COVID-19 and Ontario's Long-Term Care Homes

Nathan Stall MD, FRCPC

Geriatrician, Mount Sinai Hospital
PhD Candidate, Departments of Medicine and Health Policy & Evaluation
Assistant Scientific Director, Ontario's COVID-19 Science Advisory Table

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SINAI HEALTH/UHN MEDICAL GRAND ROUNDS
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@NathanStall

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  - Receive income as Associate Editor at CMAJ
  - Currently seconded as the Assistant Scientific Director of Ontario's COVID-19 Science Advisory Table

OUTLINE

1. What do we know about the first, second and third waves of COVID-19 in Ontario LTC homes?

2. Which risk factors are associated with COVID-19 outbreaks in Ontario LTC homes and the extent and death rates associated with outbreaks?

3. What has been the impact of the COVID-19 pandemic on the general health and wellbeing of LTC residents?

4. How has the existing Ontario evidence on COVID-19 in LTC settings been used to support public health interventions and policy changes in these settings?

5. What are the measures that could be effective in supporting Ontario's LTC comes for the remainder of the COVID-19 pandemic and beyond?

6. What was the early impact of the COVID-19 vaccine rollout on Ontario's LTC homes?

OVERVIEW OF ONTARIO'S LTC SECTOR

- Ontario has 626 licensed LTC homes and 77,257 long-stay beds
  - 58% are for-profit, 24% are non-profit/charitable, and 16% are municipal
  - ~300 homes are older and need to be redeveloped (>30,000 beds)

- Residents receive personal and nursing care as well as subsidized accommodation under a publicly funded LTC program

- As of February 2019, the average time to LTC placement was 161 days and the waitlist had nearly 35,000 individuals

- 90% of residents have some form of cognitive impairment and 86% need extensive help with daily activities

- Increasing complexity of newly admitted LTC residents

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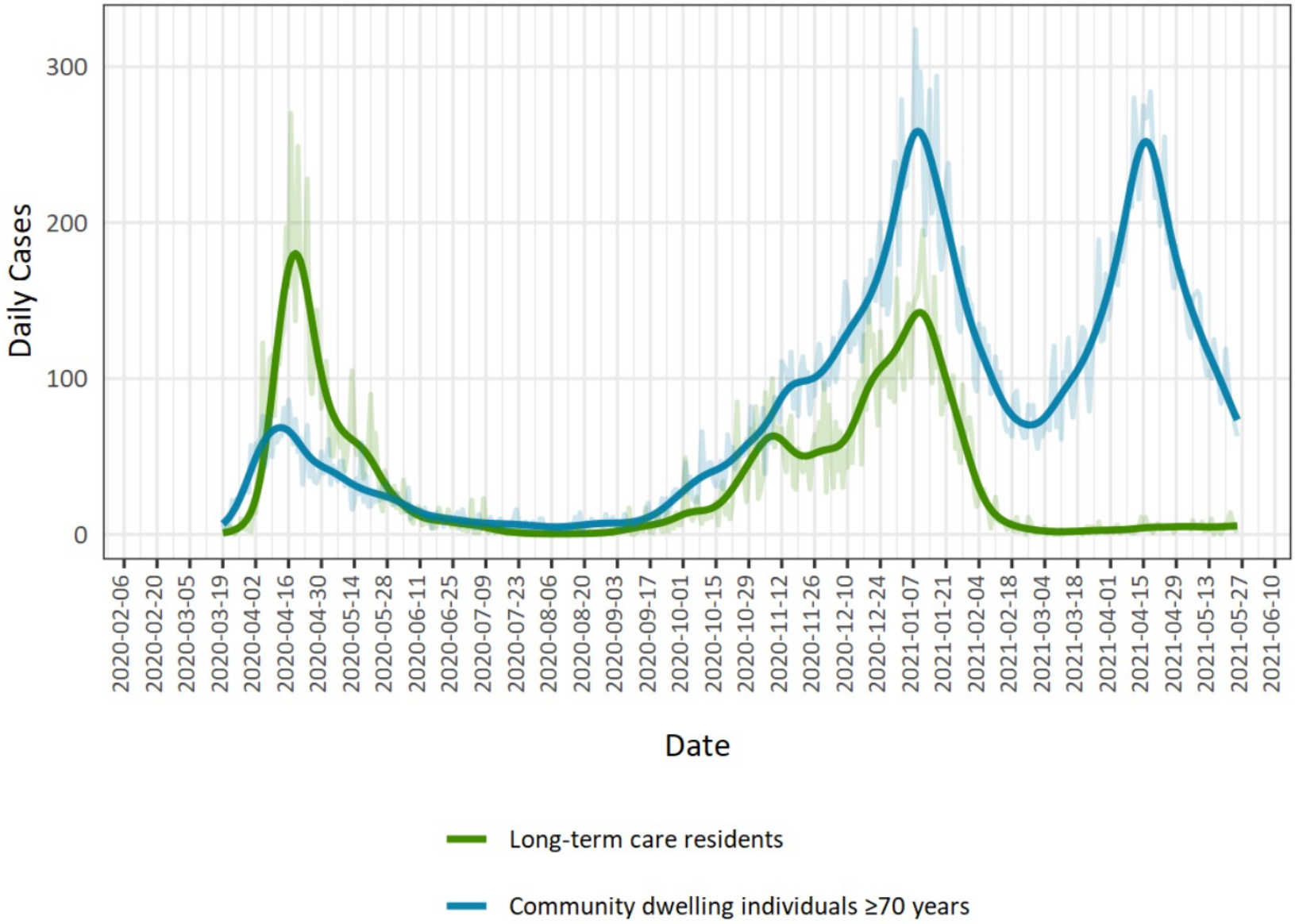
COVID-19 EPIDEMIC CURVE BY AGE AND RESIDENCE

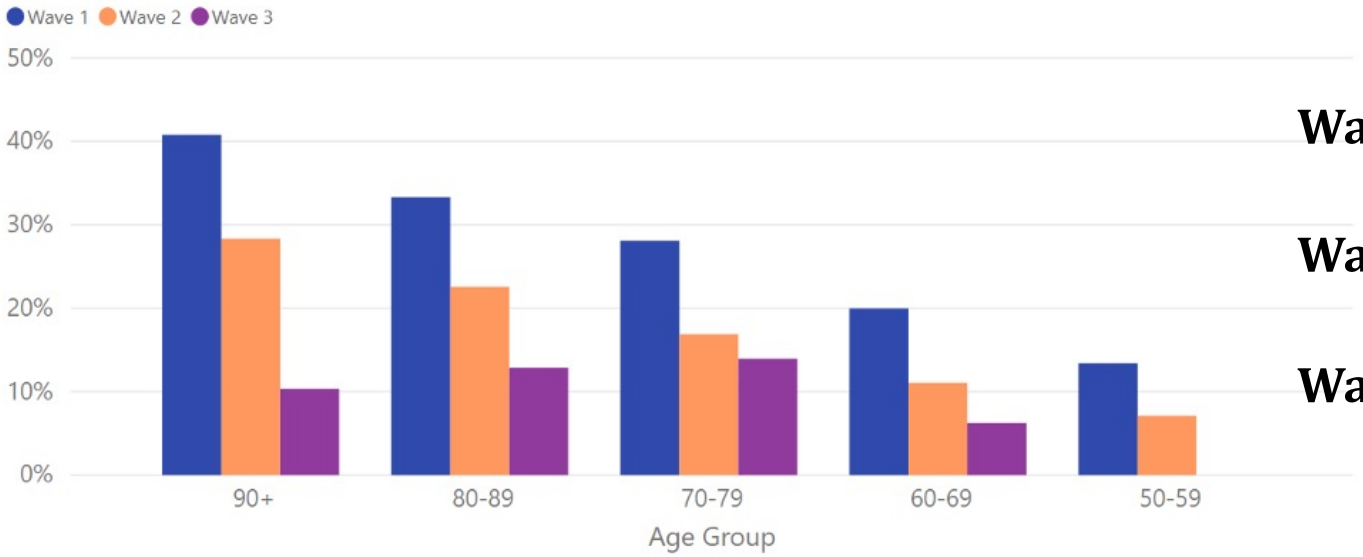


THE COVID-19 PANDEMIC IN ONTARIO'S LTC HOMES

- **Wave 1: February 26—August 31, 2020**
  - SARS-CoV-2 infections: 5,953 resident and 3,389 staff
  - COVID-19 deaths: 1,848 resident and 8 staff
- **Wave 2: September 1, 2020—February 28, 2021**
  - SARS-CoV-2 infections: 9,033 resident and 8,055 staff
  - COVID-19 deaths: 1,896 resident and 3 staff
- **Wave 3: March 1—May 24, 2021 (Ongoing)**
  - SARS-CoV-2 infections: 303 resident and 1,031 staff
  - COVID-19 deaths: 27 resident and 2 staff

