My strong foundation in statistics, combined with over four years of professional experience in health programs, has not only sharpened my analytical skills but also fueled my passion for solving complex Epidemiological issues through data-driven research. Pursuing a PhD in Epidemiology is the next essential step in expanding my expertise and preparing for an independent researcher as a faculty member. This program at the University at Buffalo aligns perfectly with my goals of deepening my Public Health knowledge, contributing to innovative health science research, and through effective policy-making. In the short term, I aim to master in Epidemiology to address vital health-related concerns, while in the long term, I aspire to lead a research lab that advances in Statistics/Machine Learning/Deep Learning/Artificial intelligence through different applications related to Public Health, trains future researchers, and fosters a collaborative research environment. This ambition is driven by the mentorship I have received and my commitment to continual learning and solving health issues.

During my undergraduate studies, I became fascinated by various subfields of statistics, including Data Mining, Biostatistics and Epidemiology, Time Series Analysis, and Statistical Inference. In particular, I found the Biostatistics and Epidemiology course particularly engaging due to its insightful applications and course projects, which sparked my strong interest in Public Health. This sparked the beginning of my public health research journey, which included various projects, fieldwork, and progressing through multiple publications. These fields have equipped me with the tools to analyze complex health-related data and derive actionable conclusions to improve health outcomes. To strengthen my skills, I pursued a double major in Computer Science and Engineering, which is quite uncommon for Bangladeshis to undertake simultaneously. Through my double major, I gained proficiency in statistical programming languages and data analysis such as SAS, Stata, R, and Python. This interdisciplinary training has enhanced my ability to address pressing epidemiological and biostatistical issues through rigorous, data-driven approaches. It has prepared me to utilize various applications of health tools and programming languages for conducting experimental health research, incorporating advanced statistical applications through big data, deep learning, and machine learning techniques to apply and resolve emerging health-related issues.

To gain real-world experience, I began working with the Joint Rohingya Response Program in 2021, focusing on health projects as a Data Management and Reporting Officer. A recent initiative I led, 'Community Health, Water Sanitation and Hygiene (WASH), Health System Support & Health Post for Forcibly Displaced Myanmar Nationals and Host Community Population,' aims to improve healthcare access, emphasize surveillance methodologies in data collection, reporting processes and suggest policies to different stakeholders in Cox’s Bazar, Bangladesh. This role has expanded my understanding of the complex health challenges faced by marginalized populations during humanitarian crises and sharpened my skills in research, data analysis, and program implementation.

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.

From several publications, my recent publication on rabies control employed time-series forecasting and multivariate techniques to predict future cases in Bangladesh. Additionally, I analyzed global COVID-19 data using various regression models, resulting in a significant publication on forecasting and pandemic preparedness. I have analyzed two decades of dengue data and the recent dengue pandemic in Bangladesh (2023), focusing on the geographical shifts in transmission and age/gender-related disparities in morbidity and mortality. This work employed various statistical models and graphical approaches, leading to a significant publication. Additionally, I utilized deep learning-based forecasting models to predict dengue outbreaks in Bangladesh, aiming to integrate artificial intelligence with dengue data for more in-depth insights. 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 the innovative thinking of various authors 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.

Given my academic and professional goals, I believe the Doctoral Program in Epidemiology at the University at Buffalo is ideal for those seeking advanced training. Graduates can pursue research roles in academia, government, clinical settings, or industry, with opportunities to teach at the university level. The curriculum covers epidemiology, biostatistics, biology, medicine, oncology, and geography, emphasizing advanced methodologies and specialty areas like cancer and infectious diseases, where I already have some research experience. This program will equip me to lead comprehensive epidemiologic research, critically evaluate studies, and engage in original research. I can also select a dissertation focused on disease-specific or exposure-related topics. Additionally, the program offers training in responsible research conduct, primary data collection, teaching assistance, and scientific communication, which are essential for my PhD journey. In addition, the program will train me to develop solutions and improve public health policies for better health outcomes. This aligns with my interests/experience and will deepen my knowledge by being a part of this department.

I am excited about the opportunity to collaborate with esteemed faculty, particularly Dr. Marina, whose extensive contributions to epidemiology, environmental health, and maternal-child health deeply resonate with my interests. I also admire Dr. Shelby's work in environmental epidemiology and the research of Dr. Kelly Baker, Dr. Matthew R. Bonner, and Dr. Renee Cadzow, which aligns with my prior experience working with mental health, health disparities, and community-based research. Additionally, Dr. Heather's focus on genetic epidemiology, chronic disease, women’s health, and breast cancer aligns with my interest and my recent project on breast cancer diagnosis delays, which we submitted to *BMC Cancer*, and my plans to complete a manuscript on cervical cancer in Bangladesh with the WHO STEPS Survey is also an exposure of my interest in that area.

With a strong background in statistics, hands-on experience in research, data analysis, program implementation, and a dedication to advancing public health research, I am confident that I will be able to make meaningful contributions to both the academic and public health communities. After earning my PhD, I aim to work in academia, leading a research lab focused on advancing public health research to address global health challenges. I look forward to engaging with the vibrant academic community at the University at Buffalo and contributing to research that addresses pressing health epidemiological issues worldwide.