

SAM HEFT-NEAL

Center on Food Security and the Environment &
Environmental Change and Human Outcomes Lab
Stanford University
Y2E2 364, 473 Via Ortega, Stanford, CA 94305

Email: sheftneal@stanford.edu
Personal Web: <http://stanford.edu/~samhn/>
Lab Web: <https://www.stanfordecholab.com/>

EMPLOYMENT

Senior Research Scholar (2024 - present)
Research Scholar (2017 - 2023)
Center on Food Security and the Environment &
Environmental Change and Human Outcomes Lab, Stanford University

Postdoctoral Scholar (2015 - 2017),
Department of Earth System Science, Stanford University

EDUCATION

Ph.D. in Agricultural & Resource Economics, University of California, Berkeley, 2015
B.A. in Statistics & Economics with Honors, University of California, Berkeley, 2007

PUBLICATIONS

Pascal Geldsetzer, Daniel Fridljand, Mathew Kiang, Eran Bendavid, Sam Heft-Neal, Marshall Burke, Alexander Thieme, & Tarik Benmarhnia. 2024. “Sociodemographic and geographic variation in mortality attributable to air pollution in the United States”. *Nature Medicine*. [paper link]

Patrick Behrer & Sam Heft-Neal. 2024. “In most low- and middle-income countries pollution levels are higher in wealthier areas”. *Nature Sustainability*, 7. [paper link]

Renzhi Jing, Sam Heft-Neal, Daniel Chavas, Max Griswold, Zetianyu Wang, Aaron Clark-Ginsberg, Debarati Guha-Sapir, Eran Bendavid, & Zachary Wagner. 2023. “Global Population Profile of Tropical Cyclone Exposure from 2002 to 2019”. *Nature*, 626. [paper link]

Marshall Burke, Marissa Childs, Brandon de la Cuesta, Minghao Qiu, Jessica Li, Carlos F. Gould, Sam Heft-Neal, & Michael Wara. 2023. “The contribution of wildfire to PM_{2.5} trends in the USA”. *Nature*, 622 (7984). [paper link]

Jeff Wen, Sam Heft-Neal, Patrick Baylis, Jud Boomhower, & Marshall Burke. 2023. “Quantifying fire-specific smoke exposure and health impacts”. *PNAS*. 120 (51). [paper link].

Sam Heft-Neal, Carlos Gould, Marissa Childs, Kari Nadeau, Mathew Kiang, Mark Duggan, Eran Bendavid, & Marshall Burke. 2023. “Emergency department visits respond non-linearly to wildfire smoke”. *PNAS*, 120 (39). [paper link]

Hemant Pullabhotla, Mustafa Zahid, Sam Heft-Neal, Vaibhav Rathi, & Marshall Burke. 2023. “Global Biomass Fires and Infant Mortality”. *PNAS*, 120 (23). [paper link]

Carlos Gould, Sam Heft-Neal, Mary Prunicki, Juan Aguilera, Marshall Burke, & Kari Nadeau. 2023. “Health effects of wildfires”. *Annual Review of Medicine*, 75. [paper link]

Sam Heft-Neal, Anne Driscoll, Wei Yang, Gary Shaw, & Marshall Burke. 2022. “Associations between wildfire smoke exposure during pregnancy and risk of preterm birth in California”. *Environmental Research*, 203. [paper link].

