Marisa A.P. Donnelly, PhD

www.epidonnelly.com | mapdonnelly@gmail.com | @MAPdonnelly | 530.864.8897

PROFESSIONAL EXPERIENCE SUMMARY

I am a research epidemiologist with 8 years of experience in applied public health, presently serving as a CDC Epidemic Intelligence Service Officer. My subject matter expertise is in domestic and global epidemiology, health equity, social determinants of health, and statistical/mathematical disease modeling. Last year, I designed and project-managed a field investigation of COVID-19 in San Diego County, California. I supervised the daily operations of over 45 CDC researchers who visited > 150 SARS-CoV-2-infected households with > 500 participants. I coordinated with public health agencies and was lead author on subsequent statistical analysis. In our scientific article, we show that decreased contact and increased ventilation lower the household risk of SARS-CoV-2 transmission, and that some social determinants (e.g., ability to isolate) explained secondary infection rates. I have designed and carried out numerous studies in Spanish and English, coordinated reporting networks and diagnostic testing pipelines in Peru and California, and developed statistical analysis plans using R and SQL languages to apply statistics and machine learning to datasets with millions of observations. I'm driven to improve health outcomes for underserved populations impacted by disease and believe that wealth and social position should not be obstacles to prevention or treatment.

Key words: **Statistics ▪ Disease Modeling ▪ Epidemiology ▪ Health Equity ▪ Global Health**
Technical skills: **R ▪ SQL ▪ SAS ▪ GitHub ▪ MATLAB ▪ ArcGIS ▪ QGIS**

EDUCATION

Ph.D. Epidemiology (2020), *University of California, Davis*

Dissertation: *"Quantifying heterogeneities in the risk of local Zika and dengue outbreaks in California"* (Advised by Dr. Christopher M. Barker)

B.S. Environmental Systems, Minor in International Studies (2013), *University of California, San Diego*

Complutense University of Madrid, Spain, International Studies (2011)

LANGUAGES: English (fluent) ▪ Spanish (fluent - written and verbal)

SCIENTIFIC AND LEADERSHIP EXPERIENCE

Centers for Disease Control and Prevention:

Epidemic Intelligence Service Officer (2020–Present)

• As an **EIS Officer** and **US Public Health Service Lieutenant** for the **CDC**, I am a front line investigator of emerging public health threats. In coordination with the federal CDC and the California Department of Public Health, I conduct epidemiological assessments, prioritize and manage outbreak investigations, and develop prevention guidelines to control the spread of outbreaks. I have led

multi-jurisdictional and multi-state investigations of disease clusters (i.e., COVID-19, Coccidioidomycosis, Monkeypox, Legionnaires' Disease, *Salmonella*, Shiga Toxin-producing *E. Coli*) and consulted local health departments on prevention and control. During my time as an EIS Officer I have:

- **Demonstrated that the California COVID-19 state surveillance system**, containing millions of observations, systematically underrepresented race and ethnicity data in electronic lab reports (ELRs), which implicates the ability of public health agencies to understand and respond to health disparities in COVID-19 and by extension, other diseases.
- **Led a 3-month household transmission investigation of SARS-CoV-2 Alpha variant of concern** in San Diego County, CA. I was the lead and project manager of > **45 CDC staff** where I designed and implemented data collection and enrollment of > 500 participants, collaborated with local, federal, and academic partners, and conducted statistical analyses (see [Published article here](#), with seven additional articles in review).
- **Showed that coccidioidomycosis infection burden** disproportionately impacts the most underserved Californian populations, measured by the [Healthy Places Index](#) (publication in preparation).
- **Provided direct scientific counsel to the California Department of Justice and Governor's Office** on a SARS-CoV-2 outbreak in around 300 high school athletes who attended multi-state tournaments; this led to a Cease and Desist order (covered by the [SF Chronicle](#) and [CNN](#)).
- **Contact traced and conducted symptom checks following monkeypox exposure** in 20 travelers on an international flight from Nigeria that then dispersed to various United States cities.
- **Performed ad hoc analyses and consulted local public health agencies** on outbreaks of Legionnaires' Disease, *Salmonella,* and Shiga Toxin-producing *E. Coli*.

California Department of Public Health:

Graduate Student Researcher (2018–2020)

- As a **researcher** for the **Climate Change and Health Equity Program**, I investigated over **8 million electronic health records** to understand how increased temperature driven by climate change may impact human morbidity and mortality burden in California. We found that underserved communities are at greatest risk for increased heat-related illness burden in the future. Methodologically, we developed **distributed lag non-linear models** to project future scenarios of excess temperature-related morbidity and mortality in California populations using RCP climate change warming scenarios (publication in preparation).

