

Robotic process automation introduces neighbourhood-level social determinants of health data into primary care EMRs based on postal codes and data from the Ontario Marginalization Index. This technology supports population management efforts by enabling clinicians to familiarize themselves with the contextual factors of the neighbourhoods in which their patients reside and make better-informed decisions based on this information.

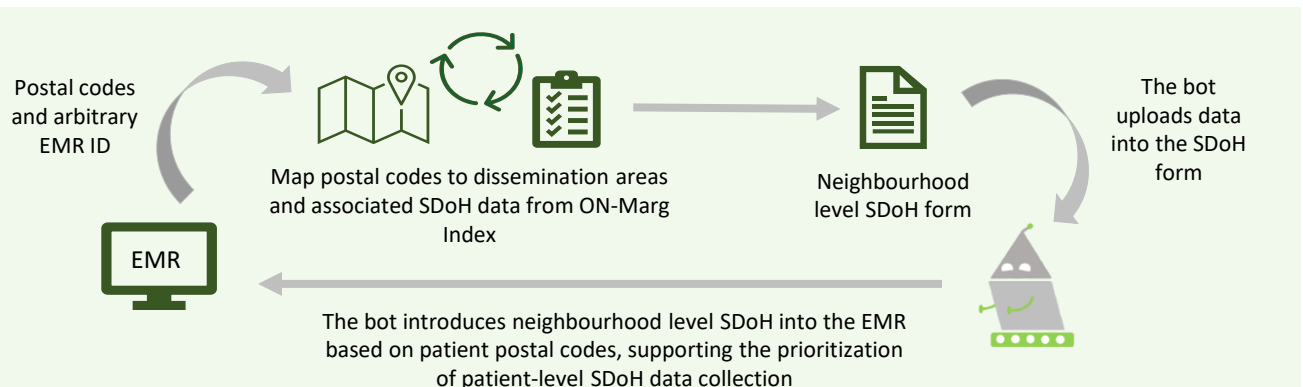
## Background

Social determinants of health (SDoH) are social factors, including education, housing, employment, and social support, that can impact patient outcomes. SDoH are recognized as having an important impact on health and mortality with strong evidence of the benefits of addressing people's unmet social needs (1). The availability of neighbourhood-level measures of SDoH in the EMR would enable clinicians to engage in patient-centred and community-oriented care that factors in the neighbourhood context where individuals grow and live (3). However, there are no standardized approaches to collecting SDoH data in primary care workflows and thus there is a lack of consistent and complete SDoH data in EMRs (2). Such challenges hinder the ability of clinicians to work towards improving health outcomes by addressing complex social factors that contribute to patient health.

To address the need for SDoH information in primary care, a new robotic process automation (RPA) or 'bot' process is used to introduce neighbourhood-level SDoH data based, on patient postal codes, into the EMR (Figure 1). This bot functions by inserting a form in the EMR within each patient chart, which presents the social complexity level of the neighbourhood where the patient lives, based on their postal codes. A distribution analysis of the neighbourhood social complexity levels of a site's patient population is also conducted, providing more insight into a site's patient population and enabling clinicians with contextual knowledge to better meet their patients' needs.

SDoH data is retrieved from the Ontario Marginal (ON-Marg) index, which presents data on four SDoH dimensions: residential instability, material deprivation, dependency (concentrations of people who don't have income from employment), and ethnic concentration data. Notably, the data from the ON-Marg Index is retrieved from the Canadian census and is available at a small area level and public health unit level (otherwise referred to as a dissemination area) that can be mapped to specific postal codes. The SDoH complexity form that the SDoH Bot introduces into the EMR to help inform clinician decision-making was co-designed with feedback from clinicians, researchers, and an equity specialist.

**Figure 1: How does the bot work?**



I reference the social determinants of health form all the time because it's in an area of my EMR that I look at often. The form has value. It's simple for me to incorporate into my practice. I can easily see the neighbourhood-level social determinants of health complexity (low, medium, high) for my patients. The information helps me provide a more complete assessment. It helps direct the intensity of family health team resources I should refer patients to in the community. Knowing this neighbourhood-level data supports equitable team-based care and the objectives of [Ontario Health Teams].

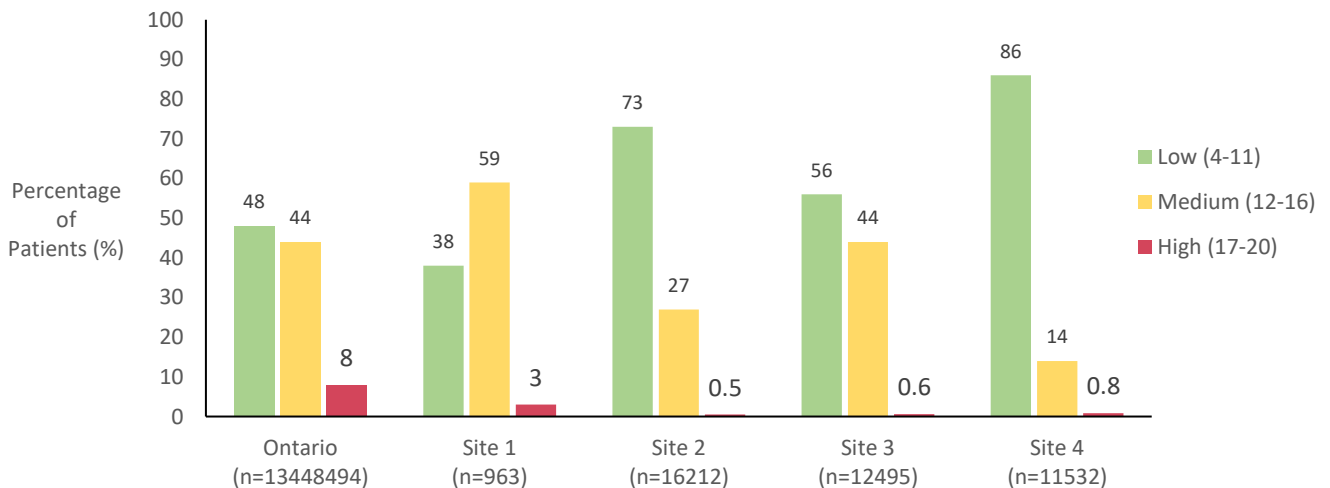
Dr. Kristen Farn, Family Physician, First Medical Group Orillia (Participating Site)