WAVE 1 VS. WAVE 2 VS. WAVE 3 IN ONTARIO'S LTC HOMES

- Case fatality ratio = number of deaths/number of cases
  - As of May 19, 2021



Wave 1 = 1,910 deaths

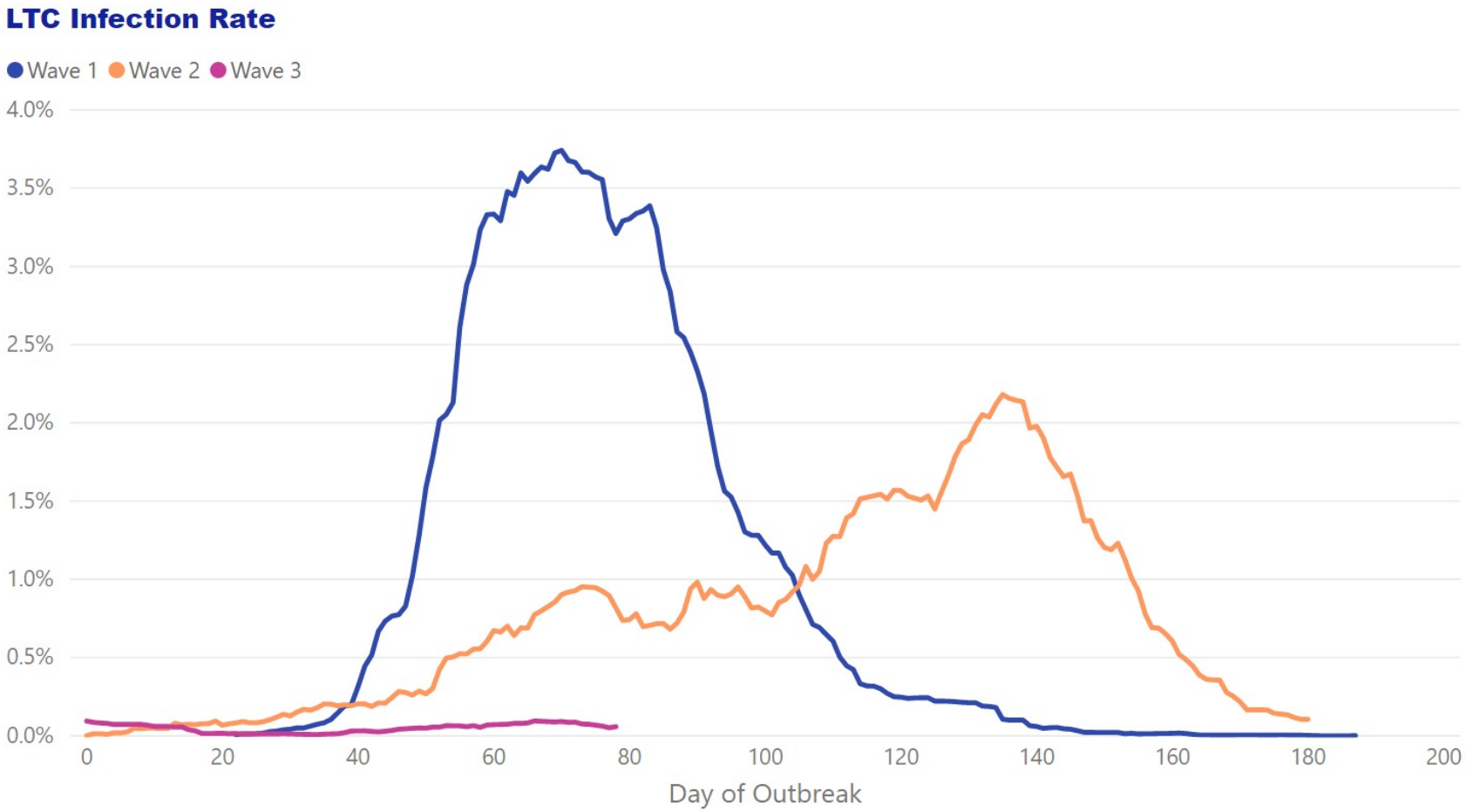
Wave 2 = 1,946 deaths

Wave 3 = 29 deaths

Age Group	Cases (wave 1)	Cases (wave 2)	Cases (wave 3)	Deaths (wave 1)	Deaths (wave 2)	Deaths (wave 3)	CFR (wave 1)	CFR (wave 2)	CFR (wave 3)
90+	1861	2879	87	759	816	9	40.78%	28.34%	10.34%
80-89	2255	3398	101	751	767	13	33.30%	22.57%	12.87%
70-79	1025	1778	43	288	300	6	28.10%	16.87%	13.95%
60-69	576	678	16	115	75	1	19.97%	11.06%	6.25%
50-59	164	225	5	22	16	0	13.41%	7.11%	0.00%

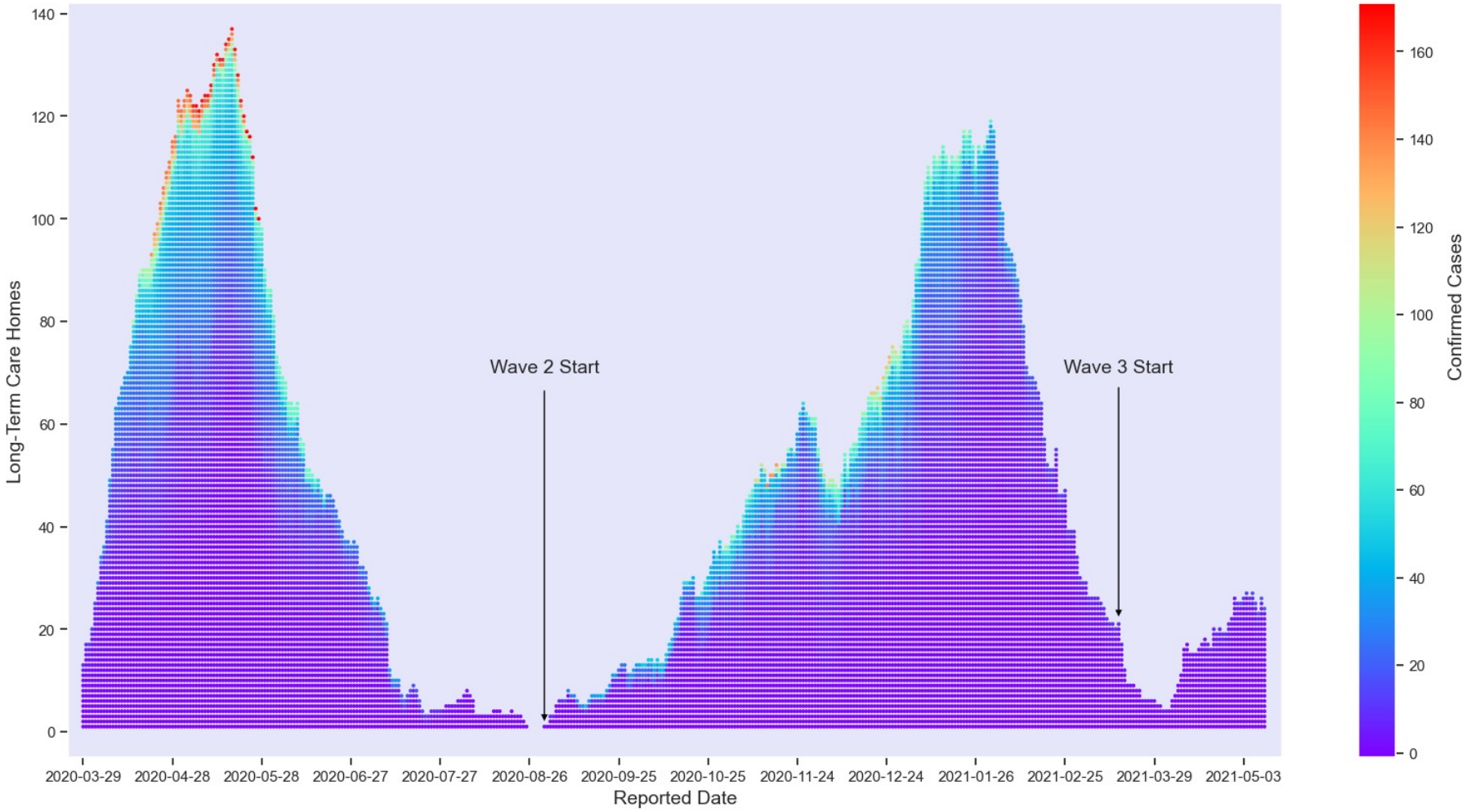
WAVE 1 VS. WAVE 2 VS. WAVE 3 IN ONTARIO'S LTC HOMES