University of California, Davis:

Graduate Student Researcher (2014-2020)

- As the **survey and data manager** for [Proyecto Dengue](#) in Iquitos, Peru (funded by a national-level multi-million dollar NIH P01 Grant, under Primary Investigators Dr. Amy Morrison and Dr. Tom Scott), I managed and developed Spanish surveys and

data-collection efforts for a longitudinal cohort study investigating Zika and dengue virus transmission dynamics which enrolled over **15,000 participants**. I field-tested applications and survey protocols, trained project members (e.g., Peruvian doctors and researchers) in data management and survey design, and oversaw the data management system.

- As the **lead investigator** on a collaboration with the **Greater Los Angeles County Vector Control District**, I ran a household survey of 163 households in Los Angeles County, California and oversaw 3 interns to quantify health disparities in the risk of local Zika and dengue outbreaks as a function of socioeconomic status. Using **hierarchical regression models**, we found that a decrease in income of approximately $20,000 was associated with a 30% increase in *Ae. aegypti* (a mosquito vector that transmits Zika, Dengue, and Yellow fever) abundance at the household level, highlighting the need for community-specific vector control programs. At each household we administered a survey, which I wrote in English and in Spanish, and collected data on household characteristics and human behaviors. We also collected adult *Ae. aegypti* which were examined in subsequent laboratory analysis to identify blood meal hosts using Illumina sequencing. I conducted all statistical and spatial analysis on household data and *Ae. aegypti* abundance ([Published article here](#)).

- As a **researcher** for the **Davis Arbovirus Research and Training group (DART)**, I developed risk assessment tools and maps that were incorporated into the California Vector-borne Disease Surveillance Gateway ([VectorSurv Gateway, visible here](#)). I developed **mechanistic models** to summarize mosquito population dynamics and assess present and future risk of *Ae. aegypti* and *Ae. albopictus* range expansion in California with climate change projections. I also raised and maintained *Culex spp.* and *Aedes spp.* mosquito colonies for laboratory experiments and participated in an experimental *Wolbachia*-infected *Aedes albopictus* release project with [MosquitoMate](#) at the Greater Los Angeles County Vector Control District in June of 2015. We found that the release of sterile male *Ae. albopictus* mosquitoes led to an overall population reduction of *Ae. albopictus* in Los Angeles communities. This field trial was one of multiple in the U.S. that contributed to MosquitoMate winning EPA approval in 2017.

Journal Reviewer

2015–present

- **Journal of Medical Entomology**

- **Parasites and Vectors**

- **PLOS Neglected Tropical Diseases**
- **Vector-Borne and Zoonotic Diseases**

University of California, San Diego

Undergraduate Student Researcher 2011–2013

- As a **research assistant** in the **Department of Global Public Health**, I translated and edited HIV/STI participant surveys in Spanish and in English and aided in data cleaning. I also instigated protocol for GIS analysis of geospatial data and

conducted general clerical tasks for multiple international epidemiological studies of HIV/STI transmission.

• As a **research assistant** at the **Scripps Institute of Oceanography**, I developed an open-source protocol using GRASS GIS to analyze retrospective seasonal change of tide-pool algae ecology in response to seasonal and anomalous climate fluctuations. I also designed the data collection methodology and identification protocols for benthic layer marine species identification survey using a Remote Operated Vehicle (ROV) video collection apparatus.

PUBLICATIONS

Donnelly, M.A.P., M.R. Cheuy, R. Soto, et al., Household transmission of SARS-CoV-2 Alpha variant - United States, 2021. 2022 https://doi.org/10.1093/cid/ciac125

Schwartz, N.G, V.T. Chu, **M.A.P Donnelly**, et al., Sensitivity of at-home antigen testing compared with polymerase chain reaction testing and viral culture over the course of SARS-CoV-2 infection. 2022 (*In review*)

Whaley, M, M.W. Waltenburg, R. Chancey, **M.A.P. Donnelly**, et al., Symptoms and transmission of SARS-CoV-2 B.1.1.7 lineage among children and adolescents in household settings - California and Colorado, January-May, 2021, 2022 (*In review*)

Magleby, R., D.W. McCormick, S.L. Konkle, B. Austin, B. Albanese, M. Beatty, V.T. Chu, M.R. Chuey, **M.A.P. Donnelly**, et al., COVID-19 Vaccine breakthrough infections, February-April, 2021: a case series, 2022 (*In review*)

