

PROMOTION RECOMMENDATION

The University of Michigan  
School of Public Health  
Department of Biostatistics

Brisa N. Sanchez, associate professor of biostatistics, with tenure, Department of Biostatistics, School of Public Health, is recommended for promotion to professor of biostatistics, with tenure, Department of Biostatistics, School of Public Health.

Academic Degrees:

Ph.D.	2006	Harvard University (Biostatistics)
M.Sc.	2003	Harvard University (Biostatistics)
M.S.	2001	University of Texas at El Paso (Statistics)
B.S.	2000	University of Texas at El Paso (Mathematics)

Professional Record:

2013 - present	Associate Professor, Department of Biostatistics, University of Michigan
2008 - 2013	Assistant Professor, Department of Biostatistics, University of Michigan
2006 - 2008	Research Assistant Professor of Biostatistics, University of Michigan

Summary of Evaluation:

**Teaching:** Professor Sanchez is an excellent, innovative teacher who has successfully taught a wide variety of courses. Since winter 2009, she has taught thirteen classes with generally excellent ratings. She has taught BIOSTAT 502/513, Application of Regression Analysis to Public Health Studies, five times, with the most recent Q1 and Q2 ratings of 3.50 and 4.92, respectively. Professor Sanchez has also taught BIOSTAT 540, Applied Statistics I: Linear Regression, three times with equally excellent evaluations (Q1: 4.63-4.67 and Q2: 4.73-4.82). Another course where she has done extremely well is BIOSTAT 699, a capstone course which challenges students to design rigorous analysis plans, apply them to real data to solve open questions in biostatistics, and interpret and present results. Professor Sanchez has chaired three completed doctoral dissertations, has served on an additional 30 doctoral committees, and currently funds five students. She has also served as a mentor for two K23 awardees.

**Research:** Professor Sanchez's body of work examines a number of interconnected and challenging problems. She has sought to enable holistic understanding of human health and disease outcomes. Specifically, she has studied the role of the environment, including the built-environment, of social-economic status and related disparities, and of public policy on human health. She has accomplished this using a variety of statistical approaches for modeling diverse datatypes, while allowing for correlated variables, spatial patterns, missing data and longitudinal measures. Professor Sanchez has been especially creative in the development, refinement and application of structural equation and latent variable models that allow one to combine many related, potentially noisy variables, to estimate the effects of an underlying unobserved parameter. She has a reputation for working with challenging datasets and interesting problems.

Professor Sanchez has a strong publication record, with a total of 137 peer-reviewed manuscripts, with 78 published (or in press) since her promotion to associate professor in 2013. She has published extensively in top tier journals, including the *American Journal of Epidemiology*, *Journal of the American Statistical Association*, *American Journal of Public Health*, and *Statistics in Medicine*. Many of Professor Sanchez's papers have already been widely cited. Her most highly cited papers

on statistical methodology include a review paper describing applications of structural equation models to environmental epidemiology (Sanchez et al, 2005, *Journal of the American Statistical Association*) and methods for studying the timing of vulnerability to environmental toxicants (Sanchez et al, 2011, *Environmental Health Perspectives*). Her collaborative work has also resulted in many additional highly cited papers, including an analysis of the clustering of fast-food restaurants around schools (Austin et al, 2005, *Am J Public Health*); an analysis of the relationship between neighborhood environment and obesity (Mujahid et al, 2008, *Am J Epidemiology*), and analysis of the relationship between neighborhood characteristics and diabetes risk (Christine et al, 2015, *JAMA Internal Medicine*).

Professor Sanchez has been well funded, including being the PI on a current RO1 grant that focuses on developing methods for assessing the health impact of neighborhood environments. In the fall of 2017, NSF awarded her a five-year grant as the co-PI.

