

Public Health Interventions in the Developing World: An Opportunity for Social Enterprise
Involvement

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A thesis submitted for approval by the University Honors Program at Santa Clara University for
the 2012-2013 academic year.

June 4, 2013

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ABSTRACT

Malaria, tuberculosis, and HIV/AIDS have plagued people in the developing world for decades. But with growing economies, the developing world is now facing a double burden of disease: as infectious diseases continue to plague these populations and non-communicable disease rates have risen as well, only worsening the current state of public health. This double burden has challenged government institutional responses that were originally designed to approach public health from an individual disease basis, and must now address both infectious and non-communicable diseases within the same populations. This paper examines the Indian government's response to malaria and cardiovascular disease, disease selected as indicators of the general response to infectious and non-communicable diseases, respectively.

The results of this evaluation reveal a broad response on the part of the government, one that leverages existing health institutions and a massive workforce. However, there is scant prospect of innovation within this government response, mostly due to funding restrictions and pressure to deliver successful results. This paper then posits social entrepreneurship as a counterpoint to government in the response to the double burden of disease. Social entrepreneurship as a field is capable of great flexibility in its response to health issues and serves as a source of potential innovation given the small size of most social enterprises. Social enterprises also place a great focus on collecting impact statistics that inform the public of the success of the intervention in a way currently unavailable from most government interventions. Ultimately, neither response alone will be sufficient to adequately respond to the growing double burden of disease in India; it will only be through government leadership and institutions, with supplemental innovation and care being provided by social enterprise, that this issue may be holistically addressed.

Disease in the Developing World

With the signing of the World Health Organization's Millennium Development Goals (MDGs) in September of 2000, eight prevailing issues in the realm of global development were targeted as areas of improvement. HIV/AIDS and malaria are identified as infectious diseases to be eradicated under the MDGs, but one prominent health issue is conspicuously missing from the WHO's list: the threat to global health posed by non-communicable diseases (1). The list of non-communicable diseases includes cardiovascular disease, cancer, and diabetes. As the issue of disease double burden was coming to the forefront of the health field, a new type of social response was born in the business field: social entrepreneurship.

Based on prior research experience, public health and government leaders are relying more and more to this burgeoning field to support government efforts (16). In the case studied in this report, the social enterprise EHealthpoint serves as the sole health care provider for some community residents, while providing services that supplement government health services to others (16). This paper makes the argument that while social enterprise should play a role in the fight against the double burden of disease, social enterprise alone cannot be the sole health and wellness provider for its population. In fact, social enterprise is most effective when it plays a *supplementary* role to broader government programs. In other words, social entrepreneurship could play a helpful role with its innovative and business-based tools, so long as the global community does not expect this public health approach to replace government-funded health institutions. This paper seeks to evaluate the strengths and weaknesses of two distinct disease prevention programs issued by the Indian government (the National Institute of Malaria Research and the National Program for Prevention and Control of Cancer, Diabetes, Cardiovascular

Diseases, and Stroke), in an effort understand what gaps remain in the distribution of health care. The paper also evaluates social entrepreneurship as a potential method to supplement the government's efforts to administer and distribute health care.

PART 1

The Double Burden Disease in Developing Countries

Under traditional theories of demography and epidemiology, researchers have attributed the demographic transition (a society's transformation from a young population faced primarily with infectious diseases to an aged population wherein non-communicable diseases [NCD] take center stage) solely to the age of the population. Yet demographers are now pointing out "that particularly in low-income countries, economic growth, market integration, foreign direct investment, and urbanization together correlated threefold greater to epidemiological transition than did population aging" (2). And such is the case in India today: with a population expected to reach 1.5 billion by 2040, an economy that has grown by 5-6% over past years, and the country's latest National Manufacturing Policy (which will lead to the creation of 100 million jobs in the manufacturing sector), India's economy has exploded in the last decade (3).

While HIV/AIDS, tuberculosis, and malaria have yet to be eradicated in India, the country has also seen a surge in the incidence of NCD rates in the country. The World Health Organization has since coined the term of a "double burden of disease," an issue defined by "the emerging epidemic of chronic NCDs, in addition to the 'unfinished agenda of infectious disease' and problems of maternal and child health" (2). According to the World Health Organization, NCDs "now account for 59% of the 56.5 million deaths which occur globally every year and almost half (45.9%) of the global burden of disease" (4). Coupled with the lack of financial and

manpower resources available to treat current infectious disease issues, it can come as no surprise that the disease burden is growing, particularly for low- and middle- income countries.

