|  |  |
| --- | --- |
| 1. **During Interview:**  * Begin with Hi/Hello * Always use Prof. / Dr. while talking (ex, Prof. Anderson) * ~~Refrain from saying Sir / Madam~~ * ~~Avoid sounding too casual / fancy~~ * Stay calm and confident * Don’t forget to smile | 1. **Introduction (Professor talks about)**  * His/Her department position * Research interest * Present/upcoming projects * Funding sources   **Just listen patiently** |
| 1. **Introduction (My):**   **Relevant to varsity/department/program**  **First: Academic Background:**   * University, department, results & Passing Year * Explain if you good in any particular coursework and interest in any coursework * Mention any good projects   **Tell your academic story sequentially.**  **Focus on your strengths**  **~~Ignore weakness~~** | 1. **Introduction (My):**   **Relevant to varsity/department/program**  **Second: Research Background:**   * Thesis work * Research Projects * Conferences   **Try to explain the motivation of those research** |
| 1. **Introduction (My):**   **Relevant to varsity/department/program**  **Third: Professional Experience:**   * Jobs/Employment * Training   **Share role and learning** | 1. **Introduction (My):**   **Relevant to varsity/department/program**  **Fourth: Skills:**   * Publications * Conferences, Editorial and Reviewer activities   **Mention skills you are good at and share those align with professor** |
| 1. **Introduction (My):**   **Relevant to varsity/department/program**  **Fifth: Skills:**   * Analysis and problem-solving skills * Project management and organizations * Others (Campaign, Campus Ambassador)   **Mention skills you are good at and share those align with professor** | 1. **Professor might ask about**  * Particular courses (related to professor’s research interest/program) * Your past research (problem solved, methodology, findings) * Your future goals (Where you see yourself in 5-10 years’ time)   **Don’t fear, it is an interview, not a viva**  **Be Honest** |
| 1. **You can ask about**  * Professors’ current projects * What his/her students are working on * What projects you might be assigned to * What skills might be expected from you   Future job prospects | 1. **Show your enthusiasm by**  * Seek permission to contact professor’s student * Request professor to send you any research papers * Ask how the interview went   Ask about what you can do next |
| 1. **Say Goodbye!** |  |

**Understand the PhD Program Structure**

* Review the PhD program’s website (https://egh.phhp.ufl.edu/education/degree-programs/phd-in-one-health/), curriculum, and any specifics about research projects or opportunities for interdisciplinary collaboration.

**Stay calm and confident**

**Don’t forget to smile**

1. **During Interview:**

**Greetings**

Hi Professors,

1. **Introduction (Professor talks about**)

**Just listen patiently**

1. **Introduction (My): Tell your academic story sequentially, focus on your strengths, Ignore ~~weakness~~**

**Relevant to varsity/department/program**

**First: Academic Background:**

**University, results, and passing year:**

My name is Mohammad Nayeem Hasan, and you can call me **Nayeem**. I completed both my **Bachelor's and Master's programs in Statistics** with a **double major** in Computer Science and Engineering (**CSE**) and thesis at Shahjalal University of Science and Technology, Sylhet, achieving a **good CGPA** in 2019.

**Courses:**

My educational journey enriched my practical knowledge through engagement in **research related courses**, commencing with foundational courses such as in Statistics, **Principles of Statistics, Sampling Techniques, Design and Analysis of Experiments, and Statistical Inference**. However, during the advanced stages of my education, specifically in the third, fourth year, and masters, I was formally introduced to **Statistical Computing, Biostatistics and epidemiology, Data Mining, and Time Series Analysis**. 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, health projects and progressing through multiple publications.

In CSE double major, I learned **different programming language, database management system, computer networking and software development**. Through this, I gained proficiency in statistical programming languages and data analysis such as **SAS, Stata, R, and Python**.

Driven by my passion for health research and expertise in statistical analysis, I transitioned from **potential opportunities** in computer science to an interdisciplinary career in public health. This focus has honed my ability to address critical health challenges through data-driven approaches, as showcased in my publications.

**Undergrad Projects:**

In undergraduate period under **Biostatistics and epidemiology** course, we completed a project on "Cesarean Delivery and Early Childhood Diseases in Bangladesh", which was later published in *PLOS ONE.*

1. **Introduction (My): Try to explain the motivation of those research**

**Relevant to varsity/department/program**

**Second: Research Background:**

**Thesis work**

My M.S. thesis titled "**Ground Water in the Vicinity of Sylhet City, Bangladesh: Assessment of Quality and Association Based on Multivariate Statistical Techniques**" was not only sponsored by the **University Research Centre but also published in a reputed journal (Sustainable water research management)**.

The aim of the study was to provide an evaluation of water quality with respect to different water quality parameters in the north-east part of Bangladesh using multivariate techniques. It also tried to identify the vital sources that control the groundwater resources in the aquifer.

All samples were collected during the pre-monsoon season in March 2019 from 20 pumps of Sylhet City Corporation area.

Correlation analysis has been used to assess the overall groundwater quality and the degree of the linear relationship between parameters. Multivariate statistical techniques have been used to interpret the water quality of the selected pumps and to provide some meaningful results that are not possible while investigating the data at a glance.

PCA extracted three components, which are accountable for the data composition explaining 71% of the total variance of the data set and allowed to set the selected parameters according to regular features as well as to evaluate the frequency of each group on the overall variation in water quality of Sylhet City Corporation area. Hierarchical cluster analysis grouped the 20 sampling stations into five groups, the values of pH and HCO3− concentration increase gradually from cluster 1 to cluster 5, i.e., from the eastern part to the western part of the city.