- Marissa Childs, Jessica Li, Jeff Wen, Sam Heft-Neal, Anne Driscoll, Sherrie Wang, Carlos Gould, Minghao Qiu, Jen Burney & Marshall Burke. 2022. “Daily local-level estimates of ambient wildfire smoke PM_{2.5} for the contiguous US”. *Environmental Science & Technology*. [paper link].
- Marshall Burke, Sam Heft-Neal, Jessica Li, Anne Driscoll, Patrick Baylis, Matthieu Stigler, Joakim Weill, Jen Burney, Jeff Wen, Marissa Childs, & Carlos Gould. 2022. “Exposures and behavioral responses to wildfire smoke”. *Nature Human Behavior*. [paper link]
- Jennifer Burney, Geeta Persad, Jonathan Proctor, Eran Bendavid, Marshall Burke & Sam Heft-Neal. 2022. “Geographically-resolved social cost of anthropogenic emissions accounting for both direct and climate-mediated effects”. *Science Advances*. [paper link].
- Jonas Miller, Emily Dennis, Sam Heft-Neal, Booil Jo, & Ian Gotlib. 2021. “Fine Particulate Air Pollution, Early Life Stress, and their Interactive Effects on Adolescent Structural Brain Development: A Longitudinal Tensor-Based Morphometry Study”. *Cerebral Cortex*, 346. [paper link].
- Marshall Burke, Anne Driscoll, Sam Heft-Neal, Jenny Xue, Jennifer Burney, & Michael Wara. 2021. “The changing risk and burden of wildfire in the US”. *PNAS*, 118 (2). [paper link].
- Eran Bendavid, Ties Boerma, Nadia Akseer, Ana Langer, Espoir Bwenge Malembaka, Emelda A. Okiro, Paul Wise, Sam Heft-Neal, Robert E. Black & Zulfiqar A. Bhutta. 2021. “The effects of armed conflict on the health of women and children”. *The Lancet*, 397 (10273). [paper link].
- Sam Heft-Neal, Jen Burney, Eran Bendavid, Kara Voss & Marshall Burke. 2020. “Dust pollution from the Sahara and African infant mortality”. *Nature Sustainability*, 3 (10). [paper link].
- Nathan Lo, Ribhav Gupta, David Addiss, Eran Bendavid, Sam Heft-Neal, Alexei Mikhailov, Antonio Montresor & Pamela Sabina Mbabazi. 2020. “Comparison of World Health Organization and Demographic and Health Survey data to estimate sub-national deworming coverage in pre-school children”. *PLOS Neglected Tropical Diseases*, 14 (8). [paper link].
- Zachary Wagner, Sam Heft-Neal, Paul Wise, Robert Black, Marshall Burke, Ties Boerma, Zulfiqar Bhutta & Eran Bendavid. 2019. “Women and children living in areas of armed conflict in Africa: a geospatial analysis of mortality and orphanhood”. *The Lancet Global Health*, 7 (12). [paper link].
- Nathan Lo, Sam Heft-Neal, Jean Coulibaly, Leslie Leonard, Eran Bendavid, & David Addiss. 2019. “State of deworming coverage and equity in low-income and middle-income countries using household health surveys: a spatiotemporal cross-sectional study”. *The Lancet Global Health*, 7 (11). [paper link].
- Corey Bradshaw, Sarah Otto, Alicia Annamalay, Sam Heft-Neal, Zach Wagner, & Peter Le Souef. 2019. “Socio-economic and environmental determinants of child health among African nations”. *BMJ Open*, 9 (9). [paper link].
- Zach Wagner, Sam Heft-Neal, Zulfiqar Bhutta, Robert Black, Marshall Burke, & Eran Bendavid. 2018. “Armed conflict and child mortality in Africa: a geospatial analysis”. *The Lancet*, 392 (10150). [paper link].
- Sam Heft-Neal, Jennifer Burney, Eran Bendavid, & Marshall Burke. 2018. “Robust relationship between air quality and infant mortality in Africa”. *Nature*, 559 (7713). [paper link].
- Marshall Burke, Felipe Gonzalez, Patrick Baylis, Sam Heft-Neal, Ceren Baysan, Sanjay Basu, & Solomon Hsiang. 2018. “Rising temperatures increase suicide rates in the United States and Mexico”. *Nature Climate Change*, 8 (1). [paper link].

Nathan Lo, Jedidiah Snyder, David Addiss, Sam Heft-Neal, Jason Andrews, & Eran Bendavid. 2018. “Deworming in pre-school age children: A global empirical analysis of health outcomes”. PLOS Neglected Tropical Diseases, 12 (5). [paper link].

Sam Heft-Neal, Marshall Burke, & David Lobell. 2017. “Using remotely sensed surface temperature to estimate climate response functions”. Environmental Research Letters, 12 (1). [paper link].

Marshall Burke, Sam Heft-Neal, & Eran Bendavid. 2016. “Understanding variation in child mortality across Sub-Saharan Africa: A spatial analysis”. The Lancet Global Health, 4 (12). [paper link].

