My strong foundation in statistics, combined with over four years of professional experience in health interventions, has sharpened my analytical skills and fueled my passion for solving complex health-relevant phenomena through data-driven research. Pursuing a Ph.D. in Population Health is the next essential step in expanding my expertise and preparing for an independent researcher as a faculty member. This program at Arizona State University aligns perfectly with my goals of deepening my Population Health knowledge, contributing to innovative health research, and enhancing organizational health services and healthcare systems through effective policy-making. In the short term, I aim to master in public health to address vital health-related issues, while in the long term, I aspire to lead a research lab that advances in Statistics through different applications related to health research, 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 in health studies.

During my undergraduate studies, I became fascinated by various subfields of statistics, including Data Mining, Time Series Analysis, Statistical Inference, Biostatistics, and Epidemiology. 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 health science. This sparked the beginning of my health research journey, which included various projects and 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 health issues through rigorous, data-driven approaches, and prepared me to utilize various applications related to health tools and programming languages for conducting experimental health research, incorporating advanced statistical applications, and resolving 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, 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, and 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 on community health, maternal and child health, and environmental health. From several publications, research on early childhood development (ECD) status using the ECD Index in Bangladesh employed bivariable analysis and logistic regression models. Our study determined that ECD status is improving through factors such as early childhood education programme, accessibility to children’s books, household mothers’ education level, and family income. Furthermore, I researched about married women’s knowledge and attitudes towards HIV/AIDs in Bangladesh. The study showed that age, division, mass media access, and economic status have a significant effect on the knowledge level of the respondents when analyzed using logistic regression.

Notably, 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. We also plan to expand our research to examine the global dengue situation, which is increasingly concerning.

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 PhD in Population Health, is my best choice. Studying here will allow me to learn from top faculty involved in cutting-edge research. In the Population Health PhD program, I will study how social determinants of health, infrastructure, and access to care impact health outcomes for different populations. I'll also learn how to collaborate with various stakeholders to improve public health. Many of these topics align with my previous research projects and professional work. Additionally, I'll explore areas like biomedical informatics, economics, international public health, program assessment, health education, and health care delivery. I’ll gain practical experience working in healthcare settings, government, research institutions, and community health organizations through coursework and research opportunities. These align with my interests/experience and will deepen my knowledge by joining this department. Recently, I took the initiative to learn Bio-informatics to contribute more in-depth research in the field of public health.

I am excited to collaborate with esteemed faculty like Professor Dr. Niko Verdecias-Pellum, whose research on Health disparities, diabetes, social determinants of health, implementation, and intervention science reinforces my belief that Arizona State University is the ideal place for my PhD. Her publications on “An Exploratory Qualitative Analysis of Explanations for COVID-19–Related Racial Disparities Among St. Louis Residents:“I Don’t Really Pay Attention to the Racial Stuff Very Much” align with my interests. I am eager to explore topics and learn from her expertise under her supervision. Dr. Alexis Koskan's research also aligns perfectly with my background, and I look forward to taking on greater challenges in her field (community health, cancer prevention, and health communication) under her supervision. Dr. William Riley’s work also attracted me to join the Population Health Program.

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. Additionally, we investigated urban-rural disparities in maternal healthcare, set to be published in *Heliyon*, and continent-wide vaccination disparities during COVID-19, published in *IJID Regions*. In the future, I aim to investigate the reason behind the spread of Dengue, MPOX, or other infectious diseases, focusing on the role of socio-economic factors on a large scale.

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