

Department of Health Care Policy
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Academic appointments

Current

Assistant Professor, Department of Health Care Policy, Harvard Medical School, Harvard University, Jul 2017 – present

Faculty Affiliate, Department of Statistics, Faculty of Arts and Sciences, Harvard University, Jul 2017 – present

Previous

Assistant Professor, Division of Decision, Risk, and Operations, Columbia Business School, Columbia University, Jan 2014 – Jun 2017

Assistant Professor (by courtesy), Department of Statistics, Faculty of Arts and Sciences, Columbia University, Oct 2013 – Jun 2017

Faculty Affiliate, Data Science Institute, Columbia University, Jan 2014 – Jun 2017

Instructor (convertible), Division of Decision, Risk, and Operations, Columbia Business School, Columbia University, Jul 2013 – Dec 2013

Education

Ph.D. Statistics, The Wharton School, University of Pennsylvania, 2013

M.A. Statistics, The Wharton School, University of Pennsylvania, 2011

M.A. Economics, Universidad de Chile, 2008

B.S. Mathematical Engineering, Universidad Católica de Chile, 2005; *Maximum Distinction*

Journal publications

Statistical methodology

- [1] Aronow, P. M., Crawford, F. W., and Zubizarreta, J. R., (2018), “Confidence Intervals for Linear Unbiased Estimators Under Constrained Dependence,” *Electronic Journal of Statistics*, in press.
- [2] Zubizarreta, J. R., Small, D. S., and Rosenbaum, P. R. (2018), “A Simple Example of Isolation in Building a Natural Experiment,” *Chance*, in press.
- [3] Haneuse, S., Zubizarreta, J. R., and Normand, S. L. T., (2018), “On Assessing the Quality of Health Care Providers Using Time-Varying Patient Outcomes,” invited commentary, *Biometrics*, in press.
- [4] Miratrix, L. W., Wager, S., and Zubizarreta, J. R., (2018), “Shape-Constrained Partial Identification of a Population Mean Under Unknown Probabilities of Sample Selection,” *Biometrika*, 1, 103–114.
- [5] Zubizarreta, J. R., and Keele, L. (2017), “Optimal Multilevel Matching in Clustered Observational Studies: A Case Study of the School Voucher System in Chile,” *Journal of the American Statistical Association*, 112, 547–560.
- [6] Hirshberg, D. A., and Zubizarreta, J. R. (2017), “On Two Approaches to Weighting in Causal Inference,” invited commentary, *Epidemiology*, 28, 812–816.

- [7] Kilcioglu, C., and Zubizarreta, J. R. (2016), “Maximizing the Information Content of a Balanced Matched Sample in a Study of the Economic Performance of Green Buildings,” *Annals of Applied Statistics*, 10, 1997–2020.
- [8] Resa, M. A., and Zubizarreta, J. R. (2016), “Evaluation of Subset Matching Methods and Forms of Covariate Balance,” *Statistics in Medicine*, 35, 4961–4979.
- [9] Zubizarreta, J. R. (2015), “Stable Weights that Balance Covariates for Estimation with Incomplete Outcome Data,” *Journal of the American Statistical Association*, 110, 910–922.
- [10] Hsu, J., Zubizarreta, J. R., Small, D. S., and Rosenbaum, P. R. (2015), “Strong Control of the Family-Wise Error Rate in Observational Studies that Discover Effect Modification by Exploratory Methods,” *Biometrika*, 102, 767–782.
- [11] Keele, L., Titiunik, R., and Zubizarreta, J. R., (2015) “Enhancing a Geographic Regression Discontinuity Design Through Matching to Estimate the Effect of Ballot Initiatives on Voter Turnout,” *Journal of the Royal Statistical Society: Series A*, 178, 223-239.
- [12] Zubizarreta, J. R., Small, D. S., and Rosenbaum, P. R. (2014), “Isolation in the Construction of Natural Experiments,” *Annals of Applied Statistics*, 8, 2096-2121.
- [13] Zubizarreta, J. R., Paredes, R. D., and Rosenbaum, P. R., (2014) “Matching for Balance, Pairing for Heterogeneity in an Observational Study of the Effectiveness of For-profit and Not-for-profit High Schools in Chile,” *Annals of Applied Statistics*, 8, 204-231.
- [14] Yang, F., Zubizarreta, J. R., Small, D. S., Lorch, S. A., and Rosenbaum, P. R. (2014), “Dissonant Conclusions When Testing the Validity of an Instrumental Variable,” *The American Statistician*, 68, 253-263.
- [15] Zubizarreta, J. R., Cerdá, M., and Rosenbaum, P. R. (2013), “Effect of the 2010 Chilean Earthquake on Posttraumatic Stress: Reducing Sensitivity to Unmeasured Bias Through Study Design,” *Epidemiology*, 24, 79-87 (with discussion). *Winner of the Kenneth Rothman Prize for the best paper published in Epidemiology in 2013.*
- [16] Zubizarreta, J. R., Small, D. S., Goyal, N. K., Lorch, S. A., and Rosenbaum, P. R. (2013), “Stronger Instruments Via Integer Programming in an Observational Study of Late Preterm Birth Outcome,” *Annals of Applied Statistics*, 7, 25-50.
- [17] Zubizarreta, J. R., (2012), “Using Mixed Integer Programming for Matching in an Observational Study of Acute Kidney Injury after Surgery,” *Journal of the American Statistical Association*, 107, 1360-1371.
- [18] Zubizarreta, J. R., Neuman, M. D., Silber, J. H., and Rosenbaum, P. R. (2012), “Contrasting Evidence Within and Between Institutions that Supply Treatment in an Observational Study of Alternative Forms of Anesthesia,” *Journal of the American Statistical Association*, 107, 901-915.
- [19] Zubizarreta, J. R., Reinke, C. E., Kelz, R. R., Silber, J. H., and Rosenbaum, P. R. (2011), “Matching for Several Sparse Nominal Variables in a Case-Control Study of Readmission Following Surgery,” *The American Statistician*, 65, 229-238.

