

Azizur Rahman

Curriculum Vitae

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Education

- 2019–Present **PhD Candidate**, Department of Community Health Sciences, University of Manitoba, Canada
Thesis: *Fast Approximate Inference for Discrete and Continuous Time Models in Intensive Longitudinal Data*
Supervisor: Dr. Depeng Jiang, Professor, Department of Community Health Sciences, University of Manitoba Canada.
- 2017 **Master of Philosophy (M.Phil) in Statistics**, Jahangirnagar University, Savar, Dhaka, Bangladesh
Supervisor: Dr. Ajit Kumar Majumder, Professor, Department of Statistics, Jahangirnagar University, Dhaka, Bangladesh
- 2008 **MSc in Statistics**, CGPA 3.80 out of 4.00 (1st Position in merit), Jahangirnagar University, Savar, Dhaka, Bangladesh
- 2007 **BSc in Statistics**, CGPA 3.72 out of 4.00 (1st Position in merit), girnagar University, Savar, Dhaka, Bangladesh

Appointments and Affiliations

- January 2023–Present **Program Evaluator (Mixed Method, SS3 job classification)**, Social Innovation Office (SIO), Department of Families, Government of Manitoba, MB, Canada
Supervisor: Adara Kaita, Manager, Social Innovation Office (SIO), Department of Families, Government of Manitoba, MB, Canada
Activities: Performing data cleaning and linkages. Conduct multivariate statistical analyses and visualizations to tell a story from the data and writing report(s) to disseminate research finding in a non-technical fashion to various audiences. Developing code to create relational database for large amounts of data from multiple sources in R (or SAS). Also, under supervisor's guidance develop statistical predictive model to identify risk factors of High-Risk Victims of youth group of population in Manitoba that requires data linkage of DAD data and CFSIS data using R (or SAS) software. Using R developed demand and supply distribution mapping for menstrual product for school division at Manitoba under MECL project and predicting future demand and needs for the year 2024 to 2025

Honors & Awards

- 2023 **CSSC Poster Presentation Competition: "First Prize Poster Presentation-PhD Category"**, the title of the poster is: *Mixture of Functional Linear Mixed Models (MixFLMMs) via Variational Approximation*, May 27, 2023, at Carleton University, Ottawa, Canada

- 2023 **CSSC Travel Award**, for the eleventh annual CSSC Student Conference 2023. Funded by “Canadian Students Statistics Conference (CSSC) 2023”
- 2023 **MMCF: Community Medicine Education and Research Travel Award 2023**, University of Manitoba. Funded by Winnipeg Foundation
- 2023 **Travel Award 2023**, University of Manitoba, Faculty of Graduate Studies (FGS)
- 2022 **SSC Case Studies in Data Analysis Competition: “SSC Award Winner”**, for case study 1 Developing physician performance model in critical care-Assessing quality and value
- 2021 **VADA Summer School Big Data Challenge 2021 – Winner**
- 2021 **Artificial Intelligence for Public Health (AI4PH) Summer Institute Big Data Challenge 2021- Winner**
- 2019–2021 **The Visual and Automated Disease Analytics (VADA) graduate training Scholarship**, funded by NSERC, University of Manitoba and University of Victoria
- 2003–2007 **University Grant Academic Merit Scholarship**, Bangladesh

Grants Obtained

As Principal Investigator

- 2017–2018 **Application of Akaike Information Criteria (AIC) in detection of Outliers**, This project report applies AIC as an outlier detection method to capture swamping effects of data series, Funded by University Grand Commission (UGC)
- 2017–2018 **Bayesian Change Point Analysis (BCPA) of Precipitation of Dhaka City**, This project report applies a method of analysis where the main objective is to determine the exact point where the major change occurred during the whole period of data series, Funded by Jahanirnagar University Grant (JU)
- 2016–2017 **A Statistical Analysis of Solid Waste Management (SWM) system of Savar Pourashava**, This project report applies statistical methodology for waste management analysis and contributes in the management system for to reduce the health hazard of population in Savar Pourashava under Dhaka City Corporation, Funded by University Grand Commission (UGC)
- 2016–2017 **Construction of Tolerance Intervals for linear and non-linear regression models**, This project report involves construction of tolerance intervals for linear and non-linear regression models in theoretical and real-life data series, Funded by Jahanirnagar University Grant (JU)
- 2015–2016 **Fuzzy Modeling Approach for Predicting the Daily Precipitation of Dhaka City – A Case study for Period of 2011-2012**, This project report applies a new method of prediction based on fuzzy modeling approach to predict the environmental variable for Dhaka city, Funded by University Grand Commission (UGC)

