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Georgia Southern Examines the Overlap Measure as Alternative to Youden Index

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The receiver operating characteristic (ROC) curve is frequently used to evaluate and compare diagnostic tests. As one of the ROC summary indices, the Youden index measures the effectiveness of a diagnostic marker and enables the selection of an optimal threshold value (cut-off point) for the marker. Recently, the overlap coefficient, which captures the similarity between 2 distributions directly, has been considered as an alternative index for determining the diagnostic performance of markers. In this case, a larger overlap indicates worse diagnostic accuracy, and vice versa.

This paper provides a graphical demonstration and mathematical derivation of the relationship between the Youden index and the overlap coefficient and states their advantages over the most popular diagnostic measure, the area under the ROC curve. Furthermore, we outline the differences between the Youden index and overlap coefficient and identify situations in which the overlap coefficient outperforms the Youden index. Numerical examples and real data analysis are provided.

"Notes on the overlap measure as an alternative to the Youden index: How are they related?," was recently published in Statistics in Medicine.

Dr. Hani Samawi, professor of biostatistics at the Jiann-Ping Hsu College of Public Health Georgia Southern University (JPHCOPH), was the lead author. JPHCOPH's Dr. Jingjing Yin, assistant professor of biostatistics, Dr. Haresh Rochani, assistant professor of biostatistics, and Viral Panchal, alumni, were co-authors.
Mitchell Gail Receives the Karl Peace Award from ASA

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Mitchell H. Gail, M.D., Ph.D., senior investigator in the Biostatistics Branch, received the 2017 Karl E. Peace Award for Outstanding Statistical Contributions for the Betterment of Society from the American Statistical Association at the recent Joint Statistical Meetings in Baltimore, Maryland.

The award recognizes Dr. Gail’s seminal contributions to the development of statistical methodology and their application to epidemiology and clinical medicine, particularly risk prediction, HIV incidence estimation, genetic epidemiology, and the design, execution, and analysis of cancer treatment and prevention trials. Notable is his work to develop the landmark Breast Cancer Risk Assessment Tool, also known as the Gail Model, which is widely used in counseling women on their risk of breast cancer.

In addition, Dr. Gail’s contributions have been recognized with his election to the National Academy of Medicine and the Marvin Zelen Leadership Award in Statistical Science. He is also a fellow of the American Statistical Association.

Established in 2012, this award is given yearly to a statistical scientist whose professional contributions have made seminal contributions with important societal impact. It is one of the most prestigious awards given by the American Statistical Association.

Previous honorees are:

- **Marvin Zelen, Harvard University**, who was recognized in 2012 for outstanding statistical contributions and dedication to the establishment of collaborative partnerships between biostatistical and clinical sciences-particularly in the design, conduct, and analysis of clinical trials and cancer screenings-and for visionay international professional leadership.

- **Fritz Schueren, University of Chicago**, who was recognized in 2012 for an exemplary career that has translated impressive statistical contributions into support of humankind, particularly through extensive international human rights work, and for effective leadership and advocacy in the promotion of volunteerism among ASA members.

- **Richard Simon, National Cancer Institute**, who was recognized in 2013 for contributions that have played a pivotal role in bridging the gap among statistics, clinical research and translational medicine to improve human health.

- **Gary Koch, University of North Carolina**, who was recognized in 2014 for exemplary scholarly research, teaching, and practice leading to improving public health, including a global impact on the design, analysis, and conduct of clinical trials in pharmaceutical regulation; for tireless efforts mentoring and leading students to fulfill their academic pursuits and promise; and for a philanthropic vision and commitment to his profession, universities, and students.

- **James Cochran, University of Alabama**, who was recognized in 2015 for tireless humanitarian efforts that leverage statistical training and expertise in the areas of international development and the world statistical community to improve the well-being of people across the globe; for outstanding leadership in consulting, instruction, and advancing statistical science in developing countries around the world; and for service and dedication to ASA committees, his students, and his profession.

- **Gary M. Shapiro of Statistics without Borders**, who was recognized in 2016 for his central role in the formation of- and ongoing volunteer mentoring in Statistics without Borders (SWB), an organization devoted to using statistics to further the development of human rights throughout the world. He was also recognized
for his devoted pro-bono work on developing a sampling scheme of police archives for evaluating police involvement in the disappearances and killing of Guatemalans.

- Ronald Brookmeyer of the University of California, Los Angeles, who was recognized in 2016 for his seminal methodological work in global health as it relates to disease monitoring; his work in biosurveillance as it relates to HIV/AIDS, Alzheimer's disease and biosecurity; and his contributions to training a generation of researchers about the importance of statistics in public health and increasing public awareness.