Stanford

Sam Heft-Neal

Senior Research Scholar, Center on Food Security and Environment at FSI

Bio

BIO

Sam Heft-Neal is a Senior Research Scholar at the Center on Food Security and the Environment. Sam is working to identify the impacts of environmental changes on health, agriculture, and food availability around the world. His recent work combines household surveys with remote sensing data to examine environmental drivers of child health. Sam holds a Ph.D. in Agricultural and Resource Economics from the University of California, Berkeley and a B.A. in Statistics and Economics from the same institution.

ACADEMIC APPOINTMENTS

- Senior Research Scholar, Center on Food Security and Environment at FSI

HONORS AND AWARDS

- Top 10 Clinical Research Achievement Award, Clinical Research Forum (03/03/2019)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Affiliate, Stanford Center for Human and Planetary Health (2025 - present)

LINKS

- CV: http://stanford.edu/~samhn/SamHeftNealCV.pdf
- Website: http://stanford.edu/~samhn/
- Lab Site: https://www.stanfordecholab.com/
- Github: https://github.com/sheftneal
- Google Scholar: https://scholar.google.com/citations?user=29qMJjAAAAAJ&hl=en

Publications

PUBLICATIONS

- **Quantifying the contributions of climate change and adaptation to mortality from unprecedented extreme heat events.** *Proceedings of the National Academy of Sciences of the United States of America*
  Callahan, C. W., Trok, J. T., Wilson, A. J., Gould, C. F., Heft-Neal, S., Burke, M., Diffenbaugh, N. S.
  2025; 122 (51): e2503577122
- **Antenatal wildfire smoke exposure and preterm birth phenotypes: A retrospective cohort study** *ENVIRONMENTAL EPIDEMIOLOGY*
  Waldrop, A. R., Blumenfeld, Y. J., Mayo, J. A., Panelli, D. M., Heft-Neal, S., Burke, M., Leonard, S. A., Shaw, G. M.
  2025; 9 (6)
- **Increasing risk of mass human heat mortality if historical weather patterns recur** *NATURE CLIMATE CHANGE*

Callahan, C. W., Trok, J., Wilson, A. J., Gould, C. F., Heft-Neal, S., Diffenbaugh, N. S., Burke, M.
2025

