

# Nicholas Williams

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## EDUCATION

M.P.H. Biostatistics, Columbia University, 2019  
B.A. Psychology, University of Colorado at Boulder, 2017

## PROFESSIONAL

2021- Columbia University, Mailman School of Public Health  
Senior Data Analyst  
Department of Epidemiology  
2021 Bayer AG, Independent Statistical Consultant  
2019-21 Weill Cornell Medical College  
Research Biostatistician I  
Division of Biostatistics, Department of Population Health Sciences  
2018 Columbia University, Mailman School of Public Health  
Research Assistant for Christine Mauro, Ph.D.  
Department of Biostatistics

## RESEARCH INTERESTS

Nonparametric causal inference.  
Open source statistical software development.

## PUBLICATIONS

### Research in statistics

2022 Rudolph, K.E., **Williams, N.**, and Díaz, I. "Efficient and flexible estimation of natural direct and indirect effects under intermediate confounding and monotonicity constraints." *Biometrics*. DOI: 10.1111/biom.13850  
2022 **Williams, N.**, Rosenblum, M. and Díaz, I. "Optimizing Precision and Power by Machine Learning in Randomized Trials, with an Application to COVID-19." *Journal of the Royal Statistical Society: Series A*. DOI: 10.1111/rssa.12915  
2021 Díaz, I., **Williams, N.**, Hoffman, K. and Schenck, E. "Non-parametric causal effects based on longitudinal modified treatment policies." *Journal of the American Statistical Association - Theory and Methods*. DOI: 10.1080/01621459.2021.1955691

## Software

- 2023 **Williams, N.** and Díaz, I. "lmt: An R package for estimating the causal effects of modified treatment policies." *Observational Studies*. <https://muse.jhu.edu/article/883479>

## Applied Epidemiology

- 2022 Hoffman, K.L., Schenck, E.J., Satlin, M.J., Whalen, W., Pan, D., **Williams, N.** and Díaz, I. "Comparison of a target trial emulation framework to Cox regression to estimate the effect of corticosteroids on COVID-19 mortality." *JAMA Network Open*. DOI: 10.1001/jamanetworkopen.2022.34425
- 2022 Rudolph, K.E., **Williams, N.**, Singham-Goodwin, A.T., Shulman, M., Fishman, M., Díaz, I., Hu, M., Luo, S.X., Rotrosen, J. and Nunes, E. "Buprenorphine & methadone dosing strategies to reduce risk of relapse in the treatment of opioid use disorder." *Drug and Alcohol Dependence*. DOI: <https://doi.org/10.1016/j.drugalcdep.2022.109609>
- 2022 Rudolph, K.E., **Williams, N.**, Díaz, I., Luo, S.X., Rotrosen, J. and Nunes, E.V. "Optimally choosing medication type for patients with opioid use disorder." In press at *American Journal of Epidemiology*.
- 2022 Min, J.Y., Simmons, W., Banerjee, S., Wang, F., **Williams, N.**, Zhang, Y., Reese, A.B., Mushlin, A.I. and Flory, J.H. "Association between antidiabetic drug use and the risk of COVID-19 hospitalization in the INSIGHT Clinical Research Network in New York City." *Diabetes, Obesity and Metabolism*. DOI: 10.1111/dom.14704
- 2022 Min, J.Y., **Williams, N.**, Simmons, W., Banerjee, S., Wang, F., Zhang, Y., Reese, A.B., Mushlin, A.I. and Flory, J.H. "Baseline Hemoglobin A1c and the Risk of COVID-19 Hospitalization Among Patients with Diabetes in the INSIGHT Clinical Research Network." *Diabetic Medicine*. DOI: 10.1111/dme.14815
- 2022 Hoffman, J.W., Bitar, R.C., **Williams, N.**, Steineman, B.D., Sturnick, D.R., Garrison, G.W., Demetracopoulos, C.A., Drakos, M.C. and O'Malley, M.J. "Orthosis and foot structure affect the fifth metatarsal principal strains during simulated level walking." *The American Journal of Sports Medicine*. DOI: 10.1177/03635465221079652
- 2022 Punjani, N., Alawamlh, O.H., Kim, S.J., Salter, C.A., Wald, G., Feliciano, M., **Williams, N.**, Dudley, V., and Goldstein, M. "Changes in semen analysis over time: A temporal trend analysis of 20 years of subfertile non-azoospermic men." *World Journal of Mens Health*. DOI: 10.5534/wjmh.210201
- 2021 Winston, G., Guadix, S., Lavieri, M., Uribe-Cardenas, R., Kocharian, G., **Williams, N.**, Sholle, E., Grinspan, Z., and Hoffman, C. "Closed-Loop Vagal Nerve Stimulation for Intractable Epilepsy: A Single-Center Experience." *Seizure: European Journal of Epilepsy*. DOI: 10.1016/j.seizure.2021.03.030
- 2021 Goel, A.R., Bruce, H.A., **Williams, N.** and Alexiades, G. "Long-Term Effects of Hearing Aids on Hearing Ability in Patients with Sensorineural Hearing Loss." *Journal of the American Academy of Audiology*.
- 2020 Thiesmeyer, J.W., Ullmann, T.M., Greenberg, J., **Williams, N.T.**, Limberg, J., Stefanova, D., Beninato, T., Finnerty, B.M., Vignaud, T., Leclerc, J., Fahey III, T.J., Mirallie, E.M., Brunaud, L. and Zarnegar, R. "Hypertension resolution after adrenalectomy for primary

