Final Written Report - Eric Yang, Dickey Global Health Initiative 13S

Internship Overview

During the spring term of 2013, I had the amazing experience of interning with the Rwandan Ministry of Health in Kigali, Rwanda. I worked under the mentorship of Dr. Fidele Ngabo, the Director of Maternal and Child Health, and served the role of an independent contractor. On a day-to-day basis, I conducted research on various health topics, prepared presentations for meetings and conferences, supported new project initiatives, and helped edit policy documents. Because the Maternal and Child Health department included the offices for family planning, nutrition, gender equality, environmental health, and community health, I was able to collaborate with a diverse assortment of health experts and engage in several different areas of Rwanda's health sector, including writing the foreword for the national family planning policy. I had the pleasure of being introduced to other high-level public health officials in Rwanda, including the Director of the Expanded Program on Immunization, the Director of Malaria Prevention, the Director of Community Health, and the Director of Family Planning, all of whom taught me new perspectives with which to view health and government. Over the course of my three months at the Ministry of Health, I was also able to attend many important technical working group meetings and conferences, including the 4th East African Community Health and Scientific Conference. These occasions allowed me to interact with officials from organizations as different as DelAgua and the Embassy of the Netherlands. On a larger scale, I was involved in two major projects and four shorter-term projects, all of which pushed me to creatively utilize my limited resources and analytical skills to address pressing public health problems.

Significant Global Health Issues in Rwanda

Recently, Rwanda has been receiving frequent praise for its innovative health sector and health advances, immense accomplishments given the devastation of the public health infrastructure during and after the 1994 genocide. Nevertheless, as a landlocked, high-population growth, and natural-resource-deficient developing country, one of the poorest in the world, Rwandans still suffer from an unacceptable burden of disease and disability, as seen by high maternal and child mortality rates. Malnutrition remains one of the key problems, with nearly half of all children under five experiencing stunted growth and over a third with anemia. Combined with poor hygiene, inadequate sanitation, and obstacles to health care access, the living conditions in most of Rwanda augment the susceptibility to debilitating ailments. Problems with obstetric care are another major concern in Rwanda, since at-risk pregnancies and deliveries threaten the lives of both the mother and the newborn if not attended to by properly-trained medical staff. Nearly two-thirds of women do not visit a health facility for the full four antenatal care visits that is recommended by the WHO, leading to many danger signs being missed. The lack of cesarean section training and intensive care units at many health facilities then makes it difficult to administer emergency obstetric care. Maternal health is also compromised by social issues, including attitudes against contraceptives and birth control, violence against women, and nutritionally imbalanced traditional diets. Despite the spectrum of health challenges, Rwanda stands out from other countries in Sub-Saharan Africa because of its rapid progress towards reaching the Millennium Development Goals. There is a special synergy in Rwanda's health sector arising from the alignment of several health system principles. The first of these is the focus on community-based programs that allow the public to take ownership of their health. Each village elects its own three community health workers to serve as the first line of primary care for

most health issues. These community health workers are organized into cooperatives, which receive government funding to invest in joint economics ventures. Both the cooperatives and professional medical staff receive performance-based financing, which are monetary bonuses given by the government for reporting data consistently and reaching target health outcomes. Another form of collectivization is Rwanda's public health insurance, the mutuelles de sante, which is free for the poorest households and In Rwanda, there is strong governmental support for health, starting from the president and moving as a top-down process reinforced by performance contracts between each level of government. This has allowed health awareness campaigns, national vaccination programs, and collaboration with non-governmental organizations to be successful over the years. Strict monitoring and evaluation practices, budget transparency, long-term goal-setting, and harmonization of the efforts of different donors and stakeholders have led to very low inefficiency and low corruption in Rwanda's health programs. Moving forward, Rwanda's Ministry of Health hopes to increase its health care capacity by training more communities in managing their own health, retaining more of the nation's skilled medical professionals, partnering with donors to increase health equipment and resources, and allocating more the country's budget towards the health sector.

Project 1 - Diarrhea Prevention Research Paper

This research paper was my overarching project at the Ministry of Health. Initially, the focus was to be on rotavirus, since in 2012, Rwanda introduced the Rotateq pentavalent rotavirus vaccine into its national immunization schedule with GAVI cofinancing support. Rotavirus is the primary cause of severe diarrheal disease and the subsequent dehydration has been a leading cause of child deaths in Rwanda and many other developing countries. Having just finished its

first year, the rotavirus program was now entering an evaluation period, with active surveillance data being analyzed and studies being carried out. Since there weren't any results yet to work with, my project became a literature review of all the diarrhea prevention interventions in Rwanda in order to determine the Ministry of Health's best practices, how other countries in Sub-Saharan Africa could similarly combat diarrhea, and how additional funding support could make a major difference now while being sustainable over time. The first step in planning this paper was to become an expert in the topic. I read through countless publications, including primary research, nongovernmental organization findings, news articles, survey data reports, and governmental policies, in order to acquire a full picture of what had been done in Rwanda and what lay ahead. To better understand the message that Rwanda hoped to convey and the challenges that were encountered along the way, I conducted interviews with the heads of the vaccine, community health, and environmental health programs. I then worked with Dr. Fidele to select the optimal outlet for publishing my research paper as an open access article before organizing all the information I had collected and drafting the paper. Just as Rwanda faced challenges in its diarrhea prevention efforts, like a lack of cold storage space for vaccines and villages that didn't understand the science behind diarrheal diseases, I came upon some challenges in the course of this project. The first of these was setting dates for the interviews. It is a cultural norm in Rwanda to have a generally flexible schedule, so when I tried to schedule too in advance, something else would always come up and take priority over the interview. The second challenge was the sheer quantity of information I had to sort through in order to understand the complexities of Rwanda's health system. The paper addresses rotavirus, clean water, and hygiene and sanitation practices, which ended up being more expansive than I had expected. Lastly, because the paper was long-term, I prioritized the daily tasks over research for

