

# COVID-19 Vaccine Uptake in Southeastern Ontario, Canada: Monitoring and Addressing Health Inequities

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## ABSTRACT

**Context:** Implementation of a population-based COVID-19 vaccine strategy, with a tailored approach to reduce inequities in 2-dose coverage, by a mid-sized local public health agency in southeastern Ontario, Canada.

**Program:** Coverage maps and crude and age-standardized coverage rates by material and social deprivation, urban/rural status, and sex were calculated biweekly and reviewed by local public health planners. In collaboration with community partners, the results guided targeted strategies to enhance uptake for marginalized populations.

**Evaluation:** The largest gaps in vaccine coverage were for those living in more materially deprived areas and rural residents—coverage was lower by 10.9% (95% confidence interval:  $-11.8$  to  $-10.0$ ) and 9.3% (95% confidence interval:  $-10.4$  to  $-8.1$ ) for these groups compared with living in less deprived areas and urban residents, respectively. The gaps for all health equity indicators decreased statistically significantly over time. Targeted strategies included expanding clinic operating hours and availability of walk-in appointments, mobile clinics targeted to marginalized populations, leveraging primary care partners to provide pop-up clinics in rural and materially and socially deprived areas, and collaborating with multiple partners to coordinate communication efforts, especially in rural areas.

**Discussion:** The scale and scope of monitoring and improving local vaccine uptake are unprecedented. Regular review of health equity indicators provided critical situational awareness for decision makers, allowing partners to align and tailor strategies locally and in collaboration with one another. Health care providers and pharmacies/pharmacists are key partners who require innovative support to increase uptake in marginalized groups. Continued engagement of other community partners such as schools, municipalities, and local service groups is also crucial. A “hyper local” approach is needed along with commitment from partners in all sectors and at all levels to reduce barriers to vaccination that lie further upstream for marginalized groups.

**KEY WORDS:** COVID-19, health equity, mass vaccination

The advent of the first COVID-19 vaccines in late 2020 raised hope that the global pandemic would eventually be managed. By

mid-October 2021 in Ontario, 88% of the population 12 years of age and older had received at least 1 dose and 84% had received 2 doses.<sup>1</sup>

In Ontario and elsewhere, marginalized groups are disproportionately burdened by COVID-19 infection.<sup>2,3</sup> Evidence suggests that COVID-19 vaccine uptake or acceptance is lower among marginalized populations, specifically for people of color, those living with lower incomes, those who have less education, and for people living in rural areas.<sup>4,6</sup> Marginalized people are members of non-dominant social group(s) with differing identities. Because of where they rank in the socioeconomic hierarchy, they face unfair barriers and do not receive the same opportunities as others to achieve their full health potential. This is imbedded in social and physical environments and more broadly through how society is organized, with its policies and institutions.<sup>7</sup>

The decision to be vaccinated (uptake) is a complex one that is impacted by many factors, including confidence in the vaccine and access to it.<sup>4,5,8</sup> It is

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made even more complex by the speed at which the pandemic has unfolded, the changing science, the changing availability of vaccine, and the proliferation of widespread misinformation. An enabling environment that makes it easy to access appointments and get to a clinic (eg, location, transportation, cost, time, information), direct social influences (eg, social networks, social norms around vaccination, narratives in the media), and motivation (eg, perceived risk, values, emotions) plays a role in ones' decision to be vaccinated.<sup>8</sup> Motivation itself is influenced by environmental and social contexts, while all 3 factors can be influenced by upstream factors defining socioeconomic position and current and historical sociopolitical contexts.<sup>7</sup> Marginalized groups, therefore, face more barriers and fewer opportunities to be vaccinated against COVID-19.

