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2015 Queenan International Agency Fellow: Final Report
Site: Genva, Switzerland
Mentor: Doris Chou, MD
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My arrival at the World Health Organization (WHO) in Geneva in February 2016 coincided with the Scientific Technical Advisory Group (STAG) meeting that began on February 24. The STAG serves as a group of independent outside advisors who meet with the WHO staff, consultants, coordinators, and interns regarding the activities of the Reproductive Health and Research (RHR) Department within the WHO. Dr. Ian Askew is the new Director of RHR and he shared his goals for the Department.

Fig 1. WHO main building

Fig 2. Doris Chou, Maria Barreix, and Kelli at WHO

I attended the main sessions as well as the breakout sessions. Within RHR, there are three divisions: human reproductive research (HRX), maternal/perinatal health and safe abortion (MPA), and adolescents and at-risk groups (AGH). My supervisor and mentor, Dr. Doris Chou, is in the AGH and that is where I am mostly centered. I attended the breakout groups for AGH to better ascertain what this division does and in particular to learn about the maternal morbidity work Doris has been involved in. The breakout sessions are not exhaustive of all projects within the department or a given division, but rather are meant to invite feedback on projects identified as priorities or needed further feedback from the group.

Doris and I met the next week to reflect on what I had observed at STAG and to review my goals during my fellowship at WHO. We decided to focus my efforts on maternal mortality, maternal morbidity, and digital innovations. The WHO has a project on maternal morbidity

identification and there are ongoing efforts to update the global maternal health databases maintained at WHO. There are also projects to integrate digital technologies to monitor and improve maternal, perinatal, and neonatal health outcomes.

Fig 3. Reproductive Health and Research Department

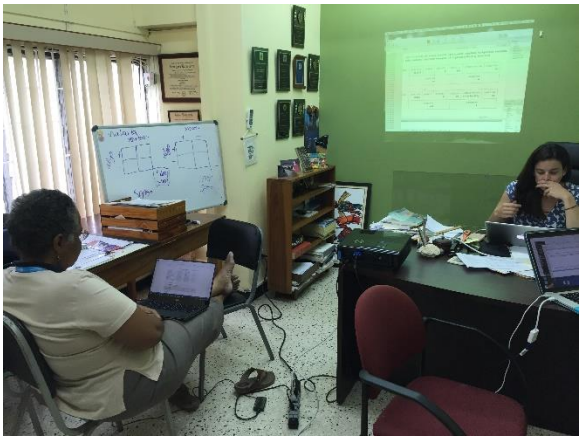

Fig 4. WHO colleagues at work in Jamaica

I spent the next two weeks reviewing WHO's work on maternal mortality classification and identification, near-miss identification and classification, and the development of the ICD-Maternal Mortality structure. I also reviewed the Maternal Morbidity Matrix and Tool project proposal and the articles that have been published on the WHO's work to date. Without seeing the tool, I then focused on how I, as a clinician, would diagnose a patient with 1) third-trimester preeclampsia and 2) preexisting diabetes utilizing patient history, physical exam, laboratories and studies, and management strategies. From the "extensive" (anything I could think of possibly being used) list, I then developed the "lowest" level of encounter list: what is the minimum information I would need to make a diagnosis. I developed a proposal for a secondary analysis of the Maternal Morbidity Tool. The goal of this study would be to 1) assess the correlation between medical chart-based diagnoses and the diagnoses identified by the Maternal Morbidity Tool and 2) assess the application of the Maternal Morbidity Tool directly to the patient's chart and the correlation between the two applications of the tools.

Next, I assisted with maternal mortality analyses that are undertaken by WHO. WHO regularly publishes on global levels, trends, and causes of maternal mortality. As part of on-going work, we decided to update the data abstraction and database tools. We developed a e-data abstraction tool and have since tested it. In the meantime, I have screened the articles the group identified through their systematic review, identifying those that would be included in the analyses. This was done on a country-by-country basis. This initial round of screening required just over three weeks.

During this time, I attended the scoping workshop on intrapartum guidelines and on preventing cesarean sections for two days. These projects are taking place in the MPA division. While I am officially in the AGH division, both Doris and Dr. Metin Gulmezoglu (the coordinator of the MPA division) have invited me to join meetings of interest to me so that I have a broader sense of the projects surrounding maternal health that occur in both divisions and have a deeper

understanding of how WHO functions. At this meeting, I was able to meet with Dr. Alan Tita and Dr. Jorge Tolosa, as well as meet other attendees.

On April 20-21, I worked with the WHO maternal morbidity team and the Jamaican PI, Dr. Affette McCaw-Bins, for the Maternal Morbidity Tool to assess the results of the tool. The Maternal Morbidity Working Group, established as part of the maternal morbidity grant, identified 121 diseases of interest and developed a matrix of signs, symptoms, laboratory and other studies, and management strategies that align with these diseases. From this matrix, a maternal morbidity identification tool was developed and piloted in 2015 in a few health care facilities in Jamaica, Kenya, and Malawi. Each site piloted the tool in 250 antenatal and 250 postnatal women. Much of the data has been cleaned and made usable for analysis in STATA. During our two-day meeting, we looked at 10 medical charts from Jamaica to see what the tool identified (what the provider said the diagnosis was in the tool) versus what the medical chart documented (and what was actually available in the medical chart), in order to identify initial weaknesses of the tool. We then worked on developing the algorithm for the diagnosis of preeclampsia and the diagnosis of postpartum UTI, assessing the initial and final sensitivity and specificity. I provided clinical and statistical expertise for this. We quickly realized that additional data cleaning was needed as diagnoses ended up in multiple columns that were not yet coded.

