Lingxin Hao, Department of Sociology

Trained as a sociologist and social demographer in an interdisciplinary environment at the University of Chicago’s Sociology PhD program and RAND’s Labor and Population Postdoc Program, Dr. Lingxin Hao has been engaged in a wide variety of NICHD-funded interdisciplinary projects. For the past 20 years, the HPC has played a primary role in providing mentorship and pilot research support for Dr. Hao to develop these research projects in collaboration with epidemiologists (Drs. Ronald Gray and Maria Wawer), health economist (Dr. David Bishai), and computational systems scientist (Dr. Joshua Epstein). Looking ahead, Dr. Hao’s research agenda continues to develop in the interdisciplinary direction.

Agent-based Modeling of Migration

Owing to the intellectual stimulation of Dr. Joshua Epstein’s seminal work on generative social science, Dr. Hao is currently leading a team to investigate the system dynamics of the unprecedented rural-to-urban migration in contemporary China. Several unique features of this research go beyond the conventional quantitative approach. First, a systems framework that integrates sociological, demographic, and economic theories guides the study. Second, the computational approach is grounded in empirical micro-data from China’s censuses and multiple nationally representative longitudinal surveys. Third, the agent-based computational model explores underlying mechanisms such as nonlinearity, actors’ interactions, and micro-macro feedback loops. In particular, migrants and non-migrants’ interactions are modeled using explicit population-wide social networks. The statistical and generative results of this study will reveal the causal mechanisms of population migration to deepen our understanding of theoretical explanations, such as cumulative causation of migration perpetuation and the emergence of migration systems, which have not been previously tested.

Early Exposure to Environment and Child Development Trajectories

Dr. Hao is extending her established research on child development with a focus on the human ecology of family, school, and immigration in the U.S. into an interdisciplinary program. The existing literature informing the relationship between early exposure to environment and children’s developmental trajectories only provides fragments of knowledge separated by disciplines. Because they are investigated within disciplinary boundaries, these studies miss interactions among phenomena across disciplinary boundaries. For example, a sociological understanding of the impact of the social/behavioral environment on cognitive development may be biased if it fails to take into account the biological environment and social-biological interactions. Dr. Hao currently seeks collaboration with experts in epigenetic science (Dr. Xiaobin Wang), public health and public policy (Dr. Christina Bethell), mathematical statistics (Dr. Daniel Naiman), and system science (Dr. Takeru Igusa) to develop an interdisciplinary research program. Substantively, this program will examine a fuller array of exposures to physical, biological, chemical, social, and behavioral environments, changes in biomarkers, and social-biological interactions and its short-, mid- and long-term consequences for multi-domains of child development. Methodologically, the program will develop statistical and computational methods that leverage multiple sources of cohort data to test hypotheses and translate findings into intervention designs with computational evaluations.
Susan Sherman, Department of Epidemiology

Evidence-based Advocacy for Marginalized Populations

Driven by a sense of social justice, Dr. Susan Sherman directs her research interests toward empowering marginalized populations, converging data-driven empirics with remedying social inequalities. Since her graduation from the Bloomberg School of Public Health in 2000, Dr. Sherman has worked passionately to develop methodologies and participate in outreach for marginalized populations like those of sex workers and drug users. While her work has taken her abroad to improve health outcomes for these individuals in India and Thailand, she also persistently pursues advocacy for sex workers in Baltimore. She hopes that her local-based research projects will eventually culminate in a full service center in the city for sex workers.

Public Health Intersects with Public Safety

Dr. Sherman’s work particularly reverberates with real-world implications because of her personal involvement as well as the practical outreach objectives and strategies. Spearheading the NIH-funded Sapphire Study in Baltimore, she is leading a team to examine the role of police in the HIV risk environment of female and transgender sex workers. An innovation of the Sapphire Study is to understand police behavior through ethnographic methods. Last year, she and her team conducted an 8-month long ethnography with the police. In addition, they recruited a street-based cohort of trans- and cisgender sex workers and conducted 5 in-depth interviews in a year to understand the nature of interaction with police so that such results could be related to incidence, prevalence, and outcomes. Integrating the expertise of public health with public safety, the study aspires to inform policy and develop innovative police intervention techniques.

Expanding the Needle Exchange in Baltimore

As an HIV-prevention researcher for over 15 years, Dr. Sherman has worked on legislation and testified in court for the cause of needle exchange programs for drug users. Her work examines the Needle and Syringe Program (NSP) in Baltimore and provides evidence that NSP has reduced HIV incidence rates among other benefits. Since its inception in 1994, the NSP has operated under an one-to-one (1-1) exchange policy. While aspects of this program have evolved, its implementation now goes beyond the 1-1 policy. It has been shown that needle exchange programs have decreased the incidence of HIV among drug users, yet the federal ban had impeded such programs. Enacted in 1988, the federal ban was lifted in 2009 and then, reinstated in 2011. In December 2015, President Obama signed off on a spending package that did not altogether lift the ban because the federal funds will not cover the actual syringes although it covered personnel and overhead expenses. Dr. Sherman continues to take part into the legislation process in testifying in the Maryland State House to support expansion of syringe exchange throughout the state.