Much of the current evidence does not go beyond the examination of COVID-19 vaccine confidence or uptake by sociodemographic factors—for example, looking deeper to understand the specific barriers or enablers in specific marginalized groups.<sup>4</sup> However, some examples may include difficulty accessing vaccine appointments because of precarious housing<sup>9</sup> or other impacts on income and living situation; certain groups may have different worldviews around science, government, or COVID-19 vaccines, which may reject vaccination<sup>6</sup>; motivation to be vaccinated may be low due to distrust of the government for how one's social group has been unfairly treated by the system.<sup>9,10</sup>

In Ontario, local public health units (PHUs) are largely responsible for the prevention and control of the spread of COVID-19, including vaccination.<sup>11</sup> Kingston, Frontenac, and Lennox & Addington (KFL&A) Public Health serves an urban-rural area of southeastern Ontario, Canada, of approximately 209 000 residents. As the vaccine rollout got underway, KFL&A Public Health sought to monitor gaps in vaccine coverage systematically and in collaboration with community partners to use this information to guide local implementation of the vaccine strategy to reduce these gaps. The objective of this article is to describe and critique the practical implementation and results of KFL&A Public Health's vaccine equity strategy for continuous quality improvement.

## Program

### *Provincial vaccination strategy*

In Ontario, the COVID-19 vaccination program began on December 14, 2020, using a 3-phased approach to align with vaccine supply limitations, with vaccine first arriving in KFL&A in January 2020.<sup>12</sup> As per provincial direction, the first 2 phases prioritized

vaccines to those associated with long-term care and retirement homes, Indigenous individuals, and seniors. Phase 3 started in July 2021 with a relatively stable vaccine supply; vaccination was opened to anyone 12 years of age or older who wished to be vaccinated.

Each of the phases used a mix of institutional (long-term care homes/retirement home, hospitals) home visits for those homebound in the community, primary care, and mass immunization clinics (MICs) to reach residents. Pharmacies were authorized to offer vaccine in phase 2 (March/April 2021), and mobile clinics began operations in the latter part of phase 2 (June 2021).

Together with hospital partners, PHUs were responsible for coordinating all vaccine supply from the province except for supply designated to pharmacies. In addition, PHUs were responsible for planning and delivering long-term care home/retirement home, mobile, and most MICs.

### **Methods to Address Local Health Equity Issues**

Beginning in April 2021, KFL&A Public Health created an equity-based planning subgroup to provide a local health equity lens to the COVID-19 vaccine strategy. The purpose of the group was to analyze and review vaccination coverage in relation to available equity indicators, consider opportunities with community partners, and synthesize best practices from research and front-line evidence—with the aim to provide clinic location, communications, and logistics recommendations to the vaccination operations team. Membership in the group was voluntary and comprised the vaccine strategy planning lead and research associates with experience in health equity analysis.

Ontario residents who consented to vaccination and consented to have their data collected by PHUs were analyzed in this report. Ontario PHUs must abide by the Personal Health Information Protection Act, 2004, SO 2004, c. 3<sup>13</sup> under the Ontario Health Protection and Promotion Act.<sup>14</sup> Surveillance of immunization coverage is authorized under the Health Protection and Promotion Act to support program evaluation and quality improvement. Within the KFL&A region, it is estimated that 0.02% of doses were administered to individuals who did not consent to data collection.

Cleaned data from the provincial COVID-19 vaccine database were used to examine at least 1 dose and 2-dose KFL&A vaccination coverage overall and then by age and sex. Postal codes from these data were assigned to 2016 census dissemination areas (DA), the smallest census geography in Canada similar to a neighborhood. Postal codes with a single DA link were assigned directly, while rural postal codes

**TABLE 1****Institut National de Santé Publique du Québec Deprivation Dimensions and Component Indicators**

Material Deprivation	Social Deprivation
Average income of the population aged 15 y and older	Proportion of single-parent families
Proportion of the population aged 15 y and older with no high school diploma or equivalent	Proportion of the population aged 15 y or older who are divorced, widowed, or separated
Ratio of employed individuals to total population 15 y of age and older	Proportion of the population aged 15 y or older living alone

linked to multiple DAs were probabilistically assigned using the weight conversion file in the Postal Code Conversion File Plus program.<sup>15,16</sup> Any urban postal codes linked to multiple DAs were probabilistically assigned on the basis of relative population size.