#### Recent and Significant Publications:

- Wu M, Diez-Roux A, Raghunathan TE, Sanchez BN. (2017) FPCA-based method to select optimal sampling schedules that capture between-subject variability in longitudinal studies. *Biometrics*, doi: 10.1111/biom.12714. [Epub ahead of print]
- Sanchez BN, Kim S, Sammel M. (2017) Estimators for longitudinal latent exposure models: Examining measurement model assumptions. *Statistics in Medicine*, 36(13): 2048-2066.
- Sanchez BN, Wu M, Song PXX, Wang W. (2016) Study design in high-dimensional classification analysis. *Biostatistics*, 17(4): 722-736.
- Baek J, Sanchez-Vaznaugh EV, Sanchez BN. (2016) Hierarchical distributed lag models: Exploring varying geographic scale and magnitude in health-built environmental associations. *American Journal of Epidemiology*, 183(6): 583-592.
- Zhang Z, O'Neill MS, Sanchez BN. (2016) Using latent variable models with on-constant factor loadings to examine PM<sub>2.5</sub> constituent data. *Statistical Modelling*, 16(2): 91-113.

Service: Professor Sanchez has served on a number of departmental committees including the admissions committee and three search committees; she currently chairs the research track faculty affairs committee in biostatistics, in which she engages our research track faculty through discussions related to equity and inclusion. She is an elected member of the SPH executive committee. At the University level, she serves as an elected member of the University of Michigan Senate Assembly (2016-2018), and recently she has served on the provost's Faculty Advisory Committee.

At the national and/or international level, Professor Sanchez currently serves as an associate editor of *Statistics in Medicine* and served as an associate editor of the *Journal of the Royal Statistical Society, Series C* (2013-2016). Additionally, she has served as a referee for a number of leading journals (e.g., *Statistics in Medicine*, *Biometrics*, *Annals of Epidemiology*, *Environmental Health*, *Journal of Dental Research*, *Environmental Health Perspectives*, *The American Statistician*, *American Journal of Epidemiology*). She has been a grant reviewer for NIH, and served on committees for the National Research Council and the National Academy of Sciences. She has chaired or co-chaired conference planning committees for professional societies (e.g., Eastern North American Region of the International Biometrics Society), and been the chair of APHA's Applied Public Health Statistics Section. She has served as an ad hoc grant reviewer for the Israel Science Foundation.

External Reviewers:

Reviewer A: "...she is a rising star in the profession. Her methodological program is cutting-edge, focusing on challenging statistical problems that are important in understanding the complex effects of exposure on disease incidence. Overall, Professor Sanchez has a fantastic record of accomplishment and would clearly be promoted in any biostatistics department in the U.S."

Reviewer B: "...based on the quality, originality, and significance of her contributions in research, teaching and service, I recommend Dr. Sanchez for promotion to Full Professor with tenure with very a high level of enthusiasm."

Reviewer C: "I strongly encourage you to promote Dr. Sanchez to full professor with tenure and do all you can to keep her as a vital member of your outstanding department and school."

Reviewer D: "...her newly funded R01 focused on methods to deal with complex data in studies of the impact of the built environment on health is a clear sign of her arrival as a leading research biostatistician skilled at envisioning and implementing her own program. It is a great pleasure to recommend her without reservation for promotion to Professor..."

Reviewer E: "I consider Dr. Sanchez to be a leading international expert on the theory of latent variable models. Dr. Sanchez has now firmly established herself as a leading researcher on methods aimed at elucidating the role of the built environment on health. I strongly support Dr. Sanchez's promotion to Professor in the Department of Biostatistics at the University of Michigan."

Reviewer F: "Dr. Sanchez is highly productive and the envy of any top biostatistics department in a health science research institute. She is a biostatistics methodology and collaborative powerhouse."

Reviewer G: "I am very impressed with her all around success and strongly support her promotion without reservation. Dr. Sanchez is a solid academic citizen, a recognized leader, and a very strong candidate for promotion to the rank of Professor with tenure in any department of Biostatistics with which I am familiar."

Summary of Recommendation:

Professor Sanchez is an outstanding and highly sought after researcher working to generate new insights about environmental epidemiology and health disparities and about the analysis of highly complex and challenging data-sets. It is with the support of the School of Public Health Executive Committee that I recommend Brisa N. Sanchez for promotion to professor of biostatistics, with tenure, Department of Biostatistics, School of Public Health.



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Cathleen M Connell, Ph.D.  
Interim Dean, School of Public Health