water has given Felicia the opportunity to grow many fruits and vegetables that she has begun selling to support her orphaned grandson. Following the implementation of the well, other forms of social change naturally ensued. The most thrilling change by far is the appearance of an elementary school in the community, allowing children the opportunity to get an education and break free of the cycle of poverty. It is astonishing to see how providing a community with a basic human necessity such as clean water, which many first world countries take for granted, has created such dramatic change in the quality of life for these children.

I am now a senior at Johns Hopkins University, majoring in Latin Ameri-

can Studies and Natural Sciences, and as a student I have taken advantage of the opportunity to continue raising money and growing Change for Children with the help of my peers. I worked with the Johns Hopkins University Class of 2017 to sponsor Change for Children, by donating the proceeds from the annual Junior Boat Cruise to make an impact and drive awareness for the global water crisis. Additionally, Change for Children has hosted a sunglass drive to collect student's old sunglasses to send to the children who cut sugarcane and suffer from actinic conjunctivitis caused by sun damage to the eyes. It was my personal experience with Change for Children that has inspired my aspirations to become a plastic and reconstructive surgeon, eventually working in Latin America with children with cleft palates. Moving forward, I plan on continuing Change for Children with hopes of one day expanding to

provide medical care for the children. Change for Children has allowed me to give back globally and has not only changed the living conditions and futures of the children but has also invoked a change within myself. I have found tenacity, passion, and perseverance. Coming from the state of California where beauty and self enhancement take top priority, it was truly inspiring to see young girls, like Yolanda, pass the camera around and share the same giddy, pure reaction. I could never imagine not having seen my face before, but what personally affected me was how these girls still able to perceive their beauty despite being impoverished and uneducated, coming from generations of slavery, and having received little opportunity in their lives. Today our youth is under constant scrutiny to conform into this idea of a “perfect” person. We are no longer judged by who we are as people, but by what we look like and how much we have accomplished. These young girls have never been exposed to the same judgments or standards, and therefore can praise their radiating beauty at the top of their lungs. Thanks to Yolanda's beautiful spirit, I have learned to ignore society's expectations and create my own path. I can now look in the mirror and not only see my own true beauty, but the true beauty of the world. With this new outlook, I am motivated to continue challenging myself to help children like Yolanda rewrite their story, and it all starts with clean water.

V.H.T.'s, V.I.P.'s, and Boda Bodas

ANISHA NAGPAL

Public Health Studies, Class of 2020

Anisha spent three weeks in Uganda in both rural and urban settings analyzing the affect of health infrastructure on childhood illness.

Where do the bananas in the dining hall come from? Who updates the public transit schedules in the app on my phone? From the complex systems that maintain the dining hall's unending supply of bananas to those that provide me with programmed bus times, Hopkins is teeming with invisible networks that sustain my daily life. In Uganda, on the other hand, the networks that fueled the country's cities, suburbs, and villages were far from invisible and I saw them take shape every time I gazed out of the bus window. Our longest bus journey during the three-week trip was the drive from the capital city of Kampala to the village of our host fami-

lies near the Southern Ugandan city of Kalisizo. During this drive, I tried my best to understand the connections between the unfamiliar blur of smells, colors, and sounds that characterized Uganda's bustling markets and dense farmlands.

Even though you can call an Uber in Kampala, the more efficient and common mode of public transportation is the boda boda. A boda boda is the regional phrase for a motorbike. No one is exactly sure where the term originates, but it may reference the sound of a revving engine. At every street corner across Uganda I saw men on motorbikes, casually waiting for a customer willing to pay a few

thousand shillings for a ride to any local area. Considering that a U.S. dollar is worth approximately 3,000 Ugandan shillings, the fare is relatively inexpensive. Sitting on the bus, my face was often level with a boda boda driver who bypassed traffic by weaving between cars on the congested road. They were usually either transporting a person or a bundle of produce to its destination. It was not uncommon to see a cluster of pineapples or bananas occupying the same space as an additional passenger on the back of a boda boda.

ADAPTING TO VILLAGE LIFE

After hearing the constant honking of car horns in bumper to bumper traffic, viewing vibrant markets that sold everything from baby shoes to freshly butchered meat, and gazing at miles of lush forestry, we finally arrived in the district of Rakai, the home of our host-families. My host family consisted of two parents, several children, grandparents, and extended family members. Even with a few children away at university, there were still 13 people living in the house during my stay. The property consisted of a main brick house with four rooms, a patio kitchen area, four outdoor latrines, two outdoor bathing rooms, and an extensive swath of farmed land. In the



FROM FAR AWAY

Bright Angels Primary School.
Photo by Anisha Nagpal.

main brick house, one room functioned as a living room and dining area while the others were bedrooms, each about the size of a Honda civic. I shared one of these bedrooms with two other students.

After figuring out a configuration in which we could fit three twin mattresses on the floor, we were puzzled as to how we would be able to hang our mosquito nets, since we had no string. Thankfully, my host-mother ingeniously found a way of hanging our nets with electrical tape tied around nails that she had hammered into the walls. Sleeping with mosquito nets is a preventative measure taken to avoid malaria. Because malaria is extremely prevalent in Uganda, especially in vegetation-rich rural areas, many people regard it the same way Americans regard the flu. I was surprised to learn that the majority of the villagers did not use mosquito nets because they found them either ineffective or uncomfortable (mosquito nets are sprayed with a pesticide that irritate exposed skin if they are not aired out before usage). As a result, we were the only people in the house sleeping with mosquito nets.

Every morning, as we crawled out from under our mosquito nets, we were greeted with the phrase, “you are so very welcome.” The same phrase was repeated at every home we visited and at every event we attended and truly characterized my experience in the village.

Despite my unfamiliarity with the local culture and customs, I quickly felt at home. My host-parents called me and the other students in the home their daughters and showered us with love. In response, I affectionately referred to my host-parents as Taata Francis and Maama Betty, the Lugandan titles for Dad and Mom.

During the six days I spent in the district of Rakai, I began to admire my host family’s work ethic. Their main sources of income were their plantation and the primary school they had built, Bright Angels. Like the interlocking gears of a well-oiled machine, the family members worked together efficiently to maintain their plantation and take care of each other. The main crops on the plantation included the staple matoke, a starchy banana that is peeled, steamed,

and mashed. They also grew coffee, potatoes, and a variety of leafy greens. The men and children worked in the fields while women mostly prepared the meals. Harvesting the plantation’s fruits and vegetables and transforming them into hot, fresh meals for the home and for the school required the commitment of raising a child. Every meal consisted of the vegetables they grew in their backyard and all food peelings and uneaten leftovers became compost that nourished the plantation. I was amazed at how a seemingly useless product could be used as a necessary input for another process, leading to a largely sustainable lifestyle. I estimated that the 13 people in the household produced less waste in a month than what I and three roommates produced in a week.

UNDERSTANDING VILLAGE HEALTHCARE

Although waste was well managed in the agriculture practices, human waste and sewage infrastructure were less efficient and often posed a public health threat in rural areas of Uganda. A few days into our homestay, other students and I were informed that we would be participating in a community service project to promote public sanitation. We were told that we were going to “paint a V.I.P.” For a solid 48 hours I was convinced the project consisted of painting a “very important person.” Eventually I learned that V.I.P. stands for “Ventilated Improved Pit” and refers to a latrine. Our actual project was to paint the latrine wall with public health messages and we eventually sketched phrases like “Wash your hands,” “Know your HIV status,” and “Care for the vulnerable” in colorful hues. Although I enjoyed the morning we spent painting, I did not understand what benefit decorating a latrine wall would provide for the community. That is, until I spoke to Joseph Muwanga, a member of the Village Health Team commonly referred to as a VHT.

After a morning of painting, I

listened to my team member, Ruth Mirembe, an undergraduate student from Makerere University, interpret Joseph’s Lugandan praise for our efforts at the public latrine wall. The other team members and I sat on Ruth’s host family’s sofas, listening to the tremor of emotion in Joseph’s voice. Even though his voice was soft, he talked quickly, as if he were trying to cram as many details and words as he could in a single breath. Whenever he finished a sentence, his mouth broke out into a crooked-toothed smile radiating an aura of friendliness.

I learned that, as a VHT, Joseph was responsible for providing the widespread homes of the village with drugs such as antimalarials, antibiotics, anti-retrovirals, oral rehydration solutions, and zinc supplements. In addition to being the village’s main supplier of medication, he was also responsible for providing treatments and educating families on simple illnesses, informing couples on family planning options, advising on nutrition, acting as a counselor in situations of domestic abuse and violence, and educating families on basic hygiene and water sanitation.

Despite the multitude of public health issues Joseph oversaw in the community of 600 homes, he was only aided by a single partner. Joseph told us that he and his partner received a regular supply of drugs every three months from the government. Unfortunately, this supply only lasted a month, or even less during the monsoon season (which hits every spring as well as in October and November) when malaria, diarrhea, and other waterborne illnesses reach annual highs. Although Joseph enthusiastically took on the role of a VHT, it was clear that the post was much more demanding than a nine-to-five job. He told us that even though he recognized the importance of his service to the community, he took safari jobs whenever possible so that he could provide an income for his family, which meant leaving his village for months at a time. In his absence, only one VHT would be left to service the community of 600 homes.

Although the VHT system in Uganda is understaffed and underfunded, the network of VHTs has created an important foundation for providing care in hard-to-reach areas while reducing overcrowding in hospitals. In a country where, according to the World Health Organization, there are 0.117 physicians per 1,000 people; every health worker is vital.¹ VHTs are especially valued since they are able to service rural areas where families are spread few and far between.

Main roads do not run through villages. Neighbors visit each other through winding dirt trails that might even pass through a friend's plantation. In fact, my host-family's home could not even be reached by the bus hired to transport the Hopkins and Makerere students for the three-week program; the bus often dropped us off at Bright Angels and we walked home through a trail that ran behind the school. As a VHT, Joseph was familiar with all of the roads, trails, and short-cuts that ran through his village. He knew the families of all 600 homes under his service, and they, in turn, knew and trusted him. In rural Uganda, modern medicine is often eschewed in preference for herbal and local treatments. The trust that was accorded to Joseph allowed him to counsel patients into considering modern medical alternatives when herbal remedies were not effective.

After spending just 6 days in the village surrounding Kalisizo, I began to realize how crucial of a role VHTs and community health workers played in the Ugandan healthcare system. When I asked Joseph what the most devastating health issue the village has ever experienced was, he responded, without pausing, that it was water sanitation. In Uganda, children under 5 most often die from malaria, respiratory infections, and diarrhea, diseases colloquially referred to as "child-killers." Although diarrhea is an easily preventable illness, 7,001 children reportedly died of diar-

rheal diseases in 2015 alone.² Joseph told us that, a few years ago, the local council had made plans to construct more wells to provide for the growing population of the village but failed to do so. The Ugandan National Sewage Corporation attempted to build pipes into homes, but the whole endeavor became too costly. Instead, many families were forced to draw water out of mosquito-infested swamps and unclean wells shared with animals. The situation resulted in a huge outbreak of waterborne illnesses throughout the community. He did not tell us more about the outbreak, but I could tell it was bad by his low voice and downcast eyes. Joseph asserted that he had a seat on the village council as a VHT, in which he made sure to emphasize the

use of clean water. During his rounds, he advised families to always boil water before drinking and to build latrines a fair distance away from homes and eating areas. I wondered how many outbreaks (and even deaths) Joseph had prevented with his counseling.

In an ideal health system, patients would have the opportunity to access the best interpersonal care, like the services offered by Joseph and other community health workers, as well as the best clinical care. However, because there is such an extreme shortage of human resources in Ugandan healthcare, the country relies on a referral system. In the referral system, VHTs and community health workers constitute the first level of healthcare (HC-I) and are the first individuals a



WASH YOUR HANDS

Hand washing station at the public latrine created by students from Makerere University. Photo by Anisha Nagpal.

sick patient turns to. HC-II consists of the parish level of healthcare and provides the first interaction between patients and the formal health sector. Most times, community health workers are the ones who refer patients to HC-II, where the highest trained staff member is a comprehensive nurse.³ As cases become more severe and hard to treat, they are referred up the ladder of the Ugandan healthcare system to HC-VI where the country's medical specialists reside in the two National Referral Hospitals and the 14 Regional Referral Hospitals.⁴ Many childhood deaths could easily be prevented if all parents received counseling from community health workers, like Joseph, on when to refer their child to a more advanced health center.

