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India; Factor 12: Malaria

Fired Up From the Fever

“It is they who must drain the standing water, swat the mosquitoes, wear the repellent, sleep under the bed nets, go to the clinics, and take the drugs.”

-Sonia Shah

For over 500,000 years, malaria has taken the lives of many indigenous animals that roam the Earth. It lingers patiently inside the mosquito's gut, waiting to leave and flourish inside its host. This tiny, unconquerable *Anopholes* mosquito buzzes aimlessly around for food to nourish her babies until its target is in sight: the human. In many areas of India, malaria sweeps the slums and villages alike. As poverty increases, health decreases. The endless cycle of poverty results in the inevitable decline in food productivity due to the lack of energy required to adequately work in the fields and, consequently, the decline in the basic standard of living.

Rampachodavaram, a densely forested area, exemplifies the typical rural community, endemic with *Falciparum* malaria. Surrounded by forest, the villages represent the starting point where preventative measures for malaria must be targeted. Despite the preventative programs in place, what are the major problems? How does one avoid these problems? What are the next steps towards successful and effective malaria education program implementation? Most importantly, what can we learn from a global standpoint?

A country of approximately 1.2 billion people, India continuously suffers with poverty, malnutrition, and economic hardships that create families with 4 to 9 empty mouths to feed. Even though around two-thirds of the country is in the agriculture industry, farmers struggle to provide properly for their families. Depending on the state, India's farms differ in products; specifically in the East Godavari region the farms are predominately rice paddies. The poor housing, diet, and education standards equally contribute to this chronic cycle of low food productivity and ultimately to increased transmission of disease, such as malaria.

Typically, the annual income in India is \$616, the 99th standing of 131 countries [2]. Poverty hinders families who need health care, nutrition, and education. Although money is a major barrier in promoting a better standard of living, the problem is further limited by the combination of communication, infrastructure, and culture. These complications interfere with the ability of the people in India to thrive, but enhance the ability of the mosquitoes to thrive.

Hidden up the mountains, tribal families live infected with malaria. No one pays attention to these people who barely survive each passing day. As of now, their ability to farm in the forest areas is not sufficient for themselves to receive the proper nutrition and health required to increase their food productivity. The tribal farmers struggle to cultivate food for their malnourished families and friends. Instead of immersion within a competitive market of sales and business, the farmers help one another with their land. The opportunity to make a profit ceases to exist for these people. If the tribals were supplied with advanced tools and technology, food productivity and competition would increase, lessening the magnitude of the chronic cycle of poverty [3].

Health must be controlled and maintained in order to effectively maintain proper work ethics in the fields throughout the day. *Falciparum* malaria is the most common strain found in India, making up 60 to 80% of malaria cases [4]. Malaria is not the number one killer in India, but there are still pockets of endemic

tribal belts throughout the country. After our team conducted an observational study in one such endemic area (Rampachodavaram, East Godavari District, Andhra Pradesh, India), four major problems surfaced.

First, there are communication gaps between the government and its people. These areas go unnoticed because of the lack of attention from both the public and private health sectors. The statistical evidence does not correlate to the ground reality of the number of deaths, i.e. the people affected by malaria in the endemic area regularly travel to urban areas in search for a treatment and usually die there. The malaria program does not claim these deaths as rural, endemic area deaths, resulting in a false representation. “Most malaria deaths occur well outside the official medical system...Even under the watchful eyes of some of the most highly trained malariologists in the world, malaria rides under the radar” (132) [5]. Furthermore, misconceptions spread throughout the huts of the villages. Our malaria team interviewed a lady who held up an unopened bed net. Because she mistrusted the government organizations, she believed the chemicals in the net would harm her and her family. As the team toured the government offices and hospitals, we learned about the programs specifically designed to prevent malaria in rural areas. The necessary tools and procedures have been created, but the critical implementation process has been ignored [6]. “Considering the picture of grim facts there is a dire need of new practices and procedures to ensure that quality and timely healthcare reaches the deprived corners of the Indian villages. Though a lot of policies and programs are being run by the Government, the success and effectiveness of these programs is questionable due to gaps in the implementation” [7]. Thankfully, there are private sector and non-governmental organizations (NGO) to help supply the villages with bed nets and antimalarial pills. Ramkrishna Mission, an NGO, delivers food and healthcare services via van once a week to different villages. These services are crucial; however, if the government were to step in, preventative measures could then be executed effectively and efficiently. The communication gap serves as a broken bridge, a bridge in dire need of restoration [6].