This new type of disease poses a different set of challenges to treatment, prevention, and education than those seen with infectious diseases. New initiatives, researchers, and politicians often feel pressure to focus on one particular health problem in an effort to generate successful results and “fulfill result contracts” (2). Furthermore, during this time of global financial crises and unpredictable health budgets, the administration of health care has morphed from an industry committed to doing good for all people, to “a fight to control either [the NCD or infectious] health problem,” (2). The current government health care structure has been constructed to address individual diseases, one at a time. But the parallel rise of NCD and infectious diseases requires an integrated approach to treatment, an approach governments are unable to meet as they stand today due to the narrow focus and limited funding of these programs.

This paper focuses on government responses to malaria and cardiovascular diseases in an effort to illustrate the challenges the government faces with the growing double burden of disease in India.

Understanding Malaria and Cardiovascular Disease

Malaria poses one of the greatest infectious disease threats in the world (5). Spread through bites from infected mosquitoes, multiple factors contribute to the transmission of malaria: the virulence of the parasite, the vector itself (*Anopheles* mosquitoes), the susceptibility of the human host, and environmental factors including climate and breeding locations (5). To restrict the spread of the disease, it is important to consider all of these factors. For example, transmission rates are highest where mosquito lifespan is highest (thus giving the parasite more opportunity to develop completely inside the mosquito). Africa is home to the mosquito with the

longest lifespan and strongest human-biting habit, which explains why more than 90% of the world's malaria deaths occur in Africa. Some *Anopheles* mosquitoes “prefer shallow collections of fresh water, such as puddles, rice fields, and hoof prints,” while other prefer deeper, larger bodies of water in which to breed (5). Lastly, rainfall patterns, temperature, and humidity all affect breeding of the host. Much of India offers favorable conditions for mosquito breeding, with peak transmission of malaria occurring during and after the rainy season.

Most malaria patients present with symptoms ranging from fever and sweats to nausea and vomiting. Persistent cases may result in an enlargement of the spleen and liver with mild jaundice. Part of the difficulty in treating malaria in the developing world is diagnosing the disease, which requires the identification of parasites in the blood. This is typically done using a microscope in a laboratory (conditions that can be difficult to find in developing countries) but can also be done using a rapid diagnostic test (6). Severe malaria, if left untreated, ultimately causes kidney failure, heart attack, and acute respiratory distress that can kill the patient (6). Given these severe symptoms of the disease and that the disease does not display symptoms until up to 7 days after the bite, it is critical that action is taken to reduce transmission in the first place, making preventive measures paramount to any anti-malaria program (5).

Based on research conducted through EHealthpoint (a social enterprise committed to distributing clean water and affordable health care to rural villagers in Punjab, India), the most effective prevention programs are implemented at the community level (16). The distribution of insecticide-treated mosquito nets (ITNs) is considered a basic preventive measure for all at-risk persons (young children, adults over 60 years of age, those with suppressed immune systems, etc.) (5). In most cases, it has been found that “the most cost effective way to achieve this is through provision of free [nets], so that everyone sleeps under a [net] every night” (5). Another

community intervention that has proven effective is spraying indoor areas with residual insecticides (such as DDT). However, as a community program, this intervention is not considered fully effective unless 80% of houses in a targeted area are sprayed (5). One difficulty in the administration of the intervention is the necessity to re-spray every 3-6 months, but new, longer-lasting insecticides are currently being studied. Lastly, most travellers visiting high transmission areas take antimalarial medicines to prevent malaria, a practice that is also recommended for pregnant women and infants living in high-transmission areas (5)

The study of cardiovascular disease, a slowly-developing non-communicable disease with multiple causes, differs drastically from that of malaria, an acute infectious disease. Cardiovascular disease encompasses a group of disorders linked to the heart, including any diseases of the blood vessels in the body, rheumatic heart disease, congenital heart disease, deep vein thrombosis, and pulmonary embolism. These diseases are most commonly manifested as heart attacks or strokes, caused by fatty deposits on the inner wall of blood vessels that prevent blood from flowing to the heart or brain (7). Both heart attack and stroke require immediate medical attention and treatment, services provided by larger institutions (hospitals) typically not found in rural areas, especially in the developing world.