Infection Rate = number of active cases/number of residents
(current as of May 19, 2021)



WAVE 1 VS. WAVE 2 VS. WAVE 3 IN ONTARIO'S LTC HOMES

Resident outbreak = outbreaks involving at least one LTC resident COVID-19 case *(current as of May 19, 2021)*



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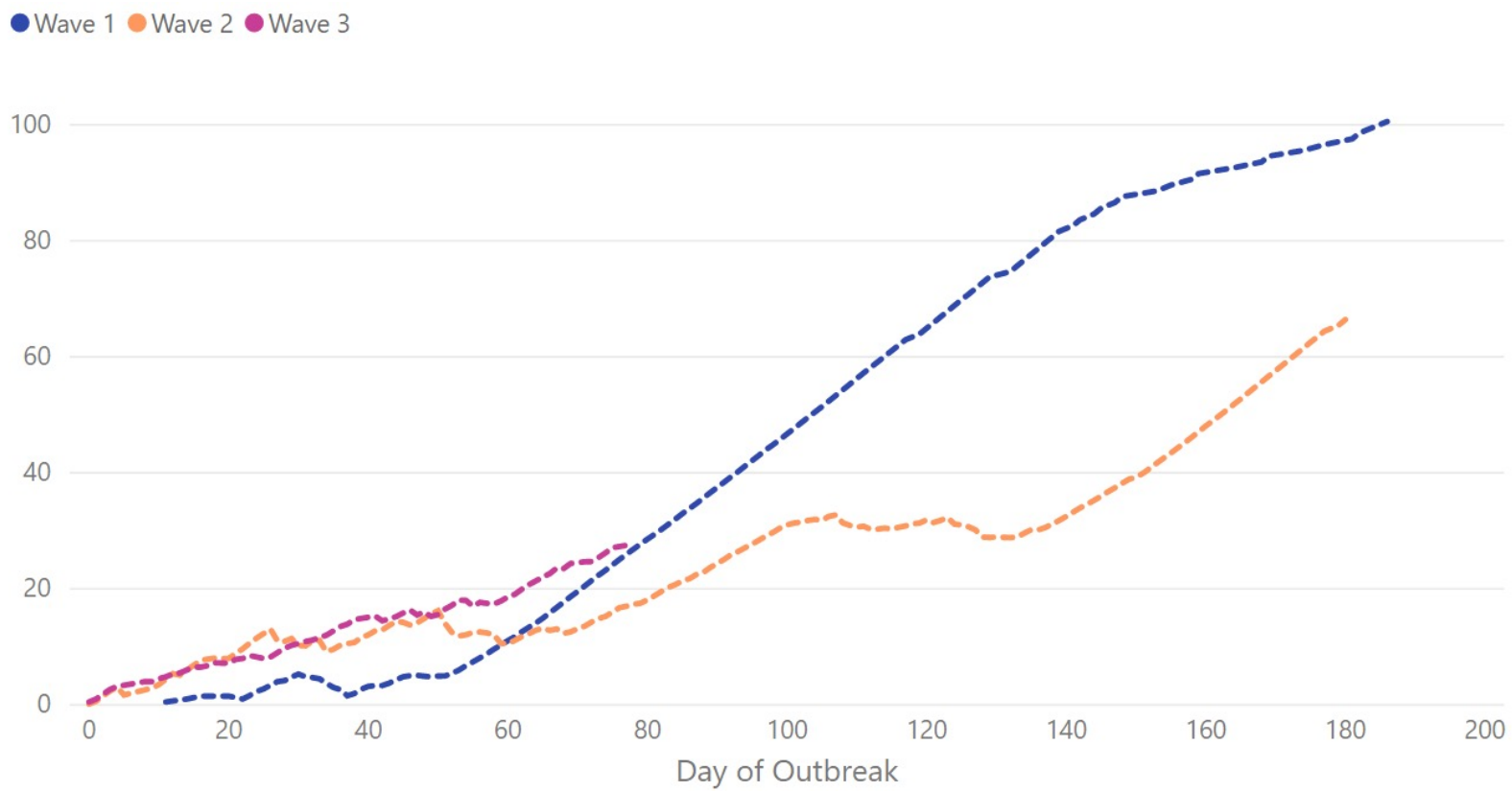
Ontario Ministries of Health and Long-Term Care

SCIENCE TABLE
COVID-19 ADVISORY FOR ONTARIO

Sinai Health System

WAVE 1 VS. WAVE 2 VS. WAVE 3 IN ONTARIO'S LTC HOMES

- *Doubling rate = number of days for case volume to double *(current as of May 19, 2021)*
  - Increased time for doubling = slower growth