Our driver maneuvered his way around the massive potholes while honking at a nearby farmer to shoo his goats out of the way; the passengers merely trust the driver and hang onto the seats as the car shakes back and forth. The dirt roads, potholes, and unevenly paved mud epitomize India’s primitive infrastructure. Green mountains and trees along with the dirt roads lined with potholes encompass the villages, providing the perfect breeding ground for mosquito larvae. If such dirt roads were to be erased of potholes, then the number of mosquitoes would decrease. However, this would not fix the problem entirely. Mosquito larvae are able to flourish with the smallest amount of stagnant water; something as simple as coconuts shells or cow imprints can serve as a breeding ground. Deep within the forest areas, the malaria team observed such breeding grounds inside the cracks of boulders and in uninhabited regions. Nevertheless, repairing each road and filling each hole is a tedious job that the government tends to ignore [6].

Those living and sleeping in the open forest with little clothing are the ideal feeding grounds for a mosquito. With this lifestyle, the natives disregard the potential dangers of malaria and the precautions, increasing malaria transmission. Malaria resistant drugs are available in village areas, but most tribals find that buying those pills is an arduous struggle. Already mired in poverty, rurals face a choice between food and medicine. In addition, because there are no proper instructions on administering the pills, they abuse the medicines, which increases drug resistance. Yet, as malariologists ponder how to eradicate this horrendous disease, the rural people seem not to understand the importance given to this disease, since they consider malaria as normal as the common cold from their perspective. Because a life with malaria is part of the norm and is “just a fever” in their culture, the villagers face various disadvantages [6].

Though addressing these weaknesses is vital, a greater underlying problem is the lack of awareness. Education is power. Without it curiosity, problem solving, and critical thinking are left behind. India’s rural youth is at a colossal disadvantage. The children walk several miles from other villages to schools that have a 100:1 student-teacher ratio. Although rural families would rather have their children help in the fields, they are persuaded by the free midday meal program. Unfortunately, the meals lack proper nourishment, as the team has observed while visiting a local government school. If the village farmers

could understand the seriousness of the outbreak of malaria, effective preventative measures could be implemented. Whether it is taking the pills, using the bed nets, or finding a treatment, the solutions will be found within the upcoming generation. By adopting these practices and teaching them to their children, the traditional attitudes will be broken. Reaching out to the younger generation can ignite a change in awareness and a hope for sustainability [6].

My malaria team accentuated our focus on the education problem after the first observational study. Prior to our return, we developed a workshop and presented it to 100 students attending a government school. During the summer of 2013, we ventured back to Rampachodavaram in hopes of instilling interest and inspiration within the tribal children, using a grassroots interactive educational program. As we entered the local government school, noting the poor conditions, the other team members and I observed the typical learning environment for village children. The goal was simple: to create an interactive workshop to spark an interest and involve the students to want to make a difference in their own communities. We gave a PowerPoint presentation followed by a review video, which was dubbed in their native language, and finished with an interactive activity of making homemade mosquito traps with local materials. At the end of the workshop, multiple students approached us with positive comments. “No organization has done this kind of activity with us before,” one student said, “I would love for you to come back.”

After listening to students tell us about their educational experiences, the malaria team concluded that preventative measures are at a standstill. During the summer of 2012, we researched and observed that preventative programs have not been effective in curbing the incidence of malaria. But change is possible. Our immersion program is as important as distributing medications and bed nets to the villages to establish a stable environment. The Bill Gates Foundation, which has been deeply involved with malaria research and eradication, exemplifies the need for rigorous programs if the disease is to be eradicated. India was “...long considered the most difficult place to end polio due to its population density, high rates of migration, poor sanitation, high birth rates, and low rates of routine immunization. Over several years of effort, a number of factors contributed to India’s success in eliminating polio, including highly targeted, data-driven planning; well-trained and motivated staff; rigorous monitoring; effective communications; mobilization of trusted community and religious leaders; political will at all levels; and adequate funding.” [10] With the proper amount of attention, polio eradication was possible. This success shows that education and communication are vital components of progress. Many NGOs and organizations exist to educate, train, and understand the farmers fighting malaria. Unfortunately, the corrupted bureaucracy already integrated into India’s culture makes the implementation of humanitarian projects nearly useless. Only organizations willing to work patiently side by side with this government and this bureaucratic system will see their ideas and mission statements flourish.

The team also conducted a workshop with 100 Auxiliary Medical Nurses (AMN) Addadhigala, a more interior village. These people work first-hand with malaria by monitoring rural households for health screenings. Ironically, the most missed question on the pre-test we structured was “What is malaria?” Confirming this statistic, the nurses told us that they have not had proper training in years. The inadequate reinforcement of malaria education and overall motivation is lacking within this group [9].