**Research Projects**

During my **MS program**, I initiated work on various projects under the **SUST Research Center, Department of Statistics, Ministry of Bangladesh**. While these studies initially aimed to tackle specific community issues, my aspirations evolved to encompass a broader spectrum of health concerns, particularly focusing on **Public Health**. So, when COVID pandemic started I have to left the job at URC due to lockdown and joined some international team (**Royal Veterinary College, Keele University, UF, University of Tennessee, Knoxville and Shahjalal University of Science and Technology**) to work on COVID projects.

**Conferences:**

I am also presented my undergrad and graduate research work on various national and international conferences.

1. **Introduction (My): Relevant to varsity/department/program**

**First: Professional Experience:**

**Jobs/Employment**

**Over four years** of experience as a **humanitarian professional** have equipped me to address real-world challenges in health-focused projects. I have worked in health data management and monitoring roles with organizations such as Community Partners International, Food for the Hungry-UNHCR, and Save the Children. Currently, as a Monitoring and Evaluation Officer with the Rohingya Response Program in collaboration with Health Sector, ministry of health, Bangladesh, I lead initiatives like "Community Health, WASH, Health System Support & Health Post" to improve healthcare access for Rohingya Refugees and host communities in Cox’s Bazar. My work involves developing protocols, implementing projects, conducting analyses, event-based surveillance, verbal autopsy, and supporting research teams. I regularly visited camps to ensure that all services were available and properly maintained. If any services were missing, I identified the reasons and informed the relevant health professionals. In addition, I created alerts by submitting case reporting forms to support early outbreak response.

**Training**

I completed some external training in Bioinformatics, Data analysis, and Research techniques. From my job and some online platform, I trained on Monitoring and Evaluation, Project management, proposal and Report writing, Research ethics, Social Determinants of health and health equity, training on disease surveillance and EWARS reporting, 4W reporting, Training on DHIS, HeRAMS, Go.Data: Managing complex data in outbreaks and Response Preparedness for Zoonotic Disease Outbreaks Using a One-Health Approach.

1. **Introduction (My):**

**Relevant to varsity/department/program**

**Mention skills you are good at and share those align with professor**

* Publications

Given my academic and professional goals, with experience in **data management and statistical analysis**, my research primarily focuses on **program implementation, developing research idea from data**, **research methodologies and contributing to data analysis**. I'm particularly focused on emerging diseases and investigating the environmental factors affecting disease prevalence in humans.

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. In addition, two ongoing projects focus on rabies: one examines vaccination delays, while the other explores the differences between pre- and post-rabies interventions and the seasonal impact of rabies.

Parallelly I am also worked on the global dengue outbreak and dengue outbreak in Bangladesh highlighted the need for advanced predictive methods. My team analyzed dengue infection data and mortality rates from 2000-2023, 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 **Epidemiology and infection, *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. In addition, a recently published article related to “The 2023 fatal dengue outbreak in Bangladesh highlights a paradigm shift of geographical distribution of cases”. Furthermore, we are working on the status of dengue situation of south Asia using spatial distribution and Global dengue situation from 2000-2024.

In COVID-19, we evaluated the effectiveness of the Global Health Security Index (GHSI) and Joint External Evaluation (JEE) in predicting COVID-19 outcomes. While the indices were strongly correlated, they showed limited predictive value for detection response times and mortality rates, with demographic factors like age being stronger predictors. The global case fatality rate (rCFR) of COVID-19 peaked early in the pandemic and declined due to improved healthcare and interventions, not solely increased testing. Vaccination significantly reduced rCFR, with better outcomes in countries with higher vaccination rates, emphasizing the critical need for equitable and rapid vaccine distribution globally. We published those work in, IJID regions, AJTMH, Epidemiology and infection.

Furthermore, I have also contributed to research covering a range of topics, including **non-communicable diseases, childhood diseases, early childhood development, maternal health, indoor air pollution, groundwater quality, and meteorological factors**.

* **Conference, Reviewers and academic editor:**

I have presented my research at several conferences, including I presented one COVID-19 projects on the **2020 World One Health Congress**, serving as an editorial board member and reviewer for multiple journals. I am working as an editorial board member in PLOS ONE & Frontiers in Water. I managed several manuscripts among them one already published. My reviewer activities: BMC, PLOS Global Public Health, PLOS ONE, and scientific reports.

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.

1. **Introduction (My):**

**Relevant to varsity/department/program**

**Fifth: Skills:**

**Analysis and problem-solving skills:**

Furthermore, my Second Major in Computer Science and Engineering greatly enhanced my proficiency in utilizing various **statistical programming languages** such as SAS, Stata, and R. **This background made data analysis a seamless and efficient process for me. I used my analytical skills in** Research methodology, machine learning, data mining, regression analysis, forecasting, multivariate techniques, survival analysis parametric, nonparametric analysis, etc. Skilled in **MS Office, Pivot Table, Kobo Toolbox** & **Power BI.**

**Project management and organizations:**

I possess extensive experience working with both **national and international organizations**, demonstrating my ability to effectively collaborate within diverse and multicultural settings. Furthermore, I have a **strong track record of successfully managing substantial projects with sizable teams**. This experience has equipped me with the skills and knowledge necessary to handle intricate projects, oversee large teams, and ensure smooth and efficient project execution, resulting in successful outcomes.

**Extra skills:**

I also played role as a different position in different program and Campaign in my university, I also Campus Ambassador, SUST under different organization and program.