2015–2016 **Biomass fuel smoke exposure and pulmonary tuberculosis among female in rural area of Bangladesh**, This project report identifies biomass fuel (environmental hazard) as a significant factor of TB in rural areas of Bangladesh using conditional logistic regression model, Funded by Ministry of ICT Government of Bangladesh

Publications

Published

1. Hossain, M., Sarkar, S., Methun, I., H., **Rahman, A.**, (2025) Exploring regional air pollution transition dynamics: A multi-state Markov model approach, *PLoS One*, 20(10), e0333849
2. Umam, S., Razzak, R., Munni, M., **Rahman, A.**, (2025) Exploring the non-linear association of daily cigarette consumption behavior and food security-An application of CMP GAM regression,*PLoS One*,20(7), e0328109
3. **Rahman, A.**, and Jiang, D., Lisa M. Lix (2025) Fast and accurate variational Bayes inference for Multilevel Threshold Autoregressive Model for Intensive Longitudinal Data,*British Journal of Mathematical and Statistical Psychology*,Wiley
4. Munni, M., **Rahman, A.**, Khan, M.M., Rois, R. (2025) A functional mixed-effects model approach to explore regional climate patterns in Bangladesh, *Discover Atmosphere*, 3(3)
5. A. Sayeed, **Rahman, A.**, and Rumana, R (2024) On the interpretability of SVM model for predicting infant mortality in Bangladesh, *Journal of Health, Population and Nutrition*,44(170)
6. **Rahman, A.**, and Jiang, D., (2023) Forecasting Canadian Age-Specific Mortality Rate: Application of Functional Time Series Analysis, *Mathematics*, 11,3808, <https://doi.org/10.3390/math11183808>
7. Ismail M., H., Islam, R., Saleheen, A. A., **Rahman, A.**, Zinia, A., F., and Urmy, U. A., (2023) Determining the risk factors of under-five morbidity in Bangladesh-A Bayesian Logistic Regression Approach, *Discover Social Science and Health*,3-21, <https://doi.org/10.1007/s44155-023-00052-2>. Springer
8. Ismail M., H., Jakaria, M., Haq, I., **Rahman, A.**, Zinia, A., F., and Mithun, I.H., (2023) Rural-urban disparities in nutritional status among ever married women in Bangladesh: A Blinder-Oaxaca decomposition approach, *PLOS ONE*, 18(12), e0289880,<https://doi.org/10.1371/journal.pone.0289880>
9. **Rahman, A.**, and Nasher, N., M., R., (2023) Forecasting Hourly Ozone Concentration using Functional Time Series Model-A case study in the coastal area in Bangladesh, *Journal of Environmental Modeling and Assessment*, Springer,<https://doi.org/10.1007/s10666-023-09928-8>
10. Hossain, M. S., **Rahman, A.**, Shahriar, M., S., Bari, Z., and Yasir, M., (2023) REEs enriched heavy minerals from the river and beach sands of Bangladesh, *Arabian Journal of Geosciences*, vol., 16, page: 90-108, <https://doi.org/10.1007/s12517-023-11191-w>