I traveled to Jamaica from May 10-22, 2016 to work with Dr. McCaw-Bins to assess the algorithms and write up our results. In preparation for this trip, I spent the weeks before ensuring we had the proper statistical coding in place and developed a list of diagnoses. In Jamaica, we focused on six antepartum and postpartum morbidities. We utilized the Maternal Morbidity Matrix to develop algorithm components; the algorithm was then adapted to maximize sensitivity and specificity.

Fig 5. Kelli with Dr. McCaw-Bins and family in Jamaica

Fig 6. Hanswilsdorf Bridge in Geneva

After returning from Jamaica, we continued to work on the statistical coding and analysis of the tool, including refinement of algorithms, assessment of sexual dysfunction, and the exploration of functional status assessment via the WHODAS components of the tool.

We presented our findings to the Maternal Morbidity Working Group (MMWG) meeting in mid-

June. The results were well received and informed the continued discussion of the importance of further research and development in the field of maternal morbidity, including functioning, symptom clustering, and the varied benefits of a morbidity assessment tool. We are collaborating with Dr. Max Petzold, a senior statistician from the Swedish National Data Service and Health Metrics Unit, to develop and perform these more sophisticated analyses. The June meeting with the MMWG allowed us to extend our maternal morbidity work under the current grant through February. I have continued and will continue to be involved in in-person and virtual meetings dedicated to further analysis.

The secondary analysis has become part of our triangulation project. The MMWG agreed that tool refinement could best be done with evaluation of the women's medical records to assess for other morbidities that may not have been documented, but could be assessed by the tool. This triangulation project brought myself, Ms. Barreix, and Dr. Gichuhi (PI in Kenya) to Jamaica to work with Dr. McCaw-Binns and her colleagues. We spent two weeks in August traveling to the clinical sites where the tool had been piloted to extract additional information from the participants' charts. I developed the triangulation project database and assessment tool and am working on the coding and eventual analysis of this data.

Functioning before and after pregnancy has become an important topic of focus for us. A systematic review of maternal functioning was presented at the June MMWG meeting, allowing us to better understand how unique the WHO morbidity tool is in its assessment of functioning and in particular with its use of the WHODAS. We are collaborating with our colleagues at the WHO who developed the WHODAS, as well as with our colleagues in Brazil who have used the WHODAS in a postpartum cohort to assess functioning after severe maternal morbidity. We continue to work towards a better understanding of how maternal morbidities affect and relate to functioning status in both antenatal and postnatal time periods.

At the end of August, we met with the MMWG steering committee to re-discuss our results and further develop the analyses planned for the final MMWG meeting in February 2017. Even though I have returned to my clinical and research responsibilities at the University of Utah, I continue to collaborate with my colleagues on these analytic endeavors.

While the bulk of the second-half of my six months has been spend on maternal morbidity work, the work on maternal causes of death continues. We reassessed the timeline for the cause of death results; we feel that presenting the results parallel in timing to the maternal mortality ratio results will be both impactful and insightful. This pushes the timeline for finishing data abstraction back and has allowed us to further refine the database in collaboration with our statisticians. My role has expanded beyond database management and data abstraction to involvement in an updated systematic review and providing insight into data analysis relationships.

In addition to the maternal morbidity and cause of death projects, I participated in the digital platform development for maternal and perinatal care project. This project is in its infancy; project goals and timeline continue to be determined.

In addition to these main activities, I was able to attend portions of the 69th World Health Assembly, which occurred May 23-28, 2016. This provided me valuable insight into how resolutions are made, how those resolutions inform WHO work, and how progress on worldwide

resolutions and projects are presented at subsequent meetings. Attending was particularly important to learning more about how the Global Strategy for Women's, Children's, and Adolescent's health was developed and the impact it is hoped to make in the next 15 years. At the end of June, I also attended the annual Policy and Coordination Committee meeting, where project updates and priorities for the Human Reproduction Programme are discussed and developed. The committee then provides feedback and prioritization on the next year's focus and framework.

Throughout my six-month fellowship, I met with Doris one-on-one every 1-2 weeks to assess project issues and progress. We met as a mini-team (for Doris's project) every 2 weeks and as the AGH division every 2 weeks. Since returning to Utah, I continue to collaborate electronically on each of the projects.

My experiences have been quite impactful and fulfilling. Not only do I believe that my experiences have fulfilled the stated expectation of the Queenan Fellowship, but have exceeded them. As I transition into the next phase of my training and career, I envision building a hybrid career that allows me to impact women locally in the United States, as well as globally, at policy, community, and individual levels.

I will be forever grateful for this opportunity and the impact it has had and continues to have on me. I give my deepest gratitude to The Pregnancy Foundation Queenan Fellowships for Global Health and the World Health Organization for making this opportunity possible and for supporting my work. I am indebted to all of the individuals and organizations who have made this fellowship possible and who have been so supportive and encouraging both locally and globally.