Another way in which CVD differs from malaria is in the multiple cost-effective interventions available for the prevention of CVD, in comparison to the relatively few interventions available to prevent malaria transmission. By “engaging in regular physical activity, avoiding tobacco use and secondhand tobacco smoke,... maintaining a healthy body weight, and avoiding the harmful use of alcohol,” patients may significantly reduce the risk of CVD (7). Community-based interventions have been proposed by the World Health Organization to address these risk factors in developing-world communities include: identifying

those at high risk during primary care visits using risk prediction metrics, and applying population-wide interventions such as tobacco control policies, taxation of high fat, salt, and sugar foods, providing children with healthy (and free) meals at school, and constructing exercise-friendly neighborhoods (7). These interventions are ideal because they are relatively inexpensive to apply, and can be administered without the presence of a licensed health professional, meaning that community workers and leaders are able to take the helm in the implementation and enforcement of these policies (although these programs should be implemented with caution as the community may interpret this health leadership as infringement of freedom).

The challenge faced by most low-income countries is in the general adoption of these practices. Given the behavioral changes targeted by these interventions, public health officials and community health workers must introduce these programs using wellness-based messaging to promote health-seeking behavior in populations. The following section examines government-initiated public health interventions to analyze the strengths and weaknesses of each program. In addition to demonstrating each program's impact, this analysis can inform future public health ventures in these areas.

PART 2

Government Response to Malaria: National Institute of Malaria Research

Established in 1977, the National Institute of Malaria Research is one of the institutes of the Indian Council of Medical Research, a government organization operating under India's Department of Health Research. By using "basic, applied and operational field research," NIMR aims to find short- and long-term solutions to malaria in India, while also developing social capital and manpower resources through trainings and workshops (8). The vast majority of the

research performed by NIMR focuses on the biological aspects of the disease, including research on insecticide resistance and variations between species, but it also includes research in the implementation of insecticide-impregnated bed nets and different anti-malarial drugs. The research takes place in ten field laboratories around the country; this paper will focus on some of the efforts occurring at the lab in Bangalore.

The city of Bangalore is located in the state of Karnataka in the south of India and houses about 8.5 million (9) of India's 1.2 billion residents (17). As the most populous city in a state that contributes 7-10% of the total malaria cases in the country, it seemed logical to place a research site in the city to capture data on the spread and treatment of malaria (10). The field station is currently housed in the campus of the Epidemic Disease Hospital of Bangalore and is staffed by 15 staff member with five scientists. It is unclear if the Epidemic Disease Hospital is publicly or privately owned. In general, the main objective of this field site was to ensure all information collected on the bioenvironmental control of malaria would be transferred to the state health department, in the hopes that the state department would eventually take over the management and administration of malaria care and prevention.

This section of the paper aims to describe an effort NIMR is taking to meet each one of the addressed goals, with the following section offering an analysis of these efforts. NIMR's research focuses on the following problems:

- Identification of bio-environmental intervention strategies to prevent transmission of the disease
- Preparation of an action plan to be implemented in problem situations (response is almost always spray the buildings and implement larvivorous fish)
- Identification of potential collaborating agencies

- Organization of workshops/training courses in various aspects of malaria control to update knowledge and proper implementation of control strategy (very vague)

One project that was examined tested two methods for vector control. Two Primary Health Centers (PHCs) in Banavara (108 villages, population: 55, 619) and Kanakatte (52 villages, population: 28,645), both located in the Hassan district of Karnataka, showed high incidences of malaria. As such, these two PHCs were involved in an experiment testing the use of impregnated bed nets and larvivorous fish as preventive measures. In PHC Banavara, only larvivorous fishes were used in the tanks and wells where the mosquitoes had been breeding as a preventive measure. In PHC Kanakatte, however, villages were split into three groups, with one receiving only larvivorous fishes, one receiving impregnated bed nets, and one receiving both interventions. This experiment identified the combination method of prevention (both fishes and bed nets) as the most effective way to prevent future malaria outbreaks, based on the results shown in the table below.