**Team Leader, Research & Reporting Team, UNITY Bangladesh (voluntary organization):**

Focused on ensuring good health and well-being for marginalized communities, particularly the ethnic community of Sylhet.

1. **Professor might ask about: Don’t fear, it is an interview, not a viva, Be Honest**

**Particular courses (related to professor’s research interest/program)**

Statistical Computing, Biostatistics and Computing

**Your past research (problem solved, methodology, findings)**

1. **Research Assistant,** Vicious Cycle of Poverty in Haor Region of Bangladesh: Impact of Formal and Informal Credit, Sponsored by the Ministry of Education under the Grant of Advanced Research in Education (GARE),

Objective

To examine the types of microcredit programs in the Haor area of Bangladesh and their impact on livelihoods through social indicators like income, consumption, assets, and poverty.

Methods

Utilized difference-in-difference and factor analysis to assess the terms and impacts of formal and informal microcredits on the poverty conditions in Haor between 2016 and 2019.

Conclusion

Microcredits showed positive impacts on income and consumption, but their role in alleviating poverty remains debatable.

1. **Research Assistant,** Effectiveness of Some Selected Promotional Social Safety Nets Programs **(food for work or money for work)** in Bangladesh: Formulation for Future Strategies, Financed by The Social Science Research Council, Planning Division, Ministry of Planning

**Objective**

To assess the effectiveness of selected promotional social safety net programs in Bangladesh and propose future strategies for improvement.

**Methods**

The study utilized surveys and interviews with beneficiaries and key informants, alongside statistical analyses, to evaluate the impact on poverty reduction, income stabilization, and social well-being.

**Conclusion**

Social safety net programs have shown positive outcomes but require better targeting, implementation, and integration with broader development strategies for greater effectiveness.

1. **Research Assistant,** Reducing the Errors in the Measurement of Food Security in Bangladesh through Development and Implementation of an Innovative Method, Sponsored by The Ministry of Education, Government of Bangladesh under GARE

Objective

This study examines whether the choice of method significantly affects the evaluation of food insecurity and poverty levels.

Methods

Data were collected from 600 households across 30 rural clusters in Bangladesh. Multiple methods were used, including the Coping Strategy Index (CSI), perception analysis, Food Consumption Score (FCS), Cost of Basic Needs (CBN), Direct Calorie Intake (DCI), and Food Energy Intake (FEI).

Conclusion

Significant variations in results across methods highlight the importance of method selection in evaluating food insecurity and poverty. Accurate assessments require careful consideration of methodological approaches.

**Publications**

1. Haider N, **Hasan MN**, et al. Global Landmark: 2023 Marks the Worst Year for Dengue Cases with Millions Infected and Thousands of Deaths Reported. ***IJID Regions*** 2024 (**Article:** [**The Guardian**](https://www.theguardian.com/global-development/2024/oct/23/dengue-fever-record-cases-in-2024-so-far-what-is-driving-the-worlds-largest-outbreak))

Objectives

In 2023, the world experienced the worst dengue virus (DENV) outbreak on record. The study aimed to identify global regions and continents with high burden of dengue in 2023.

Design

We collected data on the number of DENV cases and deaths reported by various countries to the World Health Organization and World Health Organization regional offices. We estimated DENV cases per million population and case fatality ratio (CFR) among the confirmed cases reported by each country.

Results

Overall, in 2023 more than 6.5 million cases and over 6,800 deaths attributed to DENV were recorded globally, marking a historic milestone. Two distinct hotspots of DENV circulation emerged: South America and South and Southeast Asian regions. South America reported the highest number of cases (3,924,992), and 1,946 deaths, with a CFR of 0.05. In Asia, 1,622,405 cases and 3,637 deaths were reported, with a CFR of 0.22. We observed a statistically significant difference in the number of cases and deaths per million across different continents (P-value <0.001). However, the CFR did not differ significantly across continents (P-value = 0.123).

Conclusions

The increased cases and mortality highlight the urgent need for a comprehensive global approach aimed at DENV infection control, including vaccine development, vector control, public health initiatives, and improved clinical management.

1. Ghosh S, **Hasan MN**, et al. Rabies control in Bangladesh and prediction of human rabies cases by 2030: a One Health approach. ***The Lancet Regional Health - Southeast Asia***2024

Methods and objectives

Drawing from multiple datasets, including patient immunisation record books and mass dog vaccination (MDV) databases, we conducted a comprehensive analysis between 2011 and 2023 to understand the effectiveness of rabies control programmes and predict human rabies cases in Bangladesh by 2030 using time-series forecasting models.

A time-series forecasting model called the seasonal autoregressive integrated moving average (SARIMA) model was employed to forecast rabies cases based on monthly data.

We employed count time series following generalized linear models (TSGLM) to examine the relationship between our study's outcome variable, which consists of count data, and other variables.

Findings

The estimated dog population in Bangladesh was determined to be 1,668,140, with an average dog population density of 12.83 dogs/km2 (95% CI 11.14–14.53) and a human-to-dog ratio of 86.70 (95% CI 76.60–96.80). The MDV campaign has led to the vaccination of an average of 21,295 dogs (95% CI 18,654–23,935) per district annually out of an estimated 26,065 dogs (95% CI 22,898–29,230). A declining trend in predicted and observed human rabies cases has been identified, suggesting that Bangladesh is poised to make substantial progress towards achieving the ‘Zero by 30’ goal, provided the current trajectory continues.

