

# Ibrahim Hossain Sajal

Email : [ihossain2@isrt.ac.bd](mailto:ihossain2@isrt.ac.bd)

Mobile : +1-682-232-8791

LinkedIn : [IHSajal](#)

Website : [ihajal.github.io](https://ihajal.github.io)

## EDUCATION

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### PhD in Data Science & Statistics

*School of Natural Science and Mathematics, University of Texas at Dallas*

*Aug. 2019 – Dec. 2024*

### Masters in Applied Statistics

*Institute of Statistical Research and Training, University of Dhaka*

*Jan. 2017 – Dec. 2017*

### Bachelors in Applied Statistics

*Institute of Statistical Research and Training, University of Dhaka*

*Jan. 2013 – Dec. 2016*

## PROFESSIONAL EXPERIENCE

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### Postdoctoral Fellow

*Jan. 2025 – Present*

*Division of Cancer Epidemiology & Genetics, National Cancer Institute, National Institutes of Health*

- Investigated proteomic intermediaries linking risk factors to renal cancer using two-stage Mendelian Randomization (MR), complemented by mediation analysis, cis-MR, colocalization, and differential gene expression.
- Developed and implemented pipelines for a summary-statistics based multivariate test by aggregating multiple tests with complementary strength in capturing genetic association.
- Conducted multivariate analyses to identify associations with pan-cancer phenotypes, protein modules (WGCNA), and predefined pathways from KEGG and Hallmark.
- Identified pan-cancer associations with protein modules using Bayesian Non-Negative Matrix Factorization (BNMF) and ClustImpute.

### Graduate Research Assistant

*Aug. 2019 – Dec. 2024*

*School of Natural Science and Mathematics, University of Texas at Dallas*

- **CBCRisk-Black - Contralateral breast cancer (CBC) risk prediction model for black women.**
  - \* Developed a relative risk model for CBC using matched LASSO logistic regression on BCSC data, and performed survival analysis on SEER data to estimate absolute risks.
  - \* Validated the CBCRisk-Black model through six-fold cross-validation, achieving a 10% increase in the area under the ROC curve compared to the existing CBCRisk model for 3- and 5-year predictions.
  - \* Implemented multivariate imputation by chained equations (MICE) to ensure robustness of CBCRisk-Black and created an R package for accessibility by patients, clinicians, and researchers.
- **CBCRisk-Mastectomy - CBC risk prediction tool for contralateral prophylactic mastectomy (CPM) decision making.**
  - \* Developed CBC risk prediction model using only the pre-surgical (mastectomy) risk factors. With risk estimates from this model, a BC patient who is about to undergo mastectomy can decide whether to undergo CPM at the same time.
- **Genetic association test - bivariate QBL:** Detecting common and rare genetic association with two correlated phenotypes.
  - \* Applied Bayesian LASSO to regularize regression coefficients, enhancing the detection of associated haplotypes by leveraging a latent variable to model the correlation between two phenotypes.
  - \* Estimated the posterior distribution using MCMC and calculated Bayes factors to identify haplotype effects, achieving significant performance improvements in bivariate QBL over the existing association test, Haplo.score.
  - \* Conducted extensive simulations and analyzed GAW 19 exome sequencing data to uncover rare haplotypes associated with systolic and diastolic blood pressures.
- **Multivariate genetic association test:**
  - \* Developing a multivariate version of the bivariate QBL test using an efficient machine learning tool, Variational Inference, for approximation of the parameter distribution.
  - \* Investigating the statistical properties of the test using simulations and comparing its power to that of bivariate QBL.

## SCIENTIFIC PRESENTATIONS – INVITED TALKS

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- **Multivariate QBL for Detecting Rare Haplotype Association with Correlated Phenotypes using Variational Bayes approach.**  
*Joint Statistical Meetings (JSM), Nashville, TN* Aug. 2025.
- **Meta-trans: A generalized summary statistics-based aggregative approach to identify trans-regulation of gene-sets by disease related variants.**  
*STATGEN 2026: Conference on Statistics in Genomics and Genetics, Atlanta, GA – (Currently under review)* May 2026

## POSTER PRESENTATIONS

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- **Integrative analysis identifies potential proteomic intermediates associated with renal cell carcinoma and its risk factors.**
  - \* *American Association for Cancer Research (AACR), San Diego, CA – (Accepted as Poster)* Apr. 2026
  - \* *National Institutes of Health Research Fair, Bethesda, MD* Sep. 2025
- **Bivariate QBL for Detecting Rare Haplotype Association with Two Correlated Phenotypes.**
  - \* *Advances in Statistical and Computational Methods for Analysis of Biomedical, Genetic, and Omics Data (ABGOD), Dallas, TX* Mar. 2023
  - \* *Southern Regional Council on Statistics (SRCOS), Jekyll Island, GA* Sep. 2022