Table 1: Annual Parasite Incidence (API) changes over time in reference to larvivorous fishes and impregnated bed net interventions in Banavara and Kanakatte

	PHC Banavara (fish)	PHC Kanakatte (fish)	PHC Kanakatte (bed nets)	PHC Kanakatte (fish and bed nets)
API pre-intervention	154	86	77.63	187.17
API post-intervention (4 years later)	7.3	0.2	0.2	0.2

(Note: API = (confirmed cases during 1 year/population under surveillance) x 1000.)

Unfortunately, while the drastic declines in API for all research sites but particularly for the combination method, seem to indicate that these interventions reduced malaria cases in

Bangalore, the study fails to provide critical details that would be necessary for scale-up of these programs. There is no mention of how the larvivorous fish were obtained or deployed, how bed nets were distributed, or whether community members were asked to pay for bed nets. Very little procedural information is provided in this portion of the study write-up, making this seemingly successful intervention very difficult to replicate in another malaria-endemic area.

Furthermore, there was no discussion in this study of any marketing done to promote the interventions themselves. These observations may only apply to the write-up of the project (meaning that there may have been sufficient answers to the questions posed above along with community marketing tactics and these were simply not included in the written report) however these steps are crucial to the adoption of such public health strategies and must be documented in order to make future projects as successful as possible.

Although no explicit action plan was mentioned in the list of studies provided, in examining other projects it is evident that the most common NIMR response to “problem situations” (malaria outbreaks) is the immediate spraying of insecticides in as many buildings, particularly residential homes, as possible, and the introduction of larvivorous fishes.

As for involving other agencies in collaborative projects, the Bangalore site made a conscious effort to involve the Panchayati Raj Institution (PRI) “monitoring... the survival of [larvivorous] fish with the help of local PHC Medical Officers” (NIMR Bangladesh). These PRIs are “tiers of self governance” that operate “below the level of states in the federal set up” and that serve to decentralize development by involving local peoples in the planning, decision-making, implementation, and delivery of various interventions (Planning Com). The Zilla Panchayat, the local assembly within the Tiptur Taluka region of Bangalore, was targeted by NIMR as an organization with which to form a relationship. The report also explicitly states that

this sort of relationship, wherein a local government entity slowly takes over control of a malaria control initiative would serve as model for other areas in similar circumstances (10).

This concept of developing an intervention, proving its success, and then turning it over to a local government entity to carry on is perhaps one of the most cost-effective methods employed by the NIMR program. The NIMR program in Bangalore has both the manpower and expertise to create and test these sorts of experimental programs. Once their success has been proven, it serves both the NIMR and the community itself to turn the leadership of the program over to the local governing authority, as this group generally knows the needs of the community the best and can further refine the program to increase adoption and success.

Lastly, the Bangalore report stated a goal of holding regular workshops/training meetings during which community health workers (and community members) may be informed of the most recent malaria research as well as being updated on the newest malaria preventive measures (10). In theory, this is an excellent idea. One of the keys to success for public health interventions such as these is consistent education of community health workers, in addition to giving these messengers effective marketing techniques with which to deliver these messages. Yet the written report available online offers no specifics as to how or when these workshops were held. No staffing specifics are identified nor the location where these meetings should take place. Thus, although this NIMR initiative appeared to be effective, the resulting report lacks critical information that would be necessary to the scale-up of the program.

Cardiovascular Disease in India: National Program for Prevention of Control of Cancer, Diabetes,

Cardiovascular Disease, and Stroke

Given CVD's differences to malaria, as a non-communicable, chronic disease, public health interventions regarding the prevention, detection, and treatment of the disease warrant

different emphases. Under the National Program for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases, and Stroke, the government of India aims for the “optimization of scarce resources and provision of seamless services to the end customer/patients... [while] also ensuring long term sustainability of interventions” (11, 3). NPCDCS was implemented at the district level, sharing administrative duties and funds with the National Rural Health Mission (NRHM), which was created in 2005 with the objective of expanding healthcare access to rural populations. This crucial strategic decision allowed NPCDCS initiatives to take advantage of current NRHM connections and infrastructure, while also conducting research to improve the methods by which these health initiatives would be presented and employed. The burden of providing care is further distributed with the NPCDCS’s cost sharing breakdown, wherein the national government funds 80% of the initiative, while states contribute 20%, thus helping to involve states in the process and distribute accountability to ensure the longevity of the program (12). These strategies were implemented in 100 districts across 21 states between 2010 and 2012, with 700 community health centers being created or receiving funding and staffing as a part of this initiative (11, 7).