McCormick, D.W., S.L. Konkle, R. Magleby, A.K. Chakrabarti, B. Cherney, K. Lindell, A. Namageyo-Funa, R. Soto, **M.A.P. Donnelly**, et al., Effect of vaccination against SARS-CoV-2 on household transmission during initial vaccine introduction prior to the Delta variant surge - Denver, Colorado and San Diego, California January-April 2021, 2022 (*In review*)

Shragai, T., C. Pratt, J. Castro Georgi, A. Ahmad, B. Albanese, B. Austin, M. Beatty, B. Cherney, V.T. Chu, M.R. Cheuy, **M.A.P. Donnelly**, et al., Household surface contamination with SARS-CoV-2, 2022 (*In review*)

Namageyo-Funa, A., J.D. Ruffin, M.F. Jalloh, C. Scott, K. Lindell, M. Silver, A. Matanock, B. Funnels, R. Soto, **M.A.P. Donnelly**, et al., Behaviors associated with household transmission of SARS-CoV-2 in California and Colorado, January-April, 2021, 2022 (*In review*)

Kawiecki, A., W. Elson, **M.A.P. Donnelly**, J. Schwarz, J. Simpson, T. Scott, N. Achee, A. Morrisson. Use of mobile data collection tools to improve implementation of epidemiological trials in Iquitos, Peru. 2022 (*In review*)

Donnelly, M.A.P., G.L., Sondermeyer Cooksey, A. Nguyen, A. Yu, D.Vugia, S. Jain, Health disparities in coccidioidomycosis incidence – California, 2000-2019. 2022 (*In prep.*)

Donnelly, M.A.P., D. Maffei, G.L. Sondermeyer Cooksey, B.L. Materna, A. Kamali, Coccidioidomycosis cluster among wildland firefighters – California, 2021. (*In review*)

Donnelly, M.A.P., T. Benmarhnia, J. Vargo. Quantifying Heat-related Morbidity in California: Understanding Community-scale Impacts. 2022 (*In prep*.)

Donnelly, M.A.P., C.M. Barker. The transmission potential of *Aedes aegypti*-borne viruses in Los Angeles, California. 2022 (*In prep.)*

Donnelly, M.A.P., S. Kluh, R. Snyder, C.M. Barker. Quantifying socioeconomic heterogeneities in the distribution of *Aedes aegypti* among California Households. *PLoS Neglected Tropical Diseases*. 2020 https://doi.org/10.1371/journal.pntd.0008408

Donnelly, M.A.P., B. Main, S. Kluh, C.M. Barker. *Aedes aegypti* blood and sugar-feeding patterns in Los Angeles, California, *Proceedings and Papers of the Mosquito and Vector Control Association of California*. 2019 Available here

Donnelly, M.A.P., S. Kluh, C.M. Barker. Quantifying socioeconomic heterogeneities in the risk of local Zika and dengue outbreaks in California. *Proceedings and Papers of the Mosquito and Vector Control Association of California*. 2018;86:84-85 Available here

Donnelly, M.A.P., M. Marcantonio, F. Melton, C.M. Barker. Mapping past, present, and future climatic suitability for invasive *Aedes aegypti* in the United States: a process-based modeling approach. *Proceedings and Papers of the Mosquito and Vector Control Association of California*. 2017;85:18-20 Available here

Donnelly, M.A.P., M. Marcantonio, F. Melton, C.M. Barker. Mapping climatic suitability for invasive *Aedes aegypti* and *Aedes albopictus* in the United States: a process-based modeling approach. *Proceedings and Papers of the Mosquito and Vector Control Association of California*. 2016;4:92:94 Available here

Simpson, J.K., **M.A.P. Donnelly**, M. Marcantonio, C.M. Barker. CalSurv Gateway: survey results and new tools for invasive *Aedes*, *Proceedings and Papers of the Mosquito and Vector Control Association of California*. 2016;84:69:70 Available here

GRANTS & AWARDS
- **($30,000)** Pacific Southwest Center of Excellence in Vector-borne Diseases fellowship (*national-level competition*, 2019)
- **($8,500)** University of California Global Health Institute, Planetary Health Center of Expertise Summer fellowship (*state-level competition*, 2018)
- **($2,000)** Mosquito and Vector Control Association of California, Reeves New Investigator Award (*national-level competition*, 2020)
- **($2,000)** Summer Institute in the Statistics and Modeling of Infectious Diseases fellowship (*international-level competition*, 2018)

COMMUNICATION & OUTREACH

Mentor and applications developer for the Girls Outdoor Adventure in Leadership and Science (GOALS) program 2017-2020

GOALS cultivates and emboldens the next generation of STEM leaders through a free,

immersive, field-based summer science program for high school girls. Ultimately, GOALS seeks to reduce racial and gender gaps in STEM careers by: minimizing barriers to participation in outdoor education, nurturing interest in knowledge production and scientific inquiry, supporting and guiding career path exploration, teaching tangible skills and frameworks for future scientific learning, providing access to tools and resources for college readiness, creating peer support networks

Co-founder of the UC Davis Health Policy Journal Club 2017-2020

Organized monthly discussions on topics related to health policy in the U.S., selected relevant books, and facilitated discussions to engage members in conversation. Identified and invited guest speakers to attend club meetings.

