Stanford

Carmen Y.J. Lee

Postdoctoral Scholar, Neonatal and Developmental Medicine

Bio

BIO

Throughout my education and training in system dynamics modeling, I have developed solid skills in complex system modeling for health policy, population health intervention, and implementation science. My scholarly work has focused on using System Dynamics (SD) modeling and simulation methodology and related sets of tools, such as Group Model Building (GMB), to build simulation models to study complex problems in the health systems, identify effective intervention points, and design optimal intervention strategies to improve population health. Between 2011 and 2012, I assisted in GMB workshops to study nursing shortages in Singapore. Since 2020, I have applied the SD methodology to study the institutional delivery of marginalized women in Bihar, India. The modeling project identified multiple subsystems that contribute to the disparities in institutional delivery rates among marginalized women across parities. Multiple potential interventions were designed, tested, compared, and ranked based on model-based simulation analysis. I presented a poster of this work in the MCHRI Symposium 2020 and 2021 and received the "Honorable Mention" badge in the most recent symposium. I also presented this work to the Bill and Melinda Gates Foundation in India. In January 2022, I introduced this work at Western Medical Research Conference 2022. I have acquired the skills for simple statistical analysis skills with data management software, extensive data analysis, quantitative and qualitative analysis, synthesis, and integration. These skills and my previous training have prepared me for my existing research, which includes engaging stakeholders from multi-level and multi-sector to co-develop the model and analyze large and diverse datasets. This project focuses on developing an innovative approach that improves the conventional methodologies in the quality improvement field by implementing low-dose Aspirin intervention for pregnant women at risk of pre-eclampsia in California as a case study. I am leading the SD project under the close supervision of Professors David K. Stevenson and Gary Darmstadt. The collaborators of this project include Professor Jeffrey Gould, Chief Executive Officer of California Perinatal Quality Care Collaborative (CPQCC), Ms. Leslie Ann Kowalewski, Administrative Director of California Maternal Quality Care Collaborative (CMQCC), and Dr. Elliot Main, Medical Director of California Maternal Quality Care Collaborative. My long-term research goals involve becoming an independent researcher, broaden the application of GMB and SD in translational and implementation science, population health science, health policy planning, health services delivery, and healthcare management.

STANFORD ADVISORS

- David Stevenson, Postdoctoral Faculty Sponsor
- Gary Darmstadt, Postdoctoral Research Mentor

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

We will compare the processes of learning and intervention designs of two groups in the context of planning for a QI intervention. One group will utilize SD Group Model Building processes, and another will use the conventional KDD and RBA approaches. Qualitative and quantitative analytic approaches will be utilized to compare the learning processes and the intervention approach generated by these two groups. We anticipate that this study will lead to insights into new approaches to improving Q

PROJECTS

- Using System Dynamics Modelling and Simulation to Maximize Uptake of Aspirin by Women at-risk of Preeclampsia and Preterm Birth - Prematurity Research Group and California Maternal Quality Care Collaborative (CMQCC) (February 1, 2022 - present)
- System Dynamics Modeling as an Intervention Planning Tool to Promote Institutional Delivery: learning from West Champaranin Bihar, India - Stanford University, University of Agder (Norway), and CARE India (August 1, 2019 - present)
- Community Group Model Building to Identify Systemic Barriers and Facilitators of Postpartum Depression Care Delivery for the Floating Population in Shanghai - Stanford Center for Innovation in Global Health (July 1, 2022 - December 31, 2023)