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ETHICS AND EFFECTIVENESS OF MEDICAL BRIGADES AS A PRIMARY CARE METHOD IN RURAL AND REMOTE AREAS

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I. Abstract

Medical brigades, also known as mobile health clinics, are temporary primary care stations set up by volunteer students and health professionals to bring basic healthcare to remote areas free of charge. The present review aims to explore the effectiveness and ethics of brigades, concluding in recommendations to improve these aspects of brigades. Literature regarding brigade effectiveness was examined and synthesized, while brigade ethics were analyzed through four main ethical principles of medicine: respect for autonomy, beneficence, non-maleficence, and justice. Proposed improvements to brigades include rapid testing and connection to care for chronic diseases such as HIV/AIDS, access to mental health services, and communication and data sharing among brigade groups.

II. Introduction

Carla Alvarez[*] is a 24-year-old mother of three on her way to see a primary care physician. She walks 30 minutes through rocky mountain paths with her coughing, sniffling children in tow. When she reaches her destination, she joins a line of 100 other patients and waits outside for over an hour in sweltering heat and humidity. When she finally reaches the front of the line, a young student loudly begins to ask her sensitive questions about her medical history in broken Spanish, which she can barely decipher. After another long wait, her family is ushered into a simple community building to see a doctor. Four other families are being examined by doctors in the same room at the same time; her family has limited privacy. After her doctor's

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visit she stands in another line for a makeshift pharmacy, at the end of which she is given two month's supply of vitamins and basic medicines. She gathers her children for the long hike home.

This is far from the ideal patient experience at a primary care provider, but it is a reality lived by many. Carla's story is not unique. Medical brigades, also known as mobile health clinics, short-term medical missions (STMMs), or short-term medical service trips, are temporary primary care stations set up by volunteer students and health professionals to bring basic healthcare to remote areas free of charge. Brigades vary by services offered, with some more involved outreaches including dental or surgical care. They are an especially popular method for primary care in developing countries, and most consist of volunteers from the United States, Canada, Australia, and the United Kingdom traveling to see patients in Latin America or Africa.[1] The brigade organization Global Brigades has recorded over one million patient visits in Central America and West Africa since its founding in 2003.[2]

In order to combat abysmal health outcomes in isolated, resource-poor areas, multiple organizations like Global Brigades facilitate outreach. Health disparities are health differences that are closely linked with social, economic, or environmental disadvantage.[3] Such disparities exist both within countries and among countries. For example, in the United States, life expectancy varies by over 20 years among different regions, with rural areas showing the lowest life expectancies at only 66 years, as opposed to urban areas at 87 years.[4] There is also a correlation between countries with the lowest per capita Gross National Income and shortest life expectancy.[5] The poorest areas in the world display higher maternal mortality ratios[6] and prevalence of illnesses such as malaria.[7] Despite leaps and bounds in human understanding of disease, 57 countries are experiencing shortages of healthcare workers[8] and over 18 million

people die every year due to a treatable illness,[8,9] most of whom are the poorest people in the world.[9] Volunteer medical brigades attempt to chip away at some of these issues by providing free healthcare to people with little to no income or access to medicine.

I have actively participated in and helped to organize ten medical brigades to Honduras with the John Carroll University (JCU) Immersion Program. During JCU brigades, students, faculty, and volunteer health professionals revisit select villages from year to year and facilitate communication and improvement through a public health survey, in addition to providing basic medical care. However, not every brigade group goes to even these lengths to establish community relations, and several issues arise with this type of medical system. For example, a language barrier is stressful and often inefficient, a lack of continuity of care results in an inability to track patients over time, and a "Band-Aid" effect promotes charity rather than community healthcare development. According to Jo Ann Van Engen in her article "The Cost of Short Term Missions"[10]:

> Even medical brigades are difficult to justify. The millions of dollars spent to send North American physicians to third-world countries could cover the salaries of thousands of underemployed doctors in those countries – doctors who need work and already understand the culture and language of the people they would serve.

The aforementioned considerations present only a small portion of the logistical and ethical challenges faced by brigade volunteers.

My experiences in rural medicine have given me the opportunity to question and propose improvements to this system of care. The present review compiles literature about brigades and other remote access medical solutions to help answer the questions: Under what conditions are brigades effective? Under what conditions are they ethical? Realistically, how can they be improved? Should they be replaced with a different approach to remote care?

This particular project is a fitting capstone for my undergraduate career as an Arrupe Scholar and pre-medical student of neuroscience and biology. I have been studying the link between poverty, social status, and healthcare throughout my coursework and my volunteer experiences in Cleveland and abroad. As I pursue a career as a physician, I aim to continue to work with medically underserved populations, especially in developing countries. This project is an opportunity for in-depth study in fields that interest me, and I hope that what I learn will provide insight for my future career.

III. Effectiveness of Medical Brigades

The effectiveness of medical brigades can be analyzed by considering what patients want and need and whether or not brigades meet these expectations. Brigades generally serve people living in impoverished rural areas,[8] so the specific needs of this population must be evaluated. The perception of health in rural areas is distinct from health perceptions of people living in urban areas. According to a review of many studies comparing health perceptions among rural and urban populations by Gessert[11], people living in rural areas approach healthcare in a unique way. For rural populations, good health is associated with an ability to go to work and fulfill traditional roles in the family.[11] Rural communities also emphasize distance from the healthcare system as a positive indicator of health; they wish to have infrequent visits to doctors, experience little interaction with the health system, and endure illness on their own as long as possible.[11] People living in rural areas accept poor health as natural and are willing to see disease as a natural progression toward death. In addition, death is accepted more readily in rural areas than in urban areas, whose residents are more likely to seek aggressive end-of-life care.[11] The values that rural residents most emphasize regarding their healthcare are physical ability, independence,

self-sufficiency, and spirituality. This is evident in behaviors of rural patients, who are less likely to seek mental healthcare due to its perception as weakness, take on a "work hard, eat hard" mentality, persevere through illness until their symptoms prevent them from maintaining daily responsibilities, and avoid hospitals.[11]