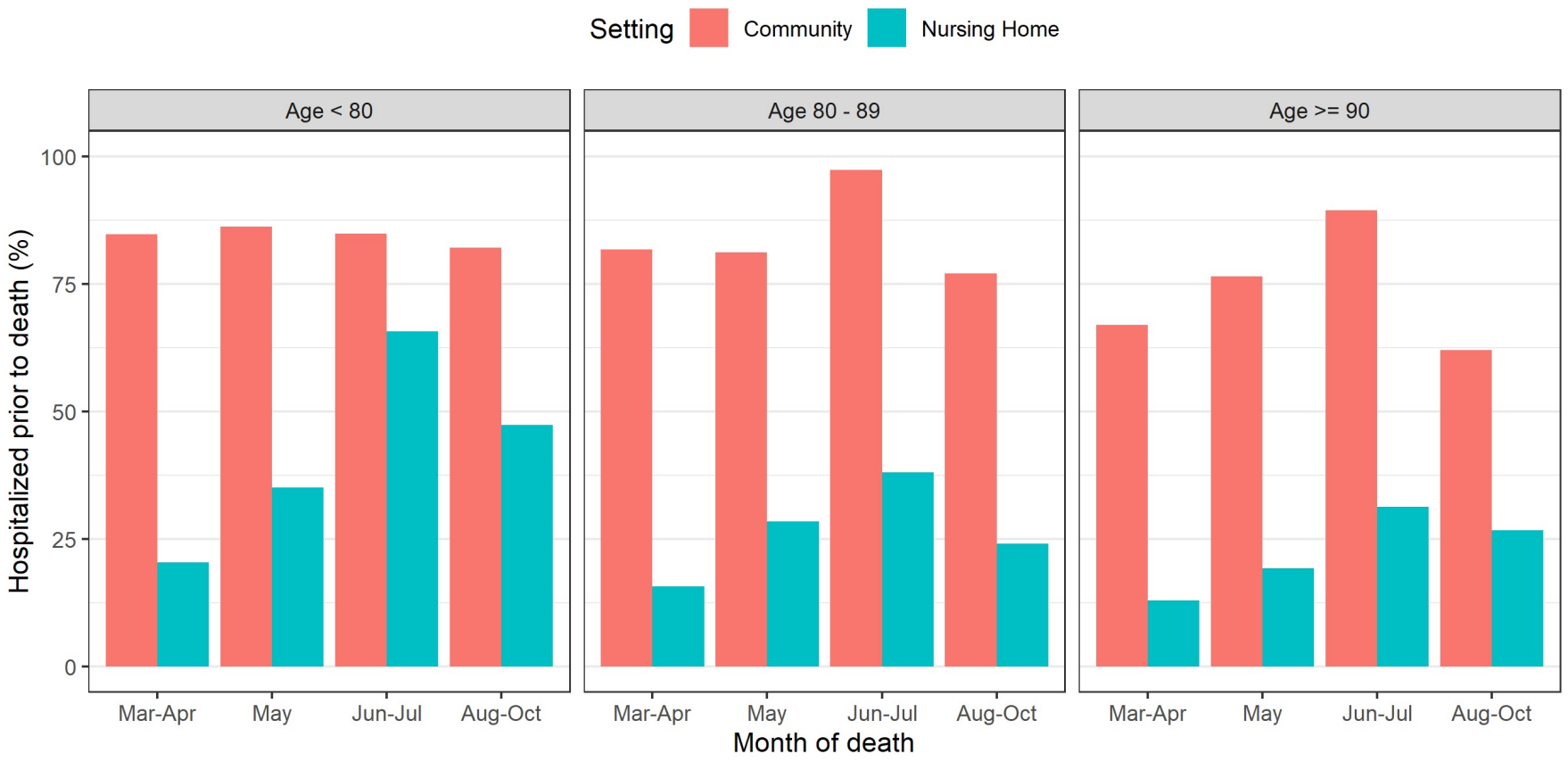
TEMPORAL VARIATIONS IN HOSPITALIZATIONS

Table. Admissions to hospital prior to death among community and nursing home residents who died with COVID-19, March to October 2020 (N=3,114).

	Community Residents			Nursing Home Residents		
	N	Hospitalized prior to death (N [%])	p-value*	N	Hospitalized prior to death (N [%])	p-value*
Total	1,114	907 (81.4)		2,000	447 (22.4)	
Month						
March-April	532	426 (80.1)	<0.001	1,028	159 (15.5)	<0.001
May	306	253 (82.7)		729	196 (26.9)	
June-July	143	127 (88.8)		165	68 (41.2)	
August-October	133	101 (75.9)		78	24 (30.8)	
Age (years)						
<70	287	239 (83.3)	<0.001	141	56 (39.7)	<0.001
70-79	250	217 (86.8)		299	82 (27.4)	
80-89	352	291 (82.7)		778	175 (22.5)	
≥90	225	160 (71.1)		782	134 (17.1)	
Gender*						
Male	621	517 (83.3)	0.1	811	202 (24.9)	0.03
Female	491	390 (79.4)		1,163	242 (20.8)	

J Am Med Dir Assoc. 2021 Apr 20:S1525-8610(21)00384-4.

TEMPORAL VARIATIONS IN HOSPITALIZATIONS



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J Am Med Dir Assoc. 2021 Apr 20:S1525-8610(21)00384-4.

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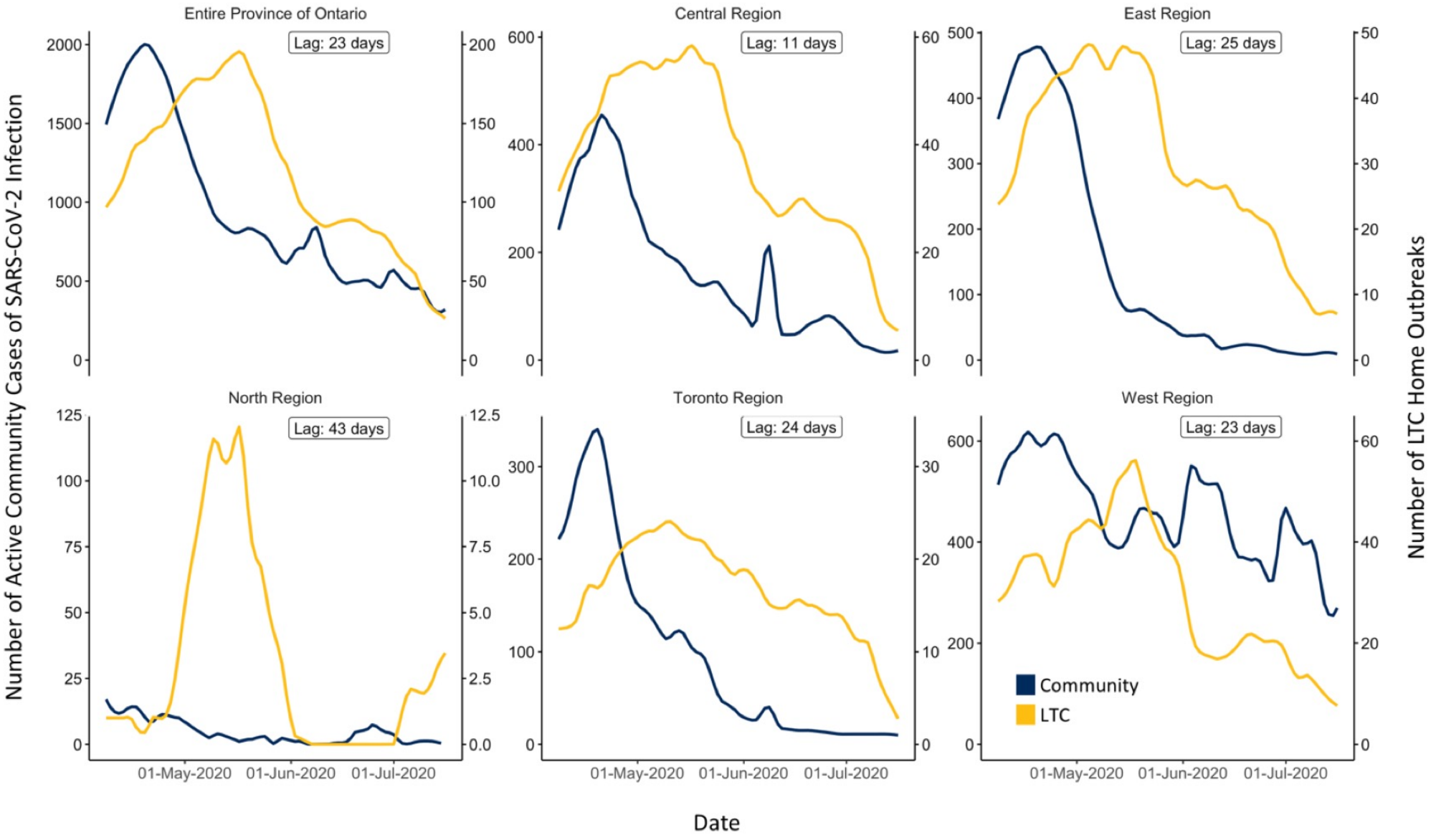
COMMUNITY INCIDENCE AND LTC OUTBREAKS



J Am Med Dir Assoc. 2021 Feb;22(2):260-262.