Health policy and medical science

- [20] Hu, W, Chan, C., Zubizarreta, J. R., and Escobar, G. (2018), “An Examination of Early Transfers to the ICU Based on a Physiologic Risk Score,” *Manufacturing & Service Operations Management*, *in press*.
- [21] Hu, W, Chan, C., Zubizarreta, J. R., and Escobar, G. (2018), “Incorporating Longitudinal Comorbidity and Acute Physiology Data in Template Matching for Assessing Hospital Quality: an Exploratory Study in an Integrated Health Care Delivery System,” *Medical Care*, *in press*.
- [22] Rosellini, A. J., Dussailant, F., Zubizarreta, J. R., Kessler, R. , and Rose, S. (2018), “Predicting Posttraumatic Stress Disorder Following a Natural Disaster,” *Journal of Psychiatric Research*, *in press*.

- [23] Zubizarreta, J. R., Lorch, S. A., Marshall, G., D'Apremont, I., and Tapia, J. L. (2016), "Effect of Prophylactic CPAP in Very Low Birth Weight Infants in South America," *Journal of Perinatology*, 36, 629-634.
- [24] Neuman, M. D., Rosenbaum, P. R., Ludwig, J. M., Zubizarreta, J. R., and Silber, J. H. (2014), "Anesthesia Technique, Mortality, and Length of Stay After Hip Fracture Surgery," *Journal of the American Medical Association*, 311, 2508-2517.
- [25] Kelz, R. R., Reinke, C. E., Zubizarreta, J. R., Wang, M., Saynisch, P., Reese, P., Even-Shoshan, O., Reese, P. R., Fleisher, L. A., and Silber, J. H. (2013) "Acute Kidney Injury, Renal Function, and the Elderly Obese Surgical Patient: A Matched Case-Control Study," *Annals of Surgery*, 258, 359-363.
- [26] Goyal, N. K., Zubizarreta, J. R., Small, D. S., and Lorch, S. A. (2013), "Length of Stay and Readmission Risk for Late Preterm Infants: An Instrumental Variable Approach," *Hospital Pediatrics*, 3, 7-15.
- [27] Reinke, C. E., Kelz, R. R., Zubizarreta, J. R., M. Lanyu, Saynisch, P., F. A. Kyle, Even-Shoshan, O., Fleisher, L. A., and Silber, J. H. (2012), "Obesity and Readmission in Elderly Surgical Patients," *Surgery*, 152, 355-362.

Conference proceedings and technical reports

- [28] Zubizarreta, J. R. (2012), "Introduction to Matching in Observational Studies Using Mixed Integer Programming," *Transactions of the Annual Deming Conference on Applied Statistics*.
- [29] Zubizarreta, J. R. (2009), "Educational Outcomes of the Children of the Poor: the Chilean Case," background paper prepared for the *Human Development Report 2008/2009 for Latin America and the Caribbean*, United Nations Development Plan.