Rural communities around the world each have their own unique histories and cultures, but most share the characteristics of isolation and low concentrations of wealth. Thus, information gleaned from any study of rural healthcare might provide insights for a variety of other places experiencing similar challenges. In poor rural communities studied in El Salvador, patients reported visiting a healthcare facility only for serious ailments.[12] This is similar to personal reports that I have heard from patients in rural Honduras who were attending the brigade to see a doctor for the first time in decades. In the types of communities that brigades visit, women and children are more likely to seek care than are men.[12] This seems to be attributed to the different needs and work schedules of men and women in a society where traditional roles dominate. Women in lower income countries usually have many children, so they often seek primary healthcare for prenatal and postpartum care or conditions related to their pregnancy. They also have primary roles as caregivers in the household and so are responsible for taking the children to seek medical care if they are ill. Men in rural areas typically have jobs outside the home that require long days of physical labor; it is difficult for them to take time off of work to seek care that is not easily accessible and the nature of their medical concerns are usually injury-related or require a specialist.[12] This is consistent with descriptions of other brigades that report a patient population of mostly women and children.[8,13]

In impoverished rural areas of developing countries, patients prefer private healthcare to public healthcare due to perceived higher quality, longer hours of operation, better supply of

medicine, better-trained staff, and availability of specialists.[12] Although the patients surveyed were living in poverty and the private care could cost up to five times more than public care, respondents still said they would prefer private care if it were available.[12] Too often, these patients have visited public primary care facilities and experienced long wait times to see only an ill-equipped provider with little or no medicine to supply. Additionally, many patients traveled to a large hospital to do "one stop shopping" for all their healthcare needs rather than trying to attend a less reliable primary care unit nearby.[12] It should be noted that the preference for public or private healthcare, or access to any healthcare at all, varies by country, as certain developing countries have more extensive health systems than others. However, in general, the populations that brigades serve expect a certain standard of their healthcare: trained staff that can diagnose and treat their illnesses, low-cost medications, and case monitoring.[12]

Whether or not medical brigades meet these expectations for patients is almost impossible to tell due to an incredible paucity of data on the subject; there is not even a standardized name for their activities. A 2014 review of short term medical missions found that published papers used more than 45 different terms to refer to medical brigades.[14] This reflects the complete lack of regulation surrounding the provision of this type of healthcare in developing countries; there are currently no government agencies or accrediting bodies which exist to oversee the activities of brigades, analyze their credibility, or assess the standard of care which they provide.[14,15] In addition, there is no authority which verifies medical licensure of doctors participating in brigades. Such a lack of supervision is startling since the population utilizing brigades for care consists of some of the most marginalized and vulnerable people in the world.

There are not many quantitative studies with which to characterize the activities of brigades. Only 6% of all published articles on the topic of medical brigades include empirical

data.[14] Most of the literature consists of short reflections on personal experiences written by professionals that volunteered.[16] There are also many barriers to collecting outcomes data so it is difficult to know whether or not the care administered was successful.[1] This is especially true for general primary care brigades, as surgical brigades generally last longer and collect data on surgery outcomes.[1,14] However, the effectiveness of primary care brigades may be qualitatively analyzed using what little data exists and my observations from the brigades I helped facilitate.

Based on the data from El Salvador, it is clear that seeing a doctor in a timely fashion is important to the population of patients attending brigades.[12] However, most patients at the brigade wait a very long time – up to four hours – before receiving care.[15] I have also observed that by the time a brigade arrives at a village, there is already a long line of patients queued up to see the doctor; one might imagine that some people showed up much earlier just to get a good spot in line. Clearly, brigades cannot provide an efficient use of time for patients in most cases. Patients also indicated that they expect to see a trained practitioner who can diagnose and treat their illness.[12] While this is far from an absurd request, whether or not this expectation is met depends on the brigade and on the illness of the patient. All brigades have at least one doctor, but many of them are staffed by medical students or even undergraduate students without any training. At the brigades I have attended, every patient has the opportunity to meet with an experienced physician, but some articles have reported improperly supervised students and irresponsible conduct.[1] To make matters worse, over 75% of diagnoses made in a brigade setting are given using only the patient's clinical presentation and no laboratory techniques.[1] This makes sense since brigades take place in poor, remote areas where access to a laboratory is practically impossible, but still calls into question the accuracy of some of the diagnoses made.

Some brigades to Honduras report predominant diagnoses of gastrointestinal infections and parasites, upper and lower respiratory tract disease, and skin infections.[8,13] In general, patients do not report chronic or non-communicable diseases at high rates as they expect that brigades cannot provide the long-term treatment necessary for such maladies.[8] Even if a health professional can accurately diagnose a patient at a brigade, whether or not they can provide treatment depends on the capabilities and medicine supply of the brigade. In the case of surgical brigades, most are only equipped to handle traumatic injury and do not treat congenital or acquired deformities.[1] These deformities, however, account for a large portion of global disability adjusted life years and up to 26,000 deaths per year.[1]

One expectation of patients that brigades can meet fairly well is low-cost medication.[12] In fact, brigades provide as much medicine as possible free of charge. As patients at the brigade generally avoid seeking care unless they are experiencing a major illness,[11,12] a brigade that comes to their village provides a great opportunity to receive medicines for less serious illnesses that are bothersome but likely would have otherwise gone untreated. One drawback, though, is that most primary care brigades only offer a variety of antibiotics and over the counter medicine, so treatment for chronic diseases is uncommon. Additionally, there is a chance, due to the mobile nature of brigades, that medicine will be depleted before everyone has had the opportunity to see a doctor. In these cases, brigades fail to meet patient expectations.

