

# Monica Alexander

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## Academic Appointments

### University of Toronto

*Assistant Professor*, Statistical Sciences and Sociology July 2018 – *current*  
(Maternity leave: April 2019 – December 2019, June 2021 – December 2021)

## Education

Ph.D (Demography), **University of California, Berkeley**, 2018.

*Dissertation title:* Bayesian Methods for Mortality Estimation.

*Committee:* Josh Goldstein (chair); Ken Wachter; Dennis Feehan; Jas Sekhon.

M.Arts (Statistics), **University of California, Berkeley**, 2015.

M.Social Research (Demography), **Australian National University**, 2013.

B.Science (First Class Honors) (Maths and Chemistry), **University of Tasmania**, 2008.

## Professional Appointments

*Member, Technical Advisory Group*

**UN Interagency Group**

**for Child Mortality Estimation**

April 2023 – *current*

*Fellow*

**Institute for Clinical Evaluative Sciences**

January 2019 – *current*

*Lead statistical consultant*

**UN Interagency Group**

**on Stateless Populations Estimation**

January 2021 – June 2022

*Lead statistical consultant*

**World Health Organization Group**

**on Estimation of Causes of Maternal Mortality**

January 2019 – December 2020

## Papers

### *Peer-reviewed articles*

Yeung, J., **Alexander, M.**, and Riffe, T. ‘Bayesian implementation of Rogers-Castro model migration schedules: An alternative technique for parameter estimation’. (conditionally accepted, *Demographic Research*).

**Alexander, M.**, and Alkema, L., ‘A Bayesian Cohort Component Projection Model to Estimate Women of Reproductive Age at the Subnational Level in Data-Sparse Settings’, *Demography*, 2022. 59(5): 1713–1737.

Maheu-Giroux, M, Sardinha, L, Stöckl, H, Meyer, S, Godin, A, **Alexander, M.**, and García-Moreno, C. ‘A framework to model global, regional, and national estimates of intimate partner violence.’ *BMC medical research methodology*, 2022. 22(1): 1–17.

Susmann, H., **Alexander, M.**, and Alkema, L.. ‘Temporal models for demographic and global health outcomes in multiple populations: Introducing a new framework to review and standardize documentation of model assumptions and facilitate model comparison’. *International Statistical Review*, 2022. 90(3):437-467.

**Alexander, M.**, and Root, L., ‘Competing effects on the average age of infant death’. *Demography*, 2022. 59 (2): 587–605.

Kiang MV, Tsai AC, **Alexander, M.**, Rehkopf DH, Basu S. ‘Racial/Ethnic Disparities in Opioid-Related Mortality in the USA, 1999–2019: the Extreme Case of Washington DC.’ *Journal of Urban Health*, 2021. 98, 589–595.

Wilson, T., Grossman, I., **Alexander, M.**, Rees, P., and Temple, J. ‘Methods for small area population forecasts: state-of-the-art and research needs’, *Population Research and Policy Review*, 2021. 41, 865–898

Kiang MV, Chen JT, Krieger N, Buckee CO, **Alexander, M.**, Baker JT, Buckner RL, Coombs III G, Rich-Edwards JW, Carlson KW, and Onnela J-P. ‘Sociodemographic characteristics of missing data in digital phenotyping’. *Scientific Reports*. 2021. 11(1): 15408.

**Alexander, M.**, Polimis, K., and Zagheni, E., ‘Combining social media and survey data to nowcast migrant stocks in the United States’, *Population Research and Policy Review*, 2020. 41, 1–28.

**Alexander, M.**, Polimis, K., and Zagheni, E., ‘The impact of Hurricane Maria on out-migration from Puerto Rico: Evidence from Facebook data’, *Population and Development Review*, 2019, 45(3): 617-630.

Hug, L., **Alexander, M.**, You, D., and Alkema, L. ‘National, regional, and global levels and trends in neonatal mortality between 1990 and 2017, with scenario-based projections to 2030: a systematic analysis by the United Nations Inter-agency Group for Child Mortality Estimation’, *Lancet Global Health*, 2019, 7(6): 710–720.

Kiang, M.V., Basu S., Chen J., and **Alexander, M.** ‘Assessment of Changes in the Geographical Distribution of Opioid-Related Mortality Across the United States by Opioid Type, 1999-2016’. *JAMA Network Open*. 2019, 2(2):e190040.

Gemmill, A., Kiang, M.V., and **Alexander, M.** ‘Trends in pregnancy-associated mortality involving opioids in the United States, 2007–2016’, *American Journal of Obstetrics and Gynecology*, 2019, 220(1): 115–116.