Using ArcGIS Pro and ArcGIS Online software, KFL&A DAs were mapped by at least 1-dose and 2-dose vaccination coverage for those aged 10+ years.\* Next, using the statistical program R, DAs were linked to 2016 area-level material and social deprivation indices (MSDI) developed by Pampalon and colleagues.<sup>17,18</sup> The index is based on principal components analysis of census data aggregated at the DA level. It is composed of 2 dimensions with 3 indicators each that combine to create an index score, 1 for material deprivation and 1 for social deprivation, for each DA in Canada (Table 1). The MSDI has been previously validated,<sup>19</sup> and compared with MSDI calculated with individual-level data, it has been shown to be a valid proxy of individual-level socioeconomic status.<sup>20,21</sup> Finally, it has also been used to monitor inequities in other health indicators across Canada.<sup>22,23</sup>

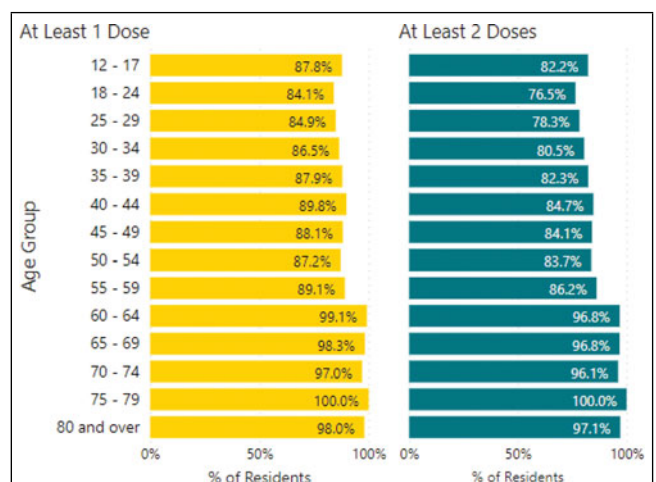
Crude and age-standardized health gap measures (rate ratios and rate differences) for both 1-dose and 2-dose coverage measures were calculated by material and social deprivation separately (using the local distribution of scores categorized into quintiles), sex, and urban/rural status. Given the desire to compare the most marginalized versus everyone else, the 2 indices were analyzed as more deprived (quintiles 4-5) versus less deprived (quintiles 1-3). Urban was defined as a DA with Statistical Area Classification codes of 1 to 3 and rural was considered codes 4 to 8.<sup>16</sup> Maps and health gap indicators were calculated biweekly. The equity planning group also sourced additional information to supplement quantitative data on an ad hoc basis, including research reviews, related to vaccine acceptance/hesitancy, MIC client feedback survey results, and detailed contextual information related to client perceptions and needs from key infor-

mant interviews (ie, public health nurses and primary care and pharmacy partners located in marginalized areas) to address the inequities in the agency's current vaccination strategy.

The equity subgroup met twice per week to review and make recommendations based on the data. Specifically, one meeting per week was focused on data-related discussions (eg, additional analyses or data sources that could provide additional context). The other was to synthesize the health equity analysis, mapping, and supplementary information to make specific recommendations, via document briefings and meeting presentations at weekly operational group meetings on (1) priority neighborhoods to target mobile vaccine efforts, and (2) partners to link with to amplify messaging and deliver vaccine. Relevant findings and recommendations were also shared directly with key external partners to focus on reaching out to populations living in areas with lower vaccination rates.

## Evaluation

As of October 19, 2021, 88% of the KFL&A population 12 years of age or older had received at least 1 dose and almost 85% had received 2 doses



**FIGURE 1** KFL&A COVID-19 Vaccination Coverage by Age for Those 12+, 2020 Denominators, October 19, 2021  
This figure is available in color online ([www.JPHMP.com](http://www.JPHMP.com)).

\*An age cutoff for 12 years and older is not available for 2016 Census data by DA. Only 5-year age groups are available starting at 0 to 4 years.

