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# Supplementary Information for

## Local lockdowns outperform global lockdown on the far side of the COVID-19 epidemic curve

**Vadim A. Karatayev, Madhur Anand, Chris T. Bauch**

**Vadim A. Karatayev.**
**E-mail: vkaratay@uoguelph.ca**

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**Table S1. Parameter definitions, baseline values and literature sources**

| Parameter | Meaning | Baseline Value | Source |
|---|---|---|---|
| $\tau_I^{t_0}$ | symptomatic testing probability for $t < t_{n=325}$ | 0.023/day | (1–3), calibrated |
| $\tau_I^{t_f}$ | symptomatic testing probability for $t > 60 + t_{n=325}$ | 0.46/day | (1–3), calibrated |
| $\alpha$ | transition probability, $E \to A$ | 0.4/day | (4, 5) |
| $\sigma$ | transition probability, $A \to I$ | 0.4/day | (4, 5) |
| $\rho$ | transition probability, $I \to R$ | 0.67/day | (4, 5) |
| $w$ | proportion of contacts in schools and workplaces | 0.45 | (6) |
| $\omega$ | risk perception proportionality constant | 5.7 $\times 10^4$ | (1–3), calibrated |
| $\epsilon$ | physical distancing efficacy | 0.64 | (1–3), calibrated |
| $\beta_0^A$ | transmission probability, asymptomatic | $5.4 \times 10^{-6}$/day | (7, 8), one-half $\beta_0^I$ |
| $\beta_0^I$ | transmission probability, symptomatic | $1.1 \times 10^{-5}$/day | (7, 8), calibrated |
| $\beta_{0\,j}^I$ | City- and county-group-specific transmission probability (constrained $\beta_{0\,Toronto}^I = \beta_0^I$) | Peel: $0.98\beta_0^I$<br>York: $0.88\beta_0^I$<br>Ottawa: $0.93\beta_0^I$<br>250-500: $0.83\beta_0^I$<br>100-250: $1.05\beta_0^I$<br>$< 100$: $1.15\beta_0^I$ | calibrated |
| $\xi$ | incidence function control parameter | 0.2 | (9–11), calibrated |
| $c$ | transmission probability constant | $7.0 \times 10^{-6}$ | calibrated |
| $s$ | superspreading parameter | 0.2 | (12) |
| $\pi$ | proportion of asymptomatic individuals | 0.2 | (13) |
| $\eta$ | adherence to isolation | 0.8 | (14, 15) |
| $r$ | reduced travel rate if symptomatic | 0.19 | (16) |
| $m_{jk}$ | connectivity matrix | see Methods | (17) |
| $\gamma_l$ | Threshold to close county | varied | |
| $\gamma_G$ | Threshold to close province | varied | |
| $\delta_C$ | Minimum closure duration | 30 days | |

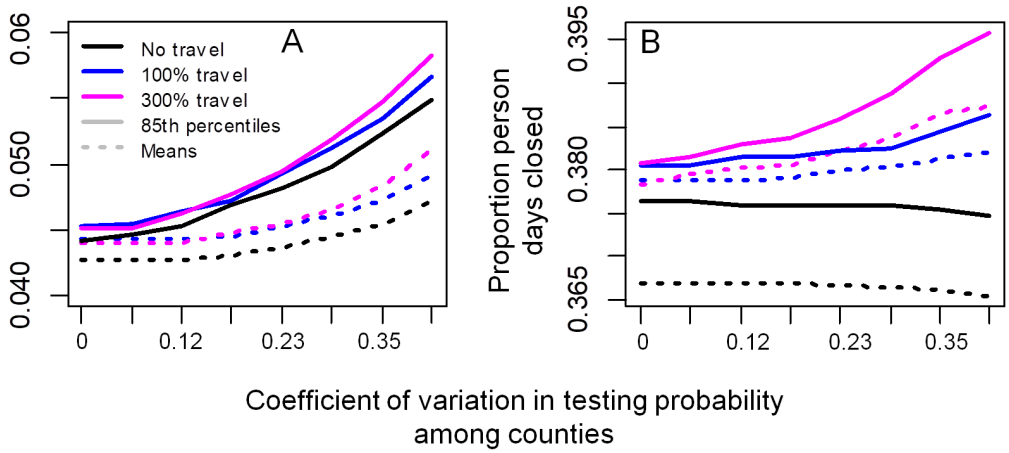


**Fig. S1. Decreasing coordination in testing of symptomatic individuals across counties increases total cases and person days closed under the local strategy.** $\tau_{I,j}$ expresses uncorrelated variation among counties according to a uniform distribution with mean $\tau_I = 0.46$.

