

## MD SHAMIM SARKER (WARASI\*)

\*Md Shamim Sarker is currently publishing under Md S. Warasi

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### EDUCATION

2016	Ph.D. in Statistics Advisor: Joshua M. Tebbs	University of South Carolina, Columbia, SC
2011	M.S. in Mathematics Advisor: Kumer Pial Das	Lamar University, Beaumont, TX
2005	B.S. in Mathematics	Jahangirnagar University, Bangladesh

### PROFESSIONAL EXPERIENCE

2023 – present	Associate Professor, Department of Mathematics and Statistics, Radford University
2016 – 2023	Assistant Professor, Department of Mathematics and Statistics, Radford University
2011 – 2016	Teaching Assistant, Department of Statistics, University of South Carolina
2008 – 2011	Teaching/Research Assistant, Department of Mathematics, Lamar University

### CURRENT RESEARCH INTERESTS

Group testing (pool testing), measurement error models, latent model misspecification, statistical computing, applications in biology, epidemiology, and public health.

### REFEREED PUBLICATIONS

- **Warasi, M.** and Das, K. 2024. Optimizing disease surveillance through pooled testing with application to infectious diseases. *Journal of Agricultural, Biological, and Environmental Statistics*. Published online: September 02, 2024. Available at [\[SpringerLink\]](#), [\[ShinyApp\]](#)
- **Warasi, M.** 2024. Group testing models. *International Encyclopedia of Statistical Science*, in press.
- **Warasi, M.**, Tebbs, J., McMahan, C., and Bilder, C. 2023. Estimating the prevalence of two or more diseases using outcomes from multiplex group testing. *Biometrical Journal*, 2200270. [\[PublishedArticle\]](#), [\[GitHub\]](#)
- **Warasi, M.** 2023. groupTesting: An R package for group testing estimation. *Communications in Statistics-Simulation and Computation*. **52**, 6210-6224. [\[Taylor&FrancisLink\]](#), [\[AcceptedManuscript\]](#), [\[R-package\]](#)
- **Warasi, M.**, Hungerford, L., and Lahmers, K. 2022. Optimizing pooled testing for estimating the prevalence of multiple diseases. *Journal of Agricultural, Biological, and Environmental Statistics*. Published online on August 12, 2022. [\[SpringerLink\]](#), [\[ShinyApp\]](#)
- Huang, X. and **Warasi, M.** 2017. Maximum likelihood estimators in regression models for error-prone group testing data. *Scandinavian Journal of Statistics*, **44**, 918-931. [\[WileyAccess\]](#), [\[GitHub\]](#)
- **Warasi, M.**, McMahan, C., Tebbs, J., and Bilder, C. 2017. Group testing regression models with dilution submodels. *Statistics in Medicine*, **36**, 4860-4872. [\[PubMed\]](#), [\[GitHub\]](#)
- **Warasi, M.**, Tebbs, J., McMahan, C., and Bilder, C. 2016. Estimating the prevalence of multiple diseases from two-stage hierarchical pooling. *Statistics in Medicine*, **35**, 3851-3864. [\[PubMed\]](#), [\[GitHub\]](#)

### OTHER PUBLICATIONS

- Das, K. and **Sarker, S.** 2009. A review of Panjer's recursion for evaluation of compound negative binomial distribution using R. *JSM Proceedings*, Statistical Computing Section. Alexandria, VA: American Statistical Association, 1121-1131.

- Das, K., **Sarker, S.**, and Diawara, N. 2011. Further review of Panjer's recursion for evaluation of compound negative binomial distribution using R. *Missouri J. Math. Sci. (MJMS)*, **23**, 182-191.
- **Warasi, M.** 2018. Problems [Prob-Feb18](#), [Prob-Jun18](#), [Prob-Oct18](#) and solutions [Soln-Feb18](#), [Soln-Jun18](#), [Soln-Oct18](#) for Problem Corner at *The Electronic Journal of Mathematics & Technology*.