**TABLE 2**  
**KFL&A 2-Dose COVID-19 Vaccination Coverage Stratified by Equity Indicators—Age-Standardized Rate Differences and Rate Ratios Using 2016 DA Denominators and KFL&A MSDI Cutoffs, N = 146 228<sup>a</sup> (October 17, 2021)**

Health Equity Stratifier	Rate Difference—per 100 (95% CI)	Rate Ratio (95% CI)
More materially deprived (Q4-5)	– 10.89 (–11.80 to –9.98)	0.88 (0.87–0.89)
Less materially deprived (Q1-3)—reference	...	...
More socially deprived (Q4-5)	– 1.49 (–2.42 to –0.57)	0.98 (0.97–0.99)
Less socially deprived (Q1-3)—reference	...	...
Males	– 3.44 (–4.34 to –2.54)	0.96 (0.95–0.97)
Females—reference	...	...
Rural	– 9.25 (–10.42 to –8.08)	0.89 (0.88–0.91)
Urban—reference	...	...

Abbreviation: CI, confidence interval.

<sup>a</sup>Excludes people with no postal code, those who cannot be assigned to an MSDI score, missing age or sex, sex not male or female, and people living outside KFL&A.

of a COVID-19 vaccine. Figure 1 provides coverage estimates by age group.

### Population health equity indicators

From Table 2, the largest gap in vaccine coverage was estimated for material deprivation where those living in more materially deprived areas had a coverage estimate that was almost 11% lower than that in less materially deprived areas. This is followed closely by a gap in rural versus urban coverage where rural coverage was estimated to be about 9% lower than urban coverage. There was a small gap by social deprivation (–1.5%) and between males and females (–3.4%). From the start of widespread 2-dose availability through October 2021, the health gaps decreased statistically for all equity indicators (Figure 2).<sup>†</sup> This may have been in part due to the implemented targeted equity interventions, but it is not possible to isolate the effects of the strategies.

### Equity-focused changes to local implementation

The planning and operations subgroups strategically allocated vaccine across the delivery channels (discussed previously). At the beginning of vaccine rollout, it was important to vaccinate as many people as fast as possible through the MICs, which diverted resources away from targeted strategies that can better reach marginalized populations.

Continuous health equity monitoring of the allocation and clinic operations showed early on that there were gaps in vaccination coverage (see previous tables and figures). Monitoring allowed KFL&A Public

Health and community partners to tailor and enhance the current delivery methods as well as add targeted approaches when needed.

