Marisa A.P. Donnelly, PhD

CDC Epidemic Intelligence Service Officer
mapdonnelly@gmail.com +1 (530) 864-8897 www.epidonnelly.com

SUMMARY OF PROFESSIONAL EXPERIENCE

I am a CDC Epidemic Intelligence Service Officer and reserach epidemiologist with 7 years of experience in applied public health research, focusing on infectious disease modeling, field epidemiology, and health equity. I have extensive experience investigating infectious disease transmission dynamics, specializing in conducting field work and building statistical and mathematical models to identify vulnerable communities and predict transmission.

I have led teams of over 40 CDC investigators, designed my own studies, built multiple spatio-temporal statistical and mechanistic models, and worked with datasets containing millions of observations. I'm ready to take on the challenge of improving public health practices in the US and globally.

EDUCATION

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

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

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

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

LANGUAGES

- English (fluent)
- Spanish (fluent)

EMPLOYMENT

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 on the front lines of public health investigating emerging public health threats. I am stationed in the Disease Investigation Section at the California Department of Public Health. As an EIS Officer, I conduct epidemiological assessments, including outbreak investigations, of infectious diseases of public health importance, and develop prevention guidelines for their control. I have lead multijurisdictional and multistate investigations of disease cluseters

and consulted local health departments on prevention and control of communicable diseases. The infectious diseases we investigate include foodborne, waterborne, and other enteric infections; infections caused by endemic fungal diseases including coccidioidomycosis (i.e. Valley fever); and infections caused by select agents including botulism.
- Projects have included: Conducting a 3 month household transmission investigation of SARS-CoV-2 in San Diego County. I **led this field investigation of over 40 CDC deployers**, designed and implemented data collection and enrollment of 75 households with more than 250 participants, and conducted all statsticiall analyses (publications in prep.); **Investigating an outbreak of SARS-CoV** in high school basketball players from 4 counties that attended a basketball tournament (publication in prep); Evaluating the California COVID-19 state surveillance system, focusing on the accuracy of case demographics; Joining and analyzing California COVID-19 surveillance data with MediCal data to understand health disparaties in COVID-19.

California Department of Public Health:

Graduate Student Researcher 2018–2020

- As a **researcher** for the **Climate Change and Health Equity Program**, I investigated the human morbidity and mortality burden attributed to ambient temperature and extreme heat and cold events in California. The dataset I worked with contained over **8 million observations**. I developed distributed non-linear lag models to project future scenarios of excess temperature-related morbidity and mortality in California populations using climate change scenarios and general circulation models. I focused on the most vulnerable populations and identified the communities at greatest risk for increases in heat-related illness burden in the future. Publication in prep.

University of California, Davis:

Graduate Student Researcher 2014-2020

- As a **researcher** for the **Davis Arbovirus Research and Training group (DART)**, I quantified sociodemographic heterogeneities in *Aedes aegypti* abundance in Los Angeles, California, and developed risk assessment tools and maps that were incorporated into the California Vectorborne Disease Surveillance Gateway (CalSurv Gateway). I developed mechanistic models to summarize mosquito population dynamics and assess present and future risk of *Ae. aegypti* and *Aedes albopictus* range expansion in California with climate change projections, which are publically accessible here. 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. The field trial found that the release of sterile male *Ae. albopictus* mosquitoes lead 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 getting EPA approval in 2017.
- As the **lead investigator** on project in collaboration with the **Greater Los Angeles County Vector Control District**, I ran a household survey of 163 participants in Los Angeles County, CA. Our aim was to quantify sociodemographic heterogeneities in the risk of local Zika and dengue outbreaks in California. We found that a decrease in income of approximately $20,000 was associated with a 30% increase in *Ae. aegypti* 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. I designed the study, collected adult *Ae. aegypti* and identified species in the laboratory, and managed 3 undergraduate researchers. I also conducted all statistical and spatial analysis on household data and *Ae. aegypti* abundance. Publication in prep.
- As the **survey and data manager** for the **Proyecto Dengue** Program Project Grant (P01) (PIs Dr. Tom Scott and Dr. Amy Morrison), I managed and developed surveys and data-collection efforts for the Proyecto Dengue longitudinal cohort study; a study which has enrolled over **15,000 participants**. I translated and streamlined surveys and Standard Operating Procedures (SOPs) into Spanish and field-tested applications and survey protocols in Iquitos, Peru. I also trained project members, including Peruvian doctors and researchers, in CommCare data management and survey design, and maintained communications between CommCare database management team and project administrators.