Interpretation

Bangladesh's One Health approach demonstrated that an increase in MDV and anti-rabies vaccine (ARV) resulted in a decline in the relative risk of human rabies cases, indicating that eliminating dog-mediated human rabies could be achievable.

1. Ullah MA, Mim AS, **Hasan MN**, et al. Deep Learning Based Forecasting Models of Dengue Outbreak in Bangladesh: Comparative Analysis of LSTM, RNN, and GRU Models Using Multivariate Variables with a Two-Decade Dataset. ***IEEE*** 2024

This study employs diverse machine-learning techniques to forecast dengue fever occurrences in Bangladesh, aiming for enhanced accuracy and proactive public health measures.

Unlike previous research focusing narrowly on specific variables, this study incorporates a wider range of factors and algorithms. Three models: Gated Recurrent Units (GRU), Recurrent Neural Network (RNN), and Long Short-Term Memory (LSTM) were evaluated using data from January 2000 to December 2022. Official patient data from the Ministry of Health and Family Welfare and meteorological data from the Bangladesh Meteorological Department were utilized.

This underscores LSTM’s efficacy in predicting dengue cases in Bangladesh, offering valuable insights for proactive disease management and public health interventions.

1. **Hasan MN**, et al. Two decades of endemic dengue in Bangladesh (2000–2022): trends, seasonality, and impact of temperature and rainfall patterns on transmission dynamics. ***J Med Entomol*** 2024

The objectives of this study were to compare dengue virus (DENV) cases, deaths, case-fatality ratio [CFR], and meteorological parameters between the first and the recent decades of this century (2000–2010 vs. 2011–2022) and to describe the trends, seasonality, and impact of change of temperature and rainfall patterns on transmission dynamics of dengue in Bangladesh.

For the period 2000–2022, dengue cases and death data from Bangladesh’s Ministry of Health and Family Welfare’s website, and meteorological data from the Bangladesh Meteorological Department were analyzed. A Poisson regression model was performed to identify the impact of meteorological parameters on the monthly dengue cases. A forecast of dengue cases was performed using an autoregressive integrated moving average (ARIMA) model.

The increased local temperature and changes in rainfall seasonality might have contributed to the increased dengue cases in Bangladesh.

1. Haider N, **Hasan MN**, *et al.* The 2022 dengue outbreak in Bangladesh: hypotheses for the late resurgence of cases and fatalities. ***J Med Entomol*** 2023

Bangladesh reported the highest number of annual deaths (*n* = 281) related to dengue virus infection in 2022 since the virus reappeared in the country in 2000. Earlier studies showed that >92% of the annual cases occurred between the months of August and September. The 2022 outbreak is characterized by late onset of dengue cases with unusually higher deaths in colder months, that is, October–December. Here we present possible hypotheses and explanations for this late resurgence of dengue cases. First, in 2022, the rainfall started late in the season. Compared to the monthly average rainfall for September and October between 2003 and 2021, there was 137 mm of additional monthly rainfall recorded in September and October 2022. Furthermore, the year 2022 was relatively warmer with a 0.71°C increased temperature than the mean annual temperature of the past 20 yr. Second, a new dengue virus serotype, DENV-4, had recently reintroduced/reappeared in 2022 and become the dominant serotype in the country for a large naïve population. Third, the post-pandemic return of normalcy after 2 yr of nonpharmaceutical social measures facilitates extra mosquito breeding habitats, especially in construction sites. Community engagement and regular monitoring and destruction of Aedes mosquitoes’ habitats should be prioritized to control dengue virus outbreaks in Bangladesh.

1. **Hasan MN**, *et al.* Early childhood developmental status and its associated factors in Bangladesh: a comparison of two consecutive nationally representative surveys. ***BMC Public Health*** 2023

Background

We aimed to investigate the status of early childhood development (ECD) and its associated factors. Additionally, aimed to compare the changes of significantly associated factors using two multiple indicator cluster surveys (MICS) in Bangladesh.

Methods

We used data from the Multiple Indicator Cluster Surveys (MICS) 2012 and 2019 nationally representative surveys. A total of 17,494 children aged 36–59 months were included in the analysis. The outcome variable was ECD status: either developmentally on-track or not. We used bivariable analysis and crude and adjusted multivariable logistic models to assess the ECD status and its associated factors.

Conclusion and recommendation

In summary, our study shows that the overall ECD status improved between MICS 2012 and MICS 2019. Important factors influence ECD status, including early childhood education programs, families’ possession of children’s books, mothers’ educational level, and wealth index. The findings of our study will help making necessary public health-related initiatives in Bangladesh to improve ECD program.

1. Haider N, **Hasan MN**, *et al.* The disproportionate case-fatality ratio of COVID-19 between countries with the highest vaccination rates and the rest of the world**. *IJID Regions*** 2023

Objectives

The global reported cumulative case–fatality ratios (rCFRs) and excess mortality rates of the 20 countries with the highest coronavirus disease 2019 (COVID-19) vaccination rates, the rest of the world and Sub-Saharan Africa (SSA) were compared before and after the commencement of vaccination programmes.

Methods

A time series model was used to understand the trend of rCFR over time, and a generalized linear mixed model was used to understand the effect of vaccination on rCFR.