Book chapters

- [30] Mozer, R., Rubin, D. B., and Zubizarreta, J. R. (2018), "Statistical Inference for Causal Effects in Clinical Psychology: Fundamental Concepts and Analytical Approaches," in *Handbook of Research Methods in Clinical Psychology*, in press.
- [31] Paredes, R. D., Volante, P., Opazo, M. O., and Zubizarreta, J. R. (2013), "Shared Financing in the Chilean Subsidized Education," in: *Proposals for Chile*, Ediciones UC, 51-83. (In Spanish.)
- [32] Rodríguez, C., Domínguez, P., Undurraga, E., and Zubizarreta, J. R. (2009), "Identification and Characterization of Vulnerable Populations: Elements for the Measurement of Risk," in: *Towards the Bicentenary: Proposals for Chile*, Ediciones UC, 305-328. (In Spanish.)

Submitted work

- [S1] Resa, M. A., and Zubizarreta, J. R., "Stable Estimation of Time-Varying Treatment Effects with Weights that Balance Covariate Histories in Marginal Structural Models."
- [S2] Resa, M. A., and Zubizarreta, J. R., "Stable Balancing Weights for Observational Studies with Multi-Valued Treatments."
- [S3] Visconti, G., and Zubizarreta, J. R., "Handling Limited Overlap in Observational Studies with Cardinality Matching," *invited revision*.
- [S4] Wang, Y., and Zubizarreta, J. R., "Minimal Approximately Balancing Weights: Asymptotic Properties and Practical Considerations," *invited revision*.

Statistical software

- [R1] `depinf` package for R, with Peter Aronow and Forrest Crawford
- [R2] `designmatch` package for R, with Cinar Kilcioglu
- [R3] `mipmatch` package for R
- [R4] `sbw` package for R, with Mohammed-Amine Allouah
- [R5] `scbounds` package for R, with Luke Miratrix and Stefan Wager

Awards and fellowships

Awards

- Runner-up Pierskalla Best Paper Award for “research excellence in health care management science,” INFORMS, 2017
- Kenneth Rothman Prize for the best paper published in *Epidemiology* in 2013, 2014
- Student Paper Award, Biometrics Section, American Statistical Association, 2014
- Student Paper Award, International Biometric Society ENAR, 2014
- Student Paper Award, Social Statistics, Government Statistics, and Survey Research Methods Sections, American Statistical Association, 2013
- Deming Scholar Award, American Statistical Society/American Society for Quality, 2012
- Young Investigator Award, Statistics in Epidemiology, American Statistical Association, 2012
- President Gutmann Leadership Award, University of Pennsylvania, 2012
- J. Parker Memorial Bursk Prize for Excellence in Research, Statistics Department, The Wharton School, 2011
- Tom Ten Have Memorial Award for “exceptionally creative or skillful research on causal inference,” Atlantic Causal Inference Conference, 2011
- Student Paper Award, Health Policy Statistics Section, American Statistical Association, 2011
- Distinguished Thesis, Industrial and Systems Engineering, Universidad Católica de Chile, 2005

Fellowships

- Initiative on Data Science in Business and Economics, 2016-17 Visiting Fellow, Chicago Booth, 2017
- Fulbright Scholarship, 2008-2012
- The Wharton School, University of Pennsylvania, Graduate Fellow, 2009-2013

Grants

As Principal Investigator

- “New Statistical Methods for Causal Inference in the Social Sciences and Public Policy,” Alfred P. Sloan Foundation, 2018-2021 (USD 327,033)
- “New Methods for Causal Inference in Randomized and Observational Studies,” Alfred P. Sloan Foundation, 2015-2017 (USD 43,767)
- “Educational Outcomes of the Children of the Poor: the Chilean Case,” Human Development Report 2008/2009 for Latin America and the Caribbean, United Nations Development Plan, 2008-2009 (USD 8,000)

As Co-Investigator

- “Machine Learning for Health Outcomes and Quality of Care in Low-Income Populations,” NIH/1DP2MD012722, PI Prof. Sherri Rose, 2017-2022
- “Improving Feasibility and Efficiency of Quality Measurement in Oncology Practices,” Laura and John Arnold Foundation, PI Prof. Nancy Keating, 2017-2020

Teaching experience

As Instructor

“Causal Inference” (Ph.D.), Division of Decision, Risk and Operations, Columbia Business School (Spring 2014, Fall 2015, Fall 2016)

“Managerial Statistics” (M.B.A.), Division of Decision, Risk and Operations, Columbia Business School (Fall 2015, Fall 2016)

“Introduction to Econometrics and Statistical Inference” (Ph.D.), Division of Decision, Risk and Operations, Columbia Business School (Fall 2014)

“Applied Econometrics” (undergraduate), Dept. of Industrial and Systems Engineering, Universidad Católica de Chile (Spring 2007, Fall 2008)