RISK FACTORS FOR LTC RESIDENT COVID-19 MORTALITY

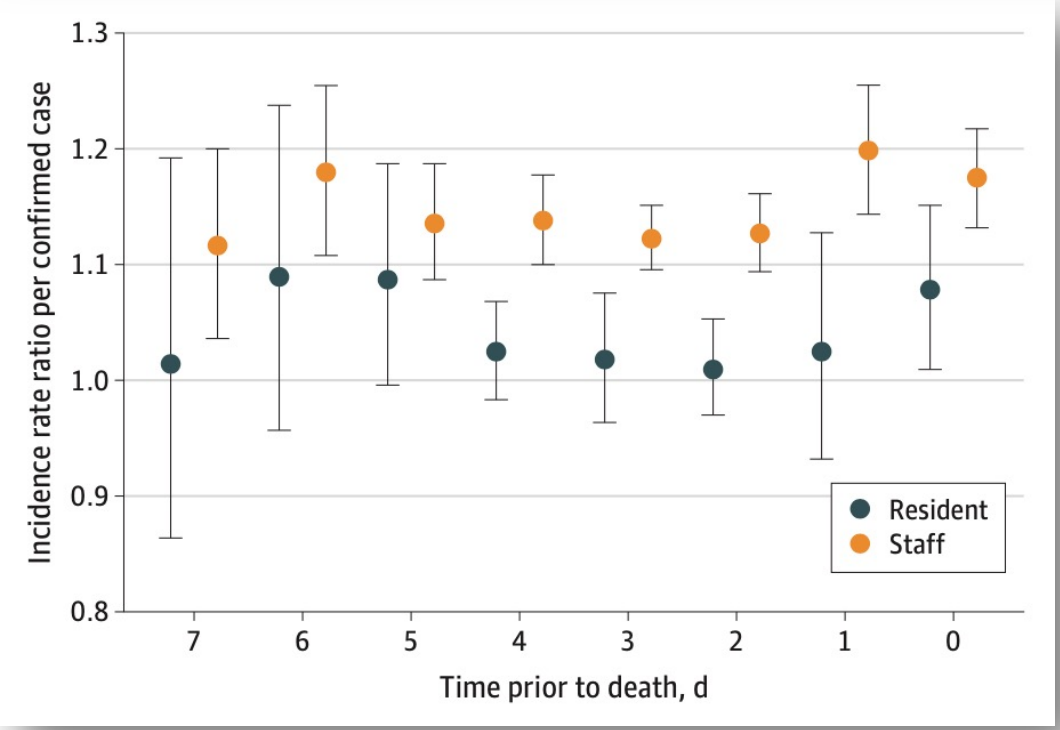
- Deaths:
  - 269 community-living adults >69 years (until Apr 11)
  - 83 LTC residents (until Apr 10)

- Incidence rate ratio for COVID-19–related death in LTC residents was **13.1** compared with community-living adults >69 years

- Infection among LTC staff associated with death among residents with a 6-day lag

Table 2. IRR for Coronavirus Disease 2019 Mortality in Long-term Care Residence[a]

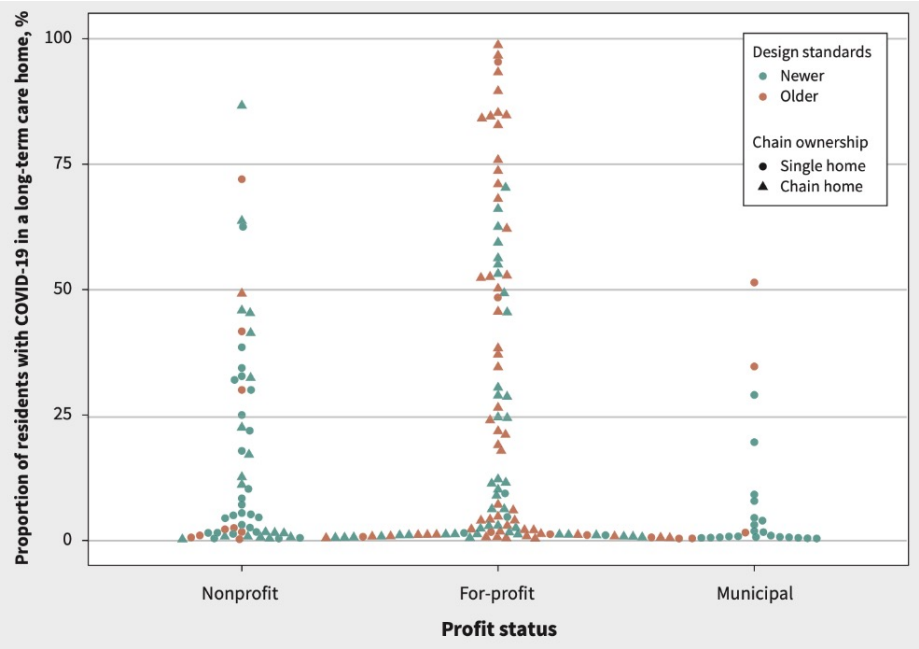
Comparator population	Total deaths	Comparator population size	IRR (95% CI)
All ages	269	14 566 547	90.4 (68.9-117.6)
≥60 y	252	3 447 723	23.1 (17.6-30.2)
≥70 y	229	1 731 315	13.1 (9.9-17.3)
≥80 y	169	642 571	7.6 (5.5-10.4)

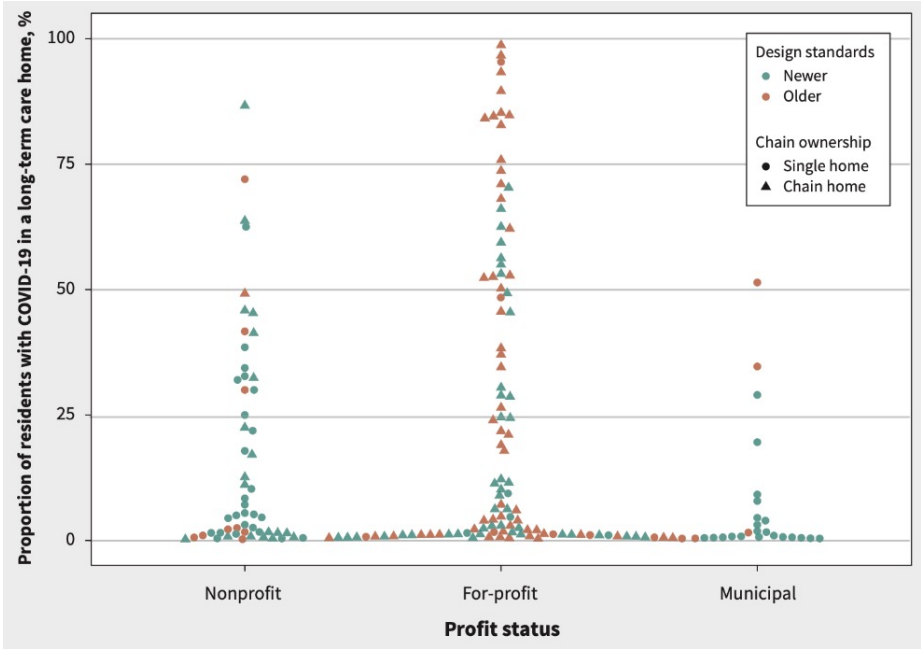


JAMA Netw Open. 2020 Jul; 3(7): e2015957.

FOR-PROFIT LTC HOMES AND COVID-19 OUTBREAKS

- Retrospective cohort study of all LTC homes from March 29-May 20, 2020
- The odds of a COVID-19 outbreak were associated with the community incidence of COVID-19 surrounding LTC homes but not profit status
- For-profit status was associated with the extent of an LTC outbreak (aRR 1.96) and the number of resident deaths (aRR 1.78); this was largely explained by older design standards and chain ownership (more common in for-profit homes)