Finally, patients expect their healthcare system to provide case monitoring,[12] which brigades carry out ineffectively or not at all. As brigades are far from permanent sources of care, volunteers come to a village for only a few hours or a few days and then leave, never to see those patients again. Continuity of care under these conditions is virtually impossible.

Some organizations go beyond primary care to foster community development and empowerment. Global Brigades claims to take a holistic approach to rural healthcare, hosting not only medical brigades, but also dental, public health, engineering, water, microfinance, and human rights brigades.[2] Their Holistic Model includes choosing communities in which to develop sustainable microbusiness, healthcare, banking, sanitation, and water infrastructure; when the community successfully takes over these projects it is inaugurated as an "Empowered Community" and brigades to that village will stop.[2] Global Brigades has had success in 11 communities thus far, 10 of which are in Honduras and one of which is in Panama.[2]

It may be worth exploring the effectiveness of some alternative types of primary care considering that brigades have mixed results in meeting patient expectations and very little data has been collected on their outcomes. Some evidence suggests that training community health workers may be an important part of the solution to health crises in rural and remote areas, especially within the realm of childhood survival. A 2007 review article remarks that in poor and underserved communities, it is feasible for community health workers to engage in preventative education; administration of vitamin supplements, immunizations, and mosquito nets; management of childhood illness; family planning and pregnancy care; and referral to emergency care.[17] When community health workers provide case management for sick children, child mortality rates fall substantially.[17] Additionally, health promoters in El Salvador were found to be very successful at achieving immunization coverage, with immunization rates above 95% for children under age one.[12]

Examples of community-driven care can be found in Honduras and Peru. In one model for primary care in Honduran communities, a strict plan for community health workers has been implemented. First a "needs assessment" is made by reviewing patient charts, and then a

community health worker commits to the project. The worker is trained on issues specific to their community, and subsequently receives continuing education and training.[18] This particular model was mostly successful over a 15-month period in two remote Honduran communities, and continual refresher courses led to improved accuracy of case management by health workers.[18] In another rural Honduran community, a hypertension treatment group was formed after training community health workers and creating standardized treatment protocols. Each member of the group paid membership fees and pooled resources to buy generic drugs and hire a physician. After 30 months, patients showed better medication adherence and hypertension management.[19] While this model for treating chronic hypertension was an important development, it is also worth noting that it may be better utilized for more immediate illnesses such as parasitic infections since the effects of chronic hypertension might not be felt until very late in life and life expectancies for the world's poorest countries are very low.

In Peru, Partners in Health developed a community strategy for addressing multi-drug resistant tuberculosis (MDR-TB) in poor communities.[20] Their program, DOTS-Plus, used "an integrated team, intensive training, community-based patient care, and addressing socioeconomic factors contributing to health disparity" to decrease MDR-TB infection.[20] Partners in Health suggests that other organizations and communities adopt a similar approach for any disease in impoverished areas.[20]

While studies on community health workers are mostly promising, an analysis of Quechua health workers in rural Peru reminded global health leaders to carefully consider culture, language, and gender issues of the target community when providing recommendations for community healthcare.[21] In this study describing the profile of community health workers in the central Andes, it was found that most community health workers and traditional healers were

older men, all of whom spoke Quechua and few of whom had received much formal education.[21] The community health workers, trained by the local Ministry of Health in the biomedical model of disease, had a much higher drop-out rate than the traditional healers, who had "prevailing health beliefs that they shared with their community."[21] It was suggested that any training given to community health workers should be sure to incorporate local, traditional beliefs and languages in order to keep community health workers engaged and supported as well as respect the spiritual beliefs of the community. Applying this standard to brigades, especially ones which stay in a certain village for more than a few days, could help keep brigades both effective and ethically responsible while reminding public health leaders that a one-size-fits-all approach is not appropriate for communities with diverse backgrounds and needs.

IV. Ethical Considerations

As brigades are largely unregulated, there is a great need for the ethics of brigades to be systematically evaluated. No study has previously evaluated brigades through the four commonly accepted principles of medical ethics, and in fact, the ethics of short-term medical missions has barely been formally studied. One author suggests that this might be caused by volunteers assuming that their charitable actions are inherently altruistic or good.[22] However, beyond the surface of charity, brigades pose very complex ethical challenges which might be best examined through the principles of medical ethics. These ethical principles drive moral decision making in modern medicine and provide a basic framework which can apply practically universally across cultures, making them ideal for examining the ethics of medical brigades. These principles include non-maleficence, beneficence, justice, and respect for autonomy.[23] All four of these principles should be respected in medicine, but cases may arise in which two or more principles

conflict and so they must be analyzed on a case-by-case basis.[23] However, in general, these principles apply to medical brigades across a broad range of activities that they perform.

Non-maleficence

Non-maleficence may be the most well-known ethical principle of medical practice. It may be summed up in the famous phrase "First, do no harm." Put simply, anyone practicing healthcare should not impose an unreasonable risk of harm upon a patient. This principle also encompasses the idea that in some cases, doing nothing for a patient may cause less harm to them than doing something (e.g. performing an unnecessary surgical procedure).