PAPERS IN PREPARATION, SUBMITTED, OR UNDER REVIEW

“Game, sweat, match: temperature and elite worker productivity” (with Marshall Burke, Vincent Tanutama, Miyuki Hino & David Lobell) [*under revision*]

“Identifying child growth effects of elevated pollution levels during pregnancy” (with Martin Heger, Vaibhav Rathi, & Marshall Burke) [*under revision*]

“Antenatal wildfire smoke exposure and preterm birth phenotypes: a retrospective cohort study” (with Anne Waldrop, Yair Blumenfeld, Jonathan Mayo, Danielle Panelli, Marshall Burke, Stephanie Leonard & Gary Shaw) [*under review*]

“Quantifying morbidity and mortality impacts from daily temperatures in California” (with Carlos Gould, Alex Heaney, Mathew Kiang, Chris Callahan, Eran Bendavid, and Marshall Burke) [*under review*]

“Wildfire smoke exposure and mortality burden in the US under future climate change” (with Minghao Qiu, Jessica Li, Carlos F. Gould, Renzhi Jing, Makoto Kelp, Marissa L. Childs, Jeff Wen, Yuanyu Xie, Meiyun Lin, Mathew V. Kiang, Noah S. Diffenbaugh, Marshall Burke) [*under review*]

“Wildfire-specific PM2.5 is associated with mental health and pregnancy-related outcomes during the 2020 California fires ” (with Youn Soo Jung, Kari Nadeau, Mary Prunicki, Mark Cullen, Lorene Nelson, Melissa Bondy, Marshall Burke) [*submitted*]

“Impact of Tropical Cyclone Exposure on Child Mortality in Low and Middle Income Countries” (with Zetianyu Wang, Renzhi Jing, Aaron Clark-Ginsberg, Debarati Guha-Sapir, Eran Bendavid, & Zachary Wagner) [*submitted*]

“Wildfire smoke exposure and health impacts uncertainty: comparing chemical transport models with machine learning approach” (with Minghao Qiu, Makoto Kelp, Xiaomeng Jin, Carlos F. Gould, Daniel Tong, and Marshall Burke) [*submitted*]

“Exposure to Long-Term Ambient Air Pollution and Cardiac Imaging Findings: A Systematic Review and Semi-Quantitative Synthesis” (with Andrew Chang, Annabel Tan, Francois Haddad, Marshall Burke, Koen Nieman, Amanda Woodward, Lily Ren, Theodore Abraham, and Michelle Odden) [*submitted*]

“Tropical Cyclones Increase Education Inequity in Low- and Middle-income Countries” (with Renzhi Jing, Zetianyu Wang, Minghao Qiu, Jie Chen, Isaac Opper, Eran Bendavid, & Zachary Wagner) [*submitted*]

“Are we adapting to climate change?” (with Marshall Burke, Mustafa Zahid, Mariana Martins, Chris Callahan, Richard Lee, Jay Amgalan, Mathew Kiang, & David Lobell) [*in prep*]

“Spatial and temporal patterns of wildfire evacuations in California” (with Lela Hanson, Atsada Israpanich, Talia Buckhouse, Jena Alsop, Julian Berkowitz, Katie Rueff, Prathmesh Sonawane, Julia Zeitlin & Evan Zhu) [*in prep*]

“The chemical composition of wildfire smoke exposure in the United States” (with Emma Krasovich Southworth, Carlos Gould, Minghao Qiu, Kara Voss, Jen Burney, Marshall Burke, Ayako Kawano, Jeff Wen, & Jenny Hand) [*in prep*]

“Characterizing the Impact of the 2019 Kincadee Wildfire on Sonoma County Adult Cardiopulmonary Emergency Department Utilization” (with Andrew Chang, Marshall Burke, Mathew Kiang, Francois Haddad, Eli Schulman, Annabel Tan, Kari Nadeau, and Michelle Odden) [*in prep*]

“The dynamics of weather, yields and deforestation: Evidence from soy in the Brazilian Amazon” (with Drew Behnke, & Ryan Abman) [*in prep*]

FELLOWSHIPS AND AWARDS

Top 10 Clinical Research Forum Research Achievement Award 2019 (*for Heft-Neal et al 2018*)

National Science Foundation Graduate Research Fellowship 2011-2014

One Health Research Fellowship, University of California Global Health Institute, 2011

REFEREE SERVICE

American Journal of Respiratory and Critical Care Medicine, Environment and Development Economics, Environmental Health Perspectives, Environmental Research, Environmental Research Letters, GeoHealth, Global Environmental Change, JAMA Network Open, Journal of the Association of Environmental and Resource Economists, Journal of Environmental Economics and Management, Journal of Peace Research, Lancet Planetary Health, Land Economics, Nature, Nature Climate Change, Nature Communications, Nature Sustainability, Philosophical Transactions A, PNAS, Science of the Total Environment, Scientific Reports.