The range of services offered at any NPCDCS point differs depending on the level of the health care facility, with a list of offerings provided in Appendix A. This paper will focus on the services provided at community health centers, as these reach similar populations focused on by social enterprises:

- Opportunistic screenings
- Prevention and health promotion
- Laboratory investigations
- Diagnosis and management
- Home-based care
- Referral
- Data recording and reporting

In understanding the strengths and weaknesses in the administration of each initiative, both the Indian government and social enterprises can better know when, how, and where to intervene in future situations (11, 21-22).

There is considerable overlap between the goals listed above, as can be seen with the screening and health promotion objectives. Under NPCDCS guidelines, an “opportunistic screening of persons above the age of 30 years shall be carried out at CHC by the appointed doctor under the programme” (11, 20). This screening involves a simple questionnaire regarding the patient’s history of tobacco and alcohol consumption, in addition to blood pressure and blood sugar measurements. Upon performing these tests, those individuals identified as having a high risk of developing CVD are directed to take further action (health promotion). Of course, screening also directly relates to the “laboratory investigations” initiative, which outlines the performance of tests such as those outlined above and in Appendix A. In the event that the CHC laboratory is unable to perform a diagnostic test (due to machinery or staff limitations), the sample is sent to the closest district hospital with the necessary testing capabilities.

The health promotion outlined in the NPCDCS guidelines involves engaging “the patients and their attendants at the time of their visit to [the] health facility” in a conversation about a variety of health topics that may impact the patient’s likelihood of developing CVD (11, 20). Doctors encourage patients to increase their intake of healthy foods and physical activity, avoid tobacco and alcohol, and decrease stress in their lives (11, 20). A counselor is also made available at these sites to counsel on “diet, nutrition and tobacco, alcohol,” and the like (11, 20). However, there is no mention of these messages being addressed to the public as a whole, much less targeting at-risk populations: low-income areas, lower castes, areas of low educational attainment, high crime areas. And while the report mentions some communication approaches

(“camp, interpersonal communication (IPC), posters, banners, etc. to educate people at community/school/workplace settings”), the guidance is quite vague (11, 17).

As outlined in the NPCDCS operational guidelines, each community health center should be staffed by a doctor, a counselor (charged with “provid[ing] counseling on diet and lifestyle management”), two nurses, and a data entry operator (whose role is unclear) (11, 21-22). These personnel play a prominent role in all of the listed CHC objectives, but particularly in the final four listed. The “diagnosis and management” objective involves all the components of the objectives previously listed.

The home-based care aspect of the CHC is unique and worth noting. Nurses play a critical role in the sense that the nurse (most often a woman) “undertake[s] home visits for bedridden cases, supervise[s] the work of health workers and attend[s] monthly clinics being held in the villages on a random basis” (11, 21). At least 4 times a month, a nurse will make community visits to the villages served by the CHC, advising patients on future care plans, updating health workers on new protocol, and referring patients to district hospitals when necessary. What the plans fails to mention, however, is the manner in which nurses receive protocol updates from their superiors, and how these health workers are selected and trained.

The final objective laid out in the guidelines, that of “data recording and reporting,” is a topic often overlooked by health initiatives. Under NPCDCS guidelines, the CHC is in charge of maintaining records on the patient’s “chronic disease card:” a card on which the patient’s diagnosis, treatment and referral records are stored, along with “verbal and pictorial advice for the patient” (11, 21). It sounds as if this card is kept in the possession of the CHC, with copies of these records being sent to the district level NCD site every month. This sort of record keeping

is critical to track both the progress of the diseases being monitored in addition to measuring the success of the preventive programs being implemented.

Overall, one great strength of the NPCDCS program is the meticulous detail with which parts of the plan has been laid out. This makes the program easier to scale and implement in many different environments. But parts of the guidelines at the community health center level are left vague and unclear, as demonstrated in sections regarding health promotion and record keeping. While it may be difficult (and perhaps unrealistic) to lay out universal guidelines for these processes as different methods will be effective with different populations, this fact should at least be acknowledged in the report. Furthermore, the report can attempt to give criteria by which each community should be evaluated when determining the most effective communication strategies and how to best to gather relevant data.