In light of his experience in advocat-

ing clean water and fighting bad hygiene habits, Joseph's fervent gratitude towards our morning spent painting the latrine wall made more sense. His excitement over the words "wash your hands" in English and Luganda showcased the passion and care he extended towards the village. He was so steadfastly part of a community that grew and thrived on the connections people formed with one and another. This network of relationships was far from invisible and during my few days in Rakai I was able to trace it through every kind word and warm gesture.

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A SECOND HOME

Anisha's host family. Photo by Anisha Nagpal.



A View from Behind the Cash Registers

IVORY LOH

Public Health Studies, Class of 2018

For the last couple of years, Ivory was involved in the childhood obesity prevention intervention, B'more Healthy Communities for Kids, at the Bloomberg School of Public Health. Ivory visited cooperating corner stores to collect data, interview store owners, conduct taste tests and teach customers about nutrition.

I got out of my Uber at the intersection of Carey and West Baltimore Street. Hiding from the chilly October breeze, I wrapped my scarf tightly around my neck and rolled down the sleeves of my Johns Hopkins sweatshirt. Before me was a three-story brick building with “Western Grocery” scrawled across the wall in blue spray paint, and an arrow directing me to turn the corner. I followed it to the store entrance on Carey Street, which was covered in wire mesh, and stepped through the bulletproof glass door. I found myself confined in a locked vestibule with a tall, bulky African American man in a baggy T-shirt and jeans. He leaned against the menu taped to the window, waiting for his sandwich.

“Jojo, you’ve got company,” yelled the man.

I heard a shuffle come from behind a thick glass window—also bulletproof—that separated the Chinese store owner, Jojo, from her customers. Before I saw her, I saw her display case, which featured a rainbow of candy and tobacco products. A no-smoking sign in capital letters and bold font hung ironically above the cigarette display. As she leaned over a small revolving window, through which the tall man placed \$3.50 to pay for his sandwich, she saw me and immediately buzzed me through.

The door unlocked and I was allowed into her store, leaving the man still waiting for his food in the vestibule.

Welcome to food shopping in a typical Baltimore corner store.

Western Grocery and Carryout is one of 450 small groceries and corner stores in the city, most of them in “food des-

erts”.³ Some are set up like Jojo’s, with windows and walls reinforced by wire mesh and locked doors that prevent customers from freely entering the store.⁵ Shopkeepers take customers’ orders through bulletproof glass and push their requested items through a rotating window after they’ve been paid for. Unlike traditional grocery stores and supermarkets, corner stores and small groceries have limited food departments and offerings, most often stocked with processed and calorie-dense foods, like chips and soda.^{3,5} Fresh and frozen produce are rarely available due to the lack of proper infrastructure, such as refrigerators, freezers, and ample shelf space.⁵

Corner stores and small groceries represent 78% of food sources for residents in food deserts – low-income neighborhoods that are over a quarter mile from a supermarket, in which at least 30% of residents live without access to a vehicle, forcing them to shop locally in an environment with limited healthy food sources.³ One in four Baltimore residents live in such food deserts, according to the Baltimore City’s Food Environment 2015 Report.³ Food deserts tend to be in the city’s poorest neighborhoods, which are predominantly African American. These neighborhoods have more liquor stores, criminal activity and violence. People living in food deserts suffer the worst health outcomes in the city, including obesity, diabetes, and cardiovascular diseases, which lead to an increased mortality rate.⁴

For good reason, city officials and public health experts are trying to see

if they can use these corner stores to improve health outcomes for food desert residents by replacing nutrient-poor processed foods with fresh nutrient-rich produce. I worked for two years on a Johns Hopkins obesity-prevention research study called B'more Healthy Communities for Kids, which ended this past June. We cooperated with corner stores and carryouts in low-income, food desert neighborhoods.² The study randomly assigned 28 geographic zones to serve as either controls or areas for interven-



tion. In intervention zones, we worked to improve access and demand for healthy foods in corner stores by paying them to stock certain products, like fresh fruits, and to use educational displays and shelf labels to encourage customers to buy the healthier offerings. We also conducted taste tests, passed out giveaways, and educated customers on nutrition.²

By the end of the program, my team found that, in comparison to control stores, more healthy foods were purchased in our intervention stores where they were made available and promoted. These kinds of positive results were also seen in previous healthy corner store programs, including Baltimore Healthy Stores and Shop Healthy NYC.⁷

I had helped recruit corner store owners to participate in the program and learned that while many were immigrants, mostly Korean-American immigrants, many were also from China, where I was raised. I was one of the only Chinese speakers on my research team, so I did most of the interviews and data collection for the stocking and sales of products. I never had the chance, how-

ever, to learn about the Chinese store owners themselves or ask about their relationship with the predominantly black community they served. That was outside the scope of our study.

Out of curiosity, and to fulfill a recent class requirement, I decided to explore this by visiting Western Grocery & Carryout, one of our experimental control stores that had not received any intervention. The store is relatively large and also operates as a carryout that sells hot foods.

Western Grocery & Carryout is located in Sandtown-Winchester, a low-income African American neighborhood that many people know as Freddie Gray's home.¹ In 2011, almost one-third of families lived below the federal poverty line. Average life expectancy at birth was 65.3 years, compared to the national average of 79. Out of the 55 Baltimore neighborhoods, Sandtown ranked in the top five amongst those with the highest density of liquor stores, tobacco retailers and vacant lots and buildings.¹ For every 1,000 residents, 4.53 were

murdered annually in Sandtown, a homicide incidence rate over twice that of Baltimore city. Sandtown also has more people in Maryland's prison system than any other neighborhood in the state.¹ "Behind Glass" corner stores, like Jojo's, are common in these high-crime neighborhoods.⁵

After getting buzzed into the store, I waited for store owner Shi Jin Zhou, nicknamed Jojo by her customers. There I stood, by yet another door that separated her and her cash register from the store's interior. Recognizing me from previous visits, Jojo unlocked the door and welcomed me in. As I stepped behind the bulletproof glass, I entered Jojo's world.

She greeted with me with a warm smile. Jojo kept her space hot, so I had to peel off my layers while I walked across the narrow hallway behind the

WESTERN GROCERY

The storefront of Western Grocery & Carryout, taken on October 20th, 2016. Photo by Ivory Loh.





INTERIOR OF THE STORE

The inside of Western Grocery & Carryout. Customers, who want to buy larger items on the shelves, are buzzed inside through a locked glass door. Photo by Ivory Loh.

glass display. The space was larger than it appeared from the outside and led to a small kitchen, where slices of bacon were sizzling on top of a black iron griddle. Through the glass, I spotted the man on the other side, still waiting in the vestibule. I wondered if he knew an entire kitchen existed behind the menu wall.

Jojo is a petite woman in her early 30s, with a heart-shaped face and large dark brown eyes. After graduating from college in the Fujian province, she immigrated to New York City to be with her family in 2010. Jojo worked long hours studying English and civics to become a U.S. citizen last year. Chuckling, she told me in Mandarin, “Bei le yi hou, kao wan yi hou, da gai jiu wan ji le.” *After memorizing, after taking the exam, I basically forgot everything.*

Jojo met her husband in New York almost as soon as she moved there. They got married and moved to Baltimore, where most of her husband’s relatives live. Jojo’s parents, who had also previously lived in Baltimore, owned Western Grocery & Carryout. They let Jojo take

over the two-story property, and it has been hers ever since. The store is on the first floor, and she lives upstairs with her husband, one-year-old son, three-year-old daughter, and a nanny she brought over from China to help take care of her kids.

Jojo’s day begins at 8am. She gets ready and cooks breakfast for her family before opening the store. Every day, she works from 9am to 10pm. Once or twice a week, she takes her family to visit her parents, who moved back to Baltimore to help her older brother and his family of five. Like Jojo, her brother emigrated from Fujian and manages a similar store in Baltimore about 15 minutes away by car. Jojo described her life here as fairly good and roughly the same as how it was in China. “Zhi shi huan ge di fang shen huo,” she said. *It’s just switching a location to live.*

Besides continuing her lifestyle, Jojo and her family have also maintained good health after emigration. “Zhi shi man man bian da le.” *Just*

slowly getting older, she joked.

While Jojo regarded her eating habits as healthy, she felt differently about her customers. In Mandarin, she said, *They drink and eat soda and chips every day* – which were the most popular items that Jojo sold. *At most, they’ll eat a healthier option of a sandwich. If they have money, they’ll order a hot food, like a sandwich or fried chicken.* During the interview, Jojo prepared a bacon, egg and cheese sandwich for a customer. She spread butter and jelly on two slices of toast, before adding the rest. “You’re putting jelly on the sandwich?” I asked, wrinkling my forehead out of confusion. She grinned and said that she found the combination weird too. *Sweet and salty. They like it. I tried it before, and it’s actually not bad.*

“Would you eat the food you sell?” I asked her. “Mei you chi,” Jojo replied. *I don’t eat it.* She commented that she rarely eats what she sells, not because she finds the food unhealthy, but because she doesn’t want to eat the same foods that she handles every day. *I’m also not used to it. I prefer Chinese food.* Jojo prepares Chinese-style cooking. *We have rice, meat, vegetables, and soup sometimes. It varies!* To convince me, she pointed to her rice cooker, which sat next to a big tub of may-

onnaise that she used for her customers. She also commented that Chinese restaurants were easy to find, because so many Chinese people lived in the city.

Jojo lives in a food desert because that's where her business is. But she owns a car, so she shops at least once a week at the large wholesalers B Green and Sam's Club, and a specialized Asian supermarket about 20 minutes away called GreatWall. When I restock for the store, I also pick up groceries at GreatWall. Many of her customers have no such option. At least 1 in 3 people in her neighborhood don't own a car or the economic flexibility to travel for groceries, so they eat Jojo's food.

I grew up in China, where I ate mostly fresh produce. Eating according to season was part of the Chinese culture. I could see that Jojo had a similar approach to food. I wondered why she was not selling the food she bought for herself. So I asked Jojo if selling fresh produce was important to her. She told me that it was and that they had tried, unsuccessfully, to sell fruits in the past. “Zui jian dan de ping guo, oranges, dou jing chang fang huai diao.” *Even the simplest kind of fruits, like apples and oranges, are often left until they're spoiled.* Jojo said that her customers had poor diets. *The healthier the food, the more unlikely they'll eat it. Items like vegetables and fruits, they eat very little of these items. Even if we provide it, they won't buy it, and it'll go*

“Even the simplest kinds of fruits, like apples and oranges, are often left until they're spoiled. Jojo said that her customers had poor diets.”

to waste.

Halfway through our interview, her one-year-old son wandered back into the store with his nanny tagging behind. Jojo told me that they had been walking around outside the store. “Do you think that's safe?” I asked, as my research coordinator had always advised me to visit these neighborhoods in pairs. *Not that safe,* Jojo replied. *But the people here, how it's like in America is that...they'll respect old people and kids more. Do you know that? Us young people, if we go out, they're more likely to harass us. But the elderly and*

kids are safer; they won't bully them, so it's alright. Jojo confessed that she's afraid to walk around outside, and if she did go out, it was for only short stretches close to the store.

She described her relationship with her clientele as pretty good, but said she found their character and behaviors improper. “Bi jiao huai,” she commented. *Quite dishonest.* Jojo said that if she doesn't watch her customers, they will steal her things. *There's poor public security. That's why we need to fence up the door and windows.* “But they know your name!” I protested, struggling to imagine myself stealing from an acquaintance. *They know my name because they live close by and come regularly. But they'll still steal from me. Of course, there are exceptions. Some are good. There're just less of them.*

Although both Jojo and I moved from China to Baltimore, our experiences with the city differ drastically. Living in the “Hopkins Bubble,” I realized how privileged I was and am to never have to worry about food and physical security. Within half a mile from where I live, I could grab an apple from Charles Market whenever I craved one. Jojo had to drive miles. Yet, she is one of the lucky ones in her community.