11. Hossain, I.M., **Rahman, A.**, Uddin, G., and Zinia, A., F., (2023) Double burden of malnutrition among women of reproductive age in Bangladesh: A comparative study of classical and Bayesian logistic regression approach,*Food Sciences and Nutrition*, page: 1-12, doi: 10.1002/fsn3.3209
12. Mithun, I.H., Haq, I., Uddin, G., **Rahman, A.**, Islam, S., Ismail M., H., Jakaria, M., Roy, S., (2022) Socioeconomic correlates of Adequate Maternal Care in Bangladesh-Analysis of Bangladesh Demographic Health Survey 2017-18,*BioMed Research International*, Vol. 2022, page: 1-7, <https://doi.org/10.1155/2022/8027712>
13. Ismail M., H., Jakaira, M., H., Ahmed, A.S.S., Kamruzzaman, M., **Rahman, A.**, Roy, S., Hasan., A., (2022) Performance evaluation of Machine learning algorithms for classification of unintended pregnancy among married women in Bangladesh,*Journal of Healthcare Engineering*, 22, 1-10, <https://doi.org/10.1155/2022/1460908>
14. Nasher, R., **Rahman, A.**, and Samad, A., (2022) Atmospheric ozone pollution dependency on meteorological parameters in Chattogram, Bangladesh,*Journal of Indian Geophysical Union*, 26(2), 108-119
15. **Rahman, A.**, and Jiang, D. (2021): Regional and Temporal Pattern of Influenza: Application of Functional Data Analysis, *Infectious Disease Modeling*, 6, 1061-1070
16. **Rahman, A.**, Tabassum, A., and Akter, Mariam (2021): Fitting Spatial Joint Model for U.S Regional Influenza-like Illness (ILINet) Data Set, *Pure and Applied Mathematics Journal*, 10(6), 127-138
17. **Rahman, A.**, and Tabassum, A. (2020): Model to assess the factors of 10-year future risk of coronary heart disease among people of Framingham, Massachusetts, *International Journal of Public Health Sciences*, vol. 9, No. 3, 259-266
18. Haque, N. M., Hasan, M. M., and **Rahman, A.**, (2019): Identifying factors in estimation of Body Mass index: cohesion between environmental factors and physical activity, *International Journal of Public Health Sciences*, vol. 8, No. 3, 352-358
19. Monir, N., Zeba, Z and **Rahman, A.**, (2018): Comparison of Knowledge of women with gestational diabetes mellitus and healthy pregnant women attending at hospital in Bangladesh, *Journal of Science Foundation*, vol. 16, No. 1, 20-26
20. Billah, M. B, Akter, S., Parveen, S., **Rahman, A.**, Nahar, L. and Kamruzzaman, M., (2018): Effects of different supplementary feeds on the growth performance and survival of Labeo bata fry, *Jahangirnagar University Journal of Biological Sciences*, vol. 7, No. 1: 15-21
21. Ullah, M., Reza, F., **Rahman, A.**, and Mariam, A., (2017): Modified fuzzy forecasting approach for student enrollment series, *International Journal of Advanced Science and Technology*, 107, 6-18
22. Mariam, A., **Rahman, A.**, and Majumder, A., K., (2017): Prediction of Rainfall over Dhaka City using Artificial Neural Network Model, *Journal of Statistical Studies*. Vol. 34, 25-36, ISSN 1022-4734

23. Begum, N., Dhar, S. K., and **Rahman, A.** (2017): A Note on Modified Umbrella Test for Randomized Block Design with Tied Observation under Ordered Alternatives, *Jahangirnagar University Journal of Science*, Vol. 38, Issue 2, 34-42
24. Miah, M, Majumder, A. K and **Rahman, A.** (2015): Capturing volatility of stock prices in Dhaka Stock Exchange (DSE)-An approach of non-stochastic volatility models, *International Journal of Research, volume 03, Issue 01, pp. 927-940*
25. **Rahman, A.**, Hadiuzzaman, M, Majumder, A. K. and Uddin, M. N. (2014): Prediction of Compressive Strength of Concrete with a Skewed Pattern- Application of Artificial Neural Network Approach, *Journal of Engineering and Technology Research, volume 02, issue 01, 104-114*
26. **Rahman, A.**, Nesha, K., Akter, M. and Uddin, M. G. (2013): Application of artificial neural network and binary logistic regression in detection of Diabetes status, *Science Journal of Public Health (SJPH)*, vol. 1, issue 1, pp. 39-43

Submitted

27. Ahmed, E., **Rahman, A.** (2025): Interpretable Bayesian Machine Learning Model for Predicting Undernutrition among Under-Five Children, *Journal of Public Health, Elsevier*
28. Ahmed, E., **Rahman, A.**, Yusuf, M.A., Hassan, M., Moureen, A., Nur Uddin, M., Hakim, M., (2025): Prediction of Alzheimer's Disease Events Using Interpretable Bayesian Machine Learning Models, *Journal of Alzheimer's Disease*

Presentations

Conference Presentaion (Oral/Poster)

