

Statistics at RTI International

For more than 50 years, statistics research has been one of RTI International's core specialties. It has helped define the institute as a global thought leader by providing collaborative and innovative approaches to the statistical design and analysis of research data and by applying statistical knowledge to research practice.

Past, Present, and Future of Statistics at RTI

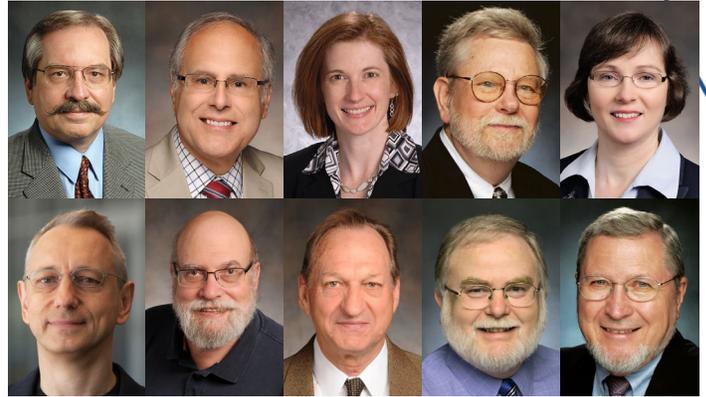
Statistics, and the quality and ingenuity of our statisticians and their work, served as the driving force behind RTI's evolution from a locally known institute to an internationally recognized research powerhouse. Gertrude Cox, a statistician at RTI, served as a trailblazer for mathematicians, statisticians, and women.

Currently, statisticians play key roles on nearly every project at RTI. Although many of our statisticians work on surveys, a key RTI strength, statisticians also collaborate on projects in neonatal research, clinical studies, impact evaluation, education, health care, and more.

Our highly skilled statisticians understand the impact that big data and complex data will have in the future of the field. Our statisticians have developed important methods for collecting, processing, and analyzing data in big data quantities. Equally, RTI statisticians analyze data of substantial diversity, including survey responses, images, social media text, and computer model output.

Statistical Staff

Our statistical staff are a key driver behind RTI's success. RTI has more than 200 statisticians collaborating on hundreds of projects each year in multidisciplinary research efforts. Nine current RTI statisticians have been recognized by their peers as having made outstanding contributions to the field of statistics by being named Fellows of the American Statistical Association (ASA). The ASA is a leading professional association for statistics consisting of academia, government,



and industry leaders from more than 90 countries. The ASA supports the development, application, and dissemination of statistical science through publications, meetings, education, and advocacy.

Survey Statistics

RTI is well known for its survey capabilities, and our survey statisticians focus on the design and administration of high-quality, cost-effective local, regional, national, and international surveys using different modes of data collection (in-person, mail, and both computer-assisted telephone and personal interviewing) with diverse target populations (individuals, households, schools, hospitals, and companies). The surveys may be based on traditional area household samples, telephone samples, address-based samples, or list samples. We use stratification and clustering to produce samples that are both statistically efficient and cost-effective. Analytical procedures include design-based, model-based, and model-assisted methods. RTI statisticians develop and manage RTI's proprietary SUDAAN® software, a widely used package for analyzing cluster-correlated data. Powerful paradigms, such as total survey error, have originated in part at RTI.

In the well-known area of survey sampling and analysis, our statisticians are particularly noted for their consistently stellar work on the National Survey on Drug Use and Health (NSDUH) conducted by RTI since 1988. NSDUH data support research into substance abuse and mental health, as well as the design and evaluation of treatment and prevention programs. RTI has led development of small-area estimation techniques for NSDUH, which enable fine-grained geographical insights.

Biostatistics and Epidemiology

RTI's biostatisticians and epidemiologists have demonstrated success with implementing and managing data coordinating centers (DCCs), working with multisite research study sponsors and clinical investigators to design and implement clinical and behavioral epidemiological studies, clinical trials, and disease registries. We have served as the DCC for a large array of clients, supporting more than 25 multisite studies that include a strong portfolio in HIV/AIDS, maternal and child health, obesity, disability, substance abuse, and other public health challenges. We provide statistical guidance in study design and analysis, including application of cutting-edge statistical methods in the areas of biomarkers, quality of life, imaging, proteomics, genomics, epigenetics, and metabolomics data. Our biostatisticians and epidemiologists are committed to building transdisciplinary collaborations across RTI to work toward a greater understanding of how a disease, disability, or disorder develops and responds to treatments.

Data Science

The field of statistics is on the cusp of an exciting new era, with more access to data and information than ever thought possible. RTI statisticians are again on the forefront, developing new methodologies and technologies that advance the field and improve the human condition.

At RTI, we approach data science through a powerful combination of thoughtful design, problem solving, analytic rigor, and rapid implementation. This—in combination with a leaning toward big data, innovative statistical and machine learning techniques, and open source tools—is how we define “data science.”

We focus on solving problems in the social, statistical, environmental, health, and discovery sciences. Our data scientists and subject matter experts collaborate on research endeavors for government, commercial, and foundation clients. We provide technical know-how and creative leadership at each stage of the project, starting with ideation and design and continuing with analysis and reporting, with the ultimate goal of delivering realistic solutions.



Statistical Modeling and Analysis

RTI has broad capabilities to explore, visualize, analyze, model, and interpret data of all types. We work with clients to transform data into information, insight, knowledge, and action. Our expertise lies in the analysis of complex survey data, predictive modeling, machine learning, data integration, spatial statistics, and uncertainty quantification. We have additional expertise in visual interfaces that increase the visibility, flexibility, and accessibility of complex, large datasets. RTI staff members are fluent in the entire range of modern statistical methods, such as latent variable models, linear and nonlinear mixed-effects models, Bayesian methods, and techniques for protecting confidential data. The RTI Center of Excellence for Complex Data Analysis and the RTI Center for Data Science focus and catalyze activities in contexts where traditional statistical methods do not adapt readily.

More Information

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