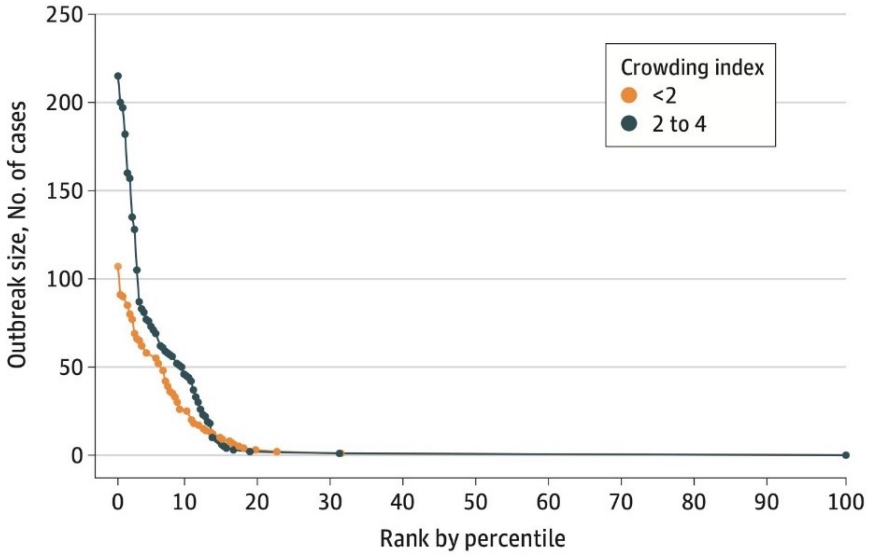


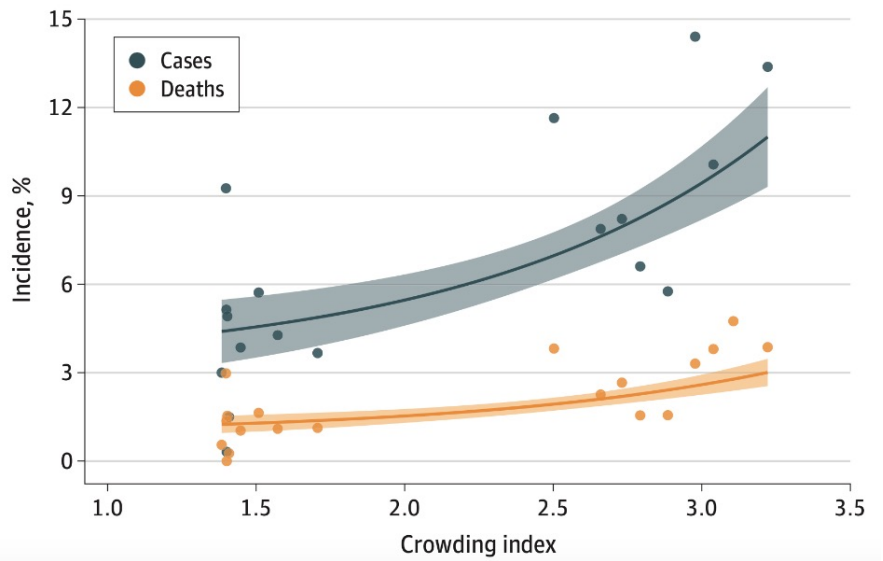


CMAJ August 17, 2020 192 (33) E946-E955

LTC HOME CROWDING AND COVID-19 INFECTION

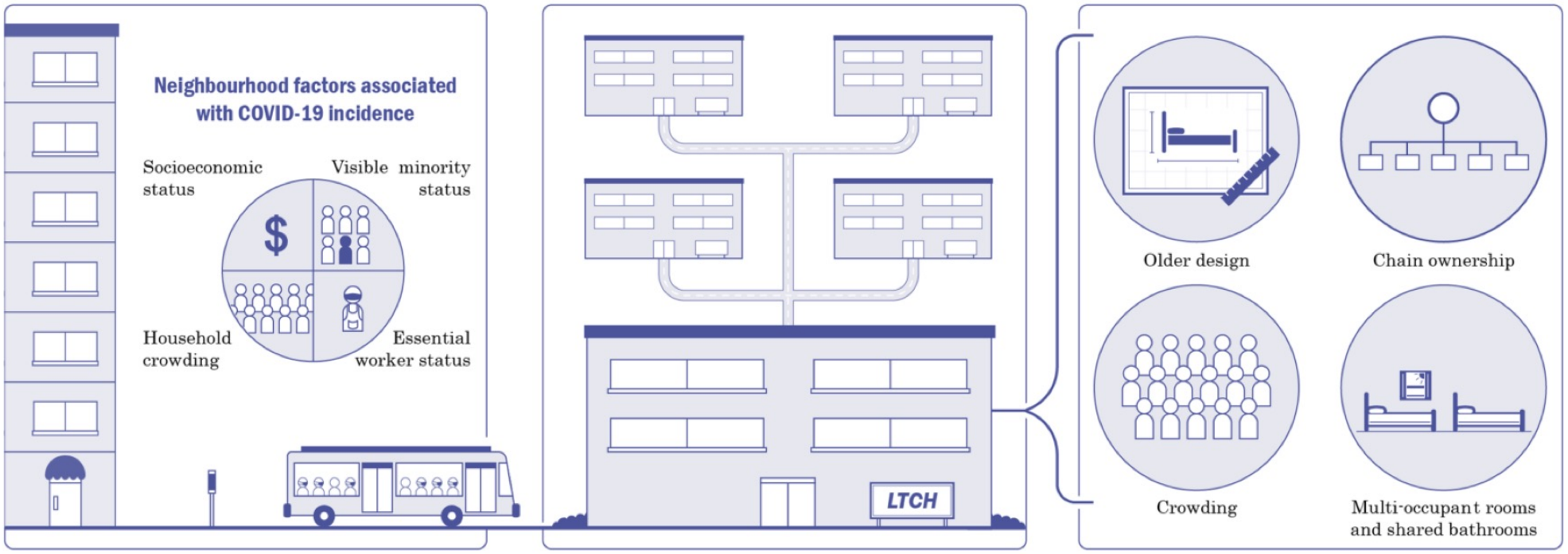
- As of March 29th, there were 78,607 resident beds in LTC homes, with 36.9%, 37.3%, and 25.8% in single, double, and quadruple-bedded rooms
- Crowding index (mean residents per room and bathroom) associated with an increased incidence of infection (RR = 1.73) and mortality (RR = 1.69)
- Simulations suggested that converting all 4-bed rooms to 2-bed rooms would have averted 998 COVID-19 cases (19.1%) and 263 deaths (18.1%)
  - Converting all 4-bedded rooms to 2-bedded rooms would require 5,070 new 2-bed rooms





JAMA Intern Med. 2020 Nov 9:e206466.

ANATOMY OF LTC OUTBREAKS AND SPREAD



Many LTC staff live in COVID-19 hotspots

Outbreaks begin in LTC homes when COVID-19 is imported from the community

1. Undetected asymptomatic and pre-symptomatic staff
2. Absence of universal paid sick-leave
3. Employment of part-time staff who work multiple jobs
4. Temporary staff work in multiple healthcare settings

Outbreaks spread in LTC homes

1. Staffing shortages
2. Availability of personal protective equipment
3. Insufficient infection prevention and control

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Science Briefs of the Ontario COVID-19 Science Advisory Table; 2021.

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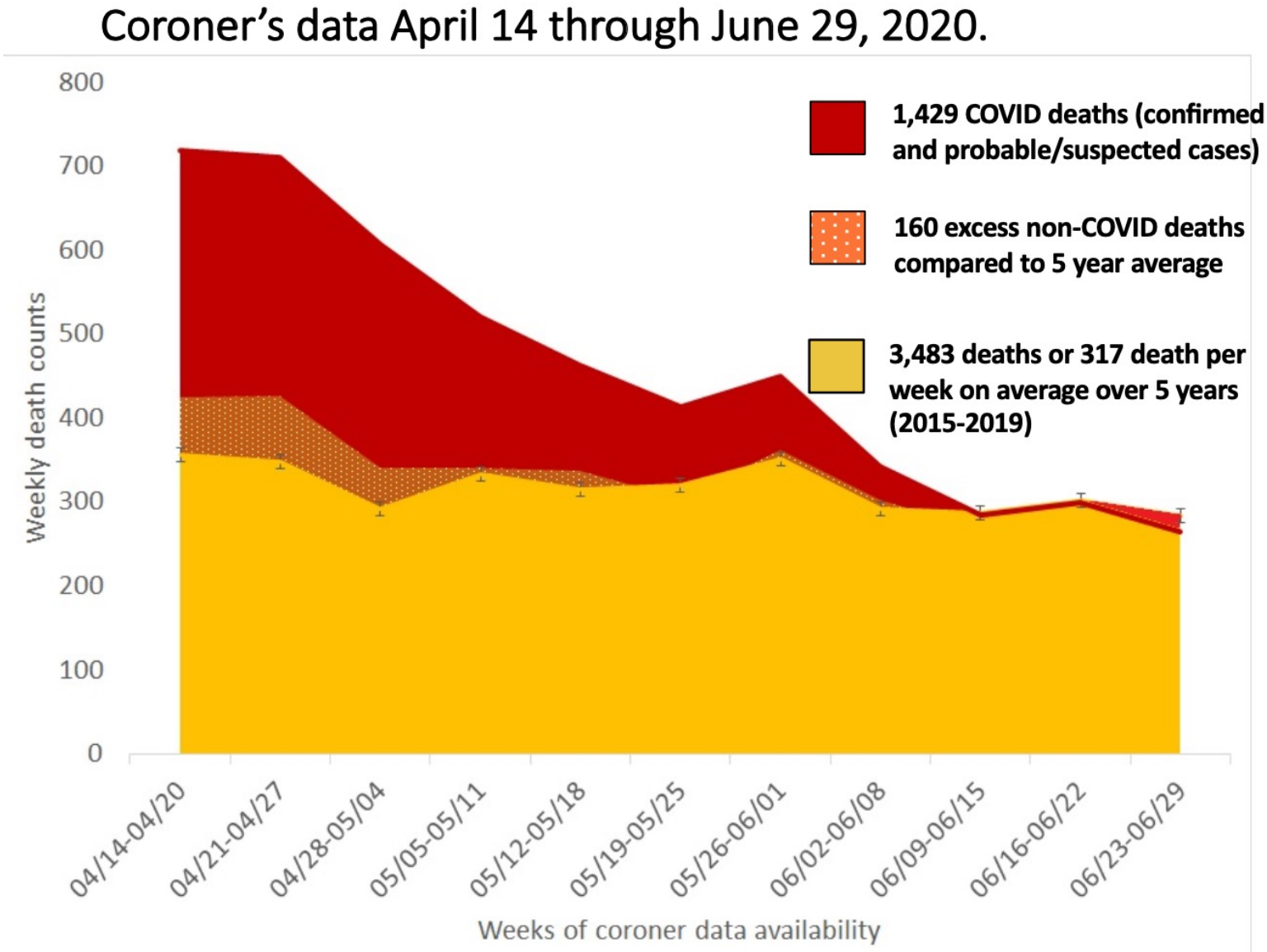
EXCESS MORTALITY IN ONTARIO LTC HOMES