Comparing/Contrasting Government Responses to Malaria and CVD

Having described portions of each government program in detail, it is also important to understand the ways in which these programs are similar and differ. First, both programs provide a written and often (but not always) detailed description of the intervention offered. For the NIMR program, this included individual web pages on each of the research sites in addition to reports detailing different portions of the intervention (i.e. “Estimation of True Malaria Burden in India,” “Health Impact Assessment (HIA) of Development Projects with Reference to Mosquito-borne Diseases,” etc.). In the NPCDCS program, detailed operational guidelines were made available to each field site as well as on online for general citizen viewing. In doing so, the government increases the transparency of these public health operations while also recording these processes for its own records, a critical component of understanding the strengths and weaknesses of these programs for future implementation.

Both programs also make active use of either community health workers or local experts with the cultural knowledge to deliver public health message in sensitive but direct ways. Although the methods of this type of marketing was not always effective in either program (generally pamphlets and billboards are not enough to saturate a community with information), employing the knowledge of local populations is perhaps the best way to ensure community buy-in to interventions. A blanket federal policy is certainly not specific enough to address the variety of challenges faced by different Indian populations, and thus interventions targeted at specific populations (for NIMR and NPCDCS programs, these communities were differentiated by geographic location) are the next best option.

Given that NIMR focuses on an infectious disease and NPCDCS a NCD, it comes as no surprise that the focuses of each intervention differed. Malaria is not difficult to diagnose in the field, making the focus of NIMR less on testing or treatment and more on the prevention of malaria, as seen with the introduction of larvivorous fishes into common mosquito breeding grounds and the distribution of insecticide bed nets. Given that the treatment of malaria takes several days and medication, it is more cost effective to focus on the prevention of the disease. NPCDCS, on the other hand, centered its efforts around the early detection and lifestyle changes associated with treating those already facing complications from CVD. While some prevention programming occurred in schools, it seemed to be implied that the NPCDCS program was counting on a trickle-down effect across generations: as parents and grandparents changed bettered their health and thus reduced the effects of CVD through NPCDCS efforts, children would learn better behaviors and be less likely to need these services in the future. In this sense, the NCD response differed from the infectious disease response in its targeting of those already affected by the disease, instead of the more traditional tactic of making sure healthy individuals

remain disease-free. It could be argued that the NIMR response focused on reducing the *incidence* of disease, while the NPCDCS program turned its attention towards lowering the *prevalence* of the disease. It is still too early to determine whether either program's method is significantly more effective at lowering disease rates than the other.

Both programs are also universally missing important impact statistics that give officials and voters the opportunity to gauge a program's success. Neither report offers any estimate of the number of diseases prevented, the number of prevention goods issued (bed nets, larvivorous fishes), or the number of lives saved due to these government programs. Ideally, these sorts of statistics would be a government requirement in order to renew program funding, however this is not currently the case in India. Again, the provision of these statistics also has the power to help officials determine the scalability of a program in addition to evaluating its overall efficiency and impact.

Social enterprise has been mentioned in the last decade as an additional way to address the growing health needs of the world's population. The areas where these programs are weak, mainly in impact statistics and the innovation of new interventions, are places where social enterprise can feasibly step in to offer support to existing government programs. The following will define the field of social entrepreneurship in addition to illustrating the strengths of social enterprises within the government response context.

PART 3

The Emerging Field of Social Entrepreneurship

The task of tackling the double burden of disease faced by India is a massive one that would be difficult for a country with even the most robust public health institutions. A crucial part of the health distribution equation that has not been presented by this paper is the role of

non-governmental organizations. Alternative methods of distributing health care and education offer a variety of ways to approach health problems from a community perspective and thus increase the likelihood of success.

Social enterprises differ from traditional business ventures by its reduced interest in “creating substantial financial profit for [its] investors” (13, 34). Instead, the social entrepreneur uses sound business practices with an emphasis on social impact to address complex social issues, such as the health care in the developing world (14, 3). Martin and Osberg define social entrepreneurship by three characteristics:

- a social enterprise identifies an unjust equilibrium that marginalizes a segment of the human population,
- the enterprise identifies an opportunity in this unjust context to bring “inspiration, creativity, direct action, courage, and fortitude” to the affected population,
- in completing the first two steps, the social enterprise creates a new equilibrium that realizes the potential in the marginalized population and creates “a stable ecosystem around the new equilibrium” that ensures the sustainability of the initiative (13, 35).