Without the private sector, these rural villages exist at the brink of survival. The communication gaps serve as a barrier between the private and public health sectors. In reality, the bureaucracy of the local Indian Tribal Development Association (ITDA) offices is extremely disconnected from each other within and outside of the organization. The motivation and efficiency to make a difference is not present. To combat this corruption, there are individuals like Dr. Reddy, who works alone to operate a 24/7 private hospital in Rayavarum, where people from the surrounding villages wait for days to be treated. This man is willing to help anyone in need of medical attention, from performing appendectomies to delivering babies. For Dr. Reddy, money is not the incentive. If people can afford the procedure, they will pay; if they cannot, they will not be asked to pay. Moreover, with an increase in collaboration and corporation between public and private sectors, doctors like Dr. Reddy will be able to have a safer and more

successful approach. NGO's and the government can partner and share information towards a common goal of integrating preventative measures and making immense changes [3].

Aside from malaria, India endures an overwhelming number of problems. Population growth, water sanitation, infrastructure, accessibility, and power outages all contribute to the mass healthcare issue in India. While organizing the workshops in Rampachodavaram and Addadhigala, we faced many obstacles such as power outages. Power outages occur routinely in India in order to conserve energy. Unfortunately, the day of the workshops was inconveniently the time of a power outage [3]. Not only the access to medical assistance, but also the technology needed to successfully administer such programs requires the proper equipment. Additionally, water sanitation parallels disease transmission; unfortunately, 69% of India's population does not use clean water sources. [12]. Furthermore, the already dense population continues to increase. Because of this increase, changing the values and practices will be even harder to sustain and embed in future generations. Above all, educating the affected population will enable them to help themselves rather than to perpetuate the welfare system, leading these issues in a positive direction.

Malaria can be eradicated in the endemic tribal belt regions in India by making necessary changes. Understanding the underrepresented tribals from a local, interactive perspective is vital. Immersion and proactive educational techniques must be instituted. Passing out bed nets and medication will continue, but will not suffice any longer. A harmonious partnership between private and public sectors must be developed. By having NGO's and governmental organizations working together, the major issues—infrastructure, culture, communication, and education—concerning malaria transmission can be resolved. Only with these steps can the hope for a better life for the endemic tribal belt regions, free from this devastating disease be realized.

Works Cited

1. "Agriculture in India." *Agriculture in India*. Maps of India, n.d. Web. 3 Mar. 2014.
2. Reporter, BS. "India's Median per Capita Income Lowest among BRICS: Gallup." *Business Standard: News & Analysis on Economy, Business and Market*. Business Standard, 16 Dec. 2013. Web. 3 Mar. 2014.
3. Karuparthi, Rekha V. "Fired Up From the Fever." *Fired Up From the Fever*. Wordpress, 30 June 2013. Web. 3 Mar. 2014.
4. "India." *WHO*. World Health Organization, n.d. Web. 3 Mar. 2014.
5. Shah, Sonia. *The Fever: How Malaria Has Ruled Humankind for 500,000 Years*. New York: Sarah Crichton /Farrar, Straus, and Giroux, 2010. Print.
6. <http://www.malariajournal.com/content/pdf/1475-2875-11-S1-P54.pdf>: Malaria Journal; October 2012
7. "Rural Health Care: Towards a Healthy Rural India." *Rural Health Care: Towards a Healthy Rural India*. Gramvaani, 3 July 2013. Web. 3 Mar. 2014.
8. Kaur, Ramandeep. "India Needs Education, Especially Rural Education." *India Needs Education Especially Rural Education*. Maps of India, 15 Mar. 2013. Web. 3 Mar. 2014.

9. Abstract Poster: Joint International Tropical Medicine Meeting

10. "Bill & Melinda Gates Foundation." *Polio*. N.p., n.d. Web. 3 Mar. 2014.

11. "Water, Environment and Sanitation." *UNICEF India*. UNICEF, n.d. Web. 3 Mar. 2014.

Pictures



Farmers working in a rice paddy.

Lady sorting out the rice to cook for the school children. She told us that this rice is very hard to cook and eat.



Children lining up to get a serving of food.



Students making the homemade mosquito trap.

First workshop with high school students in Ramapchodavaram.



Second workshop in Addadigala with the nurses.



Stagnant water deep inside the village area where *Anopheles* mosquitoes breed.



Surveying the tribals





Malaria Team

Nursing students that helped us
with the 2014 Agriculture-
Malaria survey

