

# Has the advice to increase vaccination in hot spots improved equity in Ontario?

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## Introduction

Wellesley Institute reported that areas in Ontario with higher rates of COVID-19 tend to have lower rates of vaccination, and that this pattern is greatest in the City of Toronto.<sup>1</sup>

Since the publication of that analysis, the Province of Ontario has asked public health units to increase vaccination efforts in COVID-19 “hot spots”; the 114 forward sortation areas (FSAs) with the highest rates of infection.<sup>2</sup> The change, which took place on April 7, aimed to get vaccines to the places they are most needed.

This report analyzes the impact of this change in vaccination strategy on vaccine equity.

## Methods

Data on cumulative rates of vaccination and infection for FSAs were accessed from Institute for Clinical Evaluative Sciences (ICES) for three time points: March 27, April 4, and April 18, 2021.<sup>3</sup> These data were linked to 2016 census characteristics for FSAs.<sup>a</sup> Analyses were conducted for Ontario as a whole and then separately for the Toronto M postal codes, and the L postal codes which are for areas around Toronto and for all the rest of Ontario.

## Findings

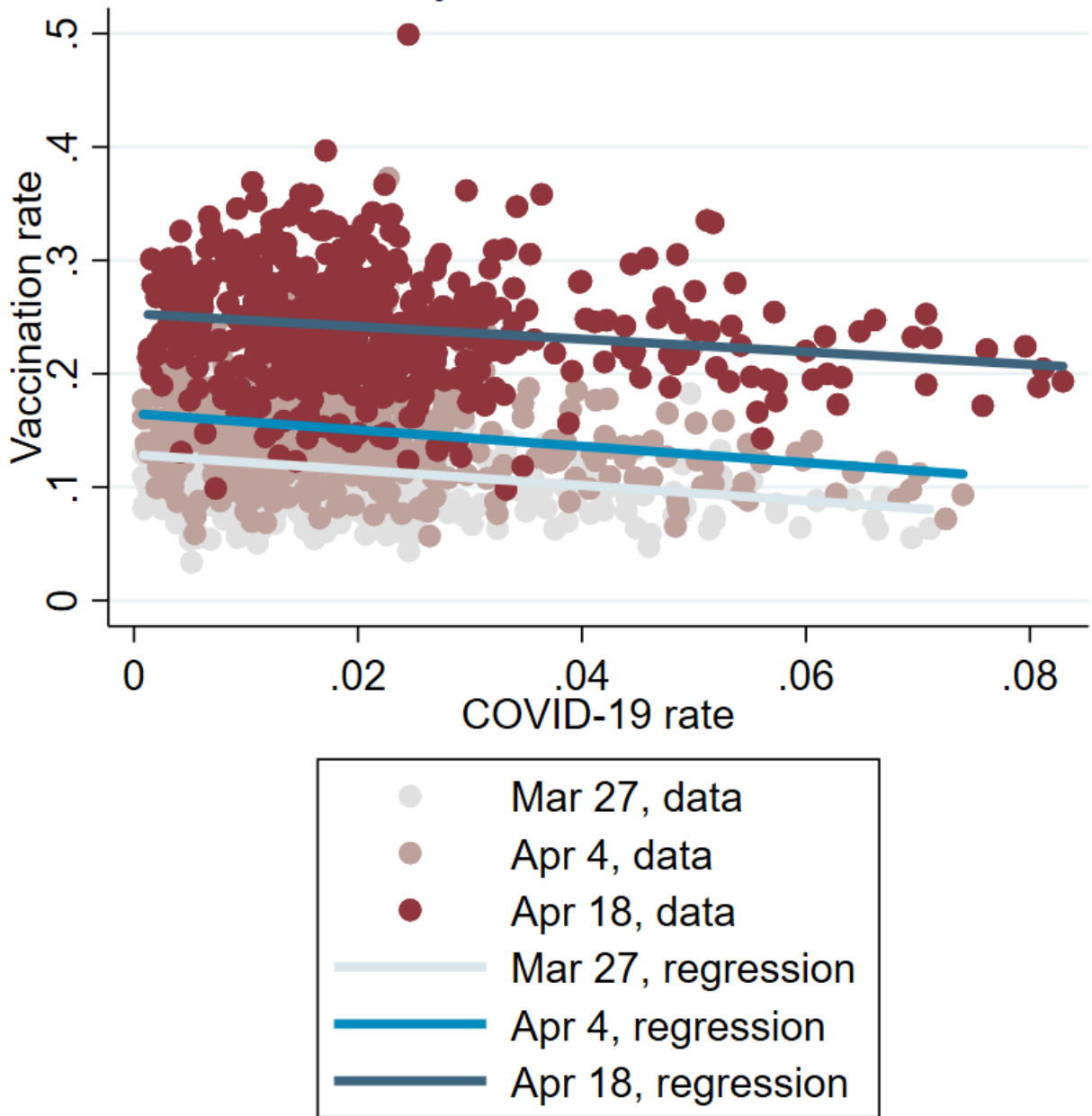
The correlation between higher COVID-19 infection rates and lower vaccination rates in an area has remained despite the change in vaccination strategy for Ontario as a whole. (see Figure 1). However, it has declined over time (Mar 27= -0.24; Apr 4 = -0.22 ; Apr 18 = -0.16, all  $p < .001$ ).

For Toronto, the correlation between higher COVID-19 infection rates and lower vaccination rates in an area has persisted but it has weakened over time (Mar 27 = -0.61 ; Apr 4 = -0.58 ; Apr 18 = -0.37, all  $p < .001$ ). Whereas for both the L postal codes and the rest of Ontario, higher COVID-19 infection rates are now correlated with higher vaccination rates.