Short Courses

“New Matching Methods for Causal Inference,” Society for Research in Educational Effectiveness (SREE) Spring Conference, Feb 28, 2018

“Recent Developments in Causal Inference,” International Conference in Health Policy Statistics, Charleston, Jan 10, 2018

“New Matching Methods for Causal Inference,” MDEpiNet PPP Annual Meeting, Food and Drug Administration (FDA), Oct 17, 2017

“New Matching Methods for Causal Inference,” Atlantic Causal Inference Meeting, University of North Carolina at Chapel Hill, May 23, 2017

“New Matching Methods for Causal Inference,” UK Causal Inference Meeting, University of Essex, England, April 4, 2017

“Optimal Designs for Causal Inference Using Integer Programming,” Center for Mathematical Studies, Kellogg School of Management, Northwestern University, Oct 31-Nov 1, 2016

“Design of Observational Studies,” International Workshop on Applied Statistics, Bogotá, Colombia, Apr 23-24, 2015 (in Spanish)

“New Methods for Causal Inferences in the Health and Social Sciences,” Columbia Global Center/PUC, Santiago, Chile, Aug 19, 2014 (in Spanish)

Student advising and student collaborations

Ph.D. students

Magdalena Bennett (Department of Education Policy and Social Analysis, Teachers College at Columbia University; joint work)

Nikhil Bhat (Division of Decision, Risk and Operations, Columbia Business School; thesis committee member)

Zach Branson (Department of Statistics, Harvard University; thesis committee member)

Ambarish Chattopadhyay (Department of Statistics, Harvard University; joint work)

Juan Díaz (Department of Statistics, Harvard University; joint work and co-advisor with Prof. D. Rubin)

David Hirshberg (Department of Statistics, Columbia University; joint work and co-advisor with Prof. D. Madigan and Prof. A. Maleki)

Wenqi Hu (Division of Decision, Risk and Operations, Columbia Business School; joint work and co-advisor with Prof. C. Chan)

Cinar Kilcioglu (Division of Decision, Risk and Operations, Columbia Business School; joint work and co-advisor with Prof. C. Maglaras)

Susanna Makela (Department of Statistics, Columbia University; joint work and thesis committee member)

Maria Resa (Department of Statistics, Columbia University; joint work and co-advisor with Prof. D. Madigan)

Zach Shahn (Department of Statistics, Columbia University; joint work and thesis committee member)

Giancarlo Visconti (Department of Political Science, Columbia University; joint work and thesis committee member)

Yixin Wang (Department of Statistics, Columbia University; joint work)

Professional activities

Reviewer

Annals of Applied Statistics

Annals of Epidemiology

Annals of Statistics

Annals of Operations Research

Biometrics

Biostatistics

Biometrika

Epidemiology

Epidemiologic Methods

Health Services and Outcomes Research Methodology

Journal of Causal Inference

Journal of Computational and Graphical Statistics

Journal of Educational and Behavioral Statistics

Journal of Machine Learning Research

Journal of Research on Educational Effectiveness

Journal of the American Statistical Association, Applications and Case Studies

Journal of the American Statistical Association, Theory and Methods

Journal of the Royal Statistical Society: Series B (Statistical Methodology)

Journal of the Royal Statistical Society: Series C (Applied Statistics)

Management Science

Observational Studies

Operations Research

Psychometrika

Statistica Sinica

Statistical Science

Statistical Methods in Medical Research

Statistics and Computing

Statistics in Medicine

Trials

Service

Reviewer, National Science Foundation (NSF), Methodology, Measurement, and Statistics (MMS) Program, 2018

Reviewer, Patient-Centered Outcomes Research Institute (PCORI), Methods Panel, 2018

Byar Award Committee Member, Biometrics Section, American Statistical Association, 2017

Student Awards Committee Member, International Conference in Health Policy Statistics, 2017

Paper Review Committee Member, Society for Research on Educational Effectiveness, 2017

Organizing Committee Member, Causal Inference Conference, Statistics Department, Columbia University, 2016 – 2017

Session Chair, INFORMS Annual Meeting, 2016

Faculty Computing Committee Member, Columbia Business School, 2015 – 2017

Empowering Research Committee Member, Columbia Business School, 2015 – 2017

Assistant Program Director for the Encuentros Conference, MIT Media Lab, 2013

Presentations

2018

Harvard Business School, Harvard University, Mar 20, 2018

Harvard Catalyst Biostatistics Symposium, Harvard University, Mar 1, 2018

Institute for Quantitative Social Science, Harvard University, Feb 7, 2018

HIV Working Group, Harvard University, Feb 1, 2018

International Conference in Health Policy Statistics, Charleston, Jan 11, 2018

2017

Ministry of Health, Gobierno de Chile, Dec 23, 2017 (in Spanish)