#### MANUSCRIPTS IN REVIEW/PREPARATION

- **Warasi, M.** 2024+. Robust optimization of group testing estimation problems.
- **Warasi, M.** and Tebbs J. 2024+. Bayesian regression models for group testing in the presence of dilution effects.
- **Warasi, M.**, Tebbs, J., and Hungerford, L. 2024+. Pooled testing regression with measurement error.

#### GRANTS FUNDED

- Radford University SEED Grant Program. 2017. *Group testing regression models in the presence of dilution effects*. Total award: \$5,000. Role: PI.
- Radford University Faculty Research Program. 2018. *Using hierarchical group testing to estimate the prevalence of multiple diseases*. Total award: \$6,700. Role: PI.
- Radford University Summer Undergraduate Research Fellowship Supplement. 2019. *Estimating the prevalence of infectious diseases through pooled sample testing*. Total award: \$3,053. Role: Mentor.
- Radford University Summer Undergraduate Research Fellowship Supplement. 2021. *The efficiency of multistage pooling in estimating the prevalence of multiple infections*. Total award: \$3,153. Role: Mentor.
- Radford University Summer Undergraduate Research Fellowship Supplement. 2023. *Optimizing the prevalence of multiple infections using adaptive group testing*. Total award: \$3,553. Role: Mentor.

#### GRANTS NOT FUNDED

- NIH R15. 2019. *Optimality in group testing with application to infectious disease surveillance*. Total budget: \$396,835. Impact Score: 52. Role: PI. Not funded.

#### SOFTWARE CONTRIBUTION

- [groupTesting](#): An R package for group testing estimation problems.
- [multGT-app](#): A Shiny application for "Optimizing pooled testing for estimating the prevalence of multiple diseases."
- [General-MultiplexBayes](#): Repository for "Estimating the prevalence of two or more diseases using outcomes from multiplex group testing."
- [RegDilution](#): Repository for "Group testing regression models with dilution submodels."
- [RegOptimalGT](#): Repository for "Maximum likelihood estimators in regression models for error-prone group testing data."
- [MultiplexBayes](#): Repository for "Estimating the prevalence of multiple diseases from two-stage hierarchical pooling."

#### UNDERGRADUATE STUDENTS MENTORED

- Lauren Craddock
- Dakota Hirmer
- Carlos Wilensky
- David Laird
- Jordan Coomes
- Sarah Church
- Katherine Bindbeutel
- Samuel Farrell

## **JOURNAL REFEREE**

- BMC Bioinformatics
- Statistical Methods in Medical Research (2)
- Metrika
- Statistics in Medicine (5)
- F1000Research
- Energy
- Physica A
- REVSTAT (3)
- Journal of Statistics Education
- Statistics Education Research Journal
- Electronic Journal of Mathematics and Technology (6)
- Journal of Statistical Theory and Practice (3)
- Ecology and Evolution
- International Encyclopedia of Statistical Science

## **BOOK REVIEW**

- A data science book published by the Cambridge University Press.

