

SHIRA MITCHELL
STATISTICIAN
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POSITIONS

2018-Present New York City Mayor's Office of Data Analytics

2016-2018 Mathematica Policy Research

2014-2016 Postdoctoral Fellow, Columbia University

STATISTICAL CONSULTANT

2011-Present Human Rights Data Analysis Group (HRDAG)

2017-Present Airwars

2018-Present Data for Progress

EDUCATION

2009-2014 PhD in Biostatistics, Harvard University

2005-2009 BA in Mathematics (minor in Computer Science), Harvard University

TEACHING

2007-2014 Teaching Assistant and Tutor, Harvard University

Courses: graph theory and combinatorics, algorithms, regression, longitudinal data analysis, econometrics, statistical inference, and probability.

EXPERIENCE

MRP: multilevel regression and poststratification (often done via Bayesian inference)

SAE: small area estimation (often done via MRP)

MSE: multiple systems estimation (also called capture-recapture)

Collaborations are with US government agencies and US-based organizations unless otherwise specified.

2011-Present Human Rights Data Analysis Group (HRDAG)

Developed Bayesian models for population size estimation using MSE. Applied methods to estimate the number of deaths in armed conflicts.

2017-Present Airwars, a journalistic transparency project, London, UK

Produced statistical graphics of reported civilian casualties from Coalition airstrikes in Iraq and Syria.

2014-2018 Millennium Villages Project (MVP)

Designed and implemented a 10-country impact evaluation of the MVP, a 10-year economic development project in Africa.

2016-2018 Department of Labor (DOL)

Produced guidance (text, videos, tools) on survey sampling and analysis for child labor research.

2017-2018 Food and Nutrition Service (FNS)

Used a matched-comparison method to estimate impact of direct certification with Medicaid for free / reduced-price meals.

2018 Department of Defense (DOD)

Developed MRP to estimate TRICARE acceptance rates in hospital service areas.

2018 Internal Revenue Service (IRS)

Validated methods to identify low-income communities for designation of Qualified Opportunity Zones, using data from the American Community Survey (ACS).

2016-2017 Center of Medicare & Medicaid Services (CMS)

Analyzed clinician and staff survey data from the Comprehensive Primary Care (CPC) initiative, accounting for sampling design and nonresponse. Developed a Bayesian varying-treatment effects model for CPC's impact on Medicare costs.

2017 Center of Medicare & Medicaid Services (CMS)

Wrote a brief on SAE for health care quality measures for Medicaid enrollees.

2017 Institute of Education Sciences (IES)

Wrote a brief on (mis)use of p -values in impact evaluations.

2016 National Law Center on Homelessness & Poverty

Conducted a literature review on public costs of providing housing to the homeless.

2009, 2012-2013 Management and Development for Health - Dar es Salaam, Tanzania

Data management and analysis for HIV patient care, including estimating the impact of quality of care on maternal mortality among HIV-positive pregnant women.

2010 Ministry of Health - Lilongwe, Malawi

Developed lot quality assurance sampling methods to assess data quality in HIV clinics.

ACADEMIC PAPERS

- 2018 Mitchell, S., E. Potash, S. Barocas. "Prediction-Based Decisions and Fairness: A Catalogue of Choices, Assumptions, and Definitions." <https://arxiv.org/abs/1811.07867>
- 2018 Mitchell, S., A. Gelman, R. Ross, J. Chen, S. Bari, U. Kim Huynh, M. Harris, S.E. Sachs, E.A. Stuart, A. Feller, S. Makela, A.M. Zaslavsky, L. McClellan, S. Ohemeng-Dapaah, P. Namakula, C. Palm, and J.D. Sachs. "The Millennium Villages Project: A Retrospective Observational End-Line Evaluation." *The Lancet Global Health*, May 2018, Volume 6, Issue 5, e500 - e513.
- 2015 Mitchell, S., A. Ozonoff, A. M. Zaslavsky, K. Lum, and B.A. Coull. "Population Size Estimation with Inactive Lists: Hierarchical Mixture Models and Missing Data with Application to Armed Conflict Data." *Annals of Applied Statistics*, revision requested.
- 2015 Exner, N., S. Mitchell, and M. Pagano. "The Use of the Finite Population Correction in Survey Design for National Disease Surveillance." Working paper.
- 2013 Mitchell, S.A. Ozonoff, A.M. Zaslavsky, B. Hedt-Gauthier, K. Lum, and B.A. Coull. "A Comparison of Marginal and Conditional Models for Capture-Recapture Data with Application to Human Rights Violations Data." *Biometrics*, vol. 69, no. 4, December 2013, pp. 1022-1032.
- 2012 Hedt-Gauthier, B.L., L. Tenthani, S. Mitchell, F.M. Chimbwandira, S. Makombe, Z. Chirwa, E.J. Schouten, M. Pagano, and A. Jahn. "Improving Data Quality and Supervision of Antiretroviral Therapy Sites in Malawi: An Application of Lot Quality Assurance Sampling." *BMC Health Services Research*, vol. 12, no. 196, 2012.
- 2012 Mitchell, S., and M. Pagano. "Pooled Testing for Effective Estimation of the Prevalence of *Schistosoma Mansoni*." *American Journal of Tropical Medicine and Hygiene*, vol. 87, no. 5, 2012, pp. 850-861.
- 2012 Mitchell, S., and M. Pagano. "Effective Classification of the Prevalence of *Schistosoma Mansoni*." *Tropical Medicine International Health*, vol. 17, no. 12, December 2012, pp. 1470-1477.
- 2007 Gravano, A., S. Bensus, J. Hirschberg, S. Mitchell, and I. Vovsha. "Classification of Discourse Functions of Affirmative Words in Spoken Dialogue." *Proceedings of Interspeech*, August 2007, pp. 1613-1616.