- hyperaldosteronism: Which is the best predictive model?" *Surgery*. DOI: 10.1016/j.surg.2020.04.017
- 2020 Riley, C.A., Zheng, Z., **Williams, N.**, Smith, T.L., Orlandi, R.R. and Tabae, A. "Concordance of self-reported practice patterns of American Rhinologic Society members with the International Consensus Statement of Allergy and Rhinology: Rhinosinusitis" *International Forum of Allergy and Rhinology*. DOI: 10.1002/alr.22533
- 2020 Day, J., Conti, M.S., **Williams, N.**, Ellis, S.J., Deland, J.T. and Cody, E.A. "Contribution of First-Tarsometatarsal Joint Fusion to Deformity Correction in the Treatment of Adult-Acquired Flatfoot Deformity." *Foot and Ankle Orthopaedics*. DOI: 10.1177/2473011420927321
- 2020 Day, J., Kim, J., Conti, M.S., **Williams, N.**, Deland, J.T. and Ellis, S.J. "Outcomes of Idiopathic Flexible Flatfoot Deformity Reconstruction in the Young Patient." *Foot and Ankle Orthopaedics*. DOI: 10.1177/2473011420937985
- 2020 Cronin, S., Conti, M., **Williams, N.** and Ellis, S.J. "Relationship Between Demographic and Radiographic Characteristics and Second Ray Pathology in Hallux Valgus Patients." *Foot and Ankle Orthopaedics*. DOI: <https://doi.org/10.1177/2473011420909088>
- 2019 Hussain, I., Winston, G.M., Goldberg, J., Curri, C., **Williams, N.**, Chazen, J.L., Greenfield, J.P. and Baaj, A.A. "Impact of imaging modality, age, and gender on craniocervical junction angles in adults without structural pathology." *Journal of Craniovertebral Junction and Spine*. PMID: 32089618

#### Preprints and manuscripts under review

- 2022 Rudolph, K.E., **Williams, N.**, and Díaz, I. "Nonparametric estimators of interventional (transported) direct and indirect effects that accommodate multiple mediators and multiple intermediate confounders." Under review at *Epidemiology*. DOI: 10.48550/arXiv.2212.08164.
- 2022 Rudolph, K.E., **Williams, N.**, Miles, C.H., Antonelli, J., and Díaz, I. "All models are wrong, but which are useful? Comparing parametric and nonparametric estimation of causal effects in finite samples." Under review at *PNAS*. DOI: 10.48550/arXiv.2211.10310.
- 2022 Díaz, I., **Williams, N.**, and Rudolph, K.E. "Efficient and flexible causal mediation with time-varying mediators, treatments, and confounders." Under review at *Biostatistics*.
- 2021 Rudolph, K.E., **Williams, N.** and Díaz, I. "Causal Mediation with Instrumental Variables." Under review at *Journal of the Royal Statistical Society: Series B*.

#### INVITED TALKS

- 2020 "An Introduction to Answering Causal Questions with the lmt R package." Weill Cornell Biostatistics Computing Club. New York, NY. July 14.

## SOFTWARE

### Maintainer

- lmtip R: Non-Parametric Causal Effects of Feasible Interventions Based on Modified Treatment Policies
- cabinets R: Project Specific Workspace Organization Templates
- simul R: Fast Simultaneous Confidence Bands Based on the Efficient Influence Function and Multiplier Bootstrap
- catfun R: Categorical Data Analysis

### Contributer

- broom R: Convert Statistical Objects into Tidy Tibbles

## CONFERENCE ACTIVITY

### Conference Presentations

Presenting author *italicized*.

- 2021 Brantner, C., Pearce-Fisher, D., Moezina, C., ..., **Williams, N.**, Demetres, M., and Goodman, S. "Treatment knowledge and preferences for Black people with hip and knee osteoarthritis: A Systematic Literature Review and Meta-Analysis." European Congress of Rheumatology.
- 2020 **Williams, N.**, Savenkov, O. and Chrea, B. "Estimating the Causal Effect of Surgical Treatment for Posterior Malleolus Fracture with Different Treatment Rules on Patient Reported Outcomes." Joint Statistical Meetings (Virtual), Philadelphia, PA.
- 2019 Mauro, C., **Williams, N.** and An, A. "Experiences with Incorporating R into a Second-Level Biostatistics Course for MPH Students." Joint Statistical Meetings, Denver, CO.

## SERVICE

### Academic Journal Peer Review

*The R Journal*

## GRANTS AND AWARDS

### Awards and Honors

- 2017 Graduate with Distinction, University of Colorado at Boulder

### Grants and Fellowships

- 2015 Virginia Summer Undergraduate Research Initiative. Project: "The relationship between cognitively oriented verbs and affect."

## TEACHING

### Weill Cornell Medicine

Data Science I – Teaching Assistant

### Columbia University

Categorical Data Analysis – Lead Teaching Assistant

Research Methods, Quantitative Foundations – Teaching Assistant

## PROFESSIONAL AFFILIATIONS

2020– American Statistical Association

## TECHNICAL SKILLS

R expert

SAS

SQL

L<sup>A</sup>T<sub>E</sub>X

Julia intermediate

C++ novice

Ruby novice

Updated April 2023