**Alexander, M.**, Kiang, M.V., and Barbieri M., ‘Trends in Black and White Opioid Mortality in the United States, 1979–2015’, *Epidemiology*, 2018, 29(5): 707–715.

**Alexander, M.**, and Alkema, L., ‘Global Estimation of Neonatal Mortality using a Bayesian Hierarchical Splines Regression Model’, *Demographic Research*, 2018, 38(15): 335–372.

**Alexander, M.**, Zagheni, E., and Barbieri, M., ‘A Flexible Bayesian Model for Estimating Subnational Mortality’, *Demography*, 2017, 54(6): 2025–2041.

**Howlett, M.**, Gray, M., and Hunter, B., ‘Wages, government payments and other income of Indigenous and non-Indigenous Australians’, *Australian Journal of Labour Economics*, 2016, 19(2): 53–76.

Hunter, B., **Howlett, M.**, and Gray, M., ‘The Economic Impact of the Mining Boom on Indigenous and Non-Indigenous Australians’, *Asia & the Pacific Policy Studies*, 2015, 2(3): 517–530.

Gray, M., **Howlett, M.**, and Hunter, B., ‘Labour Market Outcomes for Indigenous Australians’, *The Economic and Labour Relations Review*, 2014, 25(3): 497–517.

Biddle, N., **Howlett, M.**, Hunter, B., and Paradies, Y., ‘Labour Market and Other Discrimination Facing Indigenous Australians’, *Australian Journal of Labour Economics*, 2013, 16(1): 91–113.

### *Book chapters*

**Alexander, M.** ‘Using social media advertising data to estimate migration trends over time’. In *Big Data Applications in Geography and Planning*. Edward Elgar Publishing. 2021.

### *Other published papers*

Badolato, L., Decter-Frain, A.G., Irons, N., Miranda, M.L., Walk, E., Zhalieva, E., **Alexander, M.**, Basellini, U. and Zagheni, E., 2023. ‘Predicting individual-level longevity with statistical and machine learning methods’ (No. WP-2023-008). Max Planck Institute for Demographic Research, Rostock, Germany.

Chong, M., Alburez-Gutierrez, D., Del Fava, E., **Alexander, M.**, & Zagheni, E. (2022). ‘Identifying and correcting bias in big crowd-sourced online genealogies’ (No. WP-2022-005). Max Planck Institute for Demographic Research, Rostock, Germany.

Winant, C., **Alexander, M.**, Dharamshi, A., Dukhovnov, D., & Barbieri, M. (2021). Methods Protocol for the United States Mortality County Database.  
<https://usa.mortality.org/uploads/counties/USCountyBayesianEstimationMethodsProtocol20210927.pdf>.

Hunter, B., **Howlett, M.**, and Biddle, N., ‘Modelling Exposure to Risk of Experiencing Discrimination in the Context of Endogenous Ethnic Identification’, *IZA Discussion Paper #8040*, March 2014.

Gray, M., Hunter, B., and **Howlett, M.**, ‘Indigenous Employment: A Story of Continuing Growth’, *CAEPR Topical Issue 2/2013*, Australian National University, Canberra.

### *Current working papers*

Katz, L., Chong, M., and **Alexander, M.** ‘Measuring short-term mobility patterns in North America using Facebook Advertising data, with an application to adjusting Covid-19 mortality rates.’  
<https://osf.io/preprints/socarxiv/bev4p/>.

Pejchinovska, M, and **Alexander, M.**. ‘A Bayesian Framework to Account for Misclassification Error and Uncertainty in the Estimation of Abortion Incidence.’  
<https://osf.io/preprints/socarxiv/uz8ev/>.

**Alexander, M.** , M. and Root, L. ‘Racial disparities in premature births, fetal deaths and neonatal deaths: a multi-decrement lifetable approach’.  
<https://osf.io/preprints/socarxiv/k5qp7/>.

Chong, M. Y.C., and **Alexander, M.** ‘Estimating the timing of stillbirths in countries worldwide using a Bayesian hierarchical penalized splines regression model.’  
<https://arxiv.org/abs/2212.06219>.

**Alexander, M.** ‘Decomposing dimensions of mortality inequality’.  
<https://osf.io/preprints/socarxiv/uqwxj>.

McBrien, H., and **Alexander, M.** ‘Trends in opioid seizure data and their association with opioid mortality’.

<https://www.medrxiv.org/content/10.1101/2022.10.08.22280845v1>.