School of Medicine, Universidad Católica de Chile, Dec 23, 2017 (in Spanish)

International Conference on Computational and Methodological Statistics, London, England, Dec 18, 2017

Causal Inference Group, Harvard School of Public Health, Nov 15, 2017

Department of Statistics, Harvard University, Oct 16, 2017

Neocosur Conference, Buenos Aires, Argentina, Aug 18, 2017 (in Spanish)

Marketing Department, Columbia Business School, April 27, 2017

Operations Research Center, MIT, April 20, 2017

Data Science Symposium, Uber, San Francisco, Mar 2, 2017

Econometrics and Statistics Group, Booth School of Business, University of Chicago, Feb 14, 2017

Machine Learning Group, Duke University, Jan 25, 2017

Health Care Policy Department, Harvard Medical School, Jan 10, 2017

2016

INFORMS Annual Conference, Nashville, Nov 14, 2016
MEDS, Kellogg School of Management, Northwestern University, Nov 2, 2016
Joint Statistical Meetings, Chicago, Aug 31, 2016
Neocosur Conference, Buenos Aires, Argentina, Aug 19, 2017 (in Spanish)
Atlantic Causal Inference Conference, NYU, May 27, 2016
Causal Inference Group, UC Berkeley, May 20, 2016
Marketplace Optimization Sciences Division, Uber, San Francisco, May 19, 2016
Social Enterprise Leadership Forum, Columbia Business School, Apr 22, 2016
Economics Department, University of Chile, Jan 11, 2016
Pediatrics Division, Universidad Católica de Chile, Jan 07, 2016 (in Spanish)

2015

Biostatistics Department, Johns Hopkins University, Dec 8, 2015
Statistics Department, Duke University, Dec 4, 2015
Heinz College, Carnegie Mellon University, Nov 9, 2015
INFORMS Annual Conference, Philadelphia, Nov 1, 2015
Neocosur Conference, Buenos Aires, Argentina, Aug 22, 2015 (in Spanish)
DO&IT, Robert H. Smith School of Business, University of Maryland, May 1, 2015
International Workshop on Applied Statistics, Bogotá, Colombia, Apr 25, 2015
UK Causal Inference Meeting, University of Bristol, England, Apr 16, 2015
Statistical Laboratory, University of Cambridge, England, Apr 9, 2015
SREE, Washington DC, Mar 6, 2015
Institution for Social and Policy Studies, Yale University, Mar 5, 2015

2014

INFORMS Annual Conference, San Francisco, Nov 10, 2014
Neocosur Conference, Buenos Aires, Argentina, Aug 30, 2014 (in Spanish)
Joint Statistical Meetings, Boston, Aug 5, 2014
ENAR/International Biometric Society Spring Meeting, Baltimore, Mar 17, 2014
Kellogg School of Management, Northwestern University, Jun 6, 2014

2013

Department of Statistics, Columbia University, Dec 2, 2013
Neocosur Conference, Buenos Aires, Argentina, Aug 24, 2013
Neocosur Conference, Buenos Aires, Argentina, Aug 23, 2013
Joint Statistical Meetings, Montreal, Aug 4, 2013
Sociology Department, University of Pennsylvania, Apr 16, 2013
Columbia Business School, Feb 14, 2013
Department of Statistics, Harvard University, Feb 4, 2013
Heinz College, Carnegie Mellon University, Jan 28, 2013
Teachers College, Columbia University, Jan 25, 2013

Department of Statistics, Stanford University, Jan 22, 2013
Statistical Laboratory, University of Cambridge, England, Jan 18, 2013
Department of Statistics, London School of Economics, England, Jan 15, 2013
Department of Statistics, University of Oxford, England, Jan 14, 2013
Booth School of Business, University of Chicago, Jan 10, 2013
Department of Biostatistics, Johns Hopkins University, Jan 3, 2013

2012

Department of Statistics, Warwick University, England, Dec 16, 2012
Department of Psychiatry, Columbia University, Dec 12, 2012
Atlantic Causal Inference Conference, Johns Hopkins University, May 25, 2012
Mailman School of Public Health, Columbia University, Nov 29, 2011
Department of Biostatistics, Columbia University, Dec 13, 2012
Department of Biostatistics and Epidemiology, McGill University, Nov 5, 2012
Statistics Department, Columbia University, Oct 10, 2012
Neocosur Conference, Buenos Aires, Argentina, Aug 25, 2012 (in Spanish)
Joint Statistical Meetings, San Diego, Aug 1, 2012