

Thesis Project Portfolio

Structural Racism as a Barrier to Inactivated Influenza Vaccination Coverage during Pregnancy and Influenza Modeling in the Americas

(Technical Report)

Sustainable Practice Implementations Potential Impact to Global Health

(STS Research Paper)

An Undergraduate Thesis

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In Fulfillment of the Requirements for the Degree

Bachelor of Science, School of Engineering

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Sociotechnical Synthesis

Healthcare disparities are a global problem. They have been in existence for years, yet still effect millions presently. Their existence puts certain groups at a disadvantage to receiving proper care on the basis of race/ethnicity, socioeconomic status, and location as well as many other factors. These disparities cannot be resolved without illuminating the extent to which they exist and exploring the issues perpetuating their presence. Though each country has specific issues, there are common themes that must be addressed worldwide to make a step in the right direction towards creating solutions that diminish this persistent challenge.

In my technical report my capstone group investigated adverse birth outcomes in Brazil related to influenza infection. Using R, we analyzed public datasets to determine trends in these factors. We noticed some patterns that seemed to be indicative that racial disparities may also play a role in the prevalence of these adverse birth outcomes in certain populations. We also modeled the timeline of influenza infections in Ceará, Brazil to determine how their current influenza campaign could be improved with the creation of a new vaccination schedule.

My STS research examined interventions that could potentially be implemented in Low- and Middle-Income countries (LMICs) to improve their current healthcare systems. I analyzed frameworks developed to address specific issues in certain LMICs and advised ways in which they could be employed to improve Brazil's current health systems. My intent was to identify methods that could be transferable to other countries. I found sustainable, collaborative approaches that take in account community needs could be the model that would help LMICs improve their healthcare systems. Implementation of these approaches may allow more people that are currently underprivileged to access quality care.

My capstone team originally desired to investigate how the influenza campaign in Brazil as a whole could be improved. We also wanted to examine the influenza campaign in Virginia and conduct interviews with Virginian minority women that had been pregnant in the past to highlight factors that influenced or dissuaded them from getting an influenza vaccination during their pregnancy. Both of these goals were modified due to lengthy IRB approval processes; however, they are both areas where our project could be continued during the summer or next years. The STS research portion provided a solid start to the exploration of approaches that could assist LMICs; however, it could be expanded in the future to examine challenges in other LMICs besides Brazil more thoroughly to create an even clearer depiction of the problems these countries face.

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