Postdoctoral Fellowship: Developing a New Generation of Models to Explore the Transmission Dynamics of Tuberculosis

Overview

The Johns Hopkins TB Modeling and Translational Epi Group (lead investigator: Dr. David Dowdy) is expanding its focus on developing novel data-driven models to answer pressing questions about the natural history and transmission dynamics of TB, the world's deadliest infectious disease. As part of this effort, we are searching for one or two exceptional doctoral graduates with strong quantitative and research skills to be at the forefront of our group's expansion.

Our Team

We are a diverse, interdisciplinary, and collaborative team with interests that span field research (including transmission studies and clinical trials), epidemiologic methods, mechanistic modeling, health economics, and implementation science. Across these disciplines, our group seeks to both generate new knowledge and translate it into policy-relevant guidance. Based at the Johns Hopkins Bloomberg School of Public Health, our team includes faculty members, postdoctoral fellows, Masters and PhD students, full-time research staffs, and many collaborative partners across the university and in more than 10 countries – most notably Uganda and South Africa. We are funded by diverse agencies including the U.S. National Institutes of Health (including seven current R01-funded studies), CDC, and the Bill and Melinda Gates Foundation. We have strong collaborative ties to the Johns Hopkins Center for Tuberculosis Research, a multidisciplinary group in the School of Medicine that is home to >20 tuberculosis-focused faculty including basic and translational scientists, epidemiologists, implementation scientists, and clinical trial investigators. We are also core members of the Uganda Tuberculosis Implementation Research Consortium (U-TIRC), a multinational research consortium with numerous large studies evaluating the implementation of novel diagnostic tests, case-finding activities, and approaches to prevention for TB.

Fellowship Description

Our research team is accepting applications for two-year postdoctoral fellowships based in the Department of Epidemiology at the Johns Hopkins Bloomberg School of Public Health under the joint mentorship of **Dr. Emily Kendall, Dr. Sourya Shrestha, and Dr. David Dowdy**. The start date for these fellowships is flexible, but preference will be given to applicants who can start by April 2021.

We are seeking fellows with a background in mathematical modeling or other quantitative analysis (e.g., agent-based simulation, phylodynamics, network modeling, machine learning, causal inference), and interest in applying these methods to questions involving the natural history, transmission dynamics, and epidemiology of tuberculosis. Reflecting our team-based, collaborative approach to research, fellows will have a **mentorship team** consisting of junior faculty (Dr. Emily Kendall and/or Dr. Sourya Shrestha, depending on desired research focus) and senior faculty (Dr. Dowdy), with additional mentors drawn from the Center for Tuberculosis Research, U-TIRC, and other collaborating teams as appropriate. We envision these fellowships will be sufficiently **flexible** to accommodate the fellows' individual strengths and interest, and the sources of funding molded to ensure flexibility. Successful fellows will help **broaden our team's horizons**, enabling us to build new collaborations and explore new areas of research.

Potential research topics include (but are not limited to) the following topics, in which our team is actively engaged:

- Models **linking TB natural history to transmission dynamics and effective responses**
  - Ex.: exploring the role of asymptomatic/subclinical TB in transmission and implications for diagnosis & case finding
- Models incorporating the **interface between human behavior and TB transmission**
  - Ex.: models linking data on human movement, phylogenetics, and demographics to inform transmission patterns
- Models of **TB outbreaks and the effectiveness of outbreak responses**
  - Ex.: incorporating genomic and cluster data from the US Centers for Disease Control and Prevention (CDC)
- Models to **guide decision-making at the local, national, and global levels**
  - Ex.: balancing considerations of cost, implementation, and epidemiological impact to inform evidence-based policy regarding novel TB diagnostic tests and treatment regimens, as well as case-finding and preventive therapy

We value **collection and incorporation of empiric data**. As such, we will prioritize fellows who seek to engage in the process of collection and/or collation of novel data to inform the next generation of TB mechanistic models.
We anticipate that each fellow would serve as first author on multiple research projects and would apply for an independent research position by the end of the fellowship. First-year fellows will be offered an annual salary from $56,000 - $58,000, plus benefits including health insurance. This salary will be increased for fellows with additional experience and/or funding. Further information on postdoctoral fellowships at Johns Hopkins can be found at http://www.jhsph.edu/academics/postdoctoral-training.

Applicants must have:

- ✓ A recent PhD (or MD) degree in a relevant discipline (expected graduation in Dec 2020 is acceptable)
- ✓ Strong quantitative background, with demonstrated ability to program in one or more scientific programming languages, e.g. R, MATLAB, C++, etc.
- ✓ Demonstrated ability to lead modeling research, as well as strong communication and writing skills.
- ✓ Ability to work independently, function as part of a highly collaborative, interdisciplinary, open-source-oriented, electronically-connected team, and contribute to weekly team meetings and journal clubs.

Application Procedures

Interested applicants should submit the following to Dr. Dowdy at ddowdy1@jhmi.edu:

- cover letter describing research interests, career goals, and prior experience
- curriculum vitae
- contact information of 3 references (to be contacted only after first discussing with the applicant)

Applications submitted by Nov 1 will be given priority. Interviews will be held in Nov-Dec 2020 and selections made shortly thereafter. However, given uncertainties related to the ongoing pandemic, we encourage applications regardless of precise timeline or current location, and we will work with qualified candidates to sort out hiring details and timelines.

Please contact Dr. Dowdy by email with any questions.