BRIGHAM HEALTH
BRIGHAM AND WOMEN'S HOSPITAL

HARVARD MEDICAL SCHOOL

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The Division of Pharmacoepidemiology and Pharmacoeconomics at Brigham and Women's Hospital Department of Medicine and Harvard Medical School is accepting applications for post-doctoral fellows in pharmacoepidemiology - applied and methodologically focused.

The Division includes 30 faculty (drugepi.org) and 80 research staff who work closely together to research how we use medications effectively and improve health. We are a world-leading interdisciplinary research center that brings together the various sub-specialties of medicine, epidemiology, biostatistics, health services research, legal, and regulatory sciences to evaluate the effectiveness of prescription drugs in relation to their risks and costs; to study how drugs are prescribed and used; to optimize prescription drug use; to understand how medicines are approved and regulated after their marketing. The Division is a first-rank training site in a variety of subject areas and methodological research and provides direct access to one of the largest repositories of claims and EHR data in academia. We are seeking highly-motivated, diligent, and independently thinking fellows to work with Division faculty in the following areas:

- **Answering high-impact questions to inform clinical decision-making on the comparative effectiveness and safety of medications in geriatric pharmacoepidemiology by applying and advancing cutting-edge methods**: Collaborate closely with Division faculty who are leaders in the field of geriatric pharmacoepidemiology. A fellow working in this area will answer critical clinical questions on the prescribing and deprescribing of highly potent (e.g. anticoagulants) and/or potentially inappropriate medications (e.g. antipsychotics or benzodiazepines) and their comparative effectiveness and safety in older adults leveraging real world data, including administrative claims linked with electronic health records (including structured EHR and free-text notes and reports), and a variety of clinical assessment files (e.g., Minimum Data Set, Outcomes and Assessment Information Set, Inpatient Rehabilitation Facility Patient Assessment Instrument), with the opportunity to lead several NIH-funded large research projects. The ideal candidate would be a team player and have a doctoral degree in epidemiology, aging research, or clinical geriatrics.

- **IMPACT—the Integrated Multidisciplinary Program for the Assessment of Cardiovascular Therapeutics—is dedicated to advancing the study of cardiovascular treatments in real-world settings.** Our goal is to rigorously assess the safety and effectiveness of cardiovascular medications and devices as they are used in clinical practice. To achieve this, we leverage large, secondary healthcare databases—including insurance claims, electronic health records, registries, and their linkages—to generate timely, actionable evidence on cardiovascular therapies. Ideal candidates will have medical and/or methodological background and interest in conducting cutting edge research on the safety and effectiveness for various cardiovascular diseases, including heart failure, atrial fibrillation, and atherosclerotic cardiovascular diseases.

- **Answering high-impact questions to inform clinical decision making on the comparative effectiveness and safety of medications in cardiovascular-kidney-metabolic conditions by applying and advancing cutting edge methods:** A fellow working in this area will collaborate closely with Division faculty who are leaders in the pharmacoepidemiology of cardiovascular-kidney-metabolic diseases to answer critical clinical questions on the use of medications and their comparative effectiveness and safety leveraging real-world data, including administrative claims, electronic health records, and clinical registries (PROMISE program). Fellows will have the opportunity to lead several important research studies, whose findings will guide clinical decision making, as well as to apply and advance innovative methods. The ideal candidate would be a curious researcher and a team player with a penchant for open communication and transparency. The candidate would have a doctoral degree in pharmacoepidemiology and ideally a clinical background, or a degree in medicine or pharmacy combined with pharmacoepidemiology/epidemiology training.

- **Developing and implementing cutting-edge methods to bridge the gap between randomized clinical trials (RCTs) and real-world evidence (RWE):** RCTs and RWE are critical and complementary sources of evidence generation about the benefits and safety of medical products. A fellow working in this area will be involved in several interrelated projects that will leverage individual-level RCT data to explore this complementarity and will be expected to explore and test novel analytical approaches for analysis of RCT and real-world data. A fellow in this area will have the opportunity to leverage the infrastructure from RCT-DUPLICATE's large sample of trial emulations to develop and test methods designed to understand and calibrate results from RCTs and database studies, for example meta-regression techniques to examine the influence of alternative methods on concordance. Training and experience in statistical modeling and programing is required. Experience with developing prediction models, model validation and calibration approaches, imputation methods, Monte Carlo simulations, and machine learning algorithms is highly desirable.

