

The Climate Sensitive Infections (CSI-Michigan) Research Group of Dr. Jennifer Head at the University of Michigan is seeking two postdoctoral research fellows to join our research team. Our group is interested in understanding the role of climate and other environmental exposures on infectious disease transmission, with a special focus on the emergence of fungal pathogens across the US. Our work integrates field- and population-based study data with large-scale, spatiotemporal disease data (e.g., from surveillance systems or Medicare claims).

The emergence of fungal diseases has rapidly become a public health priority. Coccidioidomycosis (also called Valley fever) is a fungal disease that has been increasing dramatically across the US Southwest. We have found that climate conditions (e.g., hydroclimate volatility) and environmental disturbances (e.g., oil and gas drilling) are associated with increased risk of infection. However, infections are known to be vastly underdiagnosed, and, despite changes in epidemiology in recent years, surveys from 1949-51 provide the most recent estimates of population immunity for most counties in the U.S. Southwest. Lack of estimates on prior infection obscures our understanding of the true burden of coccidioidomycosis, especially among subgroups with low reporting; biases our understanding of the specific exposures that drive risk; and creates barriers for planning human coccidioidal vaccine trials. However, assessment of prior infection is challenging for coccidioidomycosis, owing to waning of antibodies.

Our NIH funded project seeks to 1) advance methods for estimating immunity to *Coccidioides* in the general population using cell-mediated immunity tests; 2) develop computational approaches to improve estimation of population-level immunity to *Coccidioides* via the integration of data from surveillance, serology, and cell-mediated immunity tests; 3) evaluate how population immunity interacts with environmental exposures to create risk of infection. Other funded projects within the group seek to establish climate-disease relationships for blastomycosis—an emerging fungal pathogen in the eastern half of the US—and examine how extreme precipitation and hydroclimate volatility affects health.

The candidate will have the opportunity to collaborate with various public health partners, including multiple state health departments, Centers for Disease Control and Prevention, California Correctional Health Care Services, Valley Fever Institute, and other universities. The candidate will have the opportunity to publish papers and mentor graduate students in the group.

Two types of projects are available:

1. **Advancing new methods to estimate population immunity to coccidioidomycosis:** The postdoctoral scholar involved in this project would lead projects related to establishing population immunity to coccidioidomycosis. Examples of projects that candidate may lead include: targeted studies to compare novel assays (e.g., the cytokine release assay and lateral flow assays) to older technologies (e.g., the skin test), collection of serologic and cell-mediated immunity data on prior infection from study sites in the west/southwestern US, estimation of the force of infection using catalytic models, and/or integration of immunity data with surveillance data to estimate under-reporting.

The ideal candidate for this position will have some experience designing or conducting population level studies, have some understanding of various methods for assessing population immunity (including via serology, skin tests, and cytokine release assays), and be well versed in infectious disease transmission models.

2. **Climate epidemiology of fungal and other climate sensitive infections:** The postdoctoral scholar will evaluate relationships among climate conditions, environmental exposures, and incidence of fungal disease, with particular emphasis on determining whether population immunity modifies these associations. These projects may also include evaluating exposure-response relationships between extreme climate events and health outcomes, identifying intervenable levers for mitigating harmful climate-health relationships, and/or climate attribution work. While we are primarily recruiting for a position to lead studies in coccidioidomycosis or blastomycosis, we are open to outstanding candidates interested in working with other health outcomes using Medicare claims data.

The ideal candidate for this position will be well versed in summarizing environmental exposures for health purposes and have experience analyzing longitudinal and spatial case data.

Other required qualifications:

- The ideal candidate will have a PhD in Epidemiology, Environmental Health Sciences, Biostatistics or related field
- Excellent quantitative background and strong coding skills (e.g., R).
- Strong record of peer-reviewed publications.
- High level of independence in scientific work.
- Hardworking, and motivated by the potential for scientific and policy impact
- Enthusiastic about infectious diseases and climate epidemiology
- Enthusiastic about providing mentorship to doctoral and master's level students

Required Application Materials:

- Cover letter that describes your research interests, scientific skillset and its alignment with the proposed work, and future career plans
- Curriculum vitae
- Contact information for two to three references

Lab website: <https://jrhead.github.io>

Academic website: https://sph.umich.edu/faculty-profiles/head_jennifer.html