There is some controversy regarding the definition of social entrepreneurship, in both the private and not-for-profit sectors, but I will use the description above for the purposes of this paper.

Social enterprises often focus on making products or services that are accessible, affordable, and of high-quality to these marginalized populations. In recent years, especially with the emergence of the MDGs, activists and marginalized communities have called “for universal access to essentials like clean water, affordable energy, and medicines for HIV/AIDS, tuberculosis, and malaria” (15, 119). In these last-mile distribution situations, social enterprises can be most effective. For-profit businesses, such as pharmaceutical sector, are often limited by long-term research projects that require substantial upfront investments and result in the customer being charged a premium for the good or service (15, 119). But by emphasizing easy access, social enterprises are able to take advantage of low-cost, high-quality products already on

the market (or develop these products themselves) and their unique position in the affected communities to reach as many clients as possible.

Another challenge addressed by social entrepreneurs is the high price of goods and services offered by traditional private sector businesses. According to David Green of Aurolab (a social enterprise that offers affordable healthcare products and services to the poor of South India)

it really doesn't cost that much to make ostensibly sophisticated medical devices. Most companies could have a manufacturing cost structure and sufficient production capacity to profitably serve the needs of lower-income countries, but they don't. I believe there's a way for these companies to price their products to be affordable for developing country markets in ways that don't jeopardize profitability in higher-margin developed country markets (15, 125).

Green implies that the bulk of investment in the medical device sector occurs during the research and development phase. Most pharmaceutical research endeavors do not result in marketable drugs, meaning that the manufacturing and sales of these products that are successful in research incur dramatic retail markups and thus deny access to all those unable to afford the product.

Social enterprise aims to drastically cut profit margins by focusing less on research and development and more on manufacturing the product itself. The emphasis is then placed more on distributing the product while still generating enough revenue to support the business.

Where Does Social Enterprise Fit Into the Government Response Paradigm?

Having evaluated the strengths and weaknesses of both the government and (potential) social enterprise response to the growing double burden of disease in India, this paper argues that the two ideas can be integrated in a joint, and perhaps coordinated, response to the issue. The table in Appendix B outlines the strengths and weaknesses of both social enterprise and government responses to public health issues as described below.

Dr. Victoria Hale, founder of the Institute for OneWorld Health (the first nonprofit pharmaceutical company in the United States), stated “[o]ur patients are practically invisible to global enterprises. In this case, we rely on local entrepreneurs and rural health care providers. Many of these individuals are social entrepreneurs” (15, 122). In speaking to the social enterprise’s ability to identify, work with, and therefore understand a specific community, Dr. Hale points to one of the main benefits of social enterprise over broad government work. Through reinvesting in the business and some help from private investors, social enterprises are in more of a position to try new distribution tactics, deliver products new to the market, and adjust based on the feedback from the community than their government counterparts. Lastly, social enterprises are led by social entrepreneurs, leaders with clear visions, a deep commitment to the cause, and innovative strategies to keep the organization pointed in the right direction.

Governments, on the other hand, bring a different set of strengths to the global health stage. With the infrastructure and legitimacy that comes along with government leadership, these larger institutions serve as the “center” of care: all additional organizations that provide care often operate on the margins of where government work leaves off. Government institutions are often very stable, with established protocol delineating the details of transferring power from one leader to the next (a huge problem encountered by social enterprises) and day-to-day details that can sometimes overwhelm an uninformed social enterprise. Due to this, government responses excel in routine situations, wherein a similar behavior or action (immunization, diagnostic testing, etc.) is repeated extensively over time.

It is unrealistic to expect that social entrepreneurship is “the” panacea to the looming double burden of disease in developing nations; it is beyond the capacity of this emerging sector to replace the core institutions that provide much of the care most of the world’s population

receives. Instead, the two sectors must come together to develop an integrated solution to the issue: the government handling the routine while the social enterprises manage the innovative, the government serves as the core care provider, while social enterprises work more on the periphery of society. In this sense, social enterprise serves as a “laboratory” for public health: an opportunity for both the government and the social enterprise to test a concept at the community (micro) level before implementing it at the population (macro) level. This integrated system of care challenges the traditional “either/or” paradigm of public health, a model categorizes institutions and limits patients to one organization for care. But by articulating social enterprise with government care, this black-and-white paradigm is transformed into a continuum of health care services that assigns each institution to play to its strengths. Under this model, the large, governmental institutions are equipped to handle routine tasks and maintain consistency of care, while social entrepreneurs are allowed to incubate new ideas and relationships that can be assumed under these larger organizations after they have been tested.

