Postdoctoral Opportunity at Berkeley in Surveillance Informatics

Simulation and optimization of global infectious disease surveillance systems

One or more postdoctoral fellows are sought in the research group of Justin Remais at the UC Berkeley School of Public Health, who has established a Berkeley-led, international research consortium to develop approaches for simulating and optimizing surveillance networks to detect existing and emerging infectious diseases under changing epidemiological and environmental conditions (NIH-NIAID R01AI125842). The research team will develop and apply spatio-temporal data integration techniques for assessing the performance of specific surveillance architectures, and a simulation platform for optimizing surveillance system performance under alternative configurations and constraints. The international research team is focused on infectious disease dynamics in a rapidly changing China—host of the largest electronic infectious disease reporting system in the world—and is applying simulation and statistical methods to Big Data directly sourced from the country's multiple, comprehensive surveillance systems. The work is targeting diverse infectious diseases—tuberculosis, malaria, schistosomiasis, HFMD, leptospirosis, dengue, hookworm and infectious diarrhea—with the goal of identifying the timing, geographic scope, and surveillance architectures that optimize the estimation of key epidemiological processes, such as detection of the leading edge of an epidemic; estimation of the impact of an intervention; or capture of residual cases as disease elimination is approached. The postdoctoral fellows will have opportunities to contribute to other new and ongoing projects in the group focused on the transmission dynamics of infectious diseases in changing environments, including helminths subject to industrialization of agriculture in West Africa (R01TW010286), WNV and Valley Fever under drought in California (UCOP MRPI), and diarrheal diseases subject to climate variability in Ecuador and China (NSF 1646708).

On the R01, postdoctoral scholars will have opportunities to contribute to new methodologies capable of characterizing the interaction between surveillance architectures and epidemiologic dynamics; develop simulation platforms for integrating surveillance system data, and for running experiments to identify optimal system configurations under a range of scenarios; and lead the development of mathematical modeling techniques for investigating the response of disease transmission to shifting surveillance modalities. Scholars will work closely with collaborators on these projects who are leaders in their fields, including Joe Eisenberg at University of Michigan; Elizabeth Carlton at University of Colorado; Howard Chang, Ben Lopman and Lance Waller at Emory; Sally Thompson and Alan Hubbard at Berkeley; and Manoj Gambhir at Monash.

Applicants should have a PhD and a demonstrated record of scientific achievement in statistics, biostatistics, data science, infectious disease epidemiology, population biology, theoretical ecology, or similar quantitative biological field, and should be proficient at programming, modeling and/or data analysis (e.g., R, Python, Matlab, or similar). Experience with Hadoop, AWS, Spark, cloud computing, spatio-temporal modeling, and/or modeling dynamical systems would be additionally desirable. Candidates with backgrounds in mathematics or applied mathematics, computer science, engineering, the quantitative environmental sciences, or physics are also encouraged to apply. A track record of research excellence and strong quantitative skills are essential, as are excellent written and oral communication skills.

Interested applicants should submit a curriculum vitae, a 1-2 page letter that describes in detail the professional qualifications for the above-described activities, and contact information for three referees, to Justin Remais jvr@berkeley.edu.