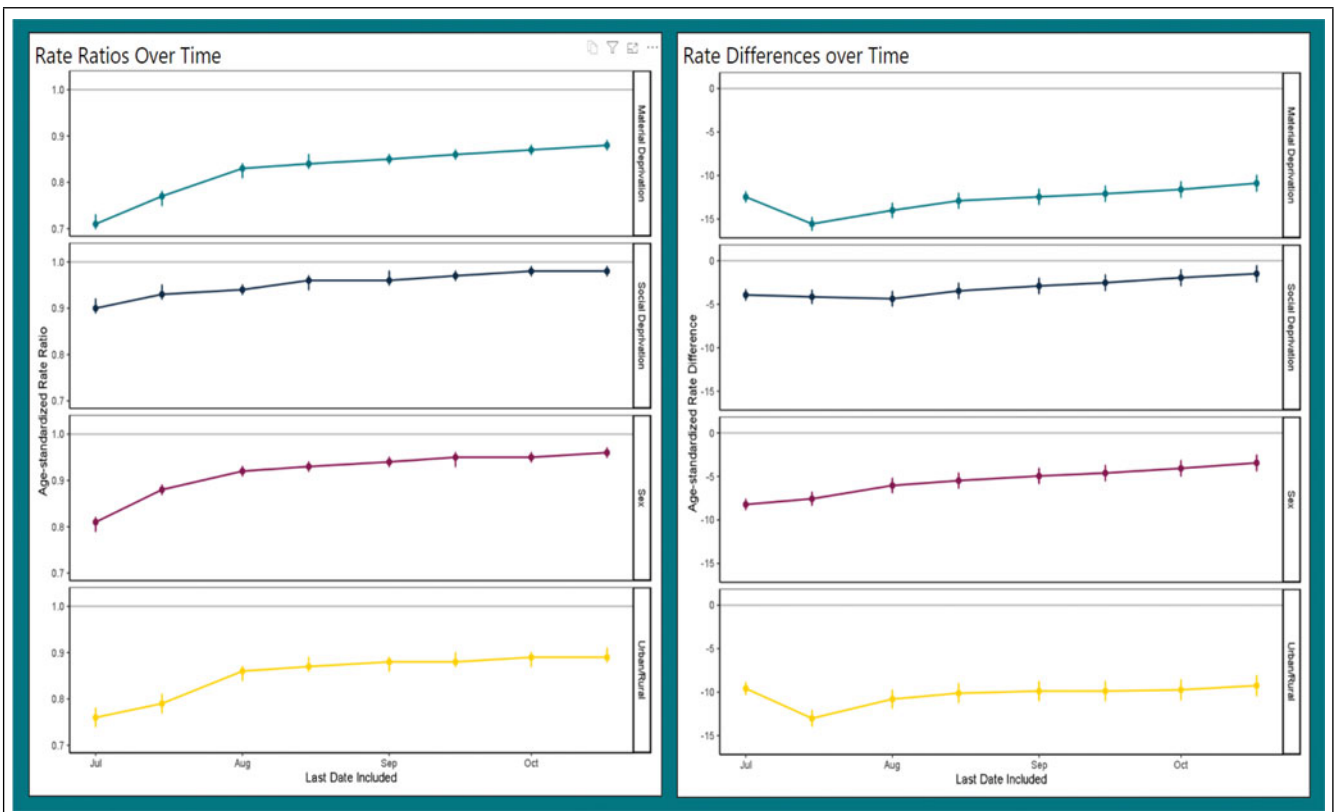
The following sections explain how these changes were implemented in practice to address the identified gaps via interlinked approaches to create an enabling environment, ensure positive social influences, and increase motivation.

### Enhancing provincially mandated approaches

Mass immunization clinics were established across KFL&A throughout the vaccine rollout with several strategies used to ensure convenience for clients. Because of the sheer volume of people flowing through on a regular basis, the MICs typically had to be in urban areas, near transport corridors, and with accessible parking. In all but 1 case, the MICs were accessible via public transportation. People accessing the largest MIC at the local arena were typically not coming from more materially deprived areas (about 29% came from Q4 or Q5 areas). Based on the early evidence of equity gaps, to increase accessibility, hours of operation shifted to include evening hours and always included a weekend day. Furthermore, given that booking of appointments was a major barrier to being immunized, accepting walk-in vaccinations at all MICs occurred as soon as it was logistically feasible (ie, when there was sufficient vaccine to meet demand in July 2021).

The PHU operations team also worked closely with the local community health center (CHC) to establish a specialized MIC. Community health centers are nonprofit organizations that provide both primary care and other health promotion programming in their area and can be accessed by individuals without a health care provider or health insurance in Ontario,

<sup>†</sup>For all indicators, confidence intervals for July 1 and October 17 did not cross.



**FIGURE 2** KFL&A COVID-19 Dose 2 Vaccination Coverage Gaps Over Time (July to October 17, 2021)  
This figure is available in color online ([www.JPHMP.com](http://www.JPHMP.com)).

or who face other barriers such as language, physical disabilities, poverty, or homelessness. As the CHC's primary site is located in a key materially and socially deprived area in North Kingston, the PHU and the CHC worked together to establish an MIC for area residents, which operated from March to mid-August 2021 and then later with smaller primary care clinics. Initially, appointments were closed to the general public to prioritize booking to those who lived in the area. Early coverage estimates showed that DAs in the area had relatively lower coverage compared with other areas of Kingston. Regular meetings between the PHU equity subgroup and the vaccination manager at the CHC were held to share health equity indicators, review coverage maps of the catchment area, and to discuss strategies to boost vaccination in the area. For example, based on these meetings, the CHC undertook door-to-door and other targeted strategies in nearby DAs with low coverage. In addition, the entire organization leveraged its program services, with translation services, when necessary, to recruit and book clients (eg, immigrant services, primary care clinics, other CHC sites, subsidized food programs, and child/youth education services) for vaccine appointments.