- **Spatial Patterns of Historical Changes in Human Heat Stress Disagree Across Metrics** *GEOPHYSICAL RESEARCH LETTERS*
  Kong, Q., Jing, R., Raymond, C., Tuholske, C., Heft-Neal, S., Wagner, Z., Wang, Z., Zimmer, A., Huber, M., Bendavid, E.
  2025; 52 (20)
- **Is a Microgram of Smoke PM2.5 Worse for Respiratory Health? Interpreting New Evidence.** *American journal of respiratory and critical care medicine*
  Heft-Neal, S., Gould, C. F.
  2025
- **Wildfire smoke exposure and mortality burden in the US under climate change.** *Nature*
  Qiu, M., Li, J., Gould, C. F., Jing, R., Kelp, M., Childs, M. L., Wen, J., Xie, Y., Lin, M., Kiang, M. V., Heft-Neal, S., Diffenbaugh, N. S., Burke, et al
  2025
- **Temperature extremes impact mortality and morbidity differently.** *Science advances*
  Gould, C. F., Heft-Neal, S., Heaney, A. K., Bendavid, E., Callahan, C. W., Kiang, M. V., Graff Zivin, J., Burke, M.
  2025; 11 (31): eadr3070
- **The impact of tropical cyclone exposure on infant mortality in low- and middle-income countries.** *Science advances*
  Wang, Z., Jing, R., Heft-Neal, S., Clark-Ginsberg, A., Guha-Sapir, D., Bendavid, E., Wagner, Z.
  2025; 11 (21): eadt9640
- **Decreased likelihood of schooling as a consequence of tropical cyclones: Evidence from 13 low- and middle-income countries.** *Proceedings of the National Academy of Sciences of the United States of America*
  Jing, R., Heft-Neal, S., Wang, Z., Chen, J., Qiu, M., Opper, I. M., Wagner, Z., Bendavid, E.
  2025; 122 (18): e2413962122
- **The 2025 report of the Lancet Countdown to 2030 for women's, children's, and adolescents' health: tracking progress on health and nutrition.** *Lancet (London, England)*
  Amouzou, A., Barros, A. J., Requejo, J., Faye, C., Akseer, N., Bendavid, E., Blumenberg, C., Borghi, J., El Baz, S., Federspiel, F., Ferreira, L. Z., Hazel, E., Heft-Neal, et al
  2025
- **Fine Particulate Matter From 2020 California Wildfires and Mental Health-Related Emergency Department Visits.** *JAMA network open*
  Jung, Y. S., Johnson, M. M., Burke, M., Heft-Neal, S., Bondy, M. L., Chinthrajah, R. S., Cullen, M. R., Nelson, L., Dresser, C., Nadeau, K. C.
  2025; 8 (4): e253326
- **The Influence of Wildfire Smoke on Ambient PM2.5 Chemical Species Concentrations in the Contiguous US.** *Environmental science & technology*
  Krasovich Southworth, E., Qiu, M., Gould, C. F., Kawano, A., Wen, J., Heft-Neal, S., Kilpatrick Voss, K., Lopez, A., Fendorf, S., Burney, J. A., Burke, M.
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- **Identifying child growth effects of elevated pollution levels during pregnancy** *ENVIRONMENTAL RESEARCH LETTERS*
  Heft-Neal, S., Heger, M., Rathi, V., Burke, M.
  2025; 20 (1)
- **Evaluating Chemical Transport and Machine Learning Models for Wildfire Smoke PM2.5: Implications for Assessment of Health Impacts.** *Environmental science & technology*
  Qiu, M., Kelp, M., Heft-Neal, S., Jin, X., Gould, C. F., Tong, D. Q., Burke, M.
  2024
- **Disparities in air pollution attributable mortality in the US population by race/ethnicity and sociodemographic factors.** *Nature medicine*
  Geldsetzer, P., Fridljand, D., Kiang, M. V., Bendavid, E., Heft-Neal, S., Burke, M., Thieme, A. H., Benmarhnia, T.
  2024
- **Sociodemographic and geographic variation in mortality attributable to air pollution in the United States.** *medRxiv : the preprint server for health sciences*
  Geldsetzer, P., Fridljand, D., Kiang, M. V., Bendavid, E., Heft-Neal, S., Burke, M., Thieme, A. H., Benmarhnia, T.

2024

- **Higher air pollution in wealthy districts of most low- and middle-income countries** *NATURE SUSTAINABILITY*
  Behrer, A., Heft-Neal, S.
  2024
- **Global population profile of tropical cyclone exposure from 2002 to 2019.** *Nature*
  Jing, R., Heft-Neal, S., Chavas, D. R., Griswold, M., Wang, Z., Clark-Ginsberg, A., Guha-Sapir, D., Bendavid, E., Wagner, Z.
  2023
- **Quantifying fire-specific smoke exposure and health impacts.** *Proceedings of the National Academy of Sciences of the United States of America*
  Wen, J., Heft-Neal, S., Baylis, P., Boomhower, J., Burke, M.
  2023; 120 (51): e2309325120
- **Emergency department visits respond nonlinearly to wildfire smoke.** *Proceedings of the National Academy of Sciences of the United States of America*
  Heft-Neal, S., Gould, C. F., Childs, M. L., Kiang, M. V., Nadeau, K. C., Duggan, M., Bendavid, E., Burke, M.
  2023; 120 (39): e2302409120
- **Health Effects of Wildfire Smoke Exposure.** *Annual review of medicine*
  Gould, C. F., Heft-Neal, S., Prunicki, M., Aguilera, J., Burke, M., Nadeau, K.
  2023
- **The contribution of wildfire to PM2.5 trends in the USA.** *Nature*
  Burke, M., Childs, M. L., de la Cuesta, B., Qiu, M., Li, J., Gould, C. F., Heft-Neal, S., Wara, M.
  2023
- **Global biomass fires and infant mortality.** *Proceedings of the National Academy of Sciences of the United States of America*
  Pullabhotla, H. K., Zahid, M., Heft-Neal, S., Rathi, V., Burke, M.
  2023; 120 (23): e2218210120
- **Geographically resolved social cost of anthropogenic emissions accounting for both direct and climate-mediated effects.** *Science advances*
  Burney, J., Persad, G., Proctor, J., Bendavid, E., Burke, M., Heft-Neal, S.
  2022; 8 (38): eabn7307
- **Daily Local-Level Estimates of Ambient Wildfire Smoke PM2.5 for the Contiguous US.** *Environmental science & technology*
  Childs, M. L., Li, J., Wen, J., Heft-Neal, S., Driscoll, A., Wang, S., Gould, C. F., Qiu, M., Burney, J., Burke, M.
  2022
- **Exposures and behavioural responses to wildfire smoke.** *Nature human behaviour*
  Burke, M., Heft-Neal, S., Li, J., Driscoll, A., Baylis, P., Stigler, M., Weill, J. A., Burney, J. A., Wen, J., Childs, M. L., Gould, C. F.
  2022
- **Associations between wildfire smoke exposure during pregnancy and risk of preterm birth in California.** *Environmental research*
  Heft-Neal, S., Driscoll, A., Yang, W., Shaw, G., Burke, M.
  2021: 111872
- **The changing risk and burden of wildfire in the United States.** *Proceedings of the National Academy of Sciences of the United States of America*
  Burke, M., Driscoll, A., Heft-Neal, S., Xue, J., Burney, J., Wara, M.
  2021; 118 (2)
- **The effects of armed conflict on the health of women and children.** *Lancet (London, England)*
  Bendavid, E. n., Boerma, T. n., Akseer, N. n., Langer, A. n., Malembaka, E. B., Okiro, E. A., Wise, P. H., Heft-Neal, S. n., Black, R. E., Bhutta, Z. A.
  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 (New York, N.Y. : 1991)*
  Miller, J. G., Dennis, E. L., Heft-Neal, S., Jo, B., Gotlib, I. H.
  2021