Jojo and her neighbors face a flawed built environment, with limited parks and green spaces, dirty streets

not be said for most of her customers, she feels there's very little she can do about it.

But Jojo can contribute to her community's health, even if she's powerless to change the built environment. Based on my team's research, corner store owners can affect their customers' shopping and eating habits. These changes are difficult, but not impossible over time and with education. Hopkins and the city health department are hoping to work through community members to change the food environment in these nutrition deserts. They are not only encouraging store owners to stock healthier items, but also guiding them on how to promote these new offerings. Stepping back into the vestibule, I thought about the candy and tobacco that greeted me and hoped that soon they could be replaced with a rainbow of fruits and vegetables instead. Although substantial reforms have yet to reach Jojo and her customers, I have a feeling that she will cooperate, probably enthusiastically. She has a stake in the city just as much as her neighbors do. While holding her son, who was recently born in Baltimore, Jojo said, “Wo men zhu zai zhe li.”

We live here now.

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In Focus

photo by
Grace Kwak





AT HOME

When I was in Uganda, my host mom dressed myself and another student in traditional Ugandan clothing for Sunday church. She insisted that we pick out the color and spent over an hour making sure that everything fit each of us. At church, everyone told us we looked very smart! It was such a treat and really made us feel incorporated into the family.

- Monica Taneja '18

photos from left to right: Yiwei Xu, Calvin Qian, Rebecca Lin, Amanda Lee, Grace Kwak, Rebecca Lin





compassion in every corner

Students offer anecdotal stories of compassion from around the world and from here in Baltimore. We hope you are reminded of your own connections to people and to places, and we hope you do not forget that public health holds its own warming memories.

A REALIZATION

If I had known what public health was, I wouldn't be in this mess. It means knowing the time and place for medicine and whether it's the right thing to do, not only whether it's the right thing for the body.
-Prisoner at Chesapeake Detention Facility

COUPON FOR KINDNESS

One time, my professor Dr. Peter Beilenson, shared a story about his time as Baltimore Health Commissioner. On a cold December day, Dr. B and the staff were getting ready for the day when an older gentleman walked up and introduced himself. He presented Dr. B with a worn and wrinkled coupon for McDonald's cut out from an old newspaper and said to them something that Dr. B said he will never forget: "You all the first people to treat me like a real human being." I think nothing more captures the importance and beauty of humanity, public service, and a rudimentary empathy for others.
- Vijay Ramasamy '19

TOYS FOR TOTS

Last year, I helped one of my clients for health leads apply for toys for tots and because she didn't have an email address, we used mine instead. A few months later, I was home for Christmas break and received an email from Toys for Tots approving her for gifts. Since her pick up day was the next day, I immediately called her. When I told her the good news, she started screaming with excitement. A year later, she comes back to the desk for assistance with Christmas gifts again, and I just happened to be working that day. She remembered me very clearly despite the fact that we had only met in person once. Now every time I see her in the clinic, she is so excited to see me and gives me a hug!
-Maggie Vitale '19



Policies

Cat

at

la flag.

Things

The Hellish Future of Healthcare

VIJAY RAMASAMY

Public Health Studies, Class of 2019

In order to get a more holistic view of the effects of Republican healthcare reform, we must delve more deeply into the history, policy, and uncertain future of healthcare for low-income families

When President Lyndon B Johnson passed Medicaid in 1965, access to affordable, quality healthcare was enshrined in American political history as a human right for all individuals, serving as a crucial precursor to a prosperous life. President Barack Obama furthered Johnson's mission of egalitarian access under the passage of the Affordable Care Act (ACA) in 2009, which expanded the Medicaid population to almost 66 million Americans. This recent election, however, has put Medicaid in the political crosshairs of the Republican Party. Leaders of America's political right are now poised to end the expansion as a part of their conservative renaissance, fueled by a perceived popular mandate from the 2016 election. Speaker Paul Ryan's plan for Medicaid, which is endorsed by President Trump, intends to slash the program by eliminating ACA expansion funding by 2020, converting all federal funding into per capita caps to states, and promoting state block "innovation grants."¹⁴ These proposals, according to the latest estimates by the Congressional Budget Office, could cut federal Medicaid spending by \$880 billion and leave 14 million fewer people receiving Medicaid by 2026.¹⁵

This paper, tasked with providing a deeper understanding of this program and its future, will first begin with a discussion about the political history of Medicaid. It will show how Democratic majorities helped Johnson propel Medic-

aid into fruition during the Great Society amid the tenuous Vietnam War era, and how subsequent Republican coalitions fought to tear down Medicaid's growing influence. It will then touch on Medicaid's salient features, including its unique state-federal partnership and the effects of the ACA's Medicaid Expansion. Finally, this paper will discuss the political prospects of Medicaid in the coming years, touching on how a repeal of the ACA's federal Medicaid guidelines would ultimately limit the program's scope. In this analysis will be a discussion of potential Republican alternatives, including block granting, pro-work Medicaid reform, and increased state control, which could flourish under the newly elected conservative presidential administration.

MEDICAID, A BRIEF POLITICAL HISTORY

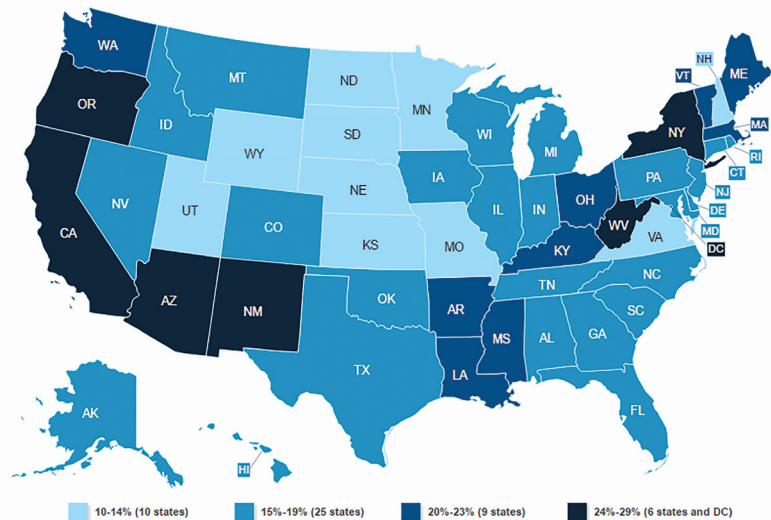
Social reform in the 1960's, unlike the Great Depression fueled social spending of the New Deal, was primarily precipitated by demands from African American communities and their allies, the adapting and transforming roles of legislators from the south, and a strong increase in the executive power of the president.³ Corporate sentiments regarding the role of the federal government were also changing, as businesses that received great gains through wartime and Cold War federal industry investment be-

gan to trust that Keynesian economic stimulus and increased federal authority might actually be good for their bottom line.³ After the civil rights movement, many northern and high income Americans translated their fervor for social equity into a platform for welfare, helping to elect an incredibly liberal Congress in 1964 to accompany a socially minded President-Elect Lyndon B. Johnson.³ Initially, the politically savvy Johnson put together a centrist "big tent" coalition comprised of Republicans, southern Democrats, and business interests to propel his War on Poverty.³ Unfortunately, this coalition, and subsequently Johnson's dreams of a "Great Society," eroded during the culminating parts of his presidency, due in large part to the Vietnam War. Johnson, who had appeased business interests by issuing tax cuts, had to make a decision between funding the Great Society or funding the Vietnam War, and he chose the latter.³ Conservatives took advantage of Johnson's current unpopularity and gained political popularity. As a result, Johnson was forced to pass legislation not through his original centrist coalitions, but through more politically polarized northern Democratic majorities.³ The political left passed Medicaid in this way, and thus immediately placed the legislation in the cross hairs of the Republican Party, who saw it as an inefficient remnant of a failed War on Poverty. Interestingly, this incredi-

FIGURE 1

Percent of People Covered By Medicaid/CHIP, 2015.

Source: Kaiser Family Foundation.



bly partisan passage of healthcare reform echoes the way in which the ACA itself was passed, along strictly Democratic lines. The current Republican crusade against “Obamacare” is a fight not new to America’s political history, and seems to indicate a familiar pattern of partisan backlash fervently sewn into the prospects of non-bipartisan legislation.

By the 1970’s and 80’s, anti-minority sentiment, coupled with fears of economic modernization and federal overreach, pushed southern white voters to functionally revive the Republican Party, a phenomenon strikingly characteristic of the 2016 election. These new voting coalitions, paired with traditional federalism and shifting business interests were used as tools by Republicans like Reagan to limit federal spending on social programs, causing many eligibility and funding requirements for programs like Medicaid to be left to the states.³ However, coalitions formed by individuals, organizations, and businesses benefiting from social programs helped defend Medicaid, forcing expanded eligibility throughout the 1980’s despite Reagan’s push for more stringent qualifications.³ Unfortunately, these leftist coalitions, crusading in the name of liberalism, further deepened the divide between working or middle class Americans and Democrats. Working and middle class Americans, believing that the liberal welfare state was not built in their interest and doomed to fail, began to parlay politically with corporations and more wealthy individuals who also opposed liberal welfare spending.

The somewhat wonky cohort of working class and elites that made up the Republican party of the late 1900s pushed, as they do today, a united message of “pro-work welfare.” In many ways, Gingrich’s “Contract with America,” released in 1994, is quite similar to Speaker Ryan’s current Republican platform “A Better Way.”^{1,3} Medicaid was on the chopping block then as it is now, and the same block grants that are being

proposed today were vetoed by President Bill Clinton in the late 1990s. Republicans in the 1990’s also proposed budgets that would have slashed Medicaid spending, and if it weren’t for strong Democratic majorities in Congress and a heavy handed Clinton White House, they would have passed them quite easily.³ Perhaps 2016 is a reprisal of the 1980s and 90’s, with a Republican White House which feels empowered by a strong showing of the same working class white voters that revived their party in past elections.

THE CURRENT STATE OF MEDICAID

Medicaid, a program currently run primarily through states with substantial federal guidelines and funding, has expanded significantly in recent years. The passage of the ACA sparked an increase in eligibility for Medicaid, with federal expansion dollars tied to mandated coverage of children, parents, expecting parents, older individuals, and those with disabilities who are 133% of the federal poverty line.⁴ Childless adults and newly arrived immigrants were still not mandated coverage under federal guidelines, with the decision resting solely on states whether or not these groups were covered.⁴ Currently, over 72.8 million Americans are covered through state Medicaid programs or associated Children’s Health Insurance Programs in 2016.⁴ Medicaid is the third largest domestic line item in the federal budget, with over 62% of the total 509 billion spent on Medicaid

coming from the federal government, according to 2015 numbers, and 38% coming from the state governments that administer these programs.⁴ Total Medicaid spending growth, however, is set to taper substantially in the coming fiscal year, fueled by decreased rates of enrollment rates following the ACA’s initial expansion and a constriction of overall state revenues causing states to control Medicaid costs.⁴

Medicaid expansion under the ACA is, through Supreme Court decree in June of 2012, a prerogative of the states. By 2017, 35 states including D.C will have expanded Medicaid through matching federal expansion.⁴ While traditional “blue states” were some of the first to expand Medicaid, empirically conservative states such as Ohio and Indiana have also chosen to accept federal monies, seemingly against prevailing conservative rhetoric against the ACA and its “anti-federalist” provisions. This may be due to the fact that current federal law allows for states to apply for waivers from federal stipulations, but only if they can prove that the waiver will allow them to demonstrate pilot programs for innovative ways to administer Medicaid.