1. **Rahman, A.**, and Hossain, I., (2023) The Royal Statistical Society (RSS) International Conference 2023 (virtually and in person): *Advancing Functional Linear Mixed Effect Regression Models for complex data via Variational Bayes Approximation*, September 4-7. Harrogate, Yorkshire, UK (Upcoming)
2. **Rahman, A.**, and Jiang, D., (2023) Forecasting Canadian Age Specific Mortality Rate-An Application of Functional Time Series (in person) at Manitoba Student Health Research Forum (MSHRF) 2023, June 12, 2023, at Bannatyne Campus, University of Manitoba, Winnipeg, Canada
3. **Rahman, A.**, and Naser, R., R., (2023) The International Environmetrics Society (TIES) 2023 Regional Meeting (virtually): *Forecasting Hourly Ozon Concentration in Coastal Area of Bangladesh: Application of Functional Time Series Analysis*, July, 24-29. Trent University, Peterborough, Ontario, Canada
4. **Rahman, A.**, and Jiang, D., (2022) CANSSI Showcase Poster Presentation (virtually): *Temporal and Regional Differences in Influenza-Application of Functional Data Analysis*, November 25

5. **Rahman, A.**, Haque, A., Gedara, M.W., and Samuel, Q., (2022) *Developing physician performance model in critical care-Assessing quality and value*. Student Poster Presentation: 2022 CASE STUDIES IN DATA ANALYSIS COMPETITION. 2022 ANNUAL MEETING OF SSC (Statistical Society of Canada) IN Virtually Monday, May 30, 2022 to Friday, June 03, 2022, Canada
6. **Rahman, A.** and Jiang, D. (2021) *Machine Learning Clustering and Latent Class Analysis for Multilevel Data*. SSC 2021 Annual Conference (Virtually), 6-12 June 2021, Canada
7. **Rahman, A.** and Jiang, D. (2020) *Machine Learning Methods and Latent Class Analysis for the Predictive of Early Child Development* 16th Annual Child Health Research Day, 5th October 2020, Canada
8. **Rahman, A.** and Jiang, D. (2020) *Machine Learning Methods in Screening Mental Health Disorder*. The Visual and Automated Disease Analytics (VADA) graduate training program Summer School, June 3rd to June 6, 2020 Canada
9. **Rahman, A.**, Isuru, D., Shayanika, S., Sachitra, R., and Liu, X., (2019) *Counting Cells from Microscopic images*. Student Poster Presentation: 2019 CASE STUDIES IN DATA ANALYSIS COMPETITION. 2019 ANNUAL MEETING OF SSC (Statistical Society of Canada) IN CALGARY University of Calgary, Calgary, Alberta Sunday, May 26, 2019 to Wednesday, May 29, 2019, Canada

Invited Speaker

1. **Rahman, A. (2023)** Functional Data Analysis: The current and future potentials in theory and application. *Bioinformatics and Biostatistics Round talk Presentation (in person)* on March 28, 2023; Chown Building, A474 the classroom, University of Manitoba, Winnipeg, Canada
2. **Rahman, A. (2023)** Designing a persuasive research poster (in online) on July 16, 2023; Department of Statistics, Jagannath University, Dhaka, Bangladesh
3. **Rahman, A. (2023)** Survey Data Analysis: Part 2; on August 09, 2023; virtually, Department of Pay and Benefits, Government of Manitoba, Winnipeg, Canada

Services

Journal Editorial Board Member

Statistics Editor: Bangladesh Journal of Infectious Diseases, Website: Editorial Team | Bangladesh Journal of Infectious Disease

Reviewer for Journals

Journal of Spatial and Spatio-temporal Epidemiology, Springer

Journal of Health, Population and Nutrition, BMC

Voluntary Activities

Conference Organizing committee member of **Research on Statistical Education (RoSE) 2026, UK**

Organizing committee member of **Canadian Students Statistics Conference (CSSC) 2025**. Leading the sub committee named “Scientific Committee”

Organizing committee member of **Canadian Students Statistics Conference (CSSC) 2024**. Leading the sub committee named “Session Committee”

Acted as Plenary Judge in **MSRP Undergraduate Medical Student Research Symposium 2022**, University of Manitoba, August 18, 2022 (virtually)

Acted as Plenary Judge in **MSRP Undergraduate Medical Student Research Symposium 2023**, August 17, at University of Manitoba (virtually)

Acted as a selection committee member in **MSRP Undergraduate Medical Student Research 2022** at University of Manitoba

Acted as a selection committee member in **VADA Scholarship Program** at University of Manitoba

Acting member of **Data Science Student Platform** under Center for Health Care Innovation (CHI) at University of Manitoba, Winnipeg, Canada

Organizing committee member of **Canadian Students Statistics Conference (CSSC) 2023**. Leading the sub committee named “Session Committee”

