

Predictors of vaccination uptake for the 2009 influenza pandemic (H1N1) in Montréal

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Objective

To assess the effectiveness of a public health automated phone campaign to increase vaccination uptake in targeted neighborhoods. To identify alternative predictors of variation in vaccination uptake, specifically to assess the association between vaccination uptake and weather conditions and day-of-week.

Introduction

Work on vaccination timing and promotion largely precedes the 2009 pandemic. Postpandemic studies examining the wide range of local vaccination efforts mostly have been limited to surveys assessing the role of administrative strategies, logistical challenges and perceived deterrents of vaccination (1).

Methods

We used a quasi-Poisson logistic regression model to analyze daily vaccination counts at Montréal's mass vaccination centers (MVC; $n = 18$) before and after an automated phone campaign promoting pandemic vaccination in 13 of the city's 29 health districts. We then used a similar model to test a more mundane explanation for the considerable variation in daily use of MVC: that inclement weather and weekends deterred vaccination.

Results

We found a nonsignificant increase in vaccinations following the phone campaign, with fewer than 1000 estimated additional vaccinations (results not shown). The association between weather conditions and vaccination was strong and significant when controlling for variation between MVC (Table 1). We found no evidence of day-of-week effect.

Table 1. Predictors of daily vaccinations at mass vaccination centres

Variable	Risk ratio [95% CI]
Mean daily temperature (°C)	1.06 [1.05–1.06]
Rainfall >20 mm (ref: <20 mm)	0.67 [0.56–0.79]
Snowfall >20 cm (ref: <20 cm)	0.43 [0.33–0.56]
Weekend (ref: weekday)	1.02 [0.97–1.07]

The model accounts for variation between MVC and for daily remaining unvaccinated population (coefficients not shown); model offset: logged daily capacity at each MVC
CI, confidence interval.

Conclusions

Only 50% of Montréal Island was vaccinated, which was well short of the public health goal for 'herd immunity'. Uptake was below 30% in some census tracts. Vaccination capacity was not the limiting factor.

Despite targeting neighborhoods with the lowest uptake, the Health Department's campaign did not appear to increase vaccination, reflecting ineffectual communication or a more

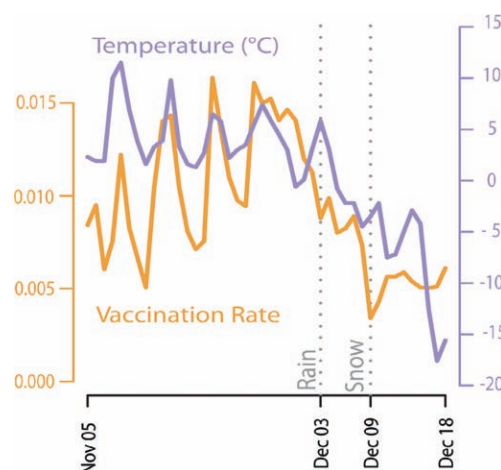


Fig. 1. Daily vaccination rate and weather conditions in Montréal.

troubling lack of trust in health authorities (2). Launching the campaign earlier might have been more effective.

The strong association between vaccination and weather (Fig. 1), suggests that many individuals either were easily deterred from vaccination or delayed their trip to MVC. For wait-and-see individuals, even a short postponement may well have become nonvaccination (3).

These findings suggest that vaccination uptake could be improved by allocating more resources at the start of the vaccination campaign.

Keywords

Vaccination campaign; pandemic; influenza; weather

Acknowledgments

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