the paper, which has ended up in a delay in the completion of the paper. Nevertheless, I am confident that this manuscript will be submitted sometime this fall for publication in 2014.

Project 2 - Evaluation of Maternal and Neonatal Health Workers

My second-largest undertaking at the Ministry of Health was an evaluation of survey data collected from nearly 1500 maternal and neonatal health community health workers, health facility supervisors, and district hospital supervisors. The goal of survey was to assess maternal and neonatal health knowledge across the country, determine effectiveness of supervision, and check whether or not community health workers were doing what they were supposed to do. The maternal and neonatal health community health workers are required to keep logbooks of the health status of all pregnant women and mothers in their communities, should be able to advise women on proper newborn care, and should know to refer women to health facilities for specialized care upon identification of certain danger signs. The Ministry of Health hoped to use the findings from the survey to locate knowledge gaps and discrepancies between districts or health facilities. When I was introduced to this project, the surveys had already been administered, and the data had been collected electronically and aggregated into ten Excel spreadsheets. From there, I worked with the monitoring and evaluation team in the Maternal and Child Health department to translate the data to English, check for and fill in missing data, and clean up mistakes in the data. Then, I joined a team consisting of Ministry of Heath staff and consultants from Partners in Health to analyze the data. The end result was a series of graphs and charts that highlighted results related to the goals of the evaluation. For this project, the main challenge I faced was having to do heavy data manipulation with low access to technical support. Because of inconsistencies in the data collection and electronic data entry process, the Excel spreadsheets

contained numerous errors that often required referring back to the paper surveys and remaking the entire spreadsheet. Moreover, it became evident the data would oftentimes not suffice for measuring the evaluation targets. Using my past experience with datasets, I was able to set up proxy variables, like ratios and percentages, to enable further analysis. Partners in Health was based in a different city and the monitoring and evaluation team was on summer leave for several weeks at the beginning, so I had to come up with my own solutions to the data problems before eventually receiving input from the team. Though frustrating, this experience taught me how to be methodical and efficient in correcting inaccurate data, and the latter part of project was extremely informative, as I worked directly with Partners in Health and saw their approach to public health. I also became more comfortable with using Excel and STATA by exploring their functions and teaching myself from online resources how to use the two programs effectively. The results of the evaluation will serve as the baseline for both an internal report and a potential publication on the efficacy of Rwanda's community health workers.

Other Projects

I completed four additional projects of significance for the Ministry of Health, albeit with a shorter timescale than the previous two projects. I would actually consider these to be the pivotal moments of my internship because they were fast-paced and showed me the immediate effects of my contributions. The first of these was designing a case study on emergency obstetric care. After collecting background information on problems with delayed obstetric care and low referral rates of at-risk pregnant women, I evaluated data on maternal health outcomes like mortality rates, antenatal care rates, referral rates, and complication rates at the district level. Giving each district a score based on these indicators, I chose the two top-performing and worst-performing districts

to carry out a comparative case study in 2014. It was during this project that I really noticed the discrepancies in numerical data between sources. To avoid misrepresenting any districts, I worked with the Maternal and Child Health department's data managers to recalculate numbers where possible. In the second of these projects, I reviewed iron and folic acid supplementation guidelines for children and women in studies from around the world and made my own recommendations for Rwanda, which in the past only supplemented pregnant women. After I evaluated the findings of the studies, some of which were in conflict, and weighed the advantages and disadvantages of daily, weekly, monthly, and cyclical supplementation, I advised that strengthening food fortification with iron, folic acid, and vitamin C would be more cost-effective, even though cyclical supplementation would improve nutrition more significantly. Given high rates of anemia, Dr. Fidele and the head of nutrition explained that they hoped to implement a twice-per year universal supplementation campaign, which would work well with an underlying food fortification program. The third project was preparing for the International Day to End Fistula. I worked with the UN Population Fund to design t-shirts, invitations, posters, and the program for a conference to raise awareness about obstetric fistula and the social stigma against women suffering from it. This was a welcome change from the policy work I had been doing previously. Finally, I had the opportunity to interview the finalists for the Global Health Corps program, which ended up selecting the candidates I ranked highest to be fellows with the Maternal and Child Health department for a year starting this past June. Not only did this allow me to see where other people had gone with their public health careers, it also allowed me to bring a sense of continuity to the work I had done at the Ministry of Health to ensure that qualified, passionate individuals would continue to support Rwanda in its efforts to better the health of its people.