### Highlighting the Population Differences Across Individual Sites, and as Compared to Ontario-level Data

It is important to note that the data provided by the bot was personalized neighbourhood-level data for each clinic based on their patient's postal code information. The distribution analysis of the neighbourhood SDoH complexity levels was conducted for four primary care sites, across a total of 41,202 patients. Figure 3 shows the distribution of patients at these sites who fall into low, medium, and high levels of neighbourhood SDoH complexity, as compared to the Ontario averages.

This solution flags a small percentage of patients living in high-SDoH complex areas at each given site and provides a new dimension of information to support sites, care teams, and clinicians, to optimally meet their patient needs, based on their social context, and has the potential to change the approach of care especially for these patients living in higher SDoH complexity areas. It is important to note this neighbourhood-level data does not always reflect the situation each patient is in, but it provides a starting place for clinicians to act on.

**Figure 3: Area-level SDoH Complexity of Patients in Ontario (2016) Compared to Participating Sites**



### Neighbourhood SDoH Data Supports Population Health Management Efforts

Clinicians shared that the neighbourhood SDoH complexity level data and distribution analysis were informative at the population level and could support clinicians and care teams with resource allocation and making more socially informed decisions when directing patients to resources for their care. Moreover, clinicians shared that it is important for clinicians to advocate for patients to use these community resources.

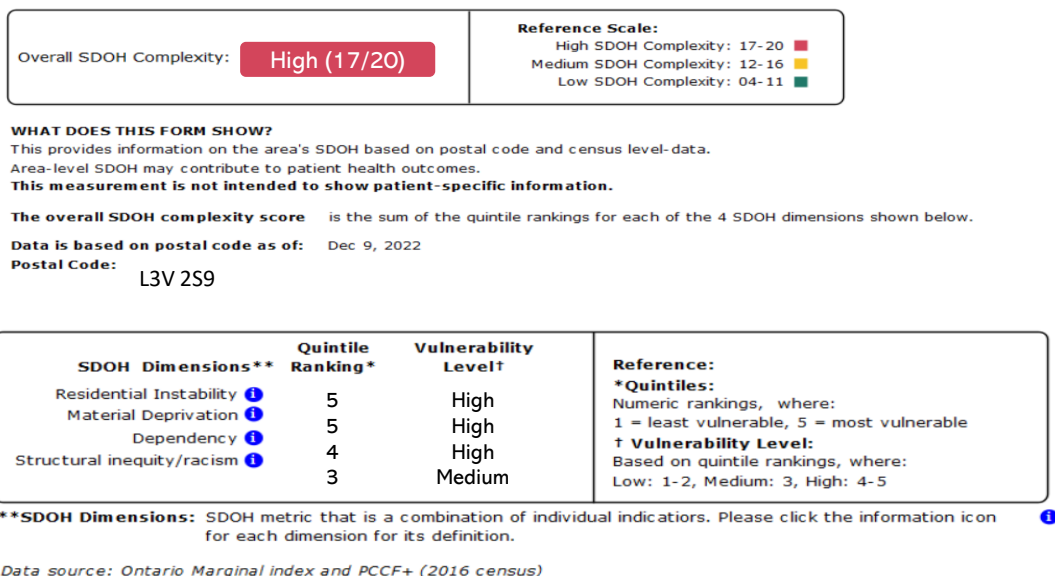
**Table 1: Identified Impact of Neighbourhood-level SDoH Data in Primary Care**

- Informs improved resource allocation
- Identifies patients who may benefit from support, encouragement, and direction to specific resources (e.g., private vs community-based resources, OHIP, social support etc.)
- Supports the identification of priority complex patients
- Supports targeted efforts for individual-SDoH data collection, which can otherwise be overwhelming
- Supports an improved understanding of the patient population

### Introducing Neighbourhood-level SDoH Data to Primary Care

The form provides quintile rankings of each of the four dimension from the ON-Marg Index. The sum of the quintile rankings across the four dimensions is taken to provide an overall neighbourhood SDoH complexity score; overall SDoH complexity is considered low from 0-11, medium from 12-16, and high from 17-20 (4). The SDoH form that the bot implemented in the EMR can be referenced below (Figure 4).

**Figure 4: Example of the Neighborhood level SDoH form**



If you have any questions or would like further information on this case study, contact

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### References:

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