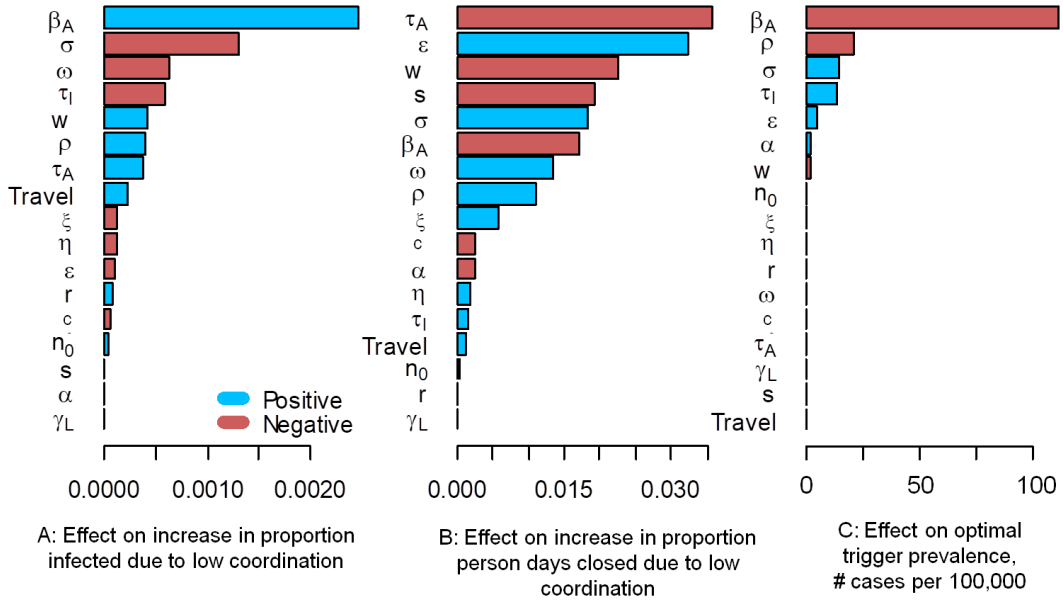


**Fig. S2. Effects of $\pm 20\%$ variation in each parameter around its default value (Table 1) on the importance of coordination and the optimal trigger prevalence for the local strategy.** Note that disease progression parameters can have counter-intuitive effects because they also regulate the number of positive, active cases on which closures and distancing depend.

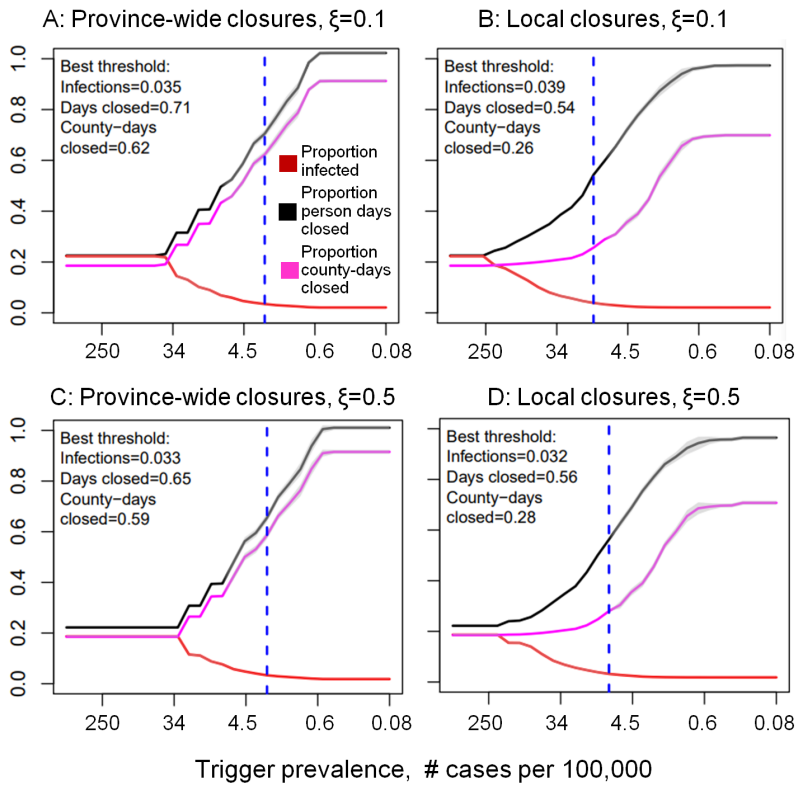


**Fig. S3. Comparison of province-wide (A, C) versus county-by-county (B, D) closure strategies as the effect of county population on transmission probability $\xi$ increases from 0.1 (A, B) to 0.5 (C, D).** For each $\xi$ value we re-calibrated the model parameters for best fit.