- **Conducting impactful pediatric real-world evidence research to advance pediatric care and inform the regulation of medications in children**: Up to 50% of medications in the outpatient setting and 80% in the inpatient setting are used off-label in pediatric patients. There is increasing interest in evaluating the suitability of real-world evidence studies to form the basis for supplemental regulatory approval of medications to be used in pediatric patients that were previously approved in adult patients. The fellow will conduct pediatric pharmacoepidemiology studies of medication safety and effectiveness using large claims and electronic health record data sources and study how it impacts the regulation of medications in children. The ideal candidate will have a doctoral degree and experience in pharmacoepidemiology. The fellow will work under the supervision of division faculty with expertise in pharmacoepidemiology and pediatrics, and in collaboration with the Harvard-MIT Center for Regulatory Science.

- **Evaluating the safety of medication use during pregnancy**, primarily using pregnancy cohorts nested in large healthcare utilization databases. A fellow working in this area will collaborate closely with faculty and other members of the Harvard Program on Perinatal and Pediatric Pharmacoepidemiology (H4P). Fellows will have the opportunity to lead NIH-funded research studies addressing critical questions related to drug safety in pregnancy across multiple clinical areas (e.g., psychiatry, neurology, infectious disease). Fellows will be able to contribute to methods-oriented projects that explore the use of cutting-edge epidemiological and statistical approaches to improve causal inference in this area. Aside from a keen interest in perinatal (pharmaco)epidemiology, the ideal candidate would have a doctoral degree in pharmacoepidemiology/ epidemiology and preferably a clinical background, or a degree in medicine combined with epidemiology training.

- **The Dermato-Pharmacoepidemiology Program advances knowledge of the treatments of dermatologic conditions in clinical practice** to inform appropriate prescribing. We do this by studying use patterns, the effectiveness and safety of systemic and topical therapeutics, and leveraging multiple real-world data sources, including nationwide claims databases and electronic health records that are linked to claims data. We apply and adapt advanced epidemiologic and statistical methods to produce decision-grade findings. A research fellow working with us will develop original ideas and implement studies using the existing and new data assets. We have collaborations with researchers and clinicians from multiple academic institutions in the United States and Europe. Our ongoing work includes studying the comparative safety of targeted immune-modulating treatments for skin diseases such as psoriasis, atopic dermatitis, alopecia areata, hidradenitis suppurativa, pediatric skin diseases, skin cancer, and more.

- **Combining AI and causal inference:** Large language models hold tremendous promise to efficiently understand the contents of medical records including free text notes. The use of LLMs and scalable NLP approaches to improve the measurement of variables that may be key to estimating the causal relationships between drug use and health outcomes may be a game changer. A group of faculty members with backgrounds in biomedical informatics, epidemiologic methods, and causal inference develops an active research pipeline using EHR data, EHR+claims linked data in conjunction with an H100 GPU cluster. Ideal candidates will have a background in biomedical informatics and analyzing EHR data with an interest in causal inference.

- **Evaluating drug repurposing opportunities for COPD using advanced causal inference methods**. Building on state-of-the-art methods for causal inference and existing claims data sources, supplemented with EHR data, we will develop, test, and implement an analytics and data infrastructure to efficiently evaluate non-COPD medications for COPD. The fellow will lead efforts to describe the use of non-COPD medications in the COPD population and to emulate trials assessing repurposed drugs for the prevention of COPD exacerbations. The ideal candidate will have doctoral training in pharmacoepidemiology and statistical modeling. Clinical background or prior work with COPD treatments is a plus. Fellows will have the opportunity to get involved in adjacent research projects (e.g., methods work, drug-drug interaction studies).

Interested individuals should send their CV and a personal statement to Lewis Seton or visit the Division website.