Supervisor/Project Information Form

Supervisor Name:
Dr. Andrew Pinto

Project Title:
Predicting health service use with primary care electronic medical record data

Hospital/Research Institution:
Upstream Lab, MAP Centre for Urban Health Solutions, St. Michael’s Hospital

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Field of Research (2 keywords):
Artificial intelligence, primary care

Department:
Department of Family and Community Medicine
School of Graduate Studies Appointment (IMS, LMP, IHPME etc)?
Yes, IHPME

**Brief Project Description (<300 words):**
Older Canadians with multimorbidity are particularly high users of health services, and are at greatest risk of unexpected visits to the emergency department (ED) and admission to hospital. Accurately predicting which older adults are at risk of requiring the ED or being admitted, and implementing effective interventions that avert these events, would improve health outcomes, reduce costs, and improve experiences of care. While they receive care in different settings, such as primary care offices, home care or hospitals, primary care is an important place to intervene to reduce avoidable health services.

With an increasing proportion of primary care electronic medical records (EMR) digitized, predictive analytics hold promise. This digitization combined with advances in data storage and processing have paved the way for new technologies such as artificial intelligence (AI) to improve medical care.

The overall objective of this study is to develop a prediction tool that processes primary care EMR data, and when implemented, helps primary care clinicians proactively identify patients at risk of deterioration to direct limited primary care resources to these patients. In phase 1, we will develop and validate EMR search strategies to quantify emergency department (ED) visits and hospitalizations, which are the main outcome events for phase 2. We will focus on older adults with multimorbidity. In phase 2, we will apply the search strategies from phase 1 to develop and test a variety of models that use EMR data to predict non-elective admissions to hospital. This work will create a foundation for future research on using EMR data to help direct primary care resources.

The summer student will be involved in both the extraction in phase 1 and analysis in phase 2. The summer student will also be an active member of the Upstream Lab which focuses on health equity and the evaluation of complex population health interventions.