Medicaid expansion under the ACA features significant but tapering federal support, with the 100% of expansion costs currently incurred by the federal government set to gradually drop to 90% from 2020 onward. States who oppose Medicaid expansion argue that if they were to choose to pass Medicaid expansion and there-

by increase enrollment, they would be left out to dry in 2020 with enlarged Medicaid costs due to a larger insured population and a 10% deficit in funding.⁵ Further, states argue that in order to offset the ballooning costs of expansion and lack of future federal funding, they would have to increase taxes or cut other programs, thereby stifling economic growth and hurting the middle class and working poor.

Proponents of expansion, mainly Democrats, point to the seemingly enduring economic benefits of Medicaid and the lack of a better alternative as key reasons for continued Medicaid spending growth. Studies show that in 2010 alone Medicaid kept an estimated 3.5 million Americans from poverty or extreme poverty, mainly because being insured reduces out of pocket medical expenditures by roughly \$495 dollars per person per year and helps mitigate disastrous long term illnesses by increasing access to preventive care.⁶ Furthermore, a report by the Council of Economic Advisors found that states that expanded Medicaid will gain \$400 billion in federal funding and 172,000 more jobs over the next 10 years, not to mention over \$170 billion in increased revenue for their respective hospitals through federally funded reimbursements for uninsured emergency room visits and taxpayer funded disaster care.⁷ Striking as they may seem, the economic boons of Medicaid expansion are not without significant Republican back-

lash. Conservatives have long labeled Medicaid as a perennial case study of wasteful government spending, and the incoming political administration, which believes Medicaid to be an enduring crutch on state budgets, may place the programs on its chopping block.

WHAT IS NEXT FOR MEDICAID?

A key campaign promise of President Donald Trump was the “repeal and replacement of the Affordable Care Act,” sometimes dubbed “Obamacare.” House Speaker Ryan, anointed by some as the potential chieftain of the Republican establishment, has also made the repeal of the ACA one of his top priorities in the new administration.⁸ A repeal of the ACA, as spelled out in Speaker Ryan’s blueprint for a conservative American health care system, “The American Health Care Act,” would primarily halt the continued expansion of Medicaid and do away with the regulatory measures and mandated programs that tend to accompany federal Medicaid expansion funding.¹⁴ If Republicans chose to do away with the current system, states would have far greater control over the way they run their programs and would also not be subject to blanket egalitarian coverage and benefit guidelines pushed by the feder-

al government.⁹ Furthermore, health care innovation funding and structural health care reforms in the realms of Medicare and Medicaid dual eligibility, patient centered medical homes, and healthcare delivery for high risk populations could be in jeopardy: mainly because these provisions are tied to federal dollars in the ACA.⁹ Democrats have vowed to fight these changes to the ACA, but will need to be careful in their response. Medicaid funding provisions in the ACA could be subject to filibuster-less budget reconciliation rules, meaning key provisions of Obamacare could be stripped of their teeth without a full repeal of the act. But, it is important to note that the political ramifications of such a repeal are somewhat tricky.¹⁰ Decreased eligibility and benefits could cause great political fallout, and overhauling Medicaid could put millions of Americans out of care, not boding well for Republicans in midterm elections in the coming years.¹⁰

So, what will the Republicans propose as a replacement? This question, although still in great debate in terms of the larger ACA, is much easier to answer in the context of Medicaid. Speaker Ryan, the President Elect, and the Secretary for Health and Human Services Tom Price have agreed on a proposal to change Medicaid funding to be entirely through block grants or per capita caps.¹ Block grants would constitute fixed amounts given to states that would functionally allow them to be the sole crafters of their Medicaid policies.⁸ Although block grants do not necessarily mean decreased funding, Speaker Ryan’s and Rep. Price’s budget calls for a cut in Medicaid spending by \$880 billion from 2017 to 2026.¹⁵ Per capita caps work similarly, limiting how much the federal government reimburses

HIP 2.0 Enrollment by Income and Benefit Package as of October, 2016

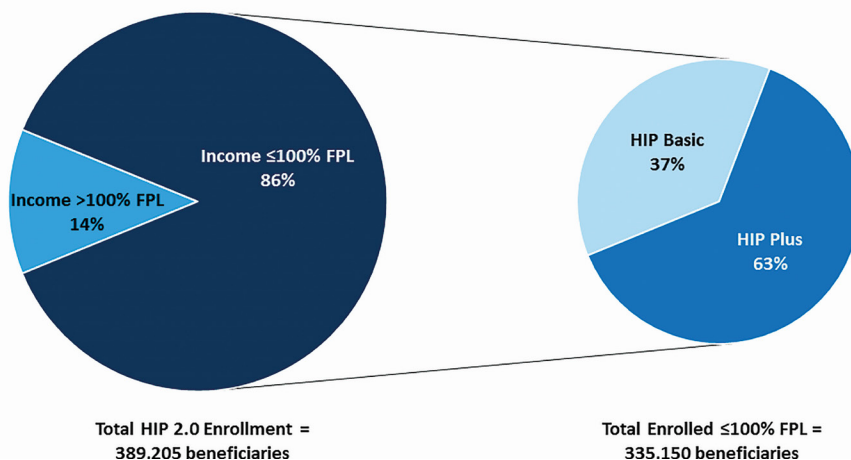


FIGURE 2

Source: Indiana Family & Social Services Administration (Indianapolis, IN: FSSA, December 30 2016).

for Medicaid patients by only allowing a specific amount of spending per patient (multiplied then by the number of patients in an area to establish area based funding) and setting an unflinching growth rate for Medical costs that the government cannot exceed.⁹

Proponents of these block grants and per capita caps indicate that less funding, paired with greater state autonomy, would force efficiency in the healthcare system and breed innovation.⁸ Opponents, mainly Democrats, argue that any perceived gains efficiency would do little to indemnify major losses in funding and federal support, causing as one study from the Congressional Budget Office assesses, “14 million fewer people receiving Medicaid by 2026.”¹⁵ Moreover, opponents to entirely state controlled Medicaid also argue that a decrease in Medicaid access will disproportionately affect African Americans, citing current diminished minority Medicaid enrollment in former Confederate states as a result of optional expansion under the ACA.¹¹ State and federal Medicaid advocates are also worried that decreased Medicaid funding will put an increased strain on already waning benefits in some states. Andrea Louise Campbell, in her book “Trapped in America’s Safety Net,” gives a narrative description of the downfalls of existing Medicaid programs, citing in particular her sister-in-law Marcella’s inability to get more than six prescriptions a month under Medi-Cal, and the asset limits imposed by California’s Medicaid system that cause beneficiaries to at times “spend down,” assets in order to maintain coverage.¹² Campbell highlights the argument that decreased federal dollars could deepen existing gaps and inadequacies in Medicaid coverage, because the issue is one of funding and not of efficiency.¹²

What policies and regulations would state and federal agencies implement under a new climate of autonomy? Perhaps the greatest sense of the answer to this question comes from one recipient of the aforementioned waivers, Indiana. The Hoosier state is not only of note because its Medicaid system is unique in its intrinsic conservative structure, but also because its architect, Seema Ver-

ma, is now the head of the Center for Medicare and Medicaid Services (CMS). Verma designed a system that is largely pro-work, pro-limited government and focuses its efforts on limiting Medicaid spending over the long run.¹³ It employs long advocated conservative health care ideas such as health savings accounts, mandated premiums for those with incomes between 100 and 138 percent of the poverty line, and decreased benefits for non-premium low income plans.¹ Proponents of Indiana’s system believe a barer, more pro-work Medicaid system that imposes premiums on those receiving benefits will incentivize enrollees to work, have some stake in the game, and eventually exit the system to get more expansive coverage in the private market.

On the other hand, recent studies, like those conducted at the Center for Budget and Policy Priorities show that Verma’s plan has decreased Medicaid enrollment by about 50,000 and worked against their original goal, forcing low income families to spend down their income in order to avoid the premium or not obtain insurance altogether.¹³ With states like Kentucky already looking to Indiana as a model for their Medicaid systems, one could make the claim that with Verma now as the helm of CMS, the U.S. could not only see increased waivers from federal guidelines, but also a shifting of federal guidelines themselves, from expanded access to the more conservative model established by Indiana.¹³ Even predominantly Democratic states who oppose conservative reforms will perhaps be forced to cut benefits and impose premiums under the new block granting and per capita cap system forced to decrease access because of slashed funding. It remains to be seen what future of Medicaid will manifest in the coming years, but if history is any indication, we may be in for a renaissance of conservative reform unparalleled in recent memory.

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Pediatric Medical Homes Should Invest In Employment Assistance

KARL JOHNSON

Economics, Class of 2018

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INTRODUCTION

Health is not a good—it is essentially a commodity. We do not seek good health primarily for the intrinsic sake of being healthy; we do it to enjoy more of what we love to do: playing with our kids, spending time on an exciting outdoor hobby, visiting distant relatives, etc. The essential task, then, of any healthcare system is to alleviate the barriers in the way of individuals and populations achieving the standard of health necessary to achieve these desirable life goals. Many obstacles in the way of meeting this standard of health fester outside of the exam room. Nutritional deficiency, poor education, racial segregation, and limited social supports all lead to illness but cannot be immediately addressed by a healthcare provider.¹ As many of these obstacles are a product of one's wealth and social standing, Tom Boyce, Chief of the University of California, San Francisco's Division of Developmental Medicine, summarizes a wealth of data when he highlights that "socioeconomic status is the most powerful predictor of disease, disorder, injury and mortality we have."²

The burdens pent up in this predictor are concentrated in low-income ur-

ban settings. To present one statistic towards this growing intuition, individuals in inner-city Baltimore live on average 20 years less than those in the city's affluent suburbs.³ Much has been researched and written about the strength and nuance of this association, and it all leaves our healthcare system with one question—to borrow from the World Health Organization's Commission on Social Determinants of Health: "Why do we keep treating people for illnesses only to send them back to the conditions that created illness in the first place?"⁴

With evidence mounting, our modern urban healthcare system is increasingly pressured to respond to this charge. In the same interview, Boyce—speaking for a growing number of his colleagues—posits one promising solution for those working in pediatric settings. A practicing pediatrician himself, he envisions "child resource centers in every neighborhood where parents, who themselves may have been poorly parented, can get expert care and advice in how to break the cycle of adversity."⁵ In Boyce's vision, along with providing traditional medical care, providers work with ancillary resources such as nutritionists, social workers, educators, and community organizations with the intent to more comprehensively address patient's needs, whether within or outside the physical practice. It is with this con-

ception of healthcare provision in mind that the American Association of Pediatrics (AAP) recently called on pediatricians to create medical homes "adapted to the needs of families in poverty."⁶

Responses to the AAP's call will be as varied as the contexts from which they are born, and appropriately so. In the words of the late Carl E. Taylor, "There are no universal solutions [in public health]. There are only universal procedures for arriving at local solutions." With that said, I believe the urban pediatric clinic may be uniquely fit to invest in a particular kind of social service: employment assistance. The provision of this ancillary service to alleviate socioeconomic burdens while improving health is theoretically sound, empirical promising, and financially feasible.

THEORETICALLY SOUND

Returning to Taylor, a central feature of his universal procedure is to engage community leaders and institutions that share similar public goals. Before programmatic particulars are addressed, it is important to first contextualize the urban pediatric clinic within its own geography. What differentiates it from non-medically oriented providers of social services, such as community resource centers, the department of human resources, or

INSIDE THE CLINIC

A view of a waiting room in the clinic. Photo by Euphie Ying.

the neighborhood church such that the AAP believes it is qualified to provide amenities addressing the needs of families in poverty, and how can these differences be used to leverage community support and engagement?