To address environment, social influences, and motivation during MIC operation at the CHC, an indigenous elder who is a well-known and trusted member within the local indigenous community frequently attended clinics to welcome indigenous clients and enhance links between the public health system, the CHC, and the indigenous community. The CHC is viewed as a culturally safe space by the indigenous community and the local indigenous health council, which is important for vaccine confidence.<sup>9</sup>

Analyzing postal code data of those immunized at the CHC showed that these targeted strategies did result in many clients from more materially (42%) or socially deprived areas (49%), supporting the aim to create an enabling environment for those in the area and those living in more deprived areas elsewhere.

### **Targeted pop-up and on-site mobile clinics**

The PHU operations and mobile clinic teams worked with trusted community partners, often primary care champions, to implement clinics to serve target populations and/or regions of lower vaccine coverage using pop-up clinics (clinics held one to a handful of times in a specific location).

In urban areas, the DA coverage maps generated by the equity subgroup were reviewed and often used to choose pop-up locations in areas of lower coverage and increased marginalization and to understand assets in the area (eg, community services partners, high-density residential buildings). As appropriate, walking times were overlaid onto the maps and knowledge of public transit routes/hubs was also considered. As an example, a social service organization for children collaborated with the PHU and other partners to host a community vaccine party (“Vaccinapoolooza”), including a BBQ, local DJ, and games, in a lower coverage, more materially deprived area in the downtown area of Kingston. Other pop-up clinics targeted public transit hubs and local schools in areas of low coverage. In rural areas, coverage was monitored at the township level (due to DA instability in rural regions)—rural townships in the north generally had lower vaccination coverage. To date, the clinics have been implemented as drive-through clinics, clinics in community halls, at fire stations, in parks, at community events, and in the parking lots of schools and churches. The PHU leveraged preexisting relationships with community partners, developed before and during the pandemic, to facilitate most arrangements. In some instances, the PHU would conduct outreach and initiate a dialogue with organizations in areas targeted by the analysis (eg, large apartment complexes, churches, or community event organizers) to request permission to hold pop-ups. In addition, organizations such as the YMCA and a number of large employers also contacted the PHU to offer or request consideration of their location.

To further address convenience and social influence as vaccination barriers, the PHU mobile team collaborated with community organizations to book appointments and vaccinate the marginalized population(s) that these organizations serve directly on-site (eg, emergency meal programs, addictions and mental health services, shelters and services for the homeless and underhoused, and developmental services organizations).

In total, almost 19 000 vaccine doses were administered to 16 000 individuals through 146 pop-up and mobile clinics by October 19, 2021. About 40% of these individuals came from more materially deprived areas and 41% came from more socially deprived areas.

### **Primary care clinics**

The PHU used established relationships with its primary care partners, many of whom had already been providing flu shots and other vaccines prior to the pandemic, to contribute significantly to the vaccine

rollout. Primary care partners provided a variety of clinic options, including in-office, drive-through, or mass clinics in community facilities. Practices would make these clinics available for their own patients and often partnered with other practices to pool resources and make clinics available to both their rostered patients and members of the wider community. This was especially helpful in more materially and socially deprived areas and key to increasing uptake in rural areas where vaccine logistics and travel time made it difficult to regularly implement mobile clinics.

Primary care partners also assisted in booking appointments and provided in-person assistance to reduce barriers for those without Internet access or who experience challenges with literacy. Physicians with rostered patients now receive the COVID-19 vaccination status of their patients every week to facilitate promotion of vaccine acceptance and uptake with their hesitant patients.<sup>24</sup>

The PHU’s equity analysis results were continually shared with primary care partners—this supported alignment of vaccine strategies across partners and underlined the continued need for targeted outreach by health care providers. As the analysis showed detailed uptake in primary care partners’ catchment areas, this would generate dialogue with primary care physicians on the need for additional pop-up, drive-through, or smaller in-office clinics. Practices could target unvaccinated or partially vaccinated patients from their rosters to phone and book appointments. The PHU also offered the use of its booking system to manage appointments for primary care clinics, which could either be booked privately by the practice or opened to public booking and promotion on the PHU’s Web site and social media.