Guest Lecturer 2016-present

Lectured in several junior high and high school classrooms on topics including epidemiology, vector-borne diseases in California, disease ecology, and statistics.

SELECTED PRESENTATIONS

Donnelly, M.A.P, R. Chuey, R. Soto, et al. "Household Transmission of SARS-Cov-2 Virus Variant B.1.1.7 Compared with Non-B.1.1.7 Viruses — San Diego County, California, January – March 2021", Council for State and Territorial Epidemiologists Annual Conference, virtual, June (2021)

Donnelly, M.A.P, S. Jain, "Evaluation of the California COVID-19 surveillance system", Epidemic Intelligence Service Annual Symposium, virtual, September (2020)

Donnelly, M.A.P, C.M. Barker. "Quantifying sociodemographic heterogeneities in the risk of local Zika and dengue outbreaks in California", Reeves Young Investigator Symposium, Mosquito and Vector Control Association of California, San Diego, CA, January (2020).

Donnelly, M.A.P, B. Main, C.M. Barker. "*Aedes aegypti* blood and sugar-feeding patterns in Los Angeles, California", American Society for Tropical Medicine and Hygiene. Washington D.C., November (2020).

Donnelly, M.A.P, B. Main, C.M. Barker. "Development of a more efficient and cost-effective blood- and sugar-meal assay for mosquitoes." Pacific Southwest Regional Center of Excellence in Vector-Borne Diseases Seminar Series. Davis, CA. February (2019).

Donnelly, M.A.P, C.M. Barker. (Invited Speaker) "Climate suitability for invasive *Aedes aegypti* in the United States." Centers for Disease Control, BRACE Methods Community of Practice Meeting, 10 October (2018).

Donnelly, M.A.P, S. Kluh, C.M. Barker. "Quantifying sociodemographic heterogeneities in the risk of local Zika and dengue outbreaks in California", American Society for Tropical Medicine and Hygiene. New Orleans, LA. November (2018).

Donnelly, M.A.P, S. Kluh, C.M. Barker. "Socioeconomic drivers of *Aedes aegypti*

abundance in Los Angeles, California", American Society for Tropical Medicine and Hygiene. Baltimore, MD. November (2017).

Donnelly, M.A.P, M. Marcantonio, M. Neteler, F. Melton, A. Rizzoli, C.M. Barker. "A mechanistic modeling approach for mapping future climatic suitability for invasive *Aedes aegypti* in the United States", Designated Emphasis in the Biology of Vector-borne Diseases Annual Symposium. Davis, CA. May (2017).

Donnelly, M.A.P, M. Marcantonio, M. Neteler, F. Melton, A. Rizzoli, C.M. Barker. "Mapping past, present, and future climatic suitability for invasive *Aedes aegypti* and *Aedes albopictus* in the United States: a process-based modeling approach", Mosquito and Vector Control Association of California. San Diego, CA. January (2017).

Donnelly, M.A.P, M. Marcantonio, M. Neteler, F. Melton, A. Rizzoli, C.M. Barker. "Current and future climatic suitability for invasive *Aedes aegypti* in the United States", American Geophysical Union. San Francisco, CA. December (2016).

Donnelly, M.A.P, M. Marcantonio, M. Neteler, F. Melton, A. Rizzoli, C.M. Barker. "Mapping past, present, and future climatic suitability for invasive *Aedes aegypti* in the United States: a process-based modeling approach", American Society for Tropical Medicine and Hygiene. Atlanta, GA. November (2016).

PROFESSIONAL AFFILIATIONS
• CDC Epidemic Intelligence Service (EIS) Alumni Association (EISAA)
• American Society for Tropical Medicine and Hygiene (ASTMH)
• American Committee of Medical Entomology (ACME)
• Mosquito and Vector Control Association of California (MVCAC)

TEACHING EXPERIENCE
• **Teaching Assistant:** Disease Ecology (VME 158) Spring 2019
• **Teaching Assistant:** Analysis and Interpretation of Epidemiological Data (EPI 208) Fall 2018
• **Teaching Assistant:** Spatial Epidemiology (EPI 223) Spring 2017
• **Teaching Assistant:** Introduction to Biology: Biodiversity (BIS2C) Fall 2014