A helpful way to understand the pediatrician's niche in the community is to consider the timeline characteristics by which they invest in individuals. For parents, especially new ones, there are few other major institutions that receive more regular attendance. In the first two years of a child's life, it's likely that caregivers will make contact with their pediatric clinic roughly 10 times. At each point of contact the clinic has a unique opportunity to build trust. For this trust to extend into the types of so-

ing employee wellness programs. Investments are made to identify, communicate, implement, integrate and evaluate physical activity, weight management, chronic condition management, tobacco cessation, stress management, and more. Currently three in four large companies use some type of health and wellness incentive system.⁷ In a 2004 study employers were inspired to implement these programs not only because sick or disabled workers can be more distracted and less productive but also because they also increased patient satisfaction.⁸ To produce these kinds of results, the National Business Group on Health reveals large employers in 2015 will spend an average of \$878 per employ-

or spending time with grandkids, then there is little incentive to exercise daily and eat well. However, for the young mother who wants to stay fit to attend to the needs of her children, it is likely she will invest in her health daily. In what may come across as a cold conclusion, chronic disease—and ultimately death—occurs when the marginal utility of maintaining one's health becomes less than the marginal cost of doing so. Of relevance to the present discussion, one of the central factors Grossman posits to influence our demand for health—through increasing the utility of healthy time—is employment. His theory is simple: for those with higher earnings sick days produce a greater disutility—a higher opportunity cost of not being at work. The corollary is equally true, if not more depressing: those with only entry-level positions or those who are completely unemployed will not pursue good health to the degree we often believe they should. The return on investment may simply not be worth it.

“Sick people do not work well, and if they become sick enough they will not work at all.”

cial services urban pediatric clinics may seek to expand into, this opportunity will undoubtedly start when patients and caregivers are given the space to open up about their external social needs. When this happens it is not unlikely that primary care pediatricians will be one of the first professions to hear of these problems. Compounding this early detection with the fact that young families, particularly those in impoverished urban contexts, are in financially precarious periods of their lives. Through meaningful partnerships with community agencies, the urban pediatric clinic has a convenient opportunity to provide meaningful resources for those in the most need.

In the continued spirit of Taylor, then, what other community organizations within the city could leverage the unique opportunities found in the pediatric medical home? In other words, where are individuals already interacting with both health and social needs beyond the clinic? A simple but surprising answer: employers.

Simply put, businesses need their employees to be healthy. Sick people do not work well, and if they become sick enough they will not work at all. In response to this, major employers have recently taken huge strides in develop-

ee, and this number is only expected to increase.⁹ Fortunately for these programs, with the advent of employer based insurance these employers save an average of \$6 for every \$1 spent on workplace wellness programs.¹⁰ The advent of these workplace institutions indicate that companies view the investment in health and well-being no differently than investments in learning, development, training and safety.

The relationship between health and vocation runs deeper still, and will be worth considering at a more fundamental level. In 1972 Michael Grossman, a pioneering health economist, produced his seminal work, “On the Concept of Health Capital and the Demand for Health.”¹¹ The central proposition of the article, and one that still resonates in the field today, is that health can be effectively viewed as a durable capital stock that produces an output of healthy time. Aligned with the previous acknowledgement of health as having primarily commodity value, Grossman posits that the degree to which one invests in this stock depends in part on the utility one receives from healthy living. If, for instance, one is in their old age and inhibited from engagement in recreation

EMPIRICALLY PROMISING

The empirical implications of this theory are important for urban pediatricians. In a 1995 study seeking to test Grossman's model it was found that full-time employment predicts slower declines in perceived health and in physical functioning for both men and women.¹² Another more recent study found that laid-off workers are 54 percent more likely than those continuously employed to have fair or poor health, and 83 percent more likely to develop a stress related condition, such as stroke, heart attack, heart disease, or arthritis.¹³ With respect to mental health, a 2010 Gallup Poll found that unemployed Americans were far more likely than employed Americans to be diagnosed with depression and report feelings of sadness and worry.¹⁴ To round out the evidence, a review of 70 studies in 2012 found that unemployment and low income were tied to a higher risk of hospital readmission among patients with heart failure and pneumonia.¹⁵

When engaging this data, the direction of causality can be ambiguous. Social causation hypothesis predicts that employment improves the health of men and women, whereas popular selection hypothesis projects that healthy people get and keep jobs more than unhealthy people do. But with respect to the urban pediatric clinic, regardless of the directional strength of causality, there is opportunity for these two hypotheses to collocate and actually reinforce each other. One's career and one's health are both personal human capital investments that demand consistent attending to. They are not only a function of similar variables but also a function of each other. Unemployment is a consequence of poor health, a barrier toward good health, and a disincentive to pursue better health—it is a subject our healthcare system would be wise to invest in alleviating. Returning to corporate America, if employers can successfully use wellness programs to sustain profits and output while genuinely promoting employee satisfaction, then the urban pediatric clinic can meet health demands while also investing in the whole person of their patients—including their career aspirations.

FINANCIALLY FEASIBLE

Institutions are already in place to begin funding this kind of collocation. A growing number of quality based payment systems are recognizing the utility in providing social services, including employment assistance. The Center for Medicare and Medicaid Services (CMS), a branch of the Department of Health and Human Resources (HHS), recently announced a pilot project called Accountable Health Communities which will grant up to \$4.5 million to organizations pledging to better coordinate community services and clinical care.¹⁶ The program is “based on emerging evidence that addressing health-related social needs through enhanced clinical-community linkages can improve health

outcomes and reduce costs.” With the likely success of this pilot program, HHS will soon establish a more rigid system of financial awards for clinics that implement amenities “adapted to the needs of families in poverty.”

Two other sources from CMS that could provide longitudinal funding for willing urban pediatric clinics include Health Care Innovation Awards and Transforming Clinical Practice Initiative grants.¹⁷ The former awards \$1 million to \$30 million dollars to healthcare systems seeking to “implement the most compelling new ideas to deliver better health, improved care and lower costs.”¹⁸ Many of the awardees have been urban pediatric clinics seeking to expand their scope of services. The latter exists to award clinical practices for “sharing, adapting and further developing their comprehensive quality improvement strategies,” with awardees typically receiving anywhere from \$100,000-\$1 million dollars.¹⁹ Willingness to implement employment assistance services within the urban pediatric clinic is an effective step towards a successful application to either of these programs.

One example of an internal funding mechanism, MACRA, the organization usually called upon to over-

see hospital financing for Medicare beneficiaries, is increasingly shifting from traditional fee for service models to evaluation protocols based on a Merit-Based Incentive Programs System (MIPS). In 2017, MIPS improvement activities, which constitute 15% of overall quality scores and payment rates, now include points based on “Engagement of community for health status improvement” and “Practice improvements that engage community resources to support patient health goals.”²⁰ Both these metrics can be successfully met by working with community organizations to integrate employment assistance services.

As our growing acknowledgement of the relationship between poverty and health increases, the sources for social service centered medical funding should also be expected to increase. While doing so these sources likely will increasingly acknowledge the comparative advantage of providing services that treat chronic, rather than acute, social ills. If it is agreed that effective dietary counseling when someone is young is more cost-effective than a coronary bypass when they are 50 years old, educating someone on how to get a job or secure the edu-



ROOM 1011

A waiting area for adolescent patients. Photo by Euphie Ying.

cation to do so should and will be more valued than helping them finance their next energy bill or giving them emergency food-vouchers. While these latter quick fixes are completely necessary under the right circumstances, leveraging resources that facilitate long-term goals will address poverty and its deleterious effect on health more proximately at its core.

PROGRAMMATIC SUGGESTIONS

With some financing opportunities already in place and more on the horizon, practical programmatic considerations can now be suggested. Once again acknowledging that any public health program need be contextualized on a case-by-case basis and agreed upon with the full support of those to be served, the following provide a helpful menu from which healthcare administrators can begin discussion with workforce development-minded community partners:

1. Job search assistance: Provide access to online job search programs, along with personal assistance and financial navigation (i.e., individualized to the needs of the caregiver or patient). Sometimes the only barrier in the way of securing employment is knowing where to submit an application. Personal assistance, if not provided by an already in-house social worker, could be outsourced to pre-existing employment assistance agencies in the community.

2. Resume construction: Assist and guide patients as they construct a suitable resume for the relevant job market, based on successful templates. The resumes can also be used to highlight the strengths of patients and how they are already a meaningful member of society.

3. Business Networking: In partnership with community-based employment assistance centers, connect with local and commercial business for job referrals. Especially in the inner city, having a network of individuals with the capacity to connect someone to job opportunities and career mentors can be difficult. Bringing these kinds of resources to the individuals is a great first step toward to fill that gap.

4. Technology Assistance: Provide

access to technology through which participants can submit online applications and create marketable cover letters. Today most job applications are done online, yet many without a job do not have the resources to secure consistent internet access. Installing a small computer bay with volunteers from the community or staff who are willing to guide interested patients to appropriate websites may be all it takes to receive an interview.

5. Job Readiness Counseling: Through group-based platforms such as guest speakers and workshops, provide guidance on interviewing, time management, and customer service. These kind of contexts can also be great avenues to discuss career goals and aspirations. External organizations performing these events and services will be incentivized to perform these services for the amount of direct marketing it provides them.

CONCLUSION

Working with community organizations on services such as these and other iterations, potential employment assistance programs powerfully demonstrate that the pediatric clinic is actually just one part of a larger system working for the individual. For those involved with the development of urban pediatric clinics that actively work to alleviate the burden poverty has on health, these particular investments will do more than simply meet quality standards, they will signal to patients and caregivers that medical professionals care about their immediate medical needs for the sake of good health as well as their life long well-being. A genuine interest in patient employment is actually an honest recognition of the limits of traditional medicine without subsidizing care for the holistic person. What's more, done effectively, implementations of this kind may actually shift how those participating in the programming demand health and the limits to which they ensure they and their children are as healthy as possible, transforming the clinic from an institution in which they must attend into a true medical home that exists to equip attendants

to achieve their personalized meaningful life goals.

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The Affordable Care Act: Easier Said Than Done

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The Obama Administration's legacy cannot be assessed without discussion of the most revolutionary health reform since the creation of Medicare and Medicaid in 1965. The Affordable Care Act, or Obamacare, passed in 2010, was the Administration's landmark piece of legislation. Its enactment made several advancements, including furthering access for dependent children and those with preexisting conditions. By far, the largest impact the ACA had was the creation of Health Insurance Exchanges (HIX), which brought subsidized plans to those previously unable to afford cov-

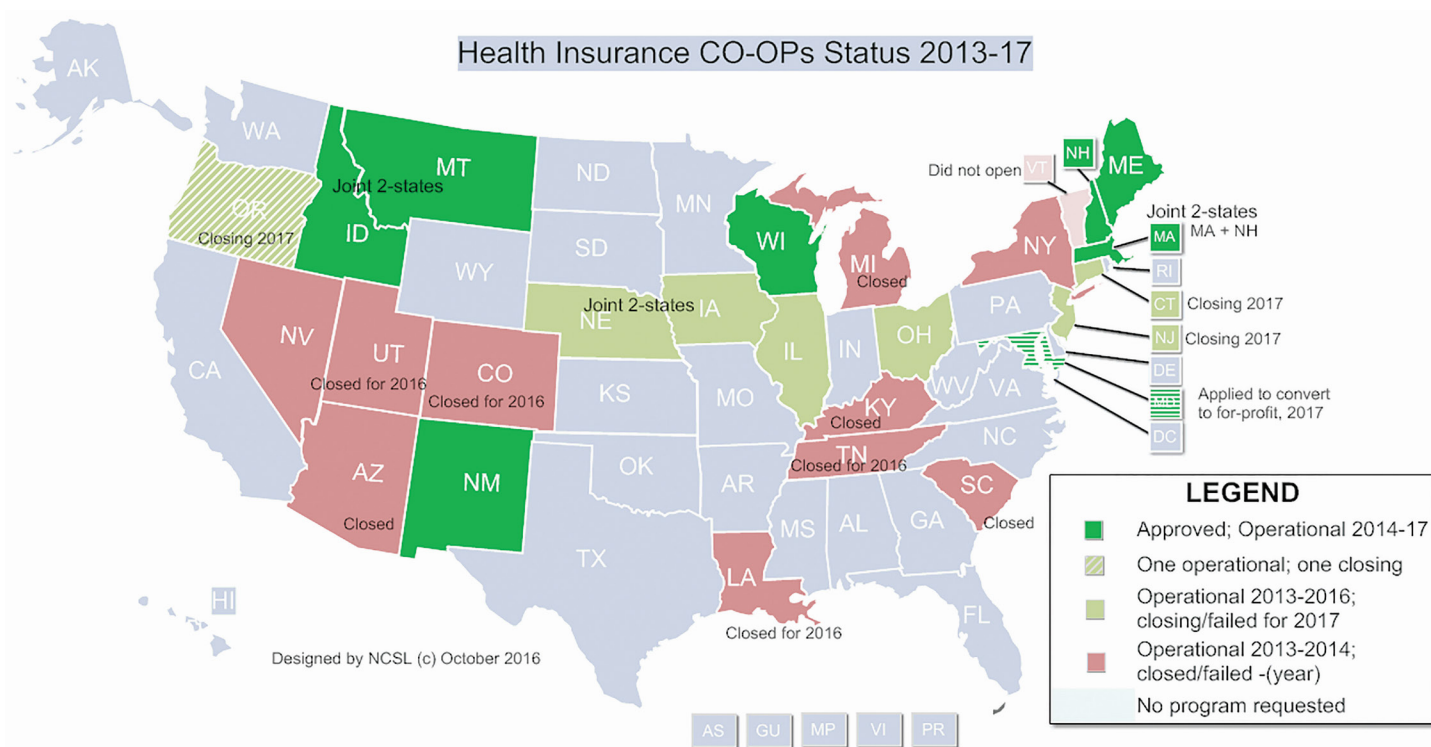
erage. The efforts of Obamacare were discontinued by the outcome of the 2016 presidential election, although the Trump Administration had little heavy lifting to do. As I have seen myself in the time I have worked with what was once Maryland's Co-Op, a company with blueprints directly stated in the ACA, most of the reform's momentum was slowed by the actions of the Centers for Medicare and Medicaid Services (CMS). In essence, even before the 2016 presidential election, Obamacare was first destabilized by the Obama Administration itself.