Alexander, R., and **Alexander, M.** ‘The Increased Effect of Elections and Changing Prime Ministers on Topics Discussed in the Australian Federal Parliament between 1901 and 2018’.

<https://arxiv.org/abs/2111.09299>.

**Alexander, M.**, Chong, M.Y.C., and Pejcinovska, M. ‘Estimating causes of maternal death in data-sparse contexts’. <https://arxiv.org/abs/2101.05240>.

**Alexander, M.**, and Goldstein, J., ‘Deaths without denominators: using a matched dataset to study mortality patterns in the United States’,

<https://osf.io/preprints/socarxiv/q79ye/>.

## Grants awarded

### Principal Investigator:

**Data Sciences Institute** 2023-2024

#### **Catalyst Grant**

*Inequality in childcare: The case of nannies in Canada.* (co-PI)

CAD \$100,000

**Data Sciences Institute** 2023-2024

#### **Computational and Quantitative Social Sciences Grant**

*Deficits of migration in the age of Covid-19: A new approach to studying changing migration patterns.*

CAD \$10,000

**School of Cities, University of Toronto** 2021-2022

#### **Urban Challenge Grant**

*Disparities in climate-induced health outcomes in the Greater Toronto Area.* (co-PI)

CAD \$75,000

**Data Sciences Institute** 2021-2022

#### **Data Access Grant**

*To purchase data for research on disparities in climate-induced health outcomes in the Greater Toronto Area.* (co-PI)

CAD \$10,000

**Social Sciences and Humanities Research Council** 2019-2023

#### **Insight Development Grant**

*Using Facebook data to measure and understand international migration patterns in Canada*

CAD \$59,000

**University of Toronto Connaught New Researcher Award** 2019-2021

CAD \$18,900

### Partner Investigator:

**Australian Research Council** 2019-2022

#### **Discovery Project Grant**

*Developing Robust Small Area Population Forecasts for Planning and Policy*

## Teaching

### University of Toronto

Applied Statistics II (graduate, statistics)	Winter, 2020–2023
Demographic Methods (graduate, statistics)	Winter, 2019
<i>Materials:</i> <a href="https://github.com/MJAlexander/demographic-methods">https://github.com/MJAlexander/demographic-methods</a>	
Statistics for sociologists (graduate, sociology)	Winter, 2023
Intermediate data analysis (graduate, sociology)	Winter, 2021, 2022
Intermediate quantitative methods (undergraduate, sociology)	Fall 2020, Winter 2023

### University of California, Berkeley

<i>Instructor</i> , Formal Demography Workshop	June, 2017
<i>Instructor</i> , Formal Demography Workshop	August, 2015
<i>Graduate Student Instructor</i> , Demographic Methods	Fall Semester, 2014

### Other

Designed and taught workshop on non-traditional data sources in demography	April 2022
<i>Materials:</i> <a href="https://mjalexander.github.io/demopop-workshop/">https://mjalexander.github.io/demopop-workshop/</a>	
Designed and taught workshop on social media in demographic research	April 2021
<i>Materials:</i> <a href="https://mjalexander.github.io/social_media_workshop/">https://mjalexander.github.io/social_media_workshop/</a>	

## Conference presentations and invited talks

Listed for the past five years.

### 2023

*Balancing different information sources and modeling decisions in the Bayesian estimation of demographic quantities*

BSPS Annual meeting (September)

*A Bayesian framework to account for misclassification error and uncertainty in the estimation of abortion incidence*

ASA Annual meeting (August)

*Using social media data to estimate migration*

Joint Statistical Meetings (July)

*Estimating stillbirth rates by timing*

International Statistical Institute (ISI) World Statistics Congress (July)

*Bayesian demography: a brief history, recent applications, and future directions*

Statistics Seminar Series, *University of Washington* (April)

*Racial disparities in fetal and infant outcomes: insights from, and for, formal demography*

Demography Seminar Series, *Australian National University* (June)

Nuffield Sociology Seminar Series, *Oxford University* (March)

### 2022

*Estimating stillbirth rates by timing*

IMS International Conference on Statistics and Data Science (December)

***Competing Effects on the Average Age of Infant Death: Reconsidering the Approximation of  ${}_1a_0$***

Social Statistics Seminar, *University of Manchester* (November)

***Racial disparities in infant outcomes: insights from, and for, formal demography***

Social Demography Seminar, *Harvard University* (November)

***Jointly estimating subnational mortality for multiple populations***

Bayesian Methods for the Social Sciences Workshop (October)

Stellar Stats Workshop, *University of Toronto* (May)