Conflicts of brigade practices with the principle of non-maleficence arise when considering the attitudes, training, and supervision of volunteers. The attitudes of some volunteers calls into question who is benefiting more from the interaction – the already privileged folks spending money to travel to a far land to use impoverished people as interesting cases to hone their medical skills, or the desperate patients on whom they are practicing. Many student and faculty volunteers during my medical brigade experience, and the brigade experiences of others,[24] said that they felt they had gotten more from the brigade than any of the patients had. Some pre-medical students even seek out brigades particularly for the benefit they will receive by "checking the box" for community service on medical school applications. It is part of a culture of gathering experiences for the application instead of seeking depth of experience. This attitude of students reflects the attitudes of some doctors who are motivated to work for brigades by personal gain. In a large review of medical missions over the last 25 years, it was found that many publications stated that doctors felt that they "gained a great deal from the missions."[16] In one particularly self-centered and cavalier reflection, one doctor stated,

> What we read about in books during our residencies walks in the door. Extremes of more common conditions . . . are also seen. It is a veritable feast of interesting cases. I often

> find myself looking forward to the next patient if for no other reason than it may be something that I have never seen.[25]

The last sentence of that particular reflection also highlights another important facet of brigade activities – many of the health professionals are inadequately trained and ill-prepared to face the endemic diseases of a region that they may never have visited before. One physician working at a long-term placement in Nepal noted that visiting physicians were working outside of their specialty or had little notion of how their trained specialty applied to the local setting in Nepal.[26] They did not understand "local illness presentation, culture, or language."[26] This kind of oversight would simply not be tolerated in the more regulated health systems of developed countries, and is a huge ethical problem facing brigade-goers. The challenge is for physicians to provide reasonable care without overstepping their scope of practice, which is difficult when the diseases are unfamiliar or a different specialty is needed.

Some U.S. physicians have provided anecdotal reports of a very clear breach of non-maleficence: unnecessary or inappropriate surgeries performed on impoverished, malnourished children of Southeast Asia resulting in their deaths,[27] and postoperative complications resulting from visiting surgeons in Rwanda.[28] There are even unacceptably high rates of postoperative infection.[1] While surgical brigades are not considered primary health care, there is a lesson to be taken from this. Local surgeons and doctors are probably struggling due to lack of funding and resources rather than due to lack of skill, and assuming that a visiting physician will be better for patients is not always true. As the physician from Nepal stated, "It is inappropriate arrogance to assume that anything that a Western doctor has to offer his less developed neighbor is progress."[26]

Some of this grey area might be eliminated by a commitment on the part of visiting physicians to refer cases outside of their scope of practice to a local medical professional.

Challenges, of course, arise with this as many of the areas that brigades visit have little or no medical infrastructure and physical barriers to access to care are common. However, more effort on the part of visiting physicians to get to know the local medical context would help with referrals or even with follow-up care. As it stands, brigades, especially those that stay in town for a day or less, have no system of follow-up care. The volunteers take no responsibility for what happens to the patients after they leave. Only 48% of patients report having another health care provider to turn to in case of an emergency or recurrence,[15] and only 40% of missions agreed that it is easy to refer patients to a local specialist.[15]

One study discussed that this was particularly frustrating from the perspective of the hosting non-governmental organizations, who were disheartened when patients were diagnosed with chronic illness such as cancer and received no assistance from the visiting brigade in procuring follow-up treatment.[29] This exposes an irresponsibility on the part of brigades that must be addressed. All brigade volunteers should be taking into account whether actions that seem beneficial are actually causing harm to the communities that they are hoping to serve.

Beneficence

Beneficence goes hand-in-hand with non-maleficence. Briefly, it means that providers have a duty to benefit the patient whenever possible. Generally, one must weigh the benefits and the risks so that net benefit to a patient exceeds harm done.[23] Ideally, patients would receive a great benefit of care without any harm, though in the brigade setting this seems to be only a pipedream.

The motivation for volunteers to travel with brigades is, indeed, usually altruistic.[15,24,25] There is a dire need for medical care in impoverished rural areas, and brigades can bring some relief in the short-term, especially those that are well-prepared with specialists trained in endemic

diseases and effective medications. Patients that may have never had the opportunity to see a doctor will now have a chance for, at the very least, a check-up. There is also some evidence that the mere act of foreign practitioners reaching out gives some hope to the patients that they have not been forgotten by the world. One extensive review of medical mission activity found that community members in both Zimbabwe and El Salvador agreed that "having a physician come, even for short periods of time, was extremely helpful to the community, as it put a human face on their problems and gave them hope that ongoing assistance would follow."[16]

Even these altruistic intentions, though, can be problematic if they result in a misconception that in resource-poor environments any healthcare is good healthcare, regardless of its quality.[15] One story, told by Berry[29] in her evaluation of medical missions in Sololá, Guatemala, highlights the significant blunder in believing that missions are inherently benevolent regardless of how they are staffed and supervised:

> On the first day of the mission, a professional Guatemalan nurse employed by the NGO accompanied the mission volunteers to the site. [The host NGO] received a frantic call from the nurse mid-day: the mission was a disaster. Rather than a group of foreign and national doctors and a few students, the NGO was actually hosting numerous North American students, the vast majority of which were not even in university. The nurse was particularly upset because she said that the quality of care that the patients received was not meeting her professional standards. [A representative of the NGO] immediately drove to the village, where she witnessed a North American high school student in a white coat filling a prescription for antibiotics with aspirin. Despite the pleas of the volunteer organizers, she promptly ended the mission.[29]

It is unfortunate that what would be considered malpractice or fraud in the United States is unregulated and therefore accepted in these environments; even if foreign groups believe that their work is inherently benevolent, the circumstances and the context can reveal a great injustice in how the most marginalized people in the world are treated. This brings us to the third ethical principle of medicine: justice.