The most visible symptom of the

already decaying system was the quick exodus of long-established carriers from the HIX. For the HIX's 2017 open enrollment, Aetna pulled out of exchanges in 536 counties for 2017, and UnitedHealthCare pulled out of exchanges in nearly all of 10 states.^{1,2} Alabama, Alaska, Oklahoma, South Carolina, and Wyoming experienced monopolies over all of the exchange

FIGURE 1

A map of operational and closed co-ops. Source: National Conference of State Legislatures.



plans in the state.³

Without competition and limitation, carriers were free to raise rates to unreasonably high values. If the pattern had continued, it would have resulted in unaffordable health coverage for those who did not qualify for federal subsidies. As plans become more expensive, relatively healthy people no longer receive their premiums' worth of covered care. The ACA did empower the government to levy a fine for those who opt not to pay for coverage, but the penalty, which gradually increased each year, was not severe enough to deter those who do not see value in paying insurance premiums. In 2015, for instance, 7.5 million people paid the IRS penalty in lieu of buying health insurance.⁴ If more consumers were to leave the market and opt to pay the penalty, the proportion of sick to healthy people on the market would increase, forcing carriers to raise their rates until eventually only the sick were left to pay for exorbitant amounts for the insurance they desperately need. The resulting paradigm, of the sick being penalized for their conditions, would drive the nation's healthcare system into a downward spiral.

Just as the Children's Health Insurance Program was to meant to be a victory for the young and Medicare a victory for the retired, the ACA was to be a victory for the working poor. A revolutionary idea, the HIX took advantage of the current market's infrastructure in order to deliver subsidized plans to those earning little enough to qualify. The Exchanges relied on carriers to sell on-exchange plans alongside their private off-exchange plans. On-exchange and off-exchange plans offered the same benefits for the same costs. The only difference is that on-exchange plans were subsidized by the government and are far more likely to cover those previously unable to afford coverage.

The difference in demographic was crucial. It consisted of, as of the end of 2016, 12 million Americans who had never before been able to afford coverage, 12 million Americans with years of untreated conditions, no primary doctors, and brand new insurance.⁵ Insurance companies, until the passage

of Obamacare, were able to refuse coverage to those they deemed too risky. Business infrastructure was built around insurance companies being able to pick and choose members. However, the implementation of the ACA led to an influx of previously denied patients adopting Exchange plans offered by such companies. Given the previous methods by which well-established carriers ran their businesses, profitability was a distant prospect. Aetna lost 430 million dollars since January 2014 on Exchange plans

of the Exchange was indirectly incorporated into the ACA. Section 1322 envisioned a network of nonprofit carriers, or Co-Ops, in every state, that were created to administer on-exchange plans.⁷ These companies, created after the passage of Obamacare, could tailor their framework to covering the needs of those eligible for federal subsidies. Traditional carriers that existed before the passage of the ACA were not eligible for Co-Op status.⁷ These companies, when created, were small and young with much po-

“The resulting paradigm, of the sick being penalized for their conditions, would drive the nation's healthcare system into a downward spiral.”

alone.¹ UnitedHealth lost a projected 650 million dollars in 2016 thanks to ACA plans.²

Although the withdrawal of big insurers grabbed media attention, it was simply a symptom of the larger failure of the ACA's most important structure, the Exchange. Traditional carriers were never compelled to take up plans on the Exchange; it was known that they could pull out at any time. Given this possibility, Congress built infrastructure to ensure the success of the Exchange.

The idea of a public option was famously floated before the Marketplace was decided upon. The proposition would have made the government a carrier that would compete with established carriers. The public option would have guaranteed coverage for those who required subsidies, but it would have been a departure from the role of the government as a carrier only for those unattractive to for-profit insurers. The intrusion of the government into the competitive market was not well received, and died an unceremonious death in the Finance Committee after strong opposition into what was considered the intrusion of government in the market.⁶

However, the idea of government involvement in ensuring the security

tential for flexibility. They could create innovative business infrastructure that allowed them to take on members new to the insurance market who would have been considered too risky for established carriers. As non-profit organizations, they were not under the same pressure to maximize profits from Exchange plans, and any profit made went back into reducing rates for members or increasing benefits.⁷ Co-Ops were to offer options on the Exchange regardless of involvement by traditional carriers. In essence, they were the ACA's safety net.

After Obamacare was passed, it was placed under the administrative control of the Center for Medicare and Medicaid Services (CMS), a division under the Obama Administration's Department of Health and Human Services (HHS). The authority of CMS forced all but a select few Co-Ops out of business, effectively dooming the success of Obamacare.

On Nov. 1st, 2013, Healthcare.gov, the federal Exchange portal, spectacularly crashed on the date it was to debut. Millions of people across the country looking to buy coverage were turned away by an error message on the site. The issue wasn't resolved for months, during which time nobody was able to enroll in an Exchange plan

through the website. Co-Ops, which had been prepared for their first set of members to sign up through the portal, were left continuing operations without anyone to insure. Lack of enrollment killed three Co-Ops in Oregon, Nevada and Louisiana.¹¹ Secretary of Health and Human Services Kathleen Sebelius resigned after CMS's debacle.

In an effort to mollify carriers anxious about insuring these 12 million unknown cases, the text of the ACA provides for three programs, known as the three Rs, to set an even playing field. The three R's are reinsurance, risk adjustment, and risk corridor. Through reinsurance, the government chips in to pay for members who are very sick and therefore cost the carrier much more than the average person. The program was designed to buy insurers time while they figured out how to cover their most expensive members.⁸

Through risk adjustment, insurers were assessed based on the average calculated health of their members.⁸ Insurers with, on average, healthier members made payments to insurers with, on average, sicker members so that insurers wouldn't focus on collecting people who were healthy and cheap to insure. Through risk corridor, carriers that made more money than expected paid part of their profits to the government, and those carriers that made less money than expected shared part of their losses with the government.⁸ The program was designed such that companies that were afraid of risk would not set rates artificially high. Reinsurance and risk corridor were to only last three years, whereas risk assessment would remain active in perpetuity.

In 2015, Congress destroyed risk corridor by amending its budget bill to make the program budget neutral.⁹ After the bill was passed, CMS was only permitted to use the funds collected by companies that had made more than expected to help those that had made less than expected. Alternatively, CMS could not use its own general appropriation to make good on its commitment to share in the losses of new carriers.⁹ In 2015, more insurers lost money than made money so CMS only collected enough

money to pay 12 cents on every dollar promised to carriers that took a loss.¹⁰

CMS had no control over appropriations, yet was the agency responsible for all other rules. As a result, its refusal to adjust the other programs accordingly granted culpability to the Administration. The most blatant example is that of risk adjustment. An insurer's risk score per person was calculated based on diagnoses made by the member's doctor during a primary care visit. For new insurers without diagnosis data on new patients who did not see their doctors after joining late in the year, diagnoses could not be tallied and the patients are assumed to be healthy. As a result, Co-Ops were wrongly assumed to have had healthy members and were summarily charged risk adjustment fees that the young companies could not afford. After taking losses and ending up with new revenues far less than expected, the government did not chip in as promised through the risk corridor program. In essence, CMS did not adjust the loss that Co-Ops took knowing that the loss would not be offset by the risk corridor program. All in all, the loss of risk corridor and the inappropriate force of risk adjustment was a crucial factor leading to the failure of the Co-Op program.¹¹

Section 1322 of the ACA created 23 Co-Ops. 3 Co-Ops failed because of lack of enrollment.¹¹ Several more Co-Ops failed because of CMS's lack of adaptability.¹¹ Another Co-Op failed because of capital restrictions. In summation, the vast majority of Co-Ops failed because of malicious oversight on the part of CMS and the Administration.

In ridding the country of most of its Co-Ops, CMS left the future of the Obamacare Exchange in the hands of traditional insurers bleeding funds from their on-exchange plans. With these traditional insurers quickly leaving state markets, those relying on Exchange subsidies were quickly running out of options while those who made too much for subsidies faced higher and higher rates. Six state Co-Ops remained.¹²

Evergreen, Maryland's Co-Op, dropped its nonprofit status and paid back federal loans in order to remain viable and provide affordable competition in the state's insurance market.¹²

Given the state in which Obamacare was inherited, it is more reasonable to say that the new administration did not euthanize the reform, but rather chose to end life support.

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Editorials



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Grace Kwak



Football's Boogeyman is Finally Exposed: Tackling Concussions

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Laurence is a football player at Johns Hopkins who shadowed Dr. Avinash Mohan, a pediatric neurosurgeon, over the summer. While shadowing, he was distinctly influenced by the children who came in with head injuries from sports, namely concussions.

Football is currently undergoing an alarming transformation. According to data from the Sports & Fitness Industry Association, 3.21 million youth aged 6-17 played football in the United States in 2015, a sharp drop from the 3.96 million who played in 2009.¹ This may be due to increased public attention to the long-term health effects of repeated head trauma that is associated with football. The downward trend in youth participation is a major threat to the viability of

the sport. Instead of asking athletes to compromise their health in order to play football, we must make it safer. Football's overlying issue is that violence is woven into the fibers of the game. Two individuals running at each other, one with the intention of reaching the end zone, the other looking to do everything in their power to stop them, is never a peaceful encounter. The harder hitting teams are often successful, but these powerful collisions are not without consequence.

Highlighting these issues are the former NFL players who have developed neurological deficiencies pertaining to memory and multitasking. Some retired players have also noticed behavioral changes such as increased aggression, bipolarity, and depression,

HEAD-ON COLLISION

A head-on-head collision between two players. Photo by Johns Hopkins University.



which has even led to suicide.² The public health risk of football, as the game exists today, cannot be ignored. However, steps to address the prevalence of concussions in the game can be taken to ensure safety at all levels.

Although I have never been diagnosed with a concussion, I have seen the toll it has taken on other student athletes. My own teammates have suffered through persistent headaches, gaps in attention span, trouble sleeping, nausea and confusion. Even if they could focus in class, it would be difficult to remember information without writing it and re-reading it. Overall, they did not feel like themselves. These symptoms lasted from a few weeks to as long as three months and had potentially devastating effects on academic performance.