Results

By 31 December 2022, an average of 260.3 doses of COVID-19 vaccine per 100 population had been administered in the top 20 vaccinated countries, compared with 152.1 doses in the rest of the world and 51.2 doses in SSA. The mean rCFR of COVID-19 had decreased by 69.0% in the top 20 vaccinated countries, 26.5% in the rest of the world and 7.6% in SSA. Excess mortality had decreased by 48.7% in the top 20 vaccinated countries, compared with 62.5% in the rest of the world and 60.7% in SSA. In a generalized linear mixed model, the reported number of vaccine doses administered (/100 population) (odds ratio 0.64) was associated with a steeper reduction in COVID-19 rCFR.

Conclusions

Vaccine equity and faster roll-out across the world is critically important in reducing COVID-19 transmission and CFR.

1. **Hasan MN**, *et al.* Knowledge of HIV/AIDS among married women in Bangladesh: analysis of three consecutive multiple indicator cluster surveys (MICS). ***AIDS Res Ther*** 2022

The study aimed to investigate the level of HIV/AIDS knowledge and the socio-demographic variables that influence HIV/AIDS knowledge among married women in Bangladesh.

We used three waves of Multiple Indicator Cluster Survey (MICS), which included 33,843, 20,727, and 29,724 married women from 2006, 2012, and 2019 MICS. A score was prepared through their interrogation to determine the level of knowledge and logistic regression models were used for analyzing the data.

This study also found respondent’s age, division, mass media access, and wealth status have played an important role in HIV/AIDS knowledge. Although a significant proportion of women had adequate knowledge of HIV/AIDS, more knowledge is still required to protect against such viruses/diseases. Thus, we advocate for the implementation of educational program in the curriculum, counselling, particularly in rural areas, and mass media access to ensure quality knowledge throughout the country.

1. **Hasan MN**, *et al.* The Global Case-Fatality Rate of COVID-19 Has Been Declining Since May 2020. ***Am J Trop Med Hyg*** 2021

The objective of this study was to evaluate the trend of reported case fatality rate (rCFR) of COVID-19 over time, using globally reported COVID-19 cases and mortality data.

We collected daily COVID-19 diagnoses and mortality data from the WHO’s daily situation reports dated January 1 to December 31, 2020. We performed three time-series models [simple exponential smoothing, auto-regressive integrated moving average, and automatic forecasting time-series (Prophet)] to identify the global trend of rCFR for COVID-19. We used beta regression models to investigate the association between the rCFR and potential predictors of each country and reported incidence rate ratios (IRRs) of each variable.

The weekly global cumulative COVID-19 rCFR reached a peak at 7.23% during the 17th week (April 22–28, 2020). We found a positive and increasing trend for global daily rCFR values of COVID-19 until the 17th week (pre-peak period) and then a strong declining trend up until the 53rd week (post-peak period) toward 2.2% (December 29–31, 2020).

In pre-peak of rCFR, the percentage of people aged 65 and above and the prevalence of obesity were significantly associated with the COVID-19 rCFR. The declining trend of global COVID-19 rCFR was not merely because of increased COVID-19 testing, because COVID-19 tests per 1,000 population had poor predictive value. Decreasing rCFR could be explained by an increased rate of infection in younger people or by the improvement of health care management, shielding from infection, and/or repurposing of several drugs that had shown a beneficial effect on reducing fatality because of COVID-19.

1. **Hasan MN**, *et al.* Cesarean delivery and early childhood diseases in Bangladesh: An analysis of Demographic and Health Survey (BDHS) and Multiple Indicator Cluster Survey (MICS). ***PLOS One*** 2020

Introduction

Our aim was to examine the association between C-section and childhood diseases and to identify the key factors associated with childhood diseases.

Methods

We used four nationally representative data sets from multiple indicator cluster survey (MICS, 2012 and 2019) and Bangladesh Demographic and Health Survey (BDHS, 2011and 2014) and analyzed 25,270 mother-child pairs. We used the frequency of common childhood diseases (fever, short or rapid breaths, cough, blood in stools, and diarrhea) as our outcome variable and C-section as exposure variable. However, due to over- dispersion in the data, we then applied negative binomial (NB) regression models. We first fitted univariate models to estimate the effect of C‐section on the outcome variable (disease count). We included mother’s age, place of residence, division, mother’s education, wealth index, child age, child sex, and child size at birth as confounding variables. Negative binomial regression model was used to analyze the data.

Conclusion

Our study shows that C-section in Bangladesh continued to increase over time, and we did not find significant association between C-section and early childhood diseases. High C-section rate has a greater impact on maternal and child health as well as the burden on the health care system. We recommend raising public awareness of the negative impact of unnecessary C-section in Bangladesh.

1. Haider N, Yavlinsky A, Chang YM, **Hasan MN**, *et al.* The Global Health Security Index and Joint External Evaluation score for health preparedness are not correlated with countries’ COVID-19 detection response time and mortality outcome. ***Epidemiol Infect*** 2020

Global Health Security Index (GHSI) and Joint External Evaluation (JEE) are two well-known health security and related capability indices. We hypothesised that countries with higher GHSI or JEE scores would have detected their first COVID-19 case earlier, and would experience lower mortality outcome compared to countries with lower scores.

We evaluated the effectiveness of GHSI and JEE in predicting countries’ COVID-19 detection response times and mortality outcome (deaths/million). We used two different outcomes for the evaluation: (i) detection response time, the duration of time to the first confirmed case detection (from 31st December 2019 to 20th February 2020 when every country’s first case was linked to travel from China) and (ii) mortality outcome (deaths/million) until 11th March and 1st July 2020, respectively. We interpreted the detection response time alongside previously published relative risk of the importation of COVID-19 cases from China. We performed multiple linear regression and negative binomial regression analysis to evaluate how these indices predicted the actual outcome.

