

BIOGRAPHICAL SKETCH

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NAME: Nuño, Miriam

eRA COMMONS USER NAME (credential, e.g., agency login): nunom1

POSITION TITLE: Associate Professor of Biostatistics

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
University of California, Riverside	B.S.	06/1996	Pure Mathematics
Claremont University	M.S.	08/1999	Applied Mathematics
Cornell University	Ph.D.	05/2005	Biological Statistics and Computational Biology
Harvard School of Public Health	Postdoctoral Fellowship	08/2005	Biostatistics
University of California, Los Angeles	Postdoctoral Fellowship	08/2007	Biostatistics

A. Personal Statement

With over 15 years of experience as a researcher, I have been deeply committed to mentoring undergraduate and graduate students, as well as research fellows, fostering their growth and success in academic and professional pursuits. In addition to mentorship, I have also taught courses in statistics, sharing my expertise and passion for the field with students from diverse academic backgrounds. My teaching emphasizes not only the theoretical foundations of statistical methods but also their practical applications to solve real-world public health challenges.

Prior to joining the Department of Public Health Sciences at UC Davis, I served as a senior statistician at Cedars-Sinai Medical Center, where I worked closely with residents and fellows, guiding them in leading and successfully completing their research projects. This experience allowed me to combine mentorship with hands-on collaboration, helping early-career researchers develop critical skills in study design, data analysis, and scientific communication. Throughout my career, I have prioritized creating a supportive and enriching environment for learning. Whether in the classroom or through individual mentorship, I strive to support students and researchers to confidently navigate complex research challenges, foster innovation, and achieve their academic and professional goals. My dedication to both teaching and mentorship reflects my commitment to shaping the next generation of researchers and advancing the field of public health. Since joining UC Davis, I have been actively involved in teaching biostatistics to clinical and research students, as well as clinical fellows. My teaching encompasses both classroom instruction and hands-on mentorship, guiding students and fellows through the design and execution of their research projects. By combining theoretical knowledge with practical application, I aim to equip learners with the skills needed to confidently apply biostatistical methods to address real-world challenges in clinical and research settings.

My research centers on leveraging advanced statistical and applied mathematical methods to address critical public health challenges, reduce health disparities, and improve patient outcomes. With expertise spanning biostatistics, mathematical modeling, epidemiology, and public health, I have contributed to over 130 peer-

reviewed publications, advancing statistical methodologies for multivariable and clustered longitudinal study design, observational studies, and big data analytics.

Building on foundational work in influenza pandemics, including research on multiple strain dynamics and cross-immunity, I led numerous impactful projects during the COVID-19 pandemic. My research assessing the pandemic's impact on nursing home residents informed the development of models that identified critical prevention opportunities, shaping public health strategies. During the pandemic, I served as the Biostatistics Core Director for **Healthy Davis Together (HDT)**, a community demonstration project that successfully reduced the burden of COVID-19 in Davis, CA. I also led initiatives to improve COVID-19 vaccine uptake in Central Valley counties through collaboration with **RADx-UP ÓRALE COVID-19!** (Organizations to Reduce and Advance and Lead for Equity against COVID-19). In addition, I directed the analytics for **MOVE IT UP** (Mobilizing Organizations Via Equitable Immunizations and Testing Unified Partnerships), a program aimed at increasing vaccination rates in underserved areas of California. My work exemplifies the integration of rigorous quantitative methods with community-centered approaches to create practical, equitable solutions for public health. By combining methodological innovation with a focus on health equity, I strive to drive meaningful improvements in health outcomes for diverse and underserved populations.

My recent research focuses on advancing predictive modeling and forecasting of infectious diseases through innovative approaches such as wastewater-based epidemiology. This work leverages environmental surveillance to provide timely, actionable insights into disease dynamics, with the goal of enhancing public health preparedness and response. In addition, I am actively engaged in multiple research initiatives aimed at promoting mental well-being. These projects emphasize the development and implementation of evidence-based strategies to address mental health challenges, with a focus on improving quality of life and fostering resilience in diverse populations. Through this work, I strive to contribute to holistic health solutions that integrate physical and mental health for comprehensive community well-being.

Key Publications Co-authored with Mentees:

1. Perry LM, Kleber KT, Rajasekar G, **Nuño M**, Bold RJ. The Impact of Preexisting Psychiatric Disorders on Outcomes After Pancreatic Cancer Surgery. *Pancreas*. 2022 Nov-Dec 01;51(10):1376-1380. PMID: 37099782.
2. Alban RF, **Nuño M**, Ko A, Barmparas G, Lewis AV, Margulies DR. Weaker gun state laws are associated with higher rates of suicide secondary to firearms. *J Surg Res*. 2018 Jan;221:135-142. PMID: 29229119.
3. Graves CE, Goyal N, Levin A, **Nuño MA**, Kim J, Campbell MJ, Shen WT, Gosnell JE, Roman SA, Sosa JA, Duh QY, Suh I. Anxiety During the COVID-19 Pandemic: A Web-Based Survey of Thyroid Cancer Survivors. *Endocr Pract*. 2022 Apr;28(4):405-413. PMID: 35032648.