- **Comparison of World Health Organization and Demographic and Health Surveys data to estimate sub-national deworming coverage in pre-school aged children.** *PLoS neglected tropical diseases*
  Lo, N. C., Gupta, R., Addiss, D. G., Bendavid, E., Heft-Neal, S., Mikhailov, A., Montresor, A., Mbabazi, P. S.
  2020; 14 (8): e0008551
- **Dust pollution from the Sahara and African infant mortality** *NATURE SUSTAINABILITY*
  Heft-Neal, S., Burney, J., Bendavid, E., Voss, K. K., Burke, M.
  2020
- **Testing the socioeconomic and environmental determinants of better child-health outcomes in Africa: a cross-sectional study among nations.** *BMJ open*
  Bradshaw, C. J., Otto, S. P., Mehrabi, Z., Annamalay, A. A., Heft-Neal, S., Wagner, Z., Le Souef, P. N.
  2019; 9 (9): e029968
- **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*
  Lo, N. C., Heft-Neal, S. n., Coulibaly, J. T., Leonard, L. n., Bendavid, E. n., Addiss, D. G.
  2019
- **Women and children living in areas of armed conflict in Africa: a geospatial analysis of mortality and orphanhood.** *The Lancet. Global health*
  Wagner, Z. n., Heft-Neal, S. n., Wise, P. H., Black, R. E., Burke, M. n., Boerma, T. n., Bhutta, Z. A., Bendavid, E. n.
  2019
- **Armed conflict and child mortality in Africa: a geospatial analysis.** *Lancet (London, England)*
  Wagner, Z., Heft-Neal, S., Bhutta, Z. A., Black, R. E., Burke, M., Bendavid, E.
  2018
- **Robust relationship between air quality and infant mortality in Africa** *NATURE*
  Heft-Neal, S., Burney, J., Bendavid, E., Burke, M.
  2018; 559 (7713): 254-+
- **Deworming in pre-school age children: A global empirical analysis of health outcomes.** *PLoS neglected tropical diseases*
  Lo, N. C., Snyder, J. n., Addiss, D. G., Heft-Neal, S. n., Andrews, J. R., Bendavid, E. n.
  2018; 12 (5): e0006500
- **Higher temperatures increase suicide rates in the United States and Mexico** *Nature Climate Change*
  Burke, M., González, F., Baylis, P., Heft-Neal, S., Baysan, C., Basu, S., Hsiang, S.
  2018; 8 (8): 723--729
- **Using remotely sensed temperature to estimate climate response functions** *Environmental Research Letters*
  Heft-Neal, S., Lobell, D. B., Burke, M.
  2017; 12 (1): 014013
- **Sources of variation in under-5 mortality across sub-Saharan Africa: a spatial analysis.** *The Lancet. Global health*
  Burke, M., Heft-Neal, S., Bendavid, E.
  2016