The two indices, GHSI and JEE were strongly correlated (r = 0.82), indicating a good agreement between them. However, both GHSI (r = 0.31) and JEE (r = 0.37) had a poor correlation with countries’ COVID-19–related mortality outcome. Higher risk of importation of COVID-19 from China for a given country was negatively correlated with the time taken to detect the first case in that country (adjusted R2 = 0.63–0.66), while the GHSI and JEE had minimal predictive value. In the negative binomial regression model, countries’ mortality outcome was strongly predicted by the percentage of the population aged 65 and above (incidence rate ratio (IRR): 1.10 (95% confidence interval (CI): 1.01– 1.21) while overall GHSI score (IRR: 1.01 (95% CI: 0.98–1.01)) and JEE (IRR: 0.99 (95% CI: 0.96–1.02)) were not significant predictors. GHSI and JEE had lower predictive value for detection response time and mortality outcome due to COVID-19.

We suggest introduction of a population healthiness parameter, to address demographic and comorbidity vulnerabilities, and reappraisal of the ranking system and methods used to obtain the index based on experience gained from this pandemic.

**Your future goals (Where you see yourself in 5-10 years’ time) look What are your career goals? (Florida)**

1. **You can ask about**

**1. Current and Future Research**:  
**What projects are currently being led by faculty, and what are students currently working on? If accepted, will I be assigned to a specific project, and what skills should I develop before admission?**

**2. Support for Research Funding**:  
How does the department assist students in securing research funding or fellowships, and are there internal resources available for grant-writing or travel support?

**3. Student Roles and Expectations**:  
What are the expectations for students regarding teaching, publishing, and participating in departmental activities or collaboration with other organization?

**4. Career Preparation**:  
How does the program support students in preparing for careers in academia, industry, and what opportunities exist for networking or alumni engagement?

**Discuss your research experience and how it fits within the One Health framework?**

My research experience aligns closely with the **One Health framework**, as I have worked on complex health challenges that span **public health**, **veterinary health**, and **environmental health**. With a strong foundation in **statistics** and a proven track record in **data-driven research**, I have focused on using statistical methodologies and machine learning techniques to analyze health issues that intersect these three domains.

During my career, I have been deeply involved in research projects that reflect the **One Health** approach, such as investigating the intersection of **human health**, **animal health**, and **environmental factors**. One notable example is my work on **rabies control** in Bangladesh. I analyzed the relationship between **mass dog vaccination (MDV)** and the use of **anti-rabies vaccines (ARV)** with the incidence of **human rabies cases**, a critical component of **One Health**. By applying advanced statistical methods, such as **hierarchical clustering**, **Seasonal Autoregressive Integrated Moving Average**, and **generalized linear models**, we found a significant correlation between increased MDV and ARV use, leading to a reduction in human rabies cases. This research, which was published in The Lancet Regional Health - Southeast Asia.

Similarly, my research on **dengue outbreaks** in Bangladesh demonstrates the **One Health approach** in action. In collaboration with my team, we analyzed meteorological data, dengue infection rates, and mortality, using **machine learning** and **generalized linear mixed models** to identify environmental factors—such as rising temperatures and altered rainfall patterns—that contribute to the spread of dengue. The results, which were published in several prominent journals, emphasize the need for **integrated surveillance systems** that link **environmental data** with **public health data**, a critical aspect of the **One Health framework**.

My research experience aligns with the One Health framework by addressing global health security and pandemic preparedness. I analyzed the effectiveness of health indices (GHSI and JEE) during COVID-19, emphasizing demographic and healthcare system vulnerabilities. My work on vaccine equity, mortality trends, and improving health system resilience demonstrates a commitment to interdisciplinary approaches that enhance human, environmental, and societal health outcomes during COVID-19.

As a **Monitoring and Evaluation Officer** with the **Rohingya Response Program**, I also contributed to cross-disciplinary initiatives focused on improving **community health**, **water, sanitation, and hygiene (WASH)**, and **health system support** in resource-constrained environments. This work involved collaboration across **public health**, **veterinary health**, and **environmental health** sectors, further cementing my commitment to **One Health** research. These experiences have provided me with the practical knowledge to implement evidence-based interventions and policy recommendations that span multiple one health domains (**Dengue, Measles, AWD, Cholera, COVID-19**).

**How statistics align with One Health (or you can align it)?**

Statistics play a crucial role in the One Health approach, which recognizes the interconnectedness of human, animal, and environmental health. One Health is an interdisciplinary framework that aims to address complex health challenges through collaborative efforts across sectors such as medicine, veterinary science, environmental science, and public health. Here's how statistics align with One Health:

**1. Data Integration and Analysis**

**Epidemiological Studies (prevalence track and forecast)**: Statistics are essential in designing and analyzing epidemiological studies that track diseases across humans, animals, and the environment. For example, tracking the spread of zoonotic diseases like Ebola, COVID-19, or avian influenza requires statistical models to understand transmission dynamics and predict future outbreaks.

**Risk Assessment (Spatial analysis, regression model)**: Statistical tools help in risk assessment by quantifying the likelihood of disease transmission between species, especially in high-risk areas. For instance, evaluating how environmental factors like temperature or deforestation affect disease prevalence involves complex statistical analysis. One Health relies on predictive models to forecast the emergence and spread of diseases. Using data on environmental factors (e.g., climate change), animal health, and human behavior, statistical models (such as machine learning, regression analysis, or Bayesian networks) can predict outbreaks and identify high-risk areas or populations.

