

Multifaceted strategies for the control of COVID-19 outbreaks in long-term care facilities in Ontario, Canada

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This appendix provides further details of the model structure and its parameterization.

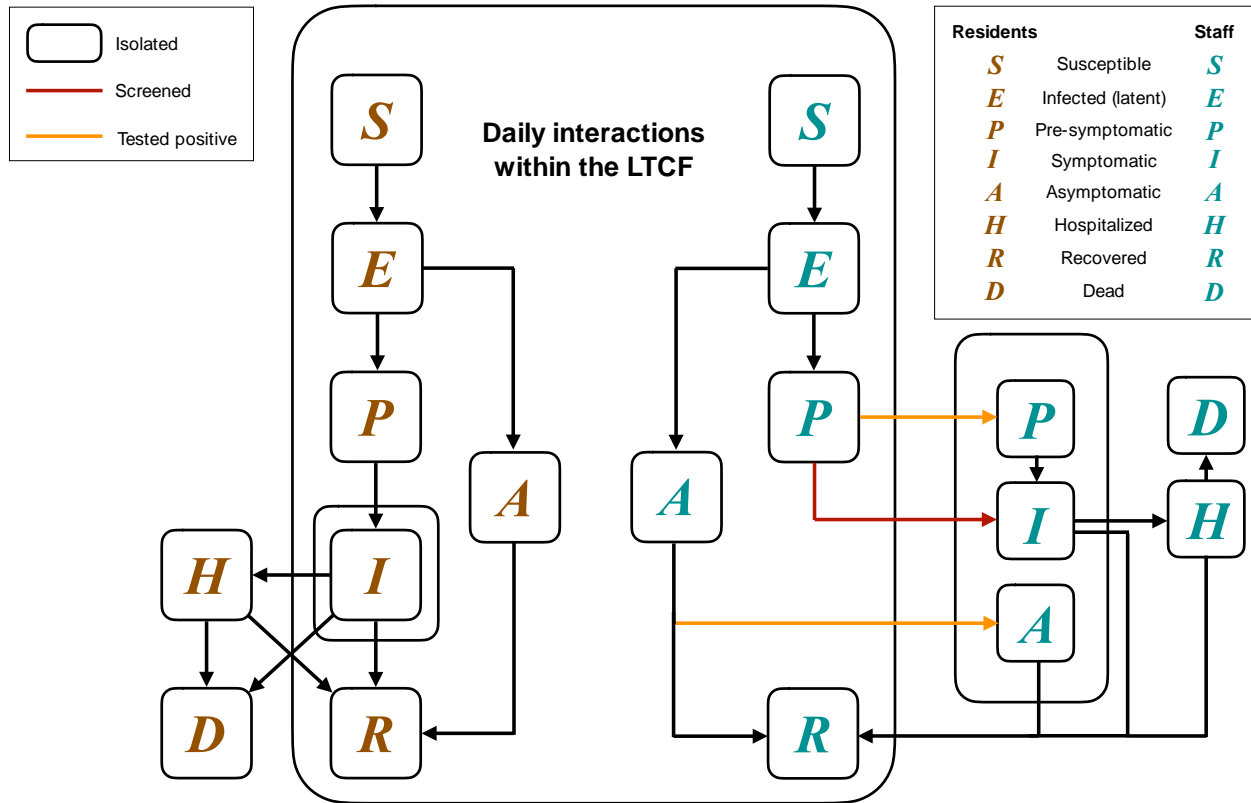


Figure 1A. Schematic model diagram for disease dynamics and interventions.

Daily number of contacts

The staff-to-resident ratio was informed through correspondence with the management teams of 10 Ontario LTCFs with COVID-19 outbreaks. The model includes one personal support worker per nine residents during day and evening shifts, and one per 22 residents in the night shift. The ratio

of nurses to residents was one to 32 during day and evening shifts and one to 64 in the night shift. The ratio of dietary and housekeeper staff to residents was one to 32 in all shifts.

The daily number of contacts between residents was sampled from a previously inferred distribution with a mean of 6.8 contacts per day per resident (1,2). The number of contacts that a resident has with a personal support worker is one to two per shift. This number for each resident was set to one for contacting a nurse. Residents were assumed to have no contact with dietary staff and housekeepers. Contacts among staff and between residents and staff are summarized in Table A1.

Table A1. Mean number of daily contacts among a single agent and a group of agents.

Single Agent	Group of Agents						
	Resident			PSW	Nurse	DS	HS
Resident	6.8 (SD: 4.75)			3-6	3	0	0
Personal support worker (PSW)	day 8-18	evening 8-9	night 20	2-4			
Nurse	30	30	60	2-4			
Dietary staff (DS)	0			1-2			
Housekeeping staff (HS)	0			1-2			

Routine testing of staff

We implemented the temporal diagnostic sensitivity of NP and saliva testing derived from our previous work (3) by fitting a sensitivity function to data reported for percent positivity of COVID-19 patients. Figure A2 shows the model outputs for the proportion of silent infections (i.e., pre-symptomatic or asymptomatic infection) detected among staff by a 7-day frequency of NP and saliva testing. Case identification is affected by both sensitivity of the test and the time from sample collection to the laboratory results, which affects the dynamics of infection in the LTCF.

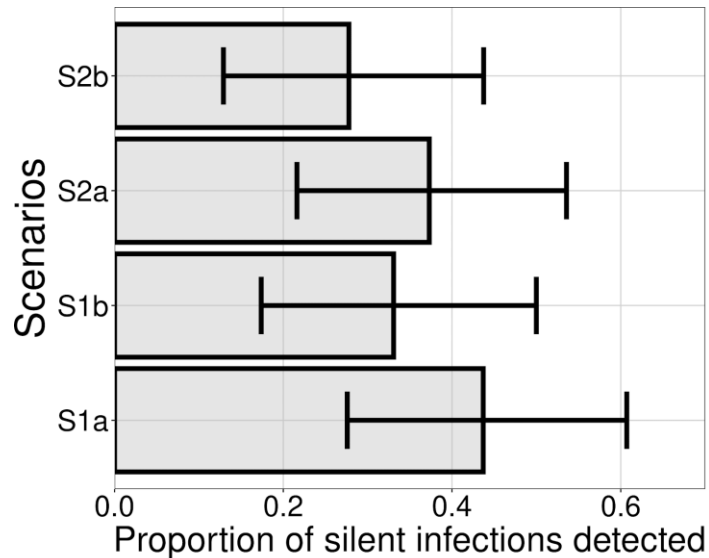


Figure A2. Proportion of silent infections that are detected in routine testing of staff. Scenarios correspond to NP testing with 1-day (S1a) and 2-day (S1b) turnaround times, and saliva testing with 1-day (S2a) and 2-day (S2b) turnaround times.

References

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3. Zhang K, Shoukat A, Crystal W, Langley JM, Galvani AP, Moghadas SM. Routine saliva testing for the identification of silent COVID-19 infections in healthcare workers [Internet]. *medRxiv*; 2020 Nov [cited 2020 Nov 30]. Available from: <http://medrxiv.org/lookup/doi/10.1101/2020.11.27.20240044>