This past summer I had the opportunity to shadow Dr. Avinash Mohan, a Johns Hopkins alum and pediatric neurosurgeon at Westchester Medical Center in Valhalla, New York. My experience exposed me to a wide range of pediatric brain surgeries such as cranial vault remodels, chiari decompressions, and tumor excisions. The personal side of medicine was revealed through the office meetings Dr. Mohan held with his patients. As a member of the Johns Hopkins University football team, I was particularly struck by the children who came in with brain injuries, namely concussions, as a result of hits to the head while playing a sport. Dr. Mohan emphasized that these brain traumas are oc-

ccurring during critical periods of neurological growth and development. Recent studies have shown that the brain does not stop developing until as late as 25 years old.³ While the total repercussions of these injuries remain unknown, parents must be cautious of any injury, especially those that affect the brain.

So what can we do to make football safer? It first starts with helmet manufacturers. Tom Udall, a U.S. senator from New Mexico, has proposed that the Federal Trade Commission hold helmet manufacturers to higher safety standards and protocols by backing up their safety claims.⁴ Many companies claim that their helmets reduce concussions but have little scientific evidence to substantiate their findings. By raising standards of honesty and quality for helmet manufacturing companies, the actual effectiveness of helmets can only increase. Riddell, one of the major football helmet manufacturers and leading helmet provider of the NFL, claimed in 2011 that its newly designed helmet reduced concussions by 31 percent.⁴ This claim holds much less weight when it is dissected. It was based on a study of only 136 high school football players and was funded by Riddell and co-authored by Riddell employees. Also, helmets that were not a part of the study were advertised similarly to younger children.⁴ This is deceptive because concussion risks vary by age

and skill level. Manufacturers must be mandated to study their products in more rigorous ways that include larger sample sizes, independent scientists and study stratification by age level. Failure to comply should lead to fines for non-abiding helmet manufacturers. This will ensure honesty and prevent fraudulent claims. Although unlikely, the Food and Drug Administration could also regulate helmet manufacturers. Medical devices already fall under the umbrella of the FDA's Center for Devices and Radiological Health.⁵ This includes surgical helmets, so it wouldn't be much of a stretch to have football helmets classified as medical devices.⁶

Similar to holding manufacturers liable to their safety claims, we should also push companies to develop safer helmets. Current helmets perform remarkably well at reducing skull fractures, but concussions are a trickier problem. A concussion is essentially invisible: medical imaging technology is not sensitive enough to detect any physical manifestations of injury in the brain. As a result, diagnosis is completely based on symptoms and

TABLE 1+2

The overall decline of participation of youth ages 6-12 and 13-17 in football over the last few years. Source: Sports and Fitness Industry Association.

Youth Tackle Football Participation, Ages 6-12									
	2009	2010	2011	2012	2013	2014	2015	1-YR CHANGE	2009/2015 CHANGE
Total participants	1,521	1,343		1,316	1,290	1,216	1,230	1.20%	-19.10%
% of age group playing	5.6	4.9	4.7	4.5	4.4	4.2	4.2	--	--
Core participants	1,081	1,045	880	1,055	1,007	959	991	3.30%	-8.30%
% of age group playing	4	3.8	3.2	3.6	3.5	3.3	3.4	--	--
-- Numbers in thousands									

Youth Tackle Football Participation, Ages 13-17									
	2009	2010	2011	2012	2013	2014	2015	1-YR CHANGE	2009/2015 CHANGE
Total participants	2,441	2,489	2,578	1,947	1,921	2,038	1,984	-2.70%	-18.70%
% of age group playing	10.8	10.9	11.3	9.2	8.9	9.3	9	--	--
Core participants	1,703	1,921	2,038	1,532	1,579	1,631	1,566	-4.00%	-8.00%
% of age group playing	7.5	8.4	9	7.2	7.3	7.5	7.1	--	--
-- Numbers in thousands									

circumstances. A major cause of concussions is rotational forces, which are derived from hits to the head that are off-center, not head-on. This causes nerve strain that is both linear and gyroscopic.⁷ To combat our lack of understanding of such an intricate force, I believe that the NFL should be held responsible for increasing funding to research in relevant fields. After all, funding research in order to make the game safer is not only within the league's capacity, but also in its best interests. A partnership between a research university with a football team, like Johns Hopkins, and the NFL with its monetary resources would make a lot of sense. Without pushing innovation, product safety stagnation will continue to trickle down to our youth.

Live tackling, which is a harder form of tackling that brings players to the ground, must also be eliminated during weekly practices. At Johns Hopkins, we rarely, if ever, tackle each other during our weekly practices, but this is not a nationwide rule. The prevalence of tackling during the week usually varies from coach to coach. Simple math suggests that if you decrease the number of live hits one endures, the less likely it is that a concussion will occur. Critics may point out that this will lead to poor technique and make players more susceptible to injuries during games. However, good tackling skills can still be promoted during practice. Form tackling, a more technical approach that breaks a tackle down into steps, can still be taught without actually bringing players to the ground. Another safe alternative is the utilization of dummies and foam rings which still assists players in polishing their skills. Ultimately, it is not necessary to expose football players to more hits that do not necessarily refine their skills but only make them more susceptible to risk for a concussion.

To help identify when concussions occur, independent doctors or emergency medical technicians trained to spot concussions should be on the sidelines of every football game at or above the high school level. The NFL has already implemented this policy, but it has not completely found its way to all schools at the college and high school levels. There

is a conflict of interest that would sway a trainer to allow a player to play even if they show signs of a concussion. An independent doctor or EMT would have no such sway. This would be relatively seamless to implement. EMTs already go through training to prepare for a wide range of medical emergencies, so spotting concussions could be incorporated into their training. The largest challenge would be the cost of putting ambulances at every game. While most games already have EMTs present, there are high schools that save money by not having them on sidelines. This brings up whether there is really a price to children's safety.

Perhaps most radically, a ban on kickoffs could also be imposed. This would garner the most opposition since it is so integral to the game, but the idea does have some merit. Kickoffs occur at the beginning of halves and after scoring plays where the football is kicked into the air for an opposing team to catch and run with. This is widely seen as the most dangerous play in football since players are colliding at near full speed, which for the fastest NFL players can constitute speeds upwards of 22 mph.⁸ When the NFL moved kickoffs from the 30 to the 35-yard line in 2011, touchbacks increased, which likely lowered concussion rates. This makes sense because the 35-yard line is closer to the opposite end zone, so kickers were able to kick it into the end zone more often. Players are much less likely to run back footballs that are caught in their end zones because they don't feel like they can run back with it as far, so they opt for touchbacks, or kneels in the end zone. This automatically puts the ball at the 25-yard line. Another reason to ban kickoffs is that they contribute little to the direct score of the game. Out of the 1,060 kickoffs during the 2015 NFL season, only seven were returned for touchdowns. The vast majority of kickoffs were returned only about 23 yards.⁹ From a public health standpoint, a ban on kickoffs seems like an obvious improvement to the game. But most fans, including me, would need con-

vincing. Some of the most exciting plays of a football game can occur during kickoffs, especially if they result in touchdowns. Large returns can lead to huge momentum swings for teams, which has implications on the rest of the game. It seems like a huge step to ban kickoffs and this policy is unlikely to change in the near future. Yet, it is important to mention in the discussion of safety and football.

Parents of athletes, particularly those playing football, will often tell you that their number one worry is injury to their child. Football must adapt to growing concerns surrounding head injuries. While safety in the game has come a long way, it still has far to go before it becomes exceptional. As concussion research becomes more prolific and unnerving, children will continue to stop playing football if the issue is not addressed. This problem is not insurmountable, and I believe that when the proper steps are taken, the most popular sport in America will be here to stay.

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Sathvik Nambur

The Hidden Issue of Healthcare Disparities

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Sathvik spent summer 2016 in Lima, Peru studying chronic respiratory illnesses, where he observed firsthand the successes and limitations of the country's health system compared to that of the United States.

Every August, U.S. News and World Report releases an annual ranking of America's best hospitals. As usual, the list of the top 20 hospitals for 2016-2017 contains only private or teaching hospitals located in major cities or suburbs. Not one of the hospitals is wholly government-operated or located in a rural area.¹ Indeed, the 2016-2017 U.S. News hospital rankings illuminate one of the greatest problems in healthcare and public health, both in the United States and internationally, a problem that does not gain much press, despite its importance: the issue of health disparities.

To be able to fully understand the issues we face domestically and to explore potential solutions for our problems, it is often beneficial to look abroad. I was located in Lima, Peru for two months this summer as part of a team from the Johns Hopkins University's Bloomberg School of Public Health, where we studied chronic obstructive pulmonary disease (COPD), a long-term lung affliction most commonly associated with smoking.² Our objective was to holistically characterize COPD treatment in the country and find potential ways to improve how Peruvian physicians treat COPD, with the ultimate goal of per-

haps improving treatment in the US. Despite having this relatively narrow research objective, it was in fact Peru's great disparities in healthcare between public and private hospitals that I found most intriguing and instructive for the United States.

In one public clinic that I visited, located in the low-income neighborhood of San Juan de Miraflores, stray dogs sat next to patients in the waiting room and basic sanitation was essentially nonexistent. In this clinic, which lacked even a roof, one hassled and overworked physician was given the monumental task of treating an entire community. In the next room, I noticed a dental assistant performing a tooth extraction without anesthesia. On the day that I visited this clinic, a gentle mist was falling on patients in the waiting room, many of who seemed quite ill. This clinic featured no specialized physicians and a minimal nursing staff to treat the two dozen or so people in the waiting room that day. The Peruvian government offers universal healthcare, so while all Peruvians possessed health insurance, enabling this clinic to provide healthcare at low upfront costs to patients, many clinics' lack of quality leaves



much to be desired, indicating that universal healthcare in the US might not be a panacea either.

A couple days later, the private hospital in the business district of San Isidro I visited, with its well-dressed receptionists and spacious examination rooms, reminded me of some of the best hospitals in America, such as the Johns Hopkins Hospital. The well-lit, freshly cleaned corridors featured clear signs in Spanish directing patients to various departments and diagnostic centers. In this hospital, physicians had the luxury of being attentive to patients with time to thoroughly examine them and address their concerns. The physician I observed discussed her diagnoses with her patients, ensuring that they understood their affliction and how to treat it. Still, only a small minority of Peruvians have the financial ability to commute to this hospital and pay the relatively larger costs not covered by insurance.³

Beyond my observations, through meetings with physicians and patients, I learned about how healthcare disparities are omnipresent in Peru. Studies show significantly worse health out-



comes, such as infant mortality and disease rates, in poorer areas in Peru.⁴ Peruvians who earn less than a certain income are guaranteed health insurance, but that insurance only permits citizens to access public clinics and hospitals, which feature much lower quality of care than that of private institutions.³

Physicians in Peruvian public hospitals told me that they have significantly less time to see patients compared with their counterparts in the private hospitals. Uncleanliness and a lack of sterility in operating rooms were common problems that I observed in public hospitals as well. Furthermore, as relates specifically to COPD, the physicians with whom I spoke stated that Peruvian public insurance only funds three different medications for the disease, compared to private insurance which funds dozens of potential medications and allows physicians to mix and match medicines to find the perfect combination to treat patients. Although Peru, where the annual health expenditure of \$359 is 1/26 that of the US (roughly \$9300), likely has greater absolute health disparities than America, my experiences in Peru reminded me of how America too has is confronted with large gaps between how different demo-

graphic groups experience healthcare.⁵ The city of Baltimore, where Freddie Gray died in a trauma center in 2015 after a confrontation with police, is an excellent example of differential health outcomes and healthcare disparities in America. According to the Baltimore City Health Department, residents in the northern part of the city can expect to live up to 19.3 years longer on average than their counterparts in poorer neighborhoods such as Sandtown-Winchester, where Gray once lived.⁶

A variety of factors contribute to the differences in life expectancy, including lack of access to healthy foods and safe neighborhoods, but differential healthcare quality is one major reason for why people in some communities live longer than people in others.⁷ Indeed, the nonprofit Kaiser Family Foundation has published statistics that demonstrate that in modern America, race and socioeconomic status continue to be major determinants of the quality of healthcare received.⁸ To address the health care disparities that America faces, I learned during my experiences in Peru that it is not enough to merely offer health insur-

LOCAL HOUSES

Houses typical of the area where research was done. Most of the houses lack running water and electricity and illustrate the precarious living state of many low-income Peruvians. Photo by Sathvik Namburar.

ance to all citizens. Even the poorest Peruvians can acquire health insurance, but doing so does not grant them high-quality healthcare. Similarly, while universal health insurance in America would be a positive first step to begin to mitigate healthcare disparities, insurance is not enough on its own.