Justice

In its most basic iteration, justice means "to each person fairly," and in the case of medicine, to each person according to need.[23] While medical brigades attempt to address the injustice of health disparities by providing free healthcare to people in need, the brigades themselves can be unjust in the ways their activities are carried out. Short-term medical missions, in order to be just, should treat patients with the same standard of care that the volunteer physicians accept in their home countries, should be regulated like any other form of medical care, should give a preferential option for the patients most in need, and should evaluate how resources are allocated so that the most benefit reaches the target communities.

If justice is to treat each person according to need, then a just brigade would give the best healthcare to the most impoverished people; however, rarely does the brigade standard of care meet standards of care in developed countries. Doctors on brigades are morally responsible to treat a patient in a developing country with as much rigor as would be expected in their home country, yet too often foreign volunteers are not held to a high standard of care. According to several authors, without formal regulation and supervision for patient safety, doctors are more likely to perform treatments for which they are inadequately trained while patient safety and quality control are easily overlooked.[1,15] The aforementioned physician in Nepal underscores the injustice by drawing the contrast between what is acceptable in developed nations and what is completely overlooked in the resource-poor setting: "If an unregistered Nepali doctor on holiday in the United Kingdom offered general medical consultations in a shopping center there would be a public and professional outcry."[26] Brigade volunteers need to take personal responsibility for treating patients with the same standard of care that they would desire out of their own

physician. As a society that propagates brigades, we should also take formal action to ensure justice in these environments.

Brigades should be subject to regulation and oversight just as any other medical activity is. For example, practicing medicine in the United States requires that the doctor pass a national exam and be registered by a state board. Medicines are regulated by the Food and Drug Administration, and there is a large body of national and state laws which regulate the activity of healthcare providers and provide a framework for consequences in cases of malpractice. Since brigades, however, are regulated by no single governing body, there are no standards with which to evaluate their activity in terms of quality of care, efficiency, value, or ethics. If anything, brigades should be subject to even more safeguards because of the vulnerable demographic with which they interact, but currently no formal regulation exists. A 2008 publication out of Harvard Medical School put forth the first formalized system for brigade evaluation in the form of a survey to evaluate each brigade's success in cost, impact, education, efficiency, sustainability, and preparedness.[15] However, when tested on five different brigades, all categories received scores of around 70%, indicating a possible bias on the part of the volunteers in the self-evaluation. This underscores the need for an objective, centralized system of supervision for all brigades.

Another issue of justice regarding brigades that, from a Western perspective, might not immediately come to mind, is treating the patients who are most in need. A volunteer on a brigade might not think that there are any people seeking free treatment who might be able to afford seeing a local physician. However, a study in rural Guatemala found that brigades do not always reach the poorest people.[30] A Guatemalan physician noted that volunteer groups who do not screen for income end up treating people free of charge who truly could afford their own

local private healthcare, in turn undermining the local Guatemalan healthcare system.[30] This physician stated that the volunteers "seem to perceive everyone in Guatemala to be poor, and therefore do not think it is important to do a socioeconomic evaluation."[30] Many healthcare providers thought that patients were also more likely to be engaged in the visit with the physician if they paid at least some money for the consultation; one doctor suggested that paying even a few cents for care changes a patient's attitude dramatically.[30] Although every healthcare provider surveyed emphasized that ability to pay even this small amount should never create a barrier to accessing the brigade for any patient, almost every healthcare provider suggested a sliding payment scale. With this method, patients would be evaluated by a careful socioeconomic screen performed by community leaders, who would best know the patient's true ability to pay.[30] This method would allow the patients to have a stake in their health while also turning no one away. Additionally, it can prevent such a dependence on the brigade; it might prompt some patients who can afford a local doctor to support them instead. I know from experience that many volunteer physicians would be very uncomfortable taking money from any patient that attends a brigade; these doctors might find comfort by quietly donating the money back to a certain project the village has undertaken or using the money to benefit the community in some other way.

One of the greatest questions of justice surrounding brigades concerns the flow of money and resources. Who needs the resources the most and are these resources being effectively directed to benefit those parties? The heart of this problem lies in foreign volunteers not truly understanding the root causes of the burden of disease in rural areas of developing countries, and employing a "savior mentality" – much like that of a dermatologist who gushed about women bringing him homemade crafts for healing their children.[25] Instead of considering the small, isolated good of one short-term medical mission, concerned healthcare professionals need to be

conscious of why the brigade system is necessary, and whether it truly is the best expenditure of funds in the long-term.

A *conservative* estimate from Harvard Medical School of the total annual expenditures for medical brigades is 250 million dollars.[15] In-country care is also understood to usually be less expensive per patient.[1] A huge portion of the 250 million dollars represents costs of travel and lodging for volunteers, money which could instead be directly donated to support local physicians and hospitals. As one volunteer put it, "what business did our team of 10 members have spending approximately $30,000 for transportation and hotel costs, when the cost of building a new 30-bed wing for the hospital in Ghana was $60,000?"[1]

According to officials at the Ministry of Health in Guatemala, it is not the manpower of foreign medical teams that would be helpful for addressing rural health's greatest problems.[30] As one official stated:

> . . .the primary problem in Guatemala is a lack of public health infrastructure and lack of primary care coverage due to a lack of financial resources. . . [Short-term medical work] does not, and cannot, address these primary health issues of Guatemala. We already have many surgeons and other physicians who are well trained to take care of all problems common in our country.[30]

Countries like Guatemala need help from developed countries, but not through sending personnel. They need financial resources to develop systems that can reach more patients effectively. Practically universally, "poverty is the root of the problem, and surgery does not address poverty."[30]

As it is likely that developed countries will continue to send personnel into impoverished rural areas, it should at least be done with attention to how they might best use the resources they bring with them. It would be beneficial to work with local organizations to train people to use any equipment they might bring. One personal account told of an American group that stationed

themselves and sought out patients without contacting the nearby health posts, having brought an ultrasound machine and a microscope with the intention of addressing chronic disease.[26] Obviously any chronic disease diagnosed could not be treated by the visiting doctors in one consultation, but by pooling resources with the local doctors the health posts might have used the training and equipment resulting in lasting benefit for the patients.[26] Ideally, any visiting physicians would know the local healthcare system and collaborate with them so as to help provide resources even after their short visit is over.