Ontario Ministries of Health and Long-Term Care

THE "CONFINEMENT SYNDROME"

JAMDA

journal homepage: www.jamda.com

Letter to the Editor

Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2)-Related Deaths in French Long-Term Care Facilities: The "Confinement Disease" Is Probably More Deleterious Than the Coronavirus Disease-2019 (COVID-19) Itself

To the Editor:

To date, coronavirus severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has infected 2.2 million people and has killed more than 150,000.[1] The population groups most susceptible to severe and fatal coronavirus disease-2019 (COVID-19) are older adults and those with chronic underlying chronic medical disorders. The residents of long-term care facilities (LTCFs) typically combine those 2 features and are, thus, particularly at risk. In France, 9.4% of the population is over age 75 years and nearly 600,000 people currently reside in LTCFs for older dependent individuals. To date, more than 60% of the French LTCFs have reported at least 1 case of COVID-19 among their residents.

Estimated overall mortality among patients with COVID-19 is 10% in France but reaches up to 30% in LTCFs. There are, however, substantial differences in mortality rates between the different LTCFs. [2] What explains these differences?

We intervened in 1 LTCF located in the Southern Île-de-France region that had registered more than 24 deaths related to COVID-19 among the 140 residents in 5 days. No acute respiratory distress syndrome was observed, and mortality was mainly due to hypovolemic shock. Most of the victims had been left alone in their rooms for confinement settings for many days without help because of the lack of protective masks and the work overload for caregivers affected by a 40% staff absenteeism rate. The dependent infected residents were confined and no longer received the usual assistance for drinking and eating. In addition, general practitioners stopped their physical examination visits, limiting their interventions to telemedicine, which proved unsuitable whenever feasible at all.

With appropriate resources lacking, the "disease linked to confinement" thus proved more fatal than COVID-19 itself. We did not observe this phenomenon in other LCTFs where healthcare staff and physicians were physically present in full force.

A task force team intervened as soon as the fifth death was reported. Adapted infusion to restore hydroelectrolytic balance as well as oxygen therapy per World Health Organization guidelines led to a rapid improvement of this high mortality trend.[3,4]

Disproportionate mortality because of COVID-19 in LTCFs is not a fatality. Continuous provision of pragmatic medicine and wellness care will limit the devastating impact of this infection in dependent older people.

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Sylvain Diamantis, MD, Coralie Noel, MD, Paul Tarteret, MD, Nicolas Vignier, MD, PhD
Hôpital Marc Jacquet, Melun, France

Sébastien Gallien, MD, PhD
Hôpital Henri-Mondor, Université Paris Est Créteil, Créteil, France

for the Groupe de Recherche et d'Etude des Maladies Infectieuses - Paris Sud-Est (GREMLIN Paris Sud-Est)

J Am Med Dir Assoc. 2020 May 3;S1525-8610(20)30354-6.

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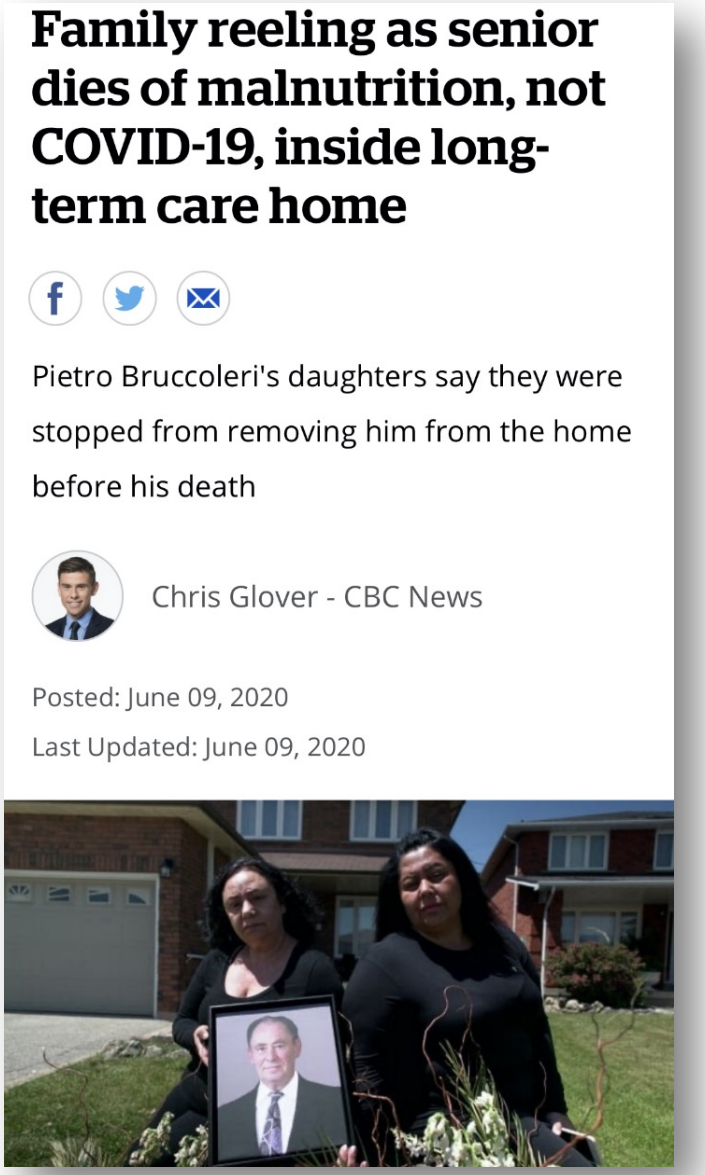
SCIENCE TABLE COVID-19 ADVISORY FOR ONTARIO

Sinai Health System

THE "CONFINEMENT SYNDROME"

- **Collateral damages:**
  - Dehydration and malnutrition
  - Physical and functional decline
  - Exacerbation of chronic medical conditions and mental health disorders
  - Cognitive decline and delirium
  - Worsening of responsive behaviors
  - Loneliness and social isolation
  - Psychological distress, depression and anxiety
  - Increased prescribing of psychotropics



Family reeling as senior dies of malnutrition, not COVID-19, inside long-term care home

Pietro Bruccoleri's daughters say they were stopped from removing him from the home before his death