Ultimately, social enterprise is not limited to treating only NCDs or only infectious disease cases, and neither is the government. But government health institutions have more resources than social enterprises to tackle both problems, given their broad scope and pre-existing connections to affected areas. Social enterprise, on the other hand, could play a direct role in developing new practices, such as a method to keep electronic files, an innovative strategy that has implications for both NIMR and NPCDCS programs. Or social enterprises could be involved in culturally-sensitive training materials for health workers, research that involves an intimate knowledge of the community to be served and its culture. These are only a few of the vast areas through which social enterprise can involve itself in a substantial and meaningful way in the global health sector.

But the conversation around these issues of infectious and non-communicable diseases can no longer focus on the one organization or institution or drug that will solve each problem. Instead the discussion must focus on how all of these political actors move within this social space, how each entity can be the most efficient and effective while allowing other entities the same position. Due to the rapid nature of the double burden of infectious disease and NCD, nothing but an integrated approach to these public health issues will result in their ultimate eradication. Government must continue to operate broad programs that address the needs of the majority, while maintaining the status quo and providing a routine around which other interventions may develop. Social enterprise can then step in to offer dynamic, novel solutions while accessing difficult-to-reach populations.

In evaluating this double burden of disease from a public health perspective, this paper identified the institutional forms that are necessary to address this double burden of disease. From a political science perspective, this paper also aims to understand the government position on this type of disease burden and its subsequent response. Ultimately, it will be the coming together of both fields, with an integrated response from both government and social enterprise angles, that most effectively address the double burden of disease in the developing world.

Appendix A:

Packages of Services made available under NPCDCS at different healthcare levels (as seen in Operational 9)

Health Facility	Packages of Services
Sub-Center	<ol style="list-style-type: none"> 1. Health promotion for behavior change 2. 'Opportunistic' Screening using B.P measurement and blood glucose by strip method 3. Referral of suspected cases to CHC
Community Health Center (CHC)	<ol style="list-style-type: none"> 1. Prevention and health promotion including counseling 2. Early diagnosis through clinical and laboratory investigations (Common lab investigations: Blood Sugar, lipid profile, ECG, Ultrasound, X ray etc.) 3. Management of common CVD, diabetes and stroke cases (out patient and in patients.) 4. Home based care for bed ridden chronic cases Referral of difficult cases to District Hospital/higher health care facility
District Hospital	<ol style="list-style-type: none"> 1. Early diagnosis of diabetes, CVDs, Stroke and Cancer 2. Investigations: <ol style="list-style-type: none"> a. Blood Sugar, lipid profile, Kidney Function Test (KFT), Liver Function Test (LFT), ECG, Ultrasound, X ray, colposcopy , mammography etc. (if not available, will be outsourced) 3. Medical management of cases (out patient , inpatient and intensive Care) 4. Follow up and care of bedridden cases 5. Day care facility 6. Referral of difficult cases to higher health care facility 7. Health promotion for behavior change
Tertiary Cancer Center	Comprehensive cancer care including prevention, early detection, diagnosis, treatment, minimal access surgery after care, palliative care and rehabilitation

Appendix B

Table 2: Strengths and Weaknesses of Social Enterprise and Government Responses to Issues of Public Health.

<p>Strengths of SE Specific: By working with smaller population, able to better understand particular needs Responsive: Creative: private funding and sustainable business models give innovators the opportunity to approach problems from a new perspective Dynamic: because of the social entrepreneur</p>	<p>Strengths of government response Centered: clearly delineated hierarchy and chain of command Stable: bureaucracy provides consistency and offers centralized support Repetitive/consistent: establish routines and detailed protocols</p>
<p>Weaknesses of SE Manpower: Recruiting employees with as strong a vision as the entrepreneur can be daunting and may be impossible to achieve Lack of experience</p>	<p>Weaknesses of government response Bureaucracy: can't respond quickly Stagnant: legal and funding obligations limit government's ability to experiment with different approaches</p>

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