### **Communications**

Regular, timely, and clear communication to the public is crucial for a successful overall vaccine rollout—adding to the positive media discourse around vaccination and providing information on where to go and what to do to be vaccinated. However, targeted approaches are needed to reach marginalized groups. The PHU communications team worked with the equity planning group to employ targeted tactics specifically for rural, indigenous, and materially and socially marginalized communities.

The PHU communications team met regularly with local partners specific to these subgroups to provide vaccine promotion messaging and clinic information via targeted media tactics—see Table 3 for examples in rural populations.

The ever-changing nature of the vaccine strategy made it extremely difficult to plan for and implement



**TABLE 3**  
**Rural Media Tactics to Promote Vaccination in KFL&A**

Local newspaper advertisements and weekly interviews and community updates
Local radio interviews and news hour coverage daily on clinic location and times
Social media—advertising clinics
Web site listings
Posters at local stores advertising clinics (liquor stores grocery stores, community hall, restaurants, and gas stations)
Local television weekly community updates
Immunizing at rural events such as annual fairs

more targeted printed campaigns (eg, mail-out, posters, pamphlets). Using a variety of media recruitment methods, especially through targeted community partner communications, is recommended to reach across sociodemographic groups.<sup>25,26</sup>

## Discussion

At the time of writing, COVID-19 vaccination in KFL&A Public Health was closing in on the province's target of 90% coverage. Throughout roll-out of the campaign, a health equity lens using systematic evidence, coordination, and intersectoral collaboration was used to enhance local implementation of the strategy. The scale and scope of monitoring and improving local vaccine uptake are unprecedented for local public health agencies in Ontario. Using a combination of monitoring overall health equity indicators, detailed neighborhood-level mapping and targeted supplementary data collection allowed the health equity subgroup to be specific in its recommendations and responsive to the changing vaccine environment when working with internal and external partners. Notably, local coverage mapping was observed to be insightful to external partners in cueing targeted actions.

Monitoring indicators of inequities in 2-dose vaccine coverage showed that inequities in KFL&A decreased over time, but the health gaps still exist. Notably, a large gap still exists in rural areas (compared with urban) and for those more materially deprived. From a mapping perspective, a large proportion of rural areas in KFL&A is more materially deprived (Q4 or Q5), so this suggests that at least some of the gap in material deprivation can be addressed by increasing coverage in rural areas. The material deprivation gap in COVID-19 vaccination rates in KFL&A has been mirrored at the Ontario level.<sup>27</sup>

This means that those living in rural areas or more materially deprived areas (ie, who may have less education, living with lower income, or less likely to be employed) will be less protected from COVID-19

infection. In collaboration with local partners, much has been done in terms of increasing accessibility—creating an enabling environment—to address these gaps. Comparatively less has been done to improve social influences and upstream sociopolitical factors that contribute to vaccine acceptance. Further work is needed in the local population to understand why vaccine acceptance may be lower in these and other marginalized groups. For example, literature in this area suggests that racialized, lower-income, and less educated groups are more vaccine hesitant and may have less trust in the government due to historical and ongoing systemic oppression.<sup>9,28</sup>

Health care providers are cited as factors important in vaccine acceptance and uptake.<sup>4,6</sup> One of the key strategies used to address health gaps in this article was close collaboration with local health care providers. However, not everyone has a family doctor—based on the collaboration, several family health teams in the region opened their clinics to the broader community, and many have helped circumvent barriers to booking appointments. In addition, the Ministry of Health is now calling nonrostered Ontario residents to encourage vaccine uptake.