Recent Publications:

1. Pollock BH, Bergheimer CL, Nesbitt TS, Stoltz T, Belafsky SR, Burtis KC, Carey KM, Nuño M. Healthy Davis Together: Creating a Model for Community Control of COVID-19. *Am J Public Health*. 2022 Aug;112(8):1142-1146. PMID: 35830663.
2. Stokes SC, Yamashiro KJ, Rajasekar G, Nuño MA, Salcedo ES, Beres AL. Medicaid Expansion Under the Affordable Care Act and Pediatric Trauma Patient Insurance Coverage. *J Surg Res*. 2022 Aug;276:10-17. Epub 2022 Mar 21. PMID: 35325680.
3. Quino JE, Perez F, Perez A, Vang AP, Avendano L, Dang J, Chen MS Jr, Arana AM, Rocha S, Nuno M, Lara PN Jr, Fejerman L, Carvajal-Carmona LG. A Cancer Health Needs Assessment Reveals Important Differences Between US-Born and Foreign-Born Latinos in California. *Front Oncol*. 2022 Jul 7;12:883200. PMID: 35875145.
4. Daza-Torres ML, García YE, Schmidt AJ, Pollock BH, Sharpnack J, Nuño M. The impact of COVID-19 vaccination on California's return to normalcy. *PLoS One*. 2022 May 19;17(5):e0264195. PMID: 35588109.
5. Ramirez-Celis A, Becker M, Nuño M, Schauer J, Aghaeepour N, Van de Water J. Risk assessment

analysis for maternal autoantibody-related autism (MAR-ASD): a subtype of autism. Mol Psychiatry. 2021 May;26(5):1551-1560. Epub 2021 Jan 22. PMID: 33483694.

B. Positions, Scientific Appointments, and Honors

Positions and Scientific Appointments

2022-present	Professor in Biostatistics
2017-2021	Associate Professor in Biostatistics and In-Residence of Surgery
2013-2015	UCLA Visiting Assistant Professor
2012-2016	Co-director of Center for Neurosurgical Outcomes Research
2012-2016	Assistant Professor of Neurosurgery
2008-2016	Senior Biostatistician
2007-2008	Postdoctoral Research Fellow
2005-2007	Yerby Postdoctoral Research Fellow

Honors

2018-2022	Campos Faculty Scholar
2005-2007	Yerby Postdoctoral Fellowship, Harvard School of Public Health
2004-2005	SUNY Fellowship, Cornell University
2011- 2003	Alfred P. Sloan Foundation Graduate Fellowship

Professional Societies and Public Advisory Committees

2018-Present	Women in Statistics and Data Science
2018-Present	Pediatric Trauma Society
2015-Present	Southwest Oncology Group
2015-Present	Western North American Region of the International Biometric Society

C. Contributions to Science

1. Protecting vulnerable populations and investigating disparities in access to healthcare and outcomes has been critical to my research program. My work integrates statistics, mathematics, epidemiology, health services research, and large data science to improve the quality of care and health of children and adults. My research on inflicted head injuries in children has investigated identified risk factors for these injuries, narrowed the gap in knowledge about the long-term impact of these injuries, and guided efforts to improve surveillance and access to specialty care to improve outcomes in children age 0-5. Using data science efforts (machine learning), we have developed algorithms that can be used for early detection of children at risk for abusive head trauma. Racial and socioeconomic disparities in outcomes and access to healthcare are intertwined with poor outcomes in vulnerable populations. My research on racial and socioeconomic disparities have increase awareness and highlighted areas for improvement in medicine and surgery for a diverse population of vulnerable children and adults.
 - a. **Nuño M**, Ugiliweneza B, Bardini, R, Ozturk A, Stephenson JT, Magana JN, Age-Related Mortality in Abusive Head Trauma. J Trauma Acute Care Surg. 2019 Oct;87(4):827-835. PMID: 30865156
 - b. **Nuño M**, Ugiliweneza B, Zepeda V, Anderson JE, Coulter K, Magana JN, Drazin D, Boakye M. Long-term impact of abusive head trauma in young children. Child Abuse Negl. 2018 Nov;85:39-46. PMID: 30144952.
 - c. **Nuño M**, Pelissier L, Varshneya K, Adamo MA, Drazin D. Outcomes and factors associated with infant abusive head trauma in the US. J Neurosurg Pediatr. 2015 Nov;16(5):515-522. PMID: 26230462.
2. Large data studies can provide a readily available source to epidemiology and health services researchers. While access to these databases may be straight forward, advanced statistical analyses and computational expertise are often needed to develop and implement practical strategies to extract useful insights from them. In an editor's choice manuscript in the journal of Neurosurgery, I lead the

work on assessing the impact of 30-day readmissions on overall survival among brain tumor patients treated with surgery; we established worse survival prognosis in patients experiencing these events post-surgery. Imputation and complete case analysis were used to improve the validity of our statistical analysis. My contribution on missing data, computational expertise, and knowledge of health services research in surgery help implement post-surgical protocols at the clinical setting to prevent these events and eventually improve overall survival in this patient population.