Volunteers should also be conscientious of the size of groups that they send, as too large of groups can be a burden on the host facilities.[30] While some organizations like Sociedad Amigos de los Niños near Tegucigalpa, Honduras host medical brigades as part of their mission and are supported in part by brigade-goers paying for lodging, other facilities like hospitals are not equipped to handle mission groups. Foreign doctors can displace local doctors and nurses in some cases. Even the locations that are experienced in hosting brigade groups still have a limit on the number of volunteers they can handle, and the larger the group the more difficult the logistics. During one of my short-term medical trips, my group included three medical doctors, two nurses, a veterinarian, four university professors, three medical students, two university alumni with no medical affiliation, and 18 undergraduate students, for a grand total of 33 people, only five of whom were actually qualified to treat patients. Although non-medical personnel are actively involved in the medical effort through raising money and providing administrative help, at some point the burden outweighs the benefit. Such a large group required our host organization to scramble for extra buses and more translators, and created issues of inefficiency when there were more students than there was work to be done. Even this is not the most extreme case. One physician who has worked on healthcare projects worldwide described a

medical team from the U.S. that traveled to Guatemala and brought 78 people including surgeons, primary care physicians, nurses, cooks and translators.[30] He said that in country:

> [There are already] doctors, nurses, cooks and translators. So, it would be better to bring the specialists that may be needed and then utilize as many in country personnel as possible to carry out the mission. In that way, you are wasting less money, strengthening the country's healthcare resources, helping the country's economy, and increasing the quality of care.[30]

Brigades whose main goal it is to expose as many Americans as possible to extreme poverty and healthcare systems in developing countries need to evaluate whether their group is actually helpful to patients in the host country or if they are simply engaging in medical tourism.

Respect for Autonomy

Autonomy has been described as "a special attribute of all moral agents."[23] It allows people to make decisions freely, ensures that they know all the possible information pertaining to making these decisions, and protects them from deceit. In essence, an autonomous entity is one that has control over itself. When analyzing the impact of medical brigades on respect for autonomy, we may consider it a two-fold issue including autonomy of the individual and autonomy of the society.

An autonomous patient has the capacity to act intentionally, with understanding, and without controlling influences that would mitigate against a free and voluntary act. Autonomy in medicine requires informed consent, confidentiality, and good communication.[23] In American medicine, a breach of a patient's right to any of these aspects of autonomy is a prosecutable offense. On brigades, these aspects of autonomy are unregulated and easily endangered. Informed consent is easily compromised for a number of reasons; since there is very little empirical data about any brigade activity, let alone the long-term effects of being treated at a brigade, it is very difficult for physicians on short-term missions to communicate with any

certainty what might happen to a particular patient should they choose to accept the treatment. Furthermore, a language barrier between volunteers and patients undermines the ability for effective communication. I once asked a young Honduran if he was going to cry when I meant to ask if it was going to rain. Even a small blunder like mixing up two similar-sounding words (llover: to rain, llorar: to cry) could be devastating in a medical setting. Even with a translator, there is no way to know that exactly the meaning, phrasing, and intonation that each party is trying to convey is not lost in the translation. In addition to lack of informed consent, brigades also can have issues of confidentiality depending on the space in which they are conducted. It is common for brigades to set up their temporary "clinic" in whatever public building the village might have, commonly a school or existing medical building if available. Patient consultations can happen in large, open spaces with no walls to serve as patient rooms. Another patient might be seeing the doctor at a table only feet away, easily seen and within earshot. This is a severe lack of confidentiality, especially if everyone is trying their best to speak extra loudly and clearly due to the language barrier. This might lead to a patient being too embarrassed to admit symptoms about something like an STD in the public space, or to teenagers being reluctant to talk about their health in front of their parents. Seeing a doctor can already be uncomfortable and scary, but adding this lack of privacy surely makes it an even worse experience for many patients.

Along with these concerns of individual autonomy comes the case for encroachment upon societal autonomy committed by short-term medical trips. Increasingly, participants of medical brigades report that the focus of their work includes collaboration with local community leaders regarding health needs and training of local healthcare workers.[24] While this is a step in the right direction toward preserving autonomy and control of health of the villages visited, it is

difficult for short-term volunteerism to take into account deleterious effects on the healthcare system of the target nation, which in most cases is nascent and in need of support. The same study that interviewed professionals from Guatemala found that the use of medical brigades decreased the incentive for the government to invest in its own healthcare and so exacerbated the issues of access.[30] One physician described how difficult it was to petition the government to build a health center in his locale when there were already foreign NGO projects underway; the government only considered how many services were available in that area rather than their source or quality.[30] Therefore, brigades may actually impede the development of healthcare infrastructure in developing nations. The previously discussed issue of patients who can afford local healthcare but choose to use foreign brigades because they are free and convenient also compounds the problem of widespread dependence on foreign medical aid.

With clear breaches of the major tenets of bioethics, especially in the areas of non-maleficence, justice, and autonomy, brigades should be a significant area of concern for global health regulation. Some might even assert that due to only mixed results in effectiveness and so many ethical issues, that short-term medical missions should be abolished and we would do better to focus our resources on other health interventions. However, it is better to send short-term medical missions to areas that are truly barred from all other access to care than to do nothing. With certain improvements, brigades could become more ethical and effective, but a major focus of global health should be to bolster local systems so that interventions like brigades eventually become unnecessary.