This article describes the activities of this collaboration during the first few months of widespread vaccine availability where most interventions were at the population-level. Further work with this collaboration can continue to address the health gaps at the individual level, as health care providers can promote vaccine acceptance with their hesitant patients. In terms of addressing health equity, they can play a role by counteracting misinformation and promoting trust in the vaccine by respecting and considering lived experiences and past histories of their patients.<sup>5</sup> Vaccine health care champions who are members of marginalized communities may also increase trust in their respective communities. Training in best practices such as motivational interviewing may be helpful, and access to up-to-date evidence-based answers to relevant questions on various media platforms is necessary to counteract specific mis/disinformation.<sup>5</sup>

Targeting of marginalized patients via electronic health records and follow-up with nonelectronic communication have demonstrated some success in a very specific clinical population in the United States.<sup>29</sup> However, for busy frontline health care workers who are also struggling to catch up on the backlog of routine health services due to the pandemic, these are major barriers to successfully counseling vaccine-hesitant patients.<sup>5</sup> There needs to be innovative and equitable ways that public health and other stakeholders may support primary care to increase vaccine uptake with their patients.

Pharmacies and pharmacists also played a large role in the vaccine rollout in Ontario. In KFL&A, they administered 35% of all doses. Pharmacies are often near people's homes, sell food and personal items, and pharmacy staff can come to know local clients, developing trust and authority within the local population. Regardless of role, pharmacists have been found to increase vaccine coverage during vaccination campaigns compared with when they are not involved at all—largely through increasing access.<sup>30</sup> Although KFL&A Public Health did not coordinate vaccine inventory for pharmacies, and implementation was overseen by the Ministry of Health, KFL&A Public Health collaborated closely with local pharmacies, meeting weekly to coordinate immunization promotion efforts. Coordination between PHUs and pharmacies should be enhanced in future vaccine strategies.

It is clear that continued close collaboration with community partners is needed to move the needle on COVID-19 vaccine coverage. To promote confidence in vaccines among those more marginalized will require targeted, “hyper-local” communication and education approaches led by trusted community members and their organizations<sup>4,9,10</sup>—specifically in more materially deprived neighborhoods and rural townships. Further audience segmentation is needed to understand and address the beliefs, attitudes, and behaviors of specific subgroups in the population, as a one-size fits all approach will not be effective.<sup>4,9,10</sup>

Certainly, the health care sector is crucial to addressing gaps in vaccination coverage, but the education and social service sectors, municipalities, and community groups will also continue to be important local partners. Finally, intersectoral collaboration needs to better coordinate messaging about vaccines from all levels of government in public health (local, provincial, and federal) and to work to address upstream factors that contribute to material deprivation and other systemic barriers to vaccine uptake.

## Implications for Policy & Practice

- This article provides frontline insight into the implementation of the COVID-19 vaccine strategy at a local level. It highlights how a local public health agency systematically and proactively used data and multisectoral engagement and collaboration to address health inequities in vaccine coverage. It shows that much remains to reduce these gaps.
- A “hyper-local” approach is needed in which public health provides innovative support to health care providers and pharmacies and continues close collaboration with schools, municipalities, and community service groups. Improving social norms and motivation toward vaccination in marginalized groups should be a long-term goal of public health.
- Reflecting on the work to date has also raised some evaluation questions:
  - How can we better plan for the collection of a broader set of individual-level social data in logistically feasible and culturally appropriate ways during provision of emergency health services?
  - What are partners' perspectives on how well the vaccine strategy addressed health equity gaps?
  - Can we robustly evaluate whether the strategy was responsible for reducing gaps over time? If not, how can we better plan for health equity evaluation in emergency preparedness planning?

## Limitations

Material and social deprivation, urban/rural status, and sex are only some of the social determinants of health. Data on racialized or indigenous groups, specifically, are critical in addressing health equity, but these data are lacking or of insufficient quality at the local level. Therefore, KFL&A Public Health does not have a good understanding of potential local gaps in coverage for these groups, which makes it difficult to plan targeted outreach. In emergency preparedness planning, collection of a broader set of individual-level social data in logistically feasible and culturally appropriate ways needs to be considered at the outset.<sup>2,31</sup> This is crucial in addressing the Truth and Reconciliation Commission of Canada's Calls to Action (number 19 and number 20 specifically).<sup>32</sup>

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