Co-RIG Project

Revolutionizing COVID-19 Data Collection: Infrastructure for rapid access to EMR data

Project lead: Noah Crampton, MD, MSc, CCFP, Clinical Associate and Clinical Investigator, Toronto Western Family Health Team, University Health Network
Project location: Ontario (Toronto, Hamilton, Eastern Ontario) and British Columbia

Summary

The software tool allows for the daily, automated, privacy-compliant upload of electronic medical record (EMR) data to practice-based research network (PBRN) systems. Access to real-time data assists family physicians in answering community-focused health care questions and translating research findings into practice.

Faces of COVID-19

A tale of two communities

John lives in Coquitlam, British Columbia. His community has been through several strict lockdowns due to the pandemic and as a result he lost his job. He recently saw his family doctor, who diagnosed him with depression and prescribed him medication. Rob works in a job similar to John and lives in a rural area in northern British Columbia. Rob's community has only been through brief and limited lockdowns and he has been able to keep his job and his mental health is stable.

With pooled health data from PBRNs it is possible to compare patient data from different communities. This can show rates of infection and spread, as well as the mental health of patients. This information can help caregivers prepare for the impact of different public health measures, such as extended lockdowns. In turn this can inform researchers and policy-makers about how to deploy additional mental health resources where they are most needed.

Project detail

An effective response to COVID-19 requires access to timely information on disease spread and impact in communities. Across Canada, PBRNs use data collated from EMRs to answer community-focused health care questions and translate research findings into practice. Historically, uploading data to PBRNs is time-consuming, costly, and infrequent.

Dr. Noah Crampton of the University of Toronto Practice-Based Research Network (UTOPIAN) partnered with PBRNs in Ontario and British Columbia and the Hamilton Health Sciences Centre for Data Science and Digital Health (CREATE) to address the urgent need for accessible, accurate, and timely community-level data.

With Co-RIG funding, Dr. Crampton and partners leveraged new technology to rapidly develop and implement a complex proof of concept software tool for the OSCAR* EMR system. It uses an extract-transform-load (ETL) process that allows for daily, automated, privacy-compliant upload of EMR data to PRBN systems.

Once fully implemented, the software has the potential to collect near real-time data on nearly 150,000 patients from clinics using the OSCAR EMRs. It can also be adapted for other EMR systems with support from the EMR vendors.

* Open Source Clinical Application and Resource.

Impact

- **Enhancing family medicine:** The groups that have adopted the software in Ontario and British Columbia are already able to inform their COVID-19-related research questions. As more clinics come on board, data available to researchers will expand and be enriched.

- **Furthering research:** Researchers will be able to map pressing needs of COVID-19 hotspots to support testing, vaccination, and mental supports. Long-term health applications include understanding hard hit communities to inform local and national responses to future COVID-19 waves or other pandemics.

- **Building capacity:** Adoption of the software has the potential to save significant time, as well as financial and human resources. It will enable timely multi-centre surveillance and analysis of COVID-19 key indicators, which will inform pandemic mitigation strategies and patient support.

Results to date

- Successfully developed a secure and efficient automated software tool for the OSCAR EMR system that is adaptable for other EMR systems.

- As of June 14, 2021, the software is established at six clinics, with plans to expand to all 33 clinics in Ontario and British Columbia that use the OSCAR EMR.

- EMR data are accessible to researchers in five PBRNs under existing data-sharing agreements and should be accessible to more PBRNs in 2021.

- One research team focused on quality improvement has already made a formal request to access the timely data enabled by the ETL tool.

Methodology

- Design software model to facilitate secure and complete data collection and retrieval for the OSCAR EMR system.

- Create software tool to extract relevant data, including COVID-19 data, that meet PBRN requirements in near real-time.

- Incorporate the extracted EMR data into the PBRN system using security best practices.

- Validate and test the pilot tool at one PBRN.

- Expand to other PBRNs and participating clinics using the OSCAR EMR system.

- Invite researchers to access data.

- Demonstrate value of the software by conducting a COVID-19 research study (ongoing).

> **"**
>
> "We can't improve what we can't measure. This project successfully demonstrates the potential of strong cross-sector partnerships for effective data collection and analysis."
>
> – Dr. Michelle Greiver (Acting Director, UTOPIAN)
>
> **"**

Project team

Project lead: Noah Crampton, MD, MSc, CCFP, Toronto Western Family Health Team, University Health Network and University of Toronto Practice-Based Research Network (UTOPIAN)

Babak Aliarzadeh, MD, MPH, UTOPIAN

David Barber, MD, CCFP, East Ontario Practice-Based Research Network (EON)

Mohamed Ibrahim, Hamilton Health Sciences Centre for Data Science and Digital Health (CREATE)

Nityan Khanna, BSc, CREATE

Jeremy Petch, PhD, CREATE

Sheryl Spithoff, MD, MSc, CCFP, UTOPIAN

Karen Tu, MD, MSc, CCFP, UTOPIAN

Sabrina Wong, BC Primary Health Care Research Network

Partners

BC Primary Health Care Research Network

East Ontario Practice-Based Research Network (EON)

Hamilton Health Sciences Centre for Data Science and Digital Health (CREATE)

Northern Ontario School of Medicine Practice-Based Research Network

University of Toronto Practice-Based Research Network (UTOPIAN)