## PUBLICATIONS

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1. **IH. Sajal**, A. Song, K. Brown, M. Machiella, P. Kraft, S. Chanock, M. Purdue, and D. Dutta (2026) *Integrative analysis prioritizes proteins associated to renal cell carcinoma and its risk factors*, **currently under reiew.**
2. **IH. Sajal**, R. Pfeiffer, I. Jatoi, M. Gail, R. Cecchini, P. Choudhary, and S. Biswas, (2026) *CBCRisk-Mastectomy: A Risk Prediction Tool to Aid for Contralateral Prophylactic Mastectomy Decision Making*, **currently under reiew.**
3. **IH. Sajal** and S. Biswas, (2023), *Bivariate Quantitative Bayesian LASSO for Detecting Association of Rare Haplotypes with Two Correlated Continuous Phenotypes*, *Frontiers in Genetics*, 14.
4. **IH. Sajal**, M. Chowdhury, T. Wang, D. Euhus, P. Choudhary, and S. Biswas, (2022), *CBCRisk-Black: A Personalized Contralateral Breast Cancer Risk Prediction Model for Black Women*, *Breast Cancer Research and Treatment*, 194(1):179-86.
5. R. Das Gupta, M. Akonde, **IH. Sajal**, A. Kibria, G. Muhammed, (2021), *Association between height and hypertension among US adults: analyses of National Health and Nutrition Examination Survey 2007–18*, *Clinical Hypertension*, 27(1), 1-12.
6. A. Talukder, R. Das Gupta, MR. Hashan, SS. Haider, **IH. Sajal**, M. Sarker, (2021), *Association between television viewing and overweight and obesity among women of reproductive age in Timor- Leste: evidence from the demographic health survey 2016*, *BMJ Open*, 11(8), e045547.
7. R. Das Gupta, M. Jahan, M. Hasan, I. Sutradhar, **IH. Sajal**, SS. Haider, M. Sarker, (2020), *Factors associated with tobacco use among Nepalese men aged 15–49 years: data from Nepal demographic and Health Survey 2016*, *Clinical Epidemiology and Global Health*, 8(3), 748-757.
8. R. Das Gupta, SS. Haider, I. Sutradhar, MR. Hashan, **IH. Sajal**, M. Sarker, (2019), *Association of frequency of television watching with overweight and obesity among women of reproductive age in India: evidence from a nationally representative study*, *PloS one*, 14(8), e0221758.
9. R. Das Gupta, SS. Haider, MR. Hashan, M. Hasan, I. Sutradhar, **IH. Sajal**, H. Joshi, MR. Haider, M. Sarker, (2019), *Association between the frequency of television watching and overweight and obesity among women of reproductive age in Nepal: analysis of data from Nepal Demographic Health survey 2016*, *PloS one*, 15(2), e0228862.
10. R. Das Gupta, **IH. Sajal**, M. Hasan, I. Sutradhar, MR. Haider, M. Sarker, (2019), *Frequency of television viewing and association with overweight and obesity among women of the reproductive age group in Myanmar: results from a nationwide cross-sectional survey*, *BMJ Open*, 9(3), e024680.

## TECHNICAL SKILLS

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**Data Analysis:** R, Python, SAS, STATA, MATLAB

**Programming Language:** C++

**Data management:** SQL, Linux commands, HPC environment, Bash scripts, AWS

**Documentation:** Latex, Microsoft Word, Excel, PowerPoint

**Reference management:** Endnote, Mendeley

## SCHOLARSHIPS AND AWARDS

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- **Fellows Award for Research Excellence** – *National Institutes of Health* Jul. 2025
- **Mei Lein Fellowship** – *University of Texas at Dallas* May 2023, May 2022
- **Travel Award** – *Advances in Statistical and Computational Methods* Jan. 2023  
for Analysis of Biomedical, Genetic, and Omics Data, Dallas, TX
- **Boyd Harshburger Travel Award** – *Southern Regional Conference on Statistics, Jekyll Island, GA* Sep. 2022
- **PhD Research Small Grant Program** – *University of Texas at Dallas* May 2022
- **Summer Institute in Statistical Genetics Scholarship** – *University of Washington* May 2021
- **Academic Excellence Award** – *University of Dhaka, Bangladesh* Dec. 2017

## TRAINING AND WORKSHOPS ATTENDED

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- **Python for Data Science Workshop** *University of Texas at Dallas* Jul. 2022
- **Summer Institute in Statistical Genetics** *University of Washington* Jul. 2021  
Module: Introduction to Genetics and Genomics, Genetic Epidemiology, MCMC for Genetics.

## VOLUNTEER EXPERIENCES

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- **Advances in Statistical and Computational Methods**  
**for Analysis of Biomedical, Genetic, and Omics Data.** *Dallas, TX* Mar. 2023
- **Florence Nightingale Day** (Event to promote statistics to school-going students.) *Dallas, TX* Oct. 2022, Oct. 2021
- **Global Conference on Implementation Science (GCIS)** *Dhaka, Bangladesh* Jun. 2019
- **International Conference on Applied Statistics (ICAS)** *Dhaka, Bangladesh* Dec. 2014

## PROFESSIONAL AFFILIATION

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- Member - **American Statistical Association** Jun. 2021 - present
- Associate Member - **American Association for Cancer Research** Jan. 2026 - present

## MEDIA APPEARANCES

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- [www.keranews.org/health-wellness/2022-10-28/ut-dallas-racial-disparities-breast-cancer-survivor-risk-screening](http://www.keranews.org/health-wellness/2022-10-28/ut-dallas-racial-disparities-breast-cancer-survivor-risk-screening)
- [magazine.utdallas.edu/2022/10/20/utd-researchers-address-racial-disparity-in-breast-cancer-risk-assessment/](http://magazine.utdallas.edu/2022/10/20/utd-researchers-address-racial-disparity-in-breast-cancer-risk-assessment/)
- [nsm.utdallas.edu/biswas-tool-black-breast-cancer-survivors/](http://nsm.utdallas.edu/biswas-tool-black-breast-cancer-survivors/)