One of the major reasons for the implementation of the Affordable Care Act was to allow more Americans to access better healthcare.⁹ However, as the example of Peru demonstrates, health insurance on its own is not sufficient for quality healthcare outcomes. It does not guarantee quality healthcare. In my home state of Georgia, for example, relatively few of the state's top-rated hospitals by U.S. News are outside of the metro Atlanta area.¹ For those in south Georgia,



ROADSIDE

This photo was taken in the area where field studies were carried out and is a typical scene in the local community. Photo by Sathvik Nambur.

hospitals in general are few and far in between. While Atlanta has a much larger population than south Georgia, the lack of hospitals in the southern portion of the state makes it much more difficult for residents in southern Georgia to access quality healthcare.

Even within cities such as Baltimore, with its collection of top-rated hospitals, simply having a large number of hospitals nearby does not mean that all residents can access high quality health-

care. As a 2015 National Public Radio (NPR) article pointed out, people working low-wage jobs, even if they have insurance, might not be able to take time off work and find effective transportation to go across town to a high-quality hospital, leaving them with no other option than visiting their local health center, which is likely of lower quality.¹⁰ Thus, giving all Americans health insurance, while definitely a positive first step, will not eliminate persistent healthcare disparities in the United States. Indeed, other factors such as neighborhood location, ability to take off work, and access to transportation continue to allow differences to fester.

We must find more aggressive solutions to address healthcare dis-

parities in America. Once again, it is beneficial to look overseas. Despite its inequalities, one positive aspect of Peru's healthcare system is that all physicians who seek employment in a public hospital must first work in a rural clinic.¹¹ US medical schools and teaching hospitals could implement a similar requirement, in which physicians-in-training must work with the under-served in inner cities and rural locales for a certain time period.

Some Peruvian hospitals also have implemented telemedicine, which allows physicians to teleconference with patients in remote areas, thus eliminating the need for the patient to travel to a hospital. The United States seems to generally be behind developing countries such as Peru in



implementing telemedicine, but using technology would be an efficacious way—above and beyond merely giving universal healthcare—to reach those whom the healthcare system might otherwise overlook.

A 2005 article in *Health Affairs* also suggested that US physicians and providers be incentivized by the government to reach new patients, as opposed to the current system in which the burden to reach physicians is on patients. This article recommends that demographic data on patients be collected and that healthcare providers that offer healthcare to those of lower socioeconomic status and underserved minorities receive financial incentives.¹² Such a solution would fundamentally shift how providers approach the issue of healthcare disparities, and if

effectively implemented, would probably be an excellent way to address this issue.

Finally, we must work to strengthen the healthcare sites that are already in place to serve those of lower socioeconomic status. Government-supported community health centers are an important safety net and serve millions of Americans annually.¹³ Despite the implementation of the ACA, the Kaiser Family Foundation estimates that 28.5 million Americans remain without health insurance, making community health centers even more crucial.¹⁴ While data demonstrate that community health centers are effective in providing healthcare, there are simply not enough health centers and physicians to offer treatment to all Americans in need; Health Resources and Service Administration (HRSA) estimates that twenty-three million Americans are served annually, or 5.5 million fewer than the number of uninsured.¹³ Therefore, it is imperative to increase the number of health centers in the US and target them to low-income communities for maximum effect.

Before we can discuss ways to decrease health disparities in the United States, however, it is important to simply gain awareness of the issue of health disparities and to have a national discussion about them. Peru and the United States are very different in regard to the state of their economic development. However, the presence of healthcare inequality among the rich and poor exists quite similarly in both countries. Given that the United States spends the most money of all countries on healthcare, it is disappointing to see these persistent gaps in the healthcare system.⁵ In our quest for a more egalitarian country and world, actively addressing health disparities would be a bold first step forward.

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Healing Hands

GIANNI THOMAS

Public Health Studies, Class of 2019

Gianni co-founded an international service organization in 2013 named Healing Hands, which currently has a presence in four nations. He has spent thousands of hours understanding the needs of underserved children around the globe.

Three billion people—nearly half of the world's population—live on less than \$2.50 a day. One billion children worldwide are living in poverty. 805 million people around the world do not have enough food to eat.¹ These statistics normatively paint a picture of a child in a foreign, often developing, country in need of the most rudimentary resources and opportunities. However, this notion that poverty is mainly an ailment beyond our borders is fundamentally challenged when one internalizes that about 15 million children in the United States—21% of U.S. children (1 in 5)—live in families below the federal poverty threshold.² In fact, according to Columbia University's National Center for Children in Poverty, families require an estimated income of approximately double the federal poverty level to cover basic expenses. Using this metric, 42% of children in the United States live in low-income families.² This shocking realization led my sister, Tiffany Thomas, and me to found the organization Healing Hands.

Healing Hands was founded in September of 2013 as a high school club with the mission of assisting medically impaired children and underprivileged persons in the local community through compassion, fundraising, and most importantly, volunteering. Healing Hands connects students interested in medicine with hands-on medical service opportunities. The overwhelming interest in and success of Healing Hands caused an expansion that neither my sister nor I ever could have predicted, resulting in the emergence of an international organization of over 400 members. Currently, Healing Hands is on seven high school campuses in Southern California,

has chapters in China and Lebanon, is implemented within ten education centers in Armenia, and most recently established a Johns Hopkins University chapter. Healing Hands has been congressionally awarded for 'outstanding and invaluable service to the community' and continues to carry out the same mission upon which it was founded through students helping children every day.

In the winter of 2013, Healing Hands conducted a toy drive at the Shriners Hospital for Children in Los Angeles with the hopes of delivering stuffed animals and drawing books to the young patients just before the holidays. Shriners Hospital for Children is a specialty hospital that provides medical, surgical, and rehabilitative care to children up to eighteen years of age with orthopedic conditions, burn scars, or cleft lips and palates, regardless of a family's ability to pay.³ After arriving at Shriners and finishing our tour of the medical facilities, we entered the playroom where the young patients awaited our delivery. Upon entry, a cold gust brushed my skin, stopping me only a few feet into the room. With every pair of tiny eyes directed towards the entrance, it only took a second for some children to run up and snatch at their favorite toys while others waited until the appropriate time to come up and pick their toy. However, one four-year-old named Henry remained seated, not caring for the toys. Henry's patience was striking, not concerning himself with the fittingly childish behavior of poking at the other children as most did. More unexpected, however, was Henry's fully amputated right arm struggling

to assist his left in opening the lid of the crayon box. With his eyes intently focused on the coloring book containing the Superman outline that laid on his desk, I gradually approached and lifted the top of the crayon box. Henry grabbed the blue crayon, and his eyes harmlessly followed my body as if amused by my presence. I cautiously grabbed the red crayon and, without a word, began coloring in Superman with him. With each pastel stroke, Henry gradually warmed up to me. Recalling my favorite childhood stuffed baby lion, I hurried to the donation table and quickly picked out the golden lion cub at the corner of the table. With the lion cub in sight, Henry grinned from cheek to cheek, showing off his almost complete set of teeth. He snatched the lion cub with his only hand and embraced me in his tiny frame.

Seconds later, a woman rushed over, hugged me, and introduced herself as Henry's mother—she had been sitting across the room the entire time. She informed me that this was the first time that Henry had smiled in three days since his arm was amputated in a necessary surgery. On the car ride home, I couldn't help but think over and over about why Henry had smiled. What was it about the time we spent together that gave him the confidence to smile? Saving Henry's life didn't get him to smile; something gave Henry the comfort to forget his troubles and forget that he had just lost his arm. Maybe it was the stuffed animal, or maybe it was that he had found someone who had taken the time to understand him.

Nearly two years later in Jbeil, Leb-



anon, Healing Hands organized fundraisers and a toy drive for Bird's Nest Orphanage, a home for Lebanese children in the community participating in after-school programs. While greeting the children at the Bird's Nest, I met a rather extroverted ten-year-old named Bilal. It didn't take long for me to realize that Bilal was the life of the afterschool program. Whether playing tag with the girls or soccer with the boys, his energetic personality kept spirits high.

After spending quite some time with Bilal, I began to notice that he had more scuffs and holes in his clothing than the other children. Bilal soon explained to

on his best face at the program, day after day.

And precisely these uncontrollable factors remain at the core of hardships shared around the world. Our perceptions of those who suffer hardships different from our own transform dramatically to align with preconceived notions of their origin and culture. But, regardless of cultural boundaries and geographic location, suffering children around the world share the same underlying afflictions and needs. Recall Henry: the four-year-old, Superman-loving amputee; what if, perhaps, Henry had instead been Liu Wei

PLAYING OUTSIDE

At Bird's Nest Orphanage.
Photo by Gianni Thomas.

to judge what suffering may be like in different parts of the world, the truth is that there is no definitive prototype for hardship. How does one provide hope and instill ideals of determination and work ethic into children like Alejandra and Bilal, who both often go without meals for days on end? What do you say to those like Henry and Liu Wei who suffer from physical impairments that cause them constant alienation from society? These children could be spread anywhere across the world, and yet you will find that their stories and emotions are not so different. Liberties that I always considered primordial privileges diminish as every second of conversation with a child in pain develops into a treasured friendship—and that transformation from stranger to friend through serving, and more importantly through healing, is unforgettable.

“What was it about the time we spent together that gave him the confidence to smile?”

me about how hard his parents worked for their family. He mentioned the longest he had gone without food was two and a half days and that he and his younger brother would pretend to play a game in which the first to eat would lose. Tears began to fill Bilal's eyes. He didn't understand how his family could starve in spite of his parents' persistent attempts to put food on the table. I saw myself in Bilal—his liveliness, altruism, and mature emotional state—and yet our differences were quite evident. To whom we were born, and where, were factors over which neither I nor Bilal had any control over, and yet such arbitrary injustice failed to deter his ability to put

who lived in the outskirts of a large Chinese city? As for Bilal, the outgoing ten-year-old who questioned the injustices of the world around him, what if he had taken the form of a seven-year-old Mexican immigrant named Alejandra from Southern California whose mother was an agricultural worker? Though the aforementioned experiences did in fact belong to Henry and Bilal, Liu Wei and Alejandra are children whom I have also had the privilege of spending time with, and they too share similar struggles despite being across the globe from one another.

Though we take it upon ourselves

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A scenic landscape photograph of a mountain valley. In the foreground, there is a grassy hillside. The middle ground features a large, calm lake surrounded by green hills and a small town. In the background, there are majestic, rocky mountains under a cloudy sky.

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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.



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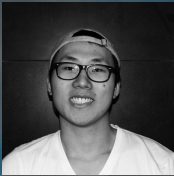


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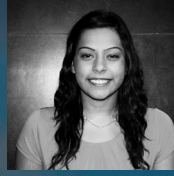
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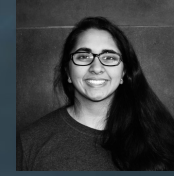
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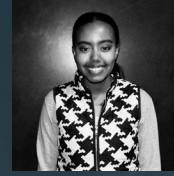
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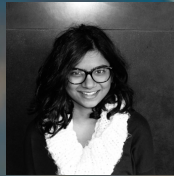
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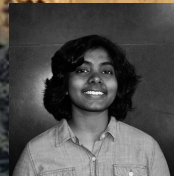


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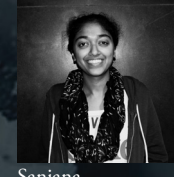
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