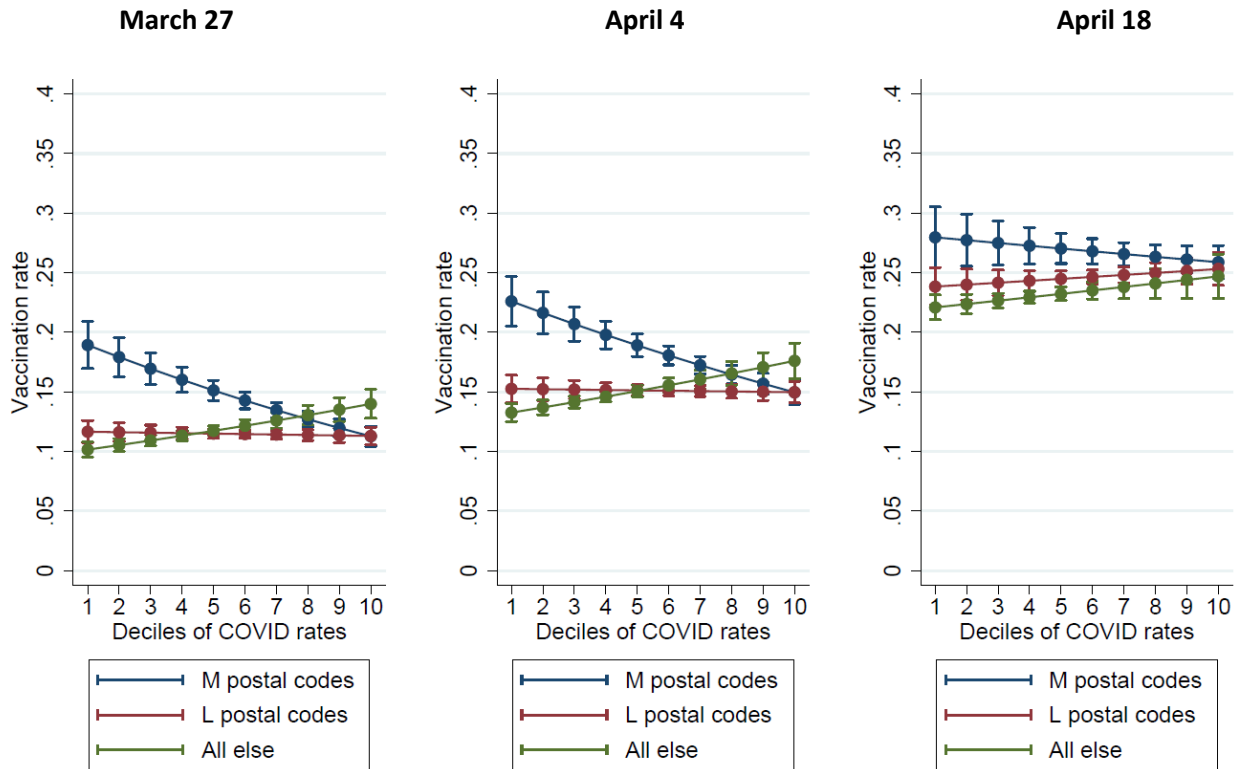
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<sup>a</sup> Bivariate correlations between vaccination rates and COVID-19 infection rates were estimated using Pearson correlations (written as ‘*r*’ in-text). Simple linear regression was used to visualize the association between vaccination and COVID-19 infection rates. Change in FSA vaccination rate over time was modeled using generalized estimating equations with an auto-regressive error structure – essentially a method that accounts for the inertia of local vaccination rates. These models included an interaction between hot spot status and time, controlling for local age composition, race, COVID-19 rates, and poverty rates.

Figure 1. Vaccination rate by COVID-19 infection rate in Ontario, over time.



**Figure 2.** Regional differences in Ontario:



## Discussion

This report provides evidence that the advice to focus on hot spots is promoting vaccination equity at an area level. Areas with higher COVID-19 rates in most of the province are now more likely to have higher vaccination rates and in Toronto the link between higher COVID-19 rates and lower vaccination rates in an area is decreasing. Overall, the strategy seems to be going in the right direction but there are two areas of caution.

First, we do not know what level of correlation between area COVID-19 levels and vaccination is optimal for the most effective and efficient strategy. Second, without individual-level data, we do not know whether the residents in greatest need, and at highest risk in hot spots, are the ones receiving the vaccine. The collection and analysis of socio-demographic data at an individual level for those who are getting the vaccine would help us better understand whether we are offering the most timely and equitable protection for people in Ontario.

## References

1. Iveniuk J, Leon S. *An Uneven Recovery: Measuring COVID-19 Vaccine Equity in Ontario*. Wellesley Institute; 2021. Accessed April 30, 2021. <https://www.wellesleyinstitute.com/wp-content/uploads/2021/04/An-uneven-recovery-Measuring-COVID-19-vaccine-equity-in-Ontario.pdf>
2. Full list of Ontario neighbourhoods where the COVID-19 vaccine will be available to those 18+. Toronto. Published April 8, 2021. Accessed April 30, 2021. <https://toronto.ctvnews.ca/full-list-of-ontario-neighbourhoods-where-the-covid-19-vaccine-will-be-available-to-those-18-1.5379755>
3. Institute for Clinical Evaluative Sciences. COVID-19 Dashboard. Accessed April 8, 2021. <https://www.ices.on.ca/DAS/AHRQ/COVID-19-Dashboard>