**2. Disease Surveillance**

**Monitoring Disease Trends and Surveillance Systems** **(seasonality)**: Statistical methods such as time-series analysis and regression models are used to monitor trends in disease prevalence and incidence over time. These trends can provide insights into how diseases evolve in human, animal, and environmental systems, allowing for early detection and intervention. Statistical models are foundational in building surveillance systems that track diseases across different populations. They help in optimizing sampling strategies, analyzing the effectiveness of interventions, and ensuring that data from various sectors (human, veterinary, environmental) is comparable.

**3. Risk Modeling and Prediction**

**Simulation Studies**: Simulation methods (like Monte Carlo simulations) allow researchers to model the potential spread of diseases under various scenarios. This helps in understanding how interventions (e.g., vaccination, sanitation) might control disease transmission.

**4. Health Interventions and Policy Making**

**Evaluation of Interventions**: Statistics help evaluate the effectiveness of health interventions (e.g., vaccination campaigns, vector control) by comparing outcomes before and after the intervention. This is done using statistical tests to determine whether changes in health outcomes are statistically significant.

**Policy Decision Support**: Statistical analysis of large datasets aids in creating evidence-based policies that address complex health issues in a One Health framework. Decision-makers use statistical data to prioritize actions, allocate resources, and make informed choices that benefit all sectors.

**5. Cross-Sector Collaboration**

**Collaborative Data Sharing**: One Health thrives on the integration of data from different sectors. Statistics help in harmonizing data from human health, veterinary science, and environmental science, making it possible to draw conclusions from combined datasets.

**Interdisciplinary Research**: Many health challenges require interdisciplinary research teams. Statistical approaches enable researchers from diverse fields (e.g., public health, ecology, veterinary science) to combine their data and make sense of complex interactions between human, animal, and environmental health.

**6. Environmental and Ecological Health Monitoring**

**Environmental Health Assessments**: Environmental changes such as deforestation, urbanization, and pollution can impact both human and animal health. Statistical models assess the effects of these environmental changes on disease patterns and ecological balance.

**Climate Change Analysis**: Climate models, which rely heavily on statistics, predict how climate change affects disease patterns, with potential impacts on both animal and human health. These models help assess how rising temperatures or changing rainfall patterns may influence disease vectors and host populations.

**7. Emerging Infectious Diseases (EIDs)**

**Surveillance of EIDs**: Emerging infectious diseases often jump from animals to humans (zoonoses). Statistical methods help track and analyze outbreaks of EIDs by identifying correlations between environmental, animal, and human health data. Statistical analysis can help prioritize interventions and resources for controlling new diseases.

**Genetic Epidemiology**: With the advancement of genomic sequencing, statistical techniques are used to track pathogen evolution, identify transmission pathways, and assess genetic diversity, which is key in understanding how diseases evolve and spread across species.

**8. Data Quality and Bias Reduction**

**Improving Data Accuracy**: Statistical methods are used to reduce biases and ensure the accuracy of data collected from various sectors. For example, issues like underreporting in animal disease surveillance can be addressed using statistical techniques to estimate the true prevalence of a disease.

**Sampling Methods**: Statistical sampling methods ensure that data collected from animal populations, human populations, or environmental sites are representative, minimizing biases that could affect conclusions.

**What makes you a good fit/Strength for this program, and what do you hope to contribute to it?**

My diverse expertise in statistical analysis and health research, coupled with my experience managing complex data in global health programs, makes me a strong fit for this program. My work in Bangladesh, particularly in refugee settings, has strengthened my ability to contribute to policy-relevant research, while my training in statistical software and health care positions me to collaborate effectively on global health challenges. With a solid foundation in public health and environmental science, I bring experience in both field work and research, bridging disciplines to address real-world issues. My passion for advancing global health aligns closely with UF’s One Health PhD program mission.

**Can you discuss a challenging project or research experience you’ve had, and how you overcame obstacles?**

In my first project, focusing on C-section deliveries and childhood diseases, we initially struggled to achieve significant findings using our desired model. When we applied a survey logistic regression model, the results were inconclusive. Aware that such findings would not be acceptable to editors and reviewers for publication, we revised our methodology. We replaced the initial model with count regression models (Poisson and Negative Binomial) and achieved excellent results, leading to a successful publication in *PLOS ONE*.

For my thesis, I encountered challenges in testing water quality due to limited budget and manpower. To address this, I reached out to a friend from the Civil Engineering department, gained access to their laboratory, and learned how to test various water parameters under their guidance. This collaboration enabled me to complete my thesis with distinction and publish my work in a reputable journal.

In a recent project on rabies, the initial manuscript lacked statistical findings robust enough for publication in a high-impact journal. To strengthen it, I incorporated rigorous statistical analyses. Initially, I was provided with yearly data, which showed no discernible trends. I suspected seasonal variations and requested monthly data instead. Analyzing the monthly data revealed a downward trend, which added significant value to the study and facilitated its publication in *The Lancet*.

During my work on COVID-19 and dengue projects, the major challenge was managing global datasets. I collaborated with various organizations, reached out to them via email, and successfully addressed gaps by obtaining missing data.

A particularly challenging project I worked on was during my tenure overseeing monitoring and evaluation for health programs in refugee camps. Timely and accurate data collection across multiple camps was a significant hurdle. To overcome this, I worked closely with field teams to develop user-friendly data collection tools, conducted regular training and capacity-building sessions, and implemented a streamlined process for data verification.

