

Mohammad Nayeem Hasan

Statement of Previous Training and Preparation

Pursuing a PhD in Public Health concentration with One Health is the next essential step in expanding my expertise and preparing to be an independent researcher of Public Health as a faculty member. The One Health program at the University of Florida aligns perfectly with my goals of deepening my combined knowledge of Public Health, Veterinary Health, and Environmental Health, contributing to innovative research, and advancing the field of public health. My research journey in public health began with my degree in Statistics from Shahjalal University of Science and Technology, Bangladesh, with an undergraduate project on "Cesarean Delivery and Early Childhood Diseases in Bangladesh", which was later published in *PLOS ONE*. This foundation equipped me with applied knowledge through hands-on research, underscoring my passion for biostatistics and epidemiology as vital tools for addressing public health challenges. Currently, I am focused on some research on rabies control and dengue outbreaks.

My educational background has provided me with numerous opportunities to address real-world challenges research scientists face. I am currently working as a Monitoring and Evaluation Officer with the Rohingya Response Program run by a local NGO in collaboration with the Directorate General of Health Services of Bangladesh. A recent initiative I led, was "Community Health, WASH, Health System Support & Health Post for Forcibly Displaced Myanmar Nationals (FDMN) and Host Community Population". The goal of this initiative is to improve health status through the provision of standard, free, dignified, and immediate access to essential healthcare services to the FDMN of and adjacent host communities. In this role, I develop protocols, implement projects, conduct scientific analyses, and report on health initiatives aimed at improving healthcare access in Cox's Bazar.

My research career has been distinguished by publications in prestigious journals and successful projects funded by the Government of Bangladesh and University Grants. As a research assistant, I contributed to these projects at every stage, from developing research proposals to submitting reports, including supervising data collection, analyzing data, and writing the final reports. Most of those projects focused on socio-economic issues, such as the Vicious Cycle of Poverty, Social Safety Nets Program, and Food Security. My voluntary research work primarily focuses and is published on community health, maternal and child health, and environmental health-related topics. With experience in data management and statistical analysis, my research primarily focuses on developing research methodologies and contributing to data analysis. My current research aligns with Bangladesh's goal to eliminate dog-mediated rabies deaths by 2030. Understanding transmission trends is crucial for effective control measures. Recently, we analyzed the correlation between mass dog vaccination (MDV) and anti-rabies vaccines (ARV) with human rabies cases. Using hierarchical clustering, Seasonal Autoregressive Integrated Moving Average, and count time series following generalized linear models in R, we found a positive association between increased MDV and ARV usage and a reduction in human rabies cases, which was published in *The Lancet Regional Health - Southeast Asia*. This study's findings can inform policy decisions for national rabies control in Bangladesh and similar countries, advancing efforts to eliminate dog-mediated human rabies globally and achieve the Zero by 30 target. The severe dengue outbreak in 2023 highlighted the need for advanced predictive methods. My team analyzed dengue infection data and mortality rates from 2022, focusing on meteorological factors influencing transmission. By employing machine learning techniques, we forecasted dengue cases based on historical data. Our findings revealed that rising temperatures and altered rainfall patterns significantly contribute to outbreaks in Bangladesh using a generalized linear mixed model, with results appearing in *IEEE, Journal of Medical Entomology, and International Journal of Infectious Diseases*. Those studies suggest that Bangladesh requires active surveillance of cases, deaths, and vectors, integrating meteorological data to identify causes of increased dengue deaths for better care. Estimating mild or subclinical cases and their risk factors is crucial for effective public health interventions. I have presented my research at several conferences, including the 2020 World One Health Congress, serving as an editorial board member and reviewer for multiple journals. Moreover, I am mentoring students in data analysis and research methodologies, particularly using SPSS, Stata, and R. Reviewing other papers has inspired me with innovative thinking and motivated me to explore new methods in health research and mentoring others on various research projects solidified my desire to pursue an academic career.

My commitment to public health is driven by merging innovative methodologies with statistical tools in large data, deep learning, and machine learning. I want to be an expert in the methods of research in public health specifically One Health and run a leading lab that advances statistical methodologies while mentoring future researchers. Taking into consideration such critical health issues as infectious diseases and maternal health, I want to contribute to the translation of evidence-based practices to improve health outcomes within my community and beyond. Building on a strong foundation in statistics and applied research, I look forward to using my skill set in a way that improves One Health to advance global health conditions. Following my PhD, I envision heading a research laboratory at the forefront of academia focused on addressing environmental and global health challenges and look forward to the exchange with academia at University of Florida.