## **RESEARCH PRESENTATIONS (STUDENTS UNDERLINED)**

- Optimizing disease surveillance through pooled testing with application to infectious diseases. JSM 2024, Portland, Oregon. Oral presentation by Kumer P. Das.
- Robust optimization techniques for disease prevalence estimation in pooled testing scenarios. Asian Technology Conference in Mathematics, December 2023, Virtual Conference. Oral presentation by Md S. Warasi.
- Optimizing pooled testing for efficient surveillance of infectious diseases. Summer Research Celebration 2023, Radford University. Poster presentation by Lauren Craddock.
- Optimizing disease prevalence estimation using adaptive group testing. ENAR Spring Meeting, Nashville, TN, March 2023. Oral presentation by Md S. Warasi.
- Bayesian pooled testing regression with measurement error. AISC 2022, Greensboro, NC, October 2022. Oral presentation by Md S. Warasi.
- The science of actuaries: The effects of location & occupancy type on the total amount claimed to the NFIP due to flooding. Honors Capstone, Radford University, April 2022. Poster presentation by Dakota Hirmer.
- Exploring the efficiency of multistage pooled testing models using R. ENAR Spring Meeting, Houston, TX, March 2022. Oral presentation by Md S. Warasi. Rules for the pool: Optimizing testing for populations and individuals. CRWAD, Chicago, IL, December 2021. Oral presentation by Laura Hungerford.
- Optimizing pooled testing for determining prevalence and/or identifying infected individuals. AAVLD, Denver, Colorado, October 2021. Presented by Laura Hungerford.
- The efficiency of multistage pooling in estimating the prevalence of multiple infections. JSM, August 2021, Virtual Conference. Speed presentation by Carlos Wilensky.
- Group testing estimation using R. ENAR Spring Meeting, March 2021, Virtual Conference. Speed presentation by David Laird.
- Pooled testing regression with measurement error. ENAR Spring Meeting, March 2021, Virtual Conference. Oral presentation by Md S. Warasi.
- Group testing estimation using R. Asian Technology Conference in Mathematics, December 2020, Virtual Conference. Invited oral presentation by Md S. Warasi.

- Statistical analysis on the effects of timeouts in volleyball. Winter Creative Arts & Research Days, Radford University, November 2020. Oral presentation by Jordan Coomes.
- Bias and efficiency in group testing estimation for infectious disease surveillance. ENAR Spring Meeting, Nashville, TN, March 2020. Poster presentation by Katherine Bindbeutel.
- On the optimality of disease surveillance through hierarchical pooling. ENAR Spring Meeting, Nashville, TN, March 2020. Poster presentation by Sarah Church.
- Bias and efficiency in group testing estimation for infectious disease surveillance. Summer Research Celebration, Radford University, October 2019. Poster presentation by Katherine Bindbeutel.
- Optimal estimation of the disease prevalence using two-stage hierarchical pooling. Student Engagement Forum, Radford University, April 2019. Poster presentation by Samuel Farrell.
- Optimality in group testing estimation with misclassification. Joint Statistical Meetings, Denver, Colorado, July 2019. Oral presentation by Md S. Warasi.
- Group testing estimation for multiple infections with adjustments for dilution effects. ENAR Spring Meeting, Philadelphia, Pennsylvania, March 2019. Oral Presentation by Md S. Warasi.
- Measurement error models for group testing data. ENAR Spring Meeting, Atlanta, Georgia, March 2018. Oral presentation by Md S. Warasi.
- Bayesian regression models for group testing in the presence of dilution effects. Joint Statistical Meetings, Baltimore, August 2017. Oral presentation by Md S. Warasi.
- Using hierarchical group testing to estimate the prevalence of multiple diseases. ENAR Spring Meeting, Washington, D.C., March 2017. Poster presentation by Md S. Warasi.
- Group testing regression models with dilution submodels. Latent Variables 2016, University of South Carolina, Columbia, October 2016. Poster presentation by Md S. Warasi.
- Group testing regression with dilution submodels. Joint Statistical Meetings, Seattle, August 2015. Oral presentation by Md S. Warasi.
- Estimating the prevalence of multiple diseases via two-stage hierarchical pooling. ENAR Spring Meeting, Miami, March 2015. Oral presentation by Md S. Warasi.
- Group testing regression with dilution submodels. South Carolina Chapter of the American Statistical Association Meeting, Columbia, March 2015. Oral presentation by Md S. Warasi.
- Estimating the prevalence of multiple diseases via two-stage hierarchical pooling. South Carolina Chapter of the American Statistical Association Meeting, Clemson, November 2014. Poster presentation by Md S. Warasi.
- Bayesian inference on prevalence and diagnostic test accuracy with group testing data for multiple infections. Department of Statistics, University of South Carolina, November 2013. Oral presentation by Md S. Warasi.
- Maximum likelihood estimators in regression models for error-prone group testing data. Department of Statistics, University of South Carolina, April 2013. Oral presentation by Md S. Warasi.
- Further review of Panjer's recursion for evaluation of compound negative binomial distribution using R. Conference of Texas Statisticians, College Station, March 2011. Poster presentation by Md S. Warasi.
- A review of Panjer's recursion for evaluation of compound negative binomial distribution using R. South Regional Council on Statistics, Virginia, June 2010. Poster presentation by Md S. Warasi.
- A review of Panjer's recursion for evaluation of compound negative binomial distribution using R. Joint Statistical Meetings, Washington, D.C., August 2009. Oral presentation by Kumer P. Das.