V. Proposed Improvements

According to an extensive review of global healthcare delivery strategies in low- and middle-income countries, there is no one perfect approach to developing health systems since they are very complex and depend on the ideologies and unique challenges of each country.[31] The author recommends that wealthy countries help by supporting reforms led by the particular societies in question and by contributing knowledge from research.[31] This is exactly the role that brigade volunteers should play – developing new strategies with the countries they visit and collecting data along the way. Although brigade models must necessarily vary by locale,[2] there are some practices that should become standardized for every medical brigade as a baseline quality of care for patients across the globe. These focus on addressing the issues of effectiveness and ethics discussed previously. Firstly, brigades should be regulated by some international entity to provide (1) a standardized tool for assessment as well as (2) record keeping for all brigades and (3) information sharing among brigade groups. Secondly, there should be rapid testing and connection to care for chronic diseases such as HIV/AIDS. Finally, brigades should collect data on, and perhaps attempt to address, mental health in the communities they visit, as there is not a single mention of mental health in any of the short-term mission literature.

An online medical record for brigades is practically non-existent excepting communities that already have an established clinic in which to store patient charts.[2] By the nature of temporary primary care clinics, continuity of care is practically nonexistent. However, there is large potential for improving patient outcomes if some form of continuity of care can be established. It has been shown that continuity of care improves quality of care, especially for patients with chronic conditions.[32] I propose the establishment of a regulating body through which brigades set up outreach to the most appropriate (most in need) areas in the world. Through this body, brigades should also store patient data so that when other brigade groups visit

the same place they have medical history and community information for those patients. I propose that through this body brigades be consistently evaluated and improved, and encouraged to conduct research. This unit might be housed under the World Health Organization of the United Nations (UN) and include representatives from each country sending and receiving brigades. This would be a daunting undertaking, but if done right could ensure safeguards against harm to patients all over the world. If enough representation from around the world were to exist in this governing body, it would be possible to tailor brigades to the needs of particular locations while also establishing international standards for care. This program might be piloted by beginning with small target populations and figuring out ways to communicate among specialists from wealthy countries, local health clinics, and patients.

Many challenges would arise with the implementation of this model, including issues of politics and authority. In practice, a UN body would likely not have the authoritative power to supersede the regulations of a sovereign nation. Thus, great diplomatic care would have to be taken in bringing many nations together to develop these rules. To protect sovereignty, the regulations would also need to be enforced on a national level rather than a global one, so a spirit of responsibility for a nation's own healthcare is absolutely necessary. The proposed body, then, would serve not as a political unit but as a hub to facilitate improved standards of care for brigades. Countries have the power to regulate brigades as they choose, but could be encouraged to allow only those brigades approved by international brigade standards to operate. If it is found that UN-approved brigades have better outcomes data and contribute to improving a nation's healthcare, more and more nations will seek to regulate brigades by these standards.

Another challenge to this model is that an electronic medical record, although safe and confidential for patients through encryption, requires accurate patient identifiers and some kind

of internet access.[33] On a typical brigade, there can be many people in the same village with the same name, and people who facilitate the intake of patients do not always spell names correctly. A more accurate identifier than a patient's name must then be used to connect records to one patient over time. Perhaps a government identification number could be used, although this raises its own concerns. Until it becomes the norm for brigades to utilize government identification numbers, patients may be suspicious of its intended use or come to the brigade without having written down or memorized the number. Perhaps worse, they may perceive that lack of a valid identification number will exclude them from treatment. This underscores the necessity for brigade groups to develop relationships with the communities they visit and collaborate on solving problems like this. It is also an unfortunate reality that most of the remote areas to which brigades reach out do not have an internet connection. One possible solution is for volunteers to carefully document patient information on paper while at the brigade site and then enter data into the shared system when they reach a location with internet access. Working in the reverse direction, volunteers might be able to download a file for the certain village they are visiting so that they can use it without internet for reference, and edit and upload it again later. Collecting data on the activity of brigades is crucial for both research and governing purposes as well as high quality patient care. With the implementation of a UN brigade organization to help facilitate this data collection, short-term missions might take steps in the right direction toward being ethical and effective resources for patients.

Brigades should also attempt to address those chronic diseases which burden many patients in developing countries. A usual brigade offers only medicines that are good for a single use or that treat communicable diseases, such as antibiotics, pain relievers, and parasite medication, rather than treatments for chronic illness. Working with existing healthcare systems,

brigade physicians could refer patients to treatment with local doctors and help raise money to defray their costs. Depending on the government and the patient, there might even be free or affordable care available for the particular disease that the patient is suffering from. Let us take HIV as an example of how a system like this might work.