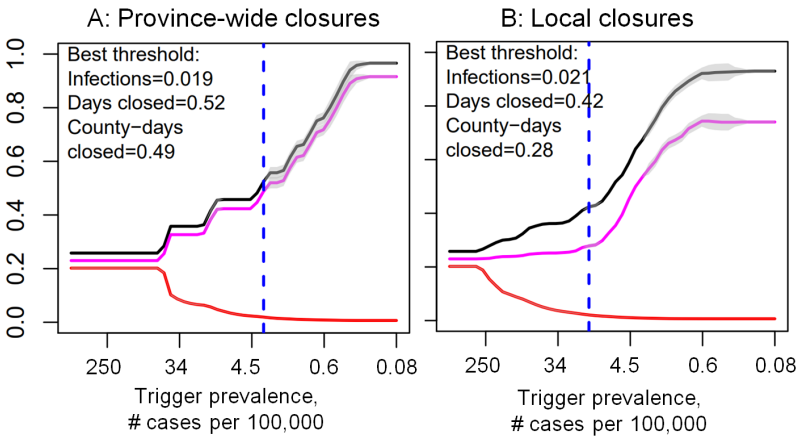


**Fig. S4. Comparison of province-wide (a) versus county-by-county (b) closure strategies under 100% higher travel rates compared to Fig. 3 of the main text.** Other settings are as in Fig. 3.

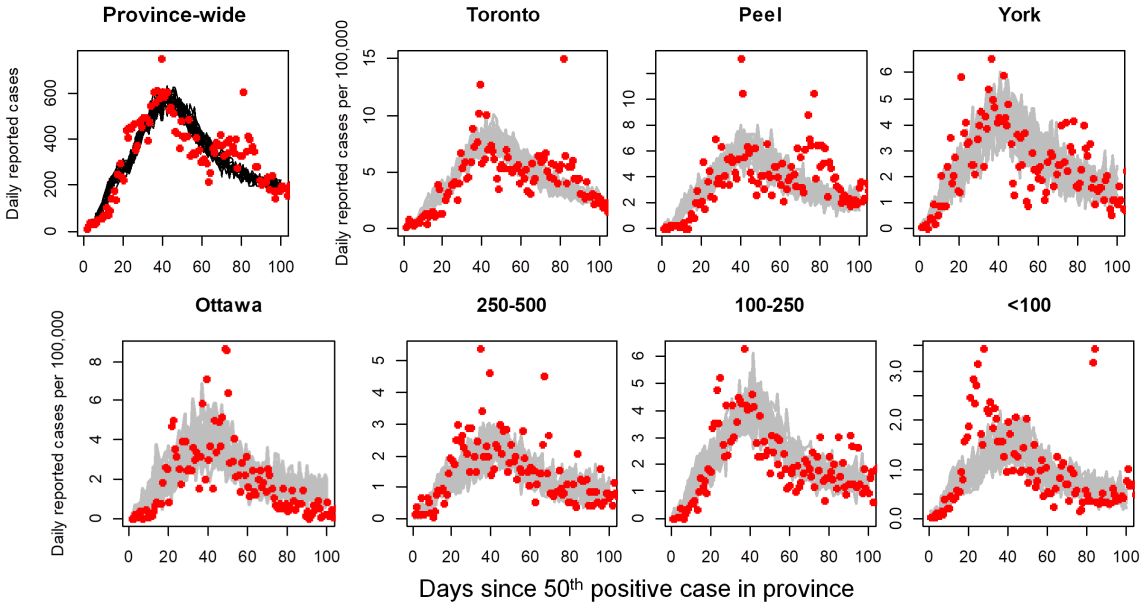


**Fig. S5. The fit of 15 stochastic model implementations (black lines) to daily reported positive cases (red dots) province-wide (top-left panel) and to each city or county group (following Fig. 1).** The large spikes apparent near the peak of the epidemic curves in the empirical data are due to intense institutional outbreaks and thus are not captured by our population-level model.

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