#### **HONORS AND AWARDS**

- 2016           Travel Grant, NSF and University of South Carolina
- 2015           Citizenship Award, University of South Carolina

- 2015 Travel Grant, University of South Carolina
- 2015 Travel Grant, University of South Carolina
- 2014 Travel Grant, University of South Carolina
- 2014 Citizenship Award, University of South Carolina
- 2008 Dean Scholarship, Lamar University
- 2008 Travel Grant, Swedish Bangladesh Trust Fund

## COURSE DEVELOPMENT

- **STAT 480 – Modern Estimation Techniques (Special Topics).** I developed this course with the goal of preparing undergraduate students for statistical research and graduate studies. This covers a number of important topics in computing, estimation, and statistical analysis, including the basics of R and FORTRAN programming, Monte Carlo integration, maximum likelihood estimation, Bayesian estimation, and logistic regression. I taught this course in Spring 2019.
- **STAT 480 – Actuarial Science and Financial Mathematics (Special Topics).** The actuarial profession is among the highest-paid jobs in the U.S. and is in high demand among students. Motivated by this, Dr. Tingyao Xiong and I jointly developed this course with the goal of preparing students for two actuarial tests: SOA/CAS Exam P/1 and SOA/CAS Exam FM (Financial Mathematics). This course is designed to cover the exam topics thoroughly and to solve numerous problems in preparation for these exams. We taught this course in Fall 2024.

## TEACHING

- **Radford University**

<u>Course</u>	<u>Semester</u>
STAT 200: Introduction to Statistics	Fall 16, 22 – 24; Spring 17, 20 – 24; Summer 17, 18, 21 – 24
STAT 301: Probability and Statistics I	Fall 17, 18, 20; Spring 17 – 24
STAT 302: Probability and Statistics II	Summer 17
STAT 330: Statistical Packages (R Progm.)	Fall 19 – 24; Spring 18, 19
STAT 420: Modern Regression Analysis	Fall 17 – 24; Spring 19
STAT 421: Design of Experiments	Fall 19; Spring 18 – 24
STAT 480: Modern Estimation Techniques	Spring 19
STAT 480: Actuarial Sc. and Financial Math	Fall 24
STAT 498: Independent Study in Statistics	Fall 17; Spring 19, 20; Summer 18

- **University of South Carolina**

<u>Course</u>	<u>Semester</u>
STAT 201: Elementary Statistics	Fall 12 – 15; Spring 13, 14, 16
STAT 509: Statistics for Engineers	Spring 15; Summer 14
MATH/STAT 511: Probability	Summer 15
STAT 516: Statistical Methods II	Summer 16

## CONSULTING EXPERIENCE

2013 Summer consultancy in Stat Lab, University of South Carolina

## UNIVERSITY/DEPARTMENTAL SERVICE

- Library Liaison 2023 - present
- Mentor, Accelerated Research Oppr. (ARO) 2019 – 2021
- Member, Scholarship Committee 2016 – present
- Member, Statistics Committee 2016 – present
- Member, Faculty search Committee 2017

- Member, Curriculum Committee 2017, 2019 – 2024
- Member, ACSAT Scholarship & Awards 2019, 2020

**PROFESSIONAL MEMBERSHIP**

- American Statistical Association 2014 – present
- American Mathematical Society 2021
- International Biometric Society 2014 – 2016, 2020 – 2021
- South Carolina Amer. Stat. Association 2013 – 2016
- American Mathematical Society 2008 – 2010