**Showcase your commitment to advancing public health through a One Health lens**

My research reflects a strong commitment to advancing public health through a One Health approach, focusing on zoonotic diseases like rabies and dengue and their connections to human, animal, and environmental health. By analyzing mass dog vaccination impacts on rabies and meteorological influences on dengue, I contribute to sustainable, interdisciplinary solutions. My dedication to One Health is further demonstrated by my active involvement in related teams, producing quality work valued by my colleagues.

**What is your Gap in research career?**

A potential gap in my CV that I am aware of is the lack of formal experience working directly in a clinical or veterinary setting. However, I have worked extensively on public health programs in **resource-limited settings** and **refugee camps** in **Bangladesh**, where I gained valuable insights into the intersections of human health, environmental conditions, and animal health in these communities. My focus has primarily been on **food security**, **disease prevention**, and **epidemiological studies** that indirectly involved animal health, such as zoonotic disease monitoring. These experiences have given me a unique perspective on the interconnectedness of **human, animal, and environmental health**, which is central to the **One Health** approach.

**How do you plan to manage the rigorous demands of a PhD program? /How do you balance the demands of research with other responsibilities (e.g., coursework, teaching, personal life)?**

I believe that time management is key to balancing the demands of research with other responsibilities. I am highly organized and skilled at managing multiple tasks and deadlines. I use tools like digital planners and task management apps to stay organized, and I make it a priority to schedule regular breaks and personal time to recharge. Throughout my academic journey, I have developed strong time management skills that enable me to prioritize effectively. During my master’s program, I balanced coursework and a research assistantship through careful planning and efficient use of time. Currently, I manage both my job and research work by strategically utilizing free time for professional development, such as training or research. Setting clear boundaries between work and personal life helps me maintain productivity and avoid burnout. Additionally, I value seeking guidance from faculty and peers, and I am confident that UF’s supportive academic environment will help me navigate any challenges during my PhD.

**What do you think are the most pressing challenges in One Health research today? (Florida)**

**Tell us about a time when you worked in a team to accomplish a research goal. How did you contribute?**

During my research experience spanning over seven years, I worked with diverse teams across Europe, America, and Asia to accomplish various research goals. One particular project required close collaboration with international colleagues to ensure timely completion of deliverables. I contributed by taking full responsibility for my assigned tasks, staying accountable at every step, and maintaining clear communication with my team and advisors. I ensured that deadlines were met and that my work aligned with the overall objectives of the project. Currently, as a part of the M&E team, I apply similar principles of responsibility and collaboration. I actively contribute by utilizing feedback mechanisms to identify areas for improvement and by fostering a team environment where responsibilities are clearly defined and shared. These experiences have taught me that teamwork thrives on accountability, communication, and a shared commitment to success, which I consistently bring to every research project I undertake.

**How do you approach teamwork in research, and how do you handle disagreements or conflicts within a team?**

I believe that open communication and mutual respect are key to successful teamwork. I always make an effort to listen carefully to my colleagues’ ideas and feedback and ensure that everyone has a chance to voice their opinions. When conflicts arise, I focus on understanding the root cause and ensuring that the team remains solution-oriented. For example, in a previous group project, there was some disagreement about the interpretation of our data. Instead of letting the conflict escalate, I suggested we all take a step back, review the data from multiple perspectives, and discuss our interpretations collaboratively. This approach helped us reach a consensus, strengthened our findings, and improved the overall quality of the project.

**How do you stay motivated when a research project isn’t going as planned or when you encounter setbacks?**

When faced with setbacks, I remind myself of the bigger picture and the long-term impact my research could have. I try to focus on what can be done in the present, rather than getting overwhelmed by challenges. For example, during one project, our initial hypothesis didn’t yield the expected results. For example, during the COVID-19 outbreak, we attempted to investigate any potential association between malaria prevalence or vaccination rates and COVID-19 prevalence. However, the project was not completed due to challenges related to distinguishing correlation from causation. For Instead of feeling discouraged, I focused on what new questions had emerged from the unexpected findings. I also keep myself motivated by seeking feedback and discussing challenges with mentors or colleagues. They often offer fresh perspectives that can reignite my enthusiasm and lead to new research directions.

**Short-Term Plans (During the PhD Program): (Career Goals)**

During my PhD, I plan to deepen my expertise in the One Health approach, focusing on the impact of environmental factors like climate change on zoonotic diseases. I also want to develop a robust methodological skillset, including advanced data analysis techniques and field research methods, which will enable me to tackle complex global health challenges. Beyond research, I hope to take advantage of UF's professional development opportunities to improve my communication and teaching skills, as I aim to mentor students and present my research at international conferences.

**Mid-Term Plans (Post-PhD Transition):**

After completing my PhD, I plan to continue my research in global health, particularly focusing on how environmental changes affect both human and animal health. I am interested in either joining a research institute, a governmental organization like the CDC or WHO, or working with NGOs that focus on disease prevention and environmental health. I aim to contribute to evidence-based policy and public health initiatives that address the intersection of climate change and emerging infectious diseases.

**Long-Term Career Plans:**

In the long run, I hope to become a thought leader in One Health research, influencing both public health policy and environmental conservation efforts globally. I am particularly passionate about bridging the gap between scientific research and practical solutions for vulnerable communities. Ideally, I would like to work in international health organizations where I can combine my research skills with policy-making to develop global health programs that mitigate the health risks posed by environmental degradation. My ultimate goal is to contribute to a healthier and more sustainable future by addressing the complex challenges that lie at the intersection of human, animal, and environmental health.