

# WSS



## 2024 Gertrude M. Cox Lecture and Reception

Sponsored by the Washington Statistical Society and RTI International

**When:** Wednesday, May 29<sup>th</sup>, 2024  
3:00 – 5:00 PM

**Where:** Mathematica Conference Center (Virtual option available)  
1100 First ST NE, 12<sup>th</sup> Floor  
Near Noma-Gallaudet Metro Station (Red Line) or PMI Parking Garage

**In-Person Registration (EventBrite):** <https://www.eventbrite.com/e/2024-washington-statistical-society-gertrude-m-cox-lecture-and-reception-tickets-899394883307?aff=oddtcreator>

**Remote Registration (WebEx):**  
<https://mathematicaorg.webex.com/weblink/register/r2de6893b181edda499e2d847064e7fa9>

### The Missing Link: Establishing the Parallels Between Censored Covariate and Missing Data



**Tanya Garcia** is the 2024 Gertrude M. Cox Award recipient. Dr. Garcia is an Associate Professor of Biostatistics, Provost Distinguished Faculty Leader, and Tyson Academic Leader at the University of North Carolina at Chapel Hill (UNC-CH). For over a decade, she has led a transdisciplinary research team of statisticians and neuroscientists toward designing robust statistical methods for neurodegenerative diseases. Dr. Garcia combines her excitement for modeling with her interest in training the next generation of (bio)statisticians to embrace a growth mindset and tackle obstacles without judgment or fear. How she mentors this

next generation is largely motivated by 500+ hours of grantsmanship and leadership training. Her desire for every mentee to achieve success and fulfillment drives her every leadership decision. These decisions have led Dr. Garcia to not only maintain continuous

funding of multiple grants as Principal Investigator from the National Institutes of Health, but also coach thirty-four mentees and counting to achieve over 70 awards, grants, and fellowships. In addition to the 2024 Gertrude M. Cox Award, Dr. Garcia has also received numerous competitive awards, including the 2022 Carolina Women's Leadership Council Faculty Mentoring Award from UNC-CH.

**Abstract:** While right-censored time-to-event outcomes have been studied for decades, handling time-to-event covariates, also known as censored covariates, is now of growing interest. So far, the literature has treated right-censored covariates as distinct from missing covariates, overlooking the potential applicability of estimators across both scenarios. We bridge this gap by establishing connections between right-censored and missing covariates under various assumptions about censoring and missingness, allowing us to identify parallels and determine when estimators can be transferred between the two contexts. This connection reveals five new estimators for right-censored covariates in the unexplored area of informative covariate censoring, where the event time depends on censoring time. We evaluate the robustness of these five estimators under incorrect distributional assumptions and establish efficiency comparisons. We further present their asymptotic properties and propose a hypothesis test for assessing if the covariate censoring is informative or not. Empirical studies demonstrate the robustness and efficiency properties of each estimator. All estimators are applied to a Huntington disease observational study to analyze cognitive impairment as a function of time to clinical diagnosis.

### **About the Gertrude M. Cox Award**

The Gertrude M. Cox Award is sponsored by the Washington Statistical Society and RTI International and is in memory of Gertrude M. Cox (1900-1978). The Award annually recognizes a statistician in early to mid-career (less than 15 years after terminal degree) who has made significant contributions to one or more of the areas of applied statistics in which Gertrude Cox worked: survey methodology, experimental design, biostatistics, and statistical computing.

In 1945, Dr. Cox became director of the Institute of Statistics of the Consolidated University of North Carolina. In the 1950's, as Head of the Department of Experimental Statistics at North Carolina State College (later renamed to North Carolina State University), she played a key role in establishing Mathematical Statistics and Biostatistics Departments at the University of North Carolina. Upon her retirement from North Carolina State University in 1960, Dr. Cox became the first head of the Statistical Research Division at the newly founded RTI. She was a founding member of the International Biometric Society (IBS) and in 1949 became the first woman elected to the International Statistical Institute. She served as president of both The American Statistical Association (1956) and the IBS (1968-69). In 1975 she was elected to the National Academy of Sciences.