Journal of Medical Entomology:

Reviewer 2019–present

- Assessed whether manuscripts meet the criteria for publication described by the *Journal of Medical Entomology*.

Parasites and Vectors:

Reviewer 2018–present

- Assessed whether manuscripts meet the criteria for publication described by *Parasites and Vectors*.

PLOS Neglected Tropical Diseases:

Reviewer 2017–present

- Assessed whether manuscripts meet the criteria for publication described by *PLOS Neglected Tropical Disease*.

Vector-Borne and Zoonotic Diseases:

Reviewer 2015–present

- Assessed whether manuscripts meet the criteria for publication described by *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 study location 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 analyzed 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., 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., T. Benmarhnia, J. Vargo. Quantifying Heat-related Morbidity in California: Understanding Community-scale Impacts. 2021 (In prep.)

Donnelly, M.A.P., C.M. Barker. The transmission potential of *Aedes aegypti*-borne viruses in Los Angeles, California. 2021 (In prep.)

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

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. *American Journal of Tropical Medicine and Hygiene.* 2019 (In review)

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

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TEACHING EXPERIENCES

- **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

GRANTS & AWARDS

- **($2,000)** Mosquito and Vector Control Association of California, Reeves New Investigator Award 2020

- **($30,000)** Pacific Southwest Center of Excellence in Vector-borne Diseases fellowship 2019
- **($8,500)** University of California Global Health Institute, Planetary Health Center of Expertise Summer fellowship 2018
- **($5,000)** University of California, Davis Graduate Group in Epidemiology fellowship 2015
- **($5,000)** University of California, Davis Graduate Group in Epidemiology fellowship 2014
- **($2,000)** Summer Institute in the Statistics and Modeling of Infectious Diseases fellowship (International competition) 2018
- *2nd place poster*, Designated Emphasis in the Biology of Vectorborne Diseases Annual Symposium 2017
- *National Institutes of Health* Ruth L. Kirschstein National Research Service Award (F31) Applicant (*unfunded*) 2017
- *National Institutes of Health* Ruth L. Kirschstein National Research Service Award (F31) Applicant (*unfunded*) 2017

COMMUNICATION & OUTREACH

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

GOALS seeks to cultivate and embolden 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-present

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.

PRESENTATIONS

Donnelly, M.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.P, B. Main, C.M. Barker. "Studies on *Aedes aegypti* feeding and risk for local Zika virus transmission in Los Angeles, California." Mosquito and Vector Control Association of California, Burlingame, CA. February (2019).

Donnelly, M.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.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.P., S. Kluh, C.M. Barker. "Quantifying sociodemographic and human behavioral heterogeneities in *Aedes aegypti* abundance in Los Angeles, California", Designated Emphasis in the Biology of Vectorborne Diseases Annual Symposium. Davis, CA. May (2018).

Donnelly, M.P., S. Kluh, C.M. Barker. "Quantifying sociodemographic heterogeneities in *Aedes aegypti* abundance in Los Angeles, California", Mosquito and Vector Control Association of California, Monterrey, CA. January (2018).

Donnelly, M.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.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 Vectorborne Diseases Annual Symposium. Davis, CA. May (2017).

Donnelly, M.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.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).

Mosquitoes: Vector Biology and Epidemiology, Symposium moderator, American Society for Tropical Medicine and Hygiene. Atlanta, GA. November (2016).

Donnelly, M.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).

Donnelly, M.P., M. Marcantonio, M. Neteler, F. Melton, A. Rizzoli, C.M. Barker. "Mapping 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. Sacramento, CA. February (2016).

PROFESSIONAL AFFILIATIONS

- American Society for Tropical Medicine and Hygiene (ASTMH)
- American Committee of Medical Entomology (ACME)
- Mosquito and Vector Control Association of California (MVCAC)