- a. **Nuño M**, García Y, Rajasekar G, Pinheiro D, Schmidt AJ. COVID-19 Hospitalizations in Five California Hospitals. *medRxiv* 2021.01.29.21250788.
 - b. **Nuño M**, Ly D, Mukherjee D, Ortega A, Black KL, Patil CG. Quality of surgical care and readmission in elderly glioblastoma patients. *Neurooncol Pract*. 2014 Jun;1(2):33-39. Epub 2014 May 19. PMID: 26034614. PMC4371163
 - c. **Nuño M**, Ly D, Ortega A, Sarmiento JM, Mukherjee D, Black KL, Patil CG. Does 30-day readmission affect long-term outcome among glioblastoma patients? *Neurosurgery*. 2014 Feb;74(2):196-204; discussion 204-5. PMID: 24176955.
3. Racial and socioeconomic disparities have been uncovered in most areas of medicine and surgery. Despite increasing awareness, my collaborative research has increased our understating of disparities in patients undergoing surgery for numerous conditions. An innovative cohort of 78,170 patients with brain metastatic tumors treated with surgery found evidence of race and gender disparities in outcomes. Black female patients experience higher mortality, complications and longer hospital stays than white women. In this study, my expertise on survey data analysis and multivariate regression analyses approaches contributed to the acceptance of research in a high impact journal widely read by neurosurgeons and clinicians.
- a. Shweikeh F, Foulad D, **Nuño M**, Drazin D, Adamo MA. Differences in surgical outcomes for patients with craniosynostosis in the US: impact of socioeconomic variables and race. *J Neurosurg Pediatr*. 2016 Jan;17(1):27-33. PMID: 26407174.
 - b. **Nuño M**, Drazin DG, Acosta FL Jr. Differences in treatments and outcomes for idiopathic scoliosis patients treated in the United States from 1998 to 2007: impact of socioeconomic variables and ethnicity. *Spine J*. 2013 Feb;13(2):116-23. PMID: 23182025.
 - c. **Nuño M**, Mukherjee D, Elramsisy A, Nosova K, Lad SP, Boakye M, Yu JS, Black KL, Patil CG. Racial and gender disparities and the role of primary tumor type on inpatient outcomes following craniotomy for brain metastases. *Ann Surg Oncol*. 2012 Aug;19(8):2657-63. PMID: 22618715.
4. I am very interested in solving complex problems through mathematical or statistical models that can be used to inform public health policy and improve health outcomes. My methodological research interests include mathematical modeling, statistical and computational techniques, longitudinal data, missing data, and survival analysis. I collaborate closely with researchers with various fields of expertise, including clinicians, surgeons, public health, and quantitative researchers. As a mathematical epidemiologist, I aim to provide actionable evidence for public health officials to improve planning and reduce disease burden. I have extensive experience in promoting models that have translated into training videos to reducing the burden of influenza in nursing home settings. While some of these modeling efforts have been partially successful in guiding prevention efforts, stronger collaborations need to be built with public health stakeholders to disseminate our findings and truly impact the individuals at risk for poor outcomes. My work related to modeling of influenza has appeared in several journals:
- a. **Nuño M**, Reichert TA, Chowell G, Gumel AB. Protecting residential care facilities from pandemic influenza. *Proc Natl Acad Sci U S A*. 2008;105(30):10625-10630. doi:10.1073/pnas.0712014105. PMC2492509
 - b. **Nuño M**, Chowell G, Gumel AB. Assessing the role of basic control measures, antivirals and vaccine in curtailing pandemic influenza: scenarios for the US, UK and the Netherlands. *J R Soc Interface*. 2007;4(14):505-521. doi:10.1098/rsif.2006.0186. PMC2373400

- c. **Nuño M**, Chowell G, Wang X, Castillo-Chavez C. On the role of cross-immunity and vaccines on the survival of less fit flu-strains. Theor Popul Biol. 2007 Feb;71(1):20-9. doi: 10.1016/j.tpb.2006.07.002. Epub 2006 Jul 11. PMID: 16930653.
- d. **Nuño M**, Feng, Z., M. Martcheva, & Castillo-Chavez, C. (2005). Dynamics of Two-Strain Influenza with Isolation and Partial Cross-Immunity. SIAM Journal on Applied Mathematics, 65(3), 964-982. doi: 10.1137/S003613990343882X

Link to published work: <https://pubmed.ncbi.nlm.nih.gov/?term=miriam+nuno>

Link to research team: <https://sofiaresearchteam.org/>