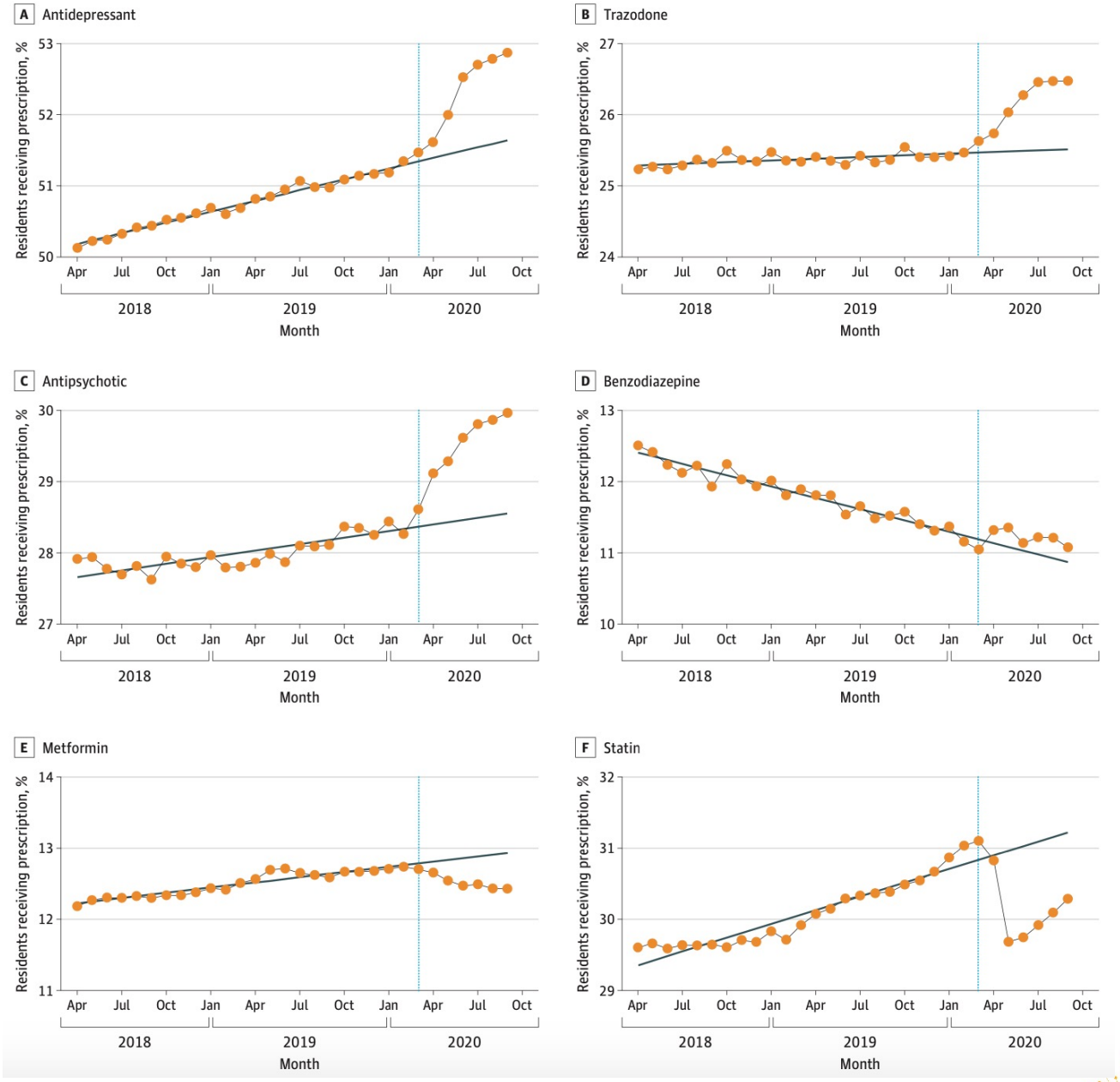
Chris Glover - CBC News

Posted: June 09, 2020

Last Updated: June 09, 2020

J Am Med Dir Assoc. 2020 May 3;S1525-8610(20)30354-6.

PSYCHOTROPIC PRESCRIBING TO LTC RESIDENTS



JAMA Intern Med. 2021 Mar 15:e210224.

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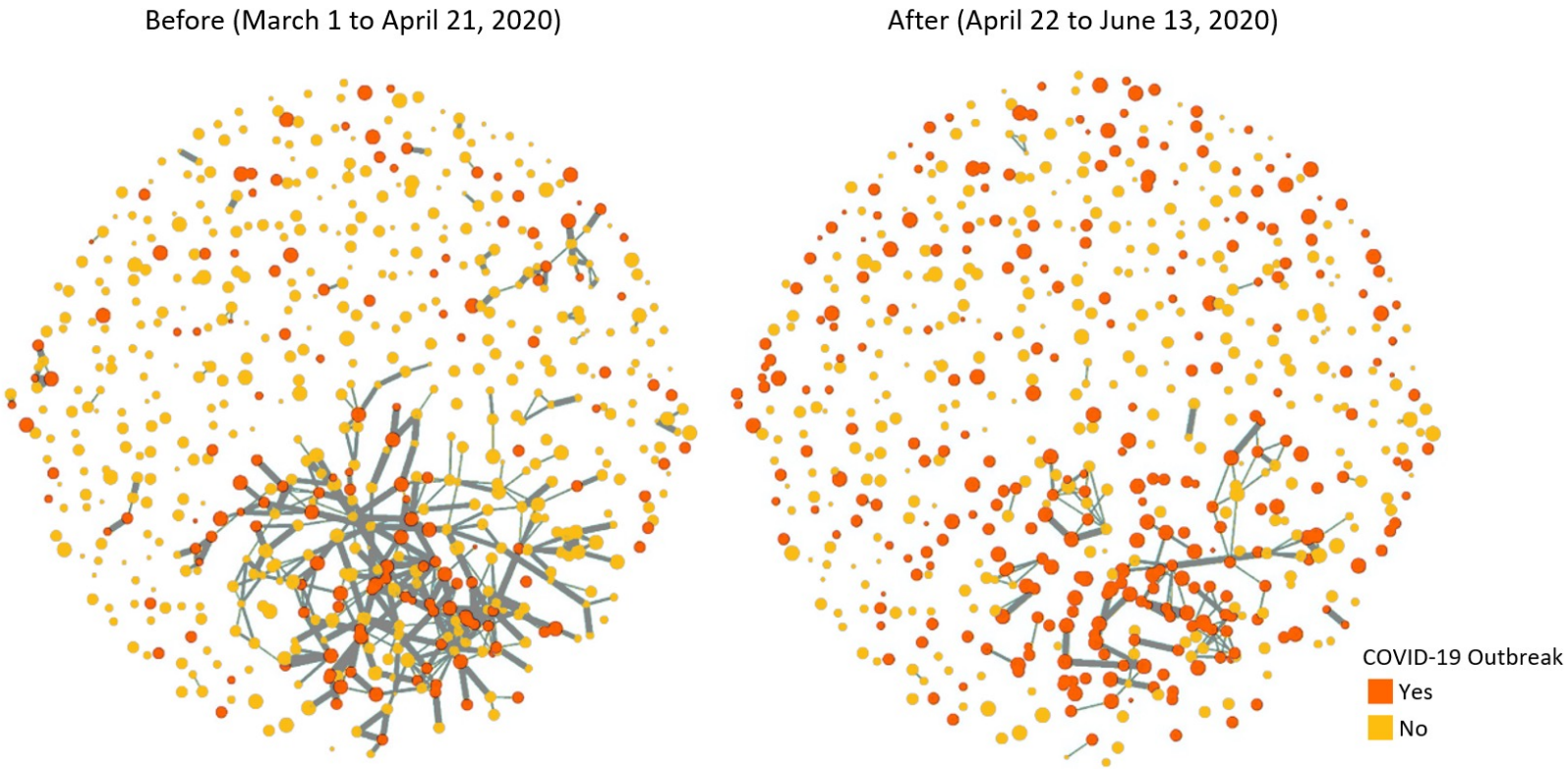
LIMITING WORKERS TO ONE LTC HOME

- Mobility data to analyze connections between homes during the 7 weeks before and after a single-site work order on April 21, 2020
- Number of connected homes dropped from 266 (43%) to 79 (13%) during the period after restrictions, a drop of 70% ($p<0.001$)



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J Am Med Dir Assoc. 2021 Mar;22(3):494-497.

SCIENCE TABLE
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