AUTHORED MEDIA ARTICLES

- 2018 Mitchell, S. "Worries Grow Census Data Could Be Used to Target the Undocumented." *The Independent*, May 2018, <https://independent.org/2018/05/census-data-could-be-used-to-target-the-undocumented/>.

INVITED TALKS

- 2019 Statistics Department Seminar, Columbia University, New York, NY
Prediction-based decisions and fairness: choices, assumptions, and definitions
- 2018 Rosenkranz Global Health Policy Symposium at Stanford University, Stanford, CA
The Millennium Villages Project: a retrospective, observational, endline evaluation
- 2018 The Math and Democracy Seminar, New York University (NYU), New York, NY
Prediction-based decisions and fairness: choices, assumptions, and definitions
- 2018 Google AI, Cambridge, MA
Prediction-based decisions and fairness: choices, assumptions, and definitions
- 2018 Joint Statistical Meetings, Vancouver, Canada
The Millennium Villages Project: a retrospective, observational, endline evaluation
- 2018 Data Analytics Networking Night, New York, NY
The Millennium Villages Project: a retrospective, observational, endline evaluation
- 2018 Program in Global Surgery and Social Change, Harvard Medical School, Boston, MA
The Millennium Villages Project: a retrospective, observational, endline evaluation
- 2018 Bayesian Statistics for the Social Sciences, Columbia University, New York, NY
The Millennium Villages Project: a retrospective, observational, endline evaluation
- 2018 Keynote Address at the Global Health & Innovation Conference, Yale University, New Haven, CT
with S.E. Sachs and J.D. Sachs
Lessons from the Millennium Villages Health System
- 2018 Department of Computer Science, Princeton University, Princeton, NJ
Fairness and Causality
- 2017 Goldman School of Public Policy at University of California, Berkeley, Berkeley, CA
The Error of Our Ways: Making Policy Decisions Under Uncertainty
- 2017 Department of Public Policy, Tel Aviv University, Tel Aviv, Israel
Evaluating the Fight Against Extreme Poverty: The Millennium Villages Project
- 2016 Department of Mathematics and Statistics, Georgetown University, Washington D.C.
Causal Inference with Small Samples and Incomplete Baseline for the Millennium Villages Project
- 2016 Department of Biostatistics, Johns Hopkins, Baltimore, MD
Causal Inference with Small Samples and Incomplete Baseline for the Millennium Villages Project

- 2015 Department of Mathematics, Bucknell University, Lewisburg, PA
Causal Inference with Small Samples and Incomplete Baseline for the Millennium Villages Project
- 2015 Seminar for the Study of Development Strategies, Columbia University, New York, NY
Causal Inference with Small Samples and Incomplete Baseline for the Millennium Villages Project
- 2014 Joint Statistical Meetings, Boston, MA
Population Size Estimation with Inactive Lists: Hierarchical Mixture Models and Missing Data with Application to Armed Conflict Data
- 2014 Conference of the ASA Section on Statistical Learning and Data Mining, Durham, NC
Population Size Estimation with Inactive Lists: Hierarchical Mixture Models and Missing Data with Application to Armed Conflict Data
- 2013 Global Maternal Health Conference, Arusha, Tanzania
Does the Quality of Clinical Care Impact Maternal Mortality Among HIV-Positive Pregnant Women in HIV Care and Treatment Clinics in Dar es Salaam?

SKILLS

Proficient in R, Stan, Git/GitHub, \LaTeX , Markdown, command line
Experience with AWS, SQL, STATA, SAS, Shiny, HTML, CSS, JavaScript
Languages: Hebrew (fluent), Spanish (elementary proficiency)

REFERENCES

Andrew Gelman
Professor of Statistics
Columbia University
212-851-2142
`gelman@stat.columbia.edu`

Joseph K Blitzstein
Professor of the Practice in Statistics
Harvard University
617-496-2985
`blitzstein@stat.harvard.edu`

Jeffrey D Sachs
Professor of Sustainable Development,
Columbia University
`sachs@ei.columbia.edu`

Alan M Zaslavsky
Professor of Health Care Policy
Harvard University
617-432-2441
`zaslavsky@hcp.med.harvard.edu`