Like many other diseases, HIV disproportionately affects those in poverty. The highest prevalence by far of HIV in the world is 4.2% in Africa, compared to a global rate of 0.8%;[7] it is no coincidence that Africa also has the largest share of people living in extreme poverty in the world.[34] This presents not only a healthcare injustice, but also a huge opportunity for change. Latin America and the Caribbean are also locations ripe for improvement in access to care for HIV/AIDS patients, as they have large disparities among care in marginalized populations such as transgender women, intravenous drug users, prisoners, and indigenous people, but the highest anti-retroviral treatment coverage of any low-and middle-income region in the world.[35] This suggests that if brigades were able to rapidly diagnose HIV/AIDS patients, there would already be resources in place for these patients to access. In order to add HIV/AIDS testing to a brigade, those volunteers would have to make connections to the local healthcare system and find out which centers have antiretroviral medicine. Then, the brigade would work out with community leaders in the target village how to ensure any HIV-positive patient can visit this health center regularly for care; perhaps one person in the village has a truck that could be loaned out. When the brigade begins, volunteers would test every patient of reproductive age with one rapid test. If the test reads positive, it is standard procedure to double check with another test. Promisingly, a study done in Bangladesh indicated that combining three rapid tests may be able to quickly, accurately, and cost-effectively diagnose patients with HIV/AIDS in the field.[36] If the patient is HIV-positive after three rapid tests, the brigade would then have

the resources to connect that patient to care at the originally researched facilities. If the brigade were in Latin America or the Caribbean, as long as there were a way for the patient to reach the facilities, they would probably receive treatment for free. If the universal regulating body described earlier were in place, the volunteers could then input the patient's information into a record and any volunteers coming to visit the village on short-term missions in the future could follow up with this patient, assess their ability to access care in country, and work together to make any necessary changes to the way they access medicines.

Another issue that brigades should make a point of addressing is mental health. Although the most pressing issues for healthcare access include communicable, preventable illness, mental health should not be overlooked – and largely, it has been. A significant factor in a person's well-being is their mental health.[37] There is very little data on mental health in developing countries, but one study found that patients seen at medical brigades in Honduras had higher scores on the PHQ-9, a measure of depression severity, than a U.S. comparison group.[38] Another study found that, even when controlling for other variables, there is a direct link between poverty and mental illness in low- and middle-income countries.[39] This is unsurprising, since stress is the environmental factor that is most influential in predisposing individuals to developing depression,[37] and chronic poverty and disease represent a very high stress situation for patients at brigades. Mental and emotional health in areas where brigades are done is an issue that is begging to be explored, and that has potential to improve many lives. I suggest adding mental health surveys to brigades in order to target communities in need of connection to mental health services. The PHQ-9 used in the study in rural Honduras was found to be very effective in identifying individuals with depression[38] and could easily be injected into the flow of a brigade. Nurses or mental health professionals could easily survey patients after their vitals are taken and

before they have a physician consultation, which is where the line tends to back up. Any patients that are diagnosed with a mood disorder could then have a consultation with a counselor that the brigade could bring along, or that might be found in a nearby health center, about ways to cope. It would likely not be responsible for brigades to prescribe psychoactive drugs to patients because they often precipitate withdrawal[37] and might cause the patient harm if they are only given a few months' supply. It is also recommended that medication for mental illness be combined with therapy and continuous support from a regular health professional,[37] which is clearly not something a brigade could provide. However, if patients with mental health concerns could be connected to local care, that would be an excellent way for brigades to facilitate mental healthcare. In addition, if there was found to be high rates of mental illness in a particular locale, brigades might note that and be able to work with community leaders to figure out what some of the root causes might be, and station a community health worker there with a focus on mental health to teach the community members effective coping strategies. Although mental health services are only beginning to be developed in low- and middle-income countries,[39] the population that attends brigades might be some of the people most vulnerable to mental illness or mood disorders and in most need of support, and so should not be overlooked.

It should, however, be noted that great care should be taken when addressing the mental health of an unfamiliar population. Vast cultural differences may exist between providers and the people they treat. Behavior may be misinterpreted based on cultural or language barriers, so it is important that standard, unbiased measures are used for assessing mental health. Another possible solution is to involve local officials in a conversation about mental health in their community, being sure to gain their insight before implementing any mental health interventions. As in all other aspects of a brigade, great care should be taken not to harm or insult the

community as the result of a misguided effort. However, if done appropriately, brigades might find that mental health support could fill a previously unaddressed gap in care.

Along with becoming regulated, conducting more research, and addressing chronic disease and mental health, brigades can make many small changes to create a better patient experience. Volunteers should be conscious of not burdening the host organization and only attend if they can truly be helpful. Otherwise, they might consider donating their costs of travel to community development projects that address root issues such as poverty, education, and clean water. Brigades should also maintain contact with the communities they visit, listen to what their needs are, and support them in addressing those needs as much as possible. In addition, volunteers should work very hard to obtain private spaces for their patients, assure that their patients understand everything and can give informed consent, and, however uncomfortable, screen for income to ensure that only the patients in most desperate need are prioritized. Volunteers might also do well to not only limit their activities to isolated brigades but to become more involved in supporting global health projects that can make lasting impact, like helping to lobby the Guatemalan government for a new health center in an area regularly served by brigades. Volunteers should always keep in mind that the endgame is not to complete more brigades, but to make the existing health system strong enough to render brigades obsolete.

VI. Conclusion

Medical brigades are not the perfect solution to lack of primary care access in rural areas of developing countries, but they do help to fill a gap in care that might otherwise go completely unaddressed. This method of care has major shortcomings in terms of effectiveness since it fails to meet many of the expectations of rural patients for primary care and cannot even be accurately

evaluated because of such a great lack of research and regulation. Ethically, brigades also fall short of the ideal medical experience as they might cause more harm than benefit to patients, do not always address issues of medical justice appropriately, and can encroach upon the autonomy of patients and their home countries. However, brigades represent outreach to people in need by people who care, and that is a strength that can be leveraged as long as volunteers are aware of the potential pitfalls and we, as a society, work to make improvements to the system. Major improvements recommended to uphold standards of effectiveness and ethics include the development of an organization that supervises all brigades and encourages ethical behavior and research, and the addition of services and connection to care for chronic disease and mental health. If volunteers, in country hosts, community leaders, and patients all collaborate, brigades could transform from a Band-Aid over a gaping wound to a helpful intermediate in connecting rural patients to care.

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