***Future Projections of State-Level Foster Care Populations in the United States***

PAA Annual Meeting (April)

***Reproducibility in Demography***

Toronto Workshop on Reproducibility, *University of Toronto* (February)

***Bayesian models and reconciling incomplete demographic data***

Demography Seminar, *University of Wisconsin Madison* (February)

## 2021

***The future of data-driven demographic research*** (Panel member)

MPIDR 25th Anniversary (October)

***A Bayesian cohort component projection model for estimating subnational populations***

Demography Seminar Series, *Australian National University* (May)

CPC Seminar Series, *University of Southampton* (April)

Pop Center Brown Bag, *Florida State University* (February)

STAB Working Group, *University of Washington* (February)

***Overcoming barriers to sharing code***

Toronto Workshop on Reproducibility, *University of Toronto* (February)

***Using social media data to estimate migration***

Mathematics and Statistics Seminar, *Maynooth University* (February)

## 2020

***Future Projections of State-Level Foster Care Populations in the United States***

APPAM Annual Meeting, *Virtual meeting* (November)

***Bayesian hierarchical models in demographic research***

CERSI seminar series, *Yale University* (November)

***Using social media data to estimate migration***

Toronto Data Workshop (December)

Berkeley Formal Demography Workshop (June)

NEST seminar series, *Western University* (March)

## 2019

***Reproducibility in demographic research***

MPIDR Open Science Workshop, Rostock, Germany (October)

***Combining social media data and traditional surveys to predict migration stocks***  
 MPIDR-IUSSP Workshop on Migration Data and Models for a Better World: Perspectives from Academia, Data Science, and International Organizations, at ASA 2019: New York, NY (August)  
 Cornell Population Center, *Cornell University* (February)

## Software

Author, **rcbayes**, R package to estimate and visualize Rogers-Castro migration schedules in Bayesian framework.  
<https://cran.uib.no/web/packages/rcbayes/>

Contributor, **DemoTools**. R package for demographic analysis.  
<https://timriffe.github.io/DemoTools/>

## Professional Experience

<b>World Health Organization</b> <i>Consultant</i>	September 2016 – June 2017
<b>Data Science for Social Good</b> <i>Fellow</i>	May 2016 – September 2016
<b>Human Mortality Database</b> <i>Graduate Student Researcher</i>	January 2015 – May 2016
<b>UNICEF Technical Advisory Group</b> <i>Consultant</i>	March 2014 – July 2015
<b>The Centre for Aboriginal Economic Policy Research</b> <i>Research Officer</i>	April 2012 – December 2014
<b>Reserve Bank of Australia</b> <i>Analyst/Senior Analyst</i>	February 2010 – June 2013

## Honors

<b>Max Planck Sabbatical Award</b>	2022-2023
<b>Doctoral Completion Fellowship</b> ( <i>UC Berkeley</i> )	2017-2018
<b>Elizabeth Scott Memorial Award</b> ( <i>UC Berkeley</i> ) Statistics MA student showing the most promise in statistical research.	2015
<b>Regents-Intern Fellowship</b> ( <i>UC Berkeley</i> )	2013-2015
<b>Lado Ruzicka Prize in Social Research</b> ( <i>Australian National University</i> ) Awarded to the most outstanding Master of Social Research candidate.	2013
<b>W.D. Borrie Prize</b> ( <i>National essay competition, Masters category</i> ) For best student paper on a population-related topic.	2012
<b>University Medal</b> ( <i>University of Tasmania</i> ) One of three awarded to the most outstanding Science and Technology undergraduates.	2008
<b>Edith Rita Lowenstern Prize</b> ( <i>University of Tasmania</i> ) Awarded to the most outstanding mathematics honors student.	2008

## Service

### *Editorial and refereeing*

**Associate Editor:** *Demographic Research*

**Editor:** Special Collection on Formal Relationships, *Demographic Research* (with Josh Goldstein)

**Editorial Board:** *Canadian Studies in Population*

### *University*

**Panel Member:** *International Union of Scientific Study of Populations panel on Digital Demography.*

**Team Member:** *Consortium on Analytics for Data-Driven Decision-Making (CAnD3).*

### *Community and other*

**Co-founder and organizer:** Formal Demography Working Group. [https://formaldemography.github.io/working\\_group/](https://formaldemography.github.io/working_group/)

**Founder and Organizer:** *R-Ladies Toronto*

**Women in Demography:** Maintain a list of active scholars: [https://www.monicaalexander.com/women\\_scholars/](https://www.monicaalexander.com/women_scholars/)