Volunteering **Statistical Society of Canada (SSC) 2023 Annual Meeting** in person at Carleton University, Ottawa, Canada

Volunteering **Manitoba Student Health Research Forum (MSHRF)-2023 Meeting** June 12, at University of Manitoba, Winnipeg, Canada

Teaching

- 2020–on study leave Associate Professor, Department of Statistics, Jahangirnagar University, Savar, Dhaka, Bangladesh
- 2017–on study leave Assistant Professor, Department of Statistics, Jahangirnagar University, Savar, Dhaka, Bangladesh
- 2014– 2017 Lecturer, Department of Statistics, Jahangirnagar University, Savar, Dhaka, Bangladesh

Teaching Assistantship (TA)

- January 2019–April 2019 Lab TA (Stat 1000/2000), at Department of Statistics, University of Manitoba

Thesis (Project Report) Supervision

- 2023 Munniara Yesmin Munni, MSc Student, Department of Statistics. Title: Temporal and Regional Variations of Effects of Daily Temperature on Annual Precipitation: A Functional Mixed Effect Model Approach. August 2023.
- 2022 Jay Panchal, MITACS Summer Student, Department of Community Health Sciences, University of Manitoba, Canada, Title: Application of functional data analysis to observation of COVID-19 prevalence in the USA: Impact of regional, political and vaccination rates (2022). Role: Co-supervisor
- 2017 Piash Paul, MSc Student, Department of Statistics. Title: Application of Akaike Information Criterion (AIC) in Outlier Detection

- 2017 Arifa Tabassum Anika, BSc Student, Department of Statistics. Title: Modeling Generalized Zero-Inflated Poisson Distribution for Torrential Rainfall of Dhaka City
- 2016 Md. Nofeyer Haque, MSc Student, Department of Statistics. Bayesian Change Point Analysis for Time Series Data: A Case Study on Dhaka Stock Exchange from 2015-2016
- 2014 Mamun Miah, MSc Student, Department of Statistics. His supervisor was Dr. Ajit Kumar Majumder, Professor, and I was mentoring him on “Capturing volatility of stock prices in Dhaka Stock Exchange (DSE)-An approach of non-stochastic volatility models”. Wrote two papers together as a co-author

Research Experience

- January 2021- March 2022 **Quantitative Data Analyst**, *MHA Evaluation Program, Government of Manitoba, Canada*
- 2022 Supervisor: Dr. Brian Rush, VIRGO Planning and Evaluation Consultants Inc. ON, Canada
- June 2020- October 2020 **Step Student (Research Analyst)**, *MHA Evaluation, Healthy Child Manitoba Office (SIO)*
- Supervisor: Dr. Monica Novotny, Social Innovation Office, Department of Families, Government of Manitoba.
- May 2019-August 2019 **Research Assistant (RA)**, Supervisor: Dr. Depeng Jiang, Associate Professor, Department of Community Health Sciences, University of Manitoba.

2019

Consultancy

- May 2017-August 2017 **Prevalence and determinants of child abuse and neglect among working children**, Department of Public Health and Informatics, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh. **Role: Consultant**

Projects (Completed/Ongoing)

- September 2022-August 2025 **Manitoba Education and Early Childhood Learning (MEECL) Project** Work Ongoing: Data Linkage, updating demand and supply distribution of Menstrual products to school divisions and status of women shelters, creating templates, mapping of product distribution for each initiative and reporting survey data. Institution Name: Social Innovation Office, Department of Families, Government of Manitoba
- September 2022-August 2025 **Mental Health and Addictions Evaluation** Work Completed: Indicator list selection for each initiative, creating templates, quantitative analysis of COVID 19 impacts for remote services of each initiative and data linkage for EDI and G-5 data. Institution Name: Social Innovation Office (Health Child Manitoba Office)
- May 2019-August 2019 **Simulation of Random and Fixed Effects model with Missing Completely at Random scenario** Work Completed: Statistical simulation in longitudinal data analysis using R and SAS Institution Name: Department of Community Health Sciences, University of Manitoba, Canada

May 2017-August 2017 **Prevalence and determinants of child abuse and neglect among working children** Work Completed: Developing sampling design and statistical models using R and SAS. Institution Name: Department of Public Health and Informatics, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh

■ Computing

Languages R, Python, LATEX

Tools RStudio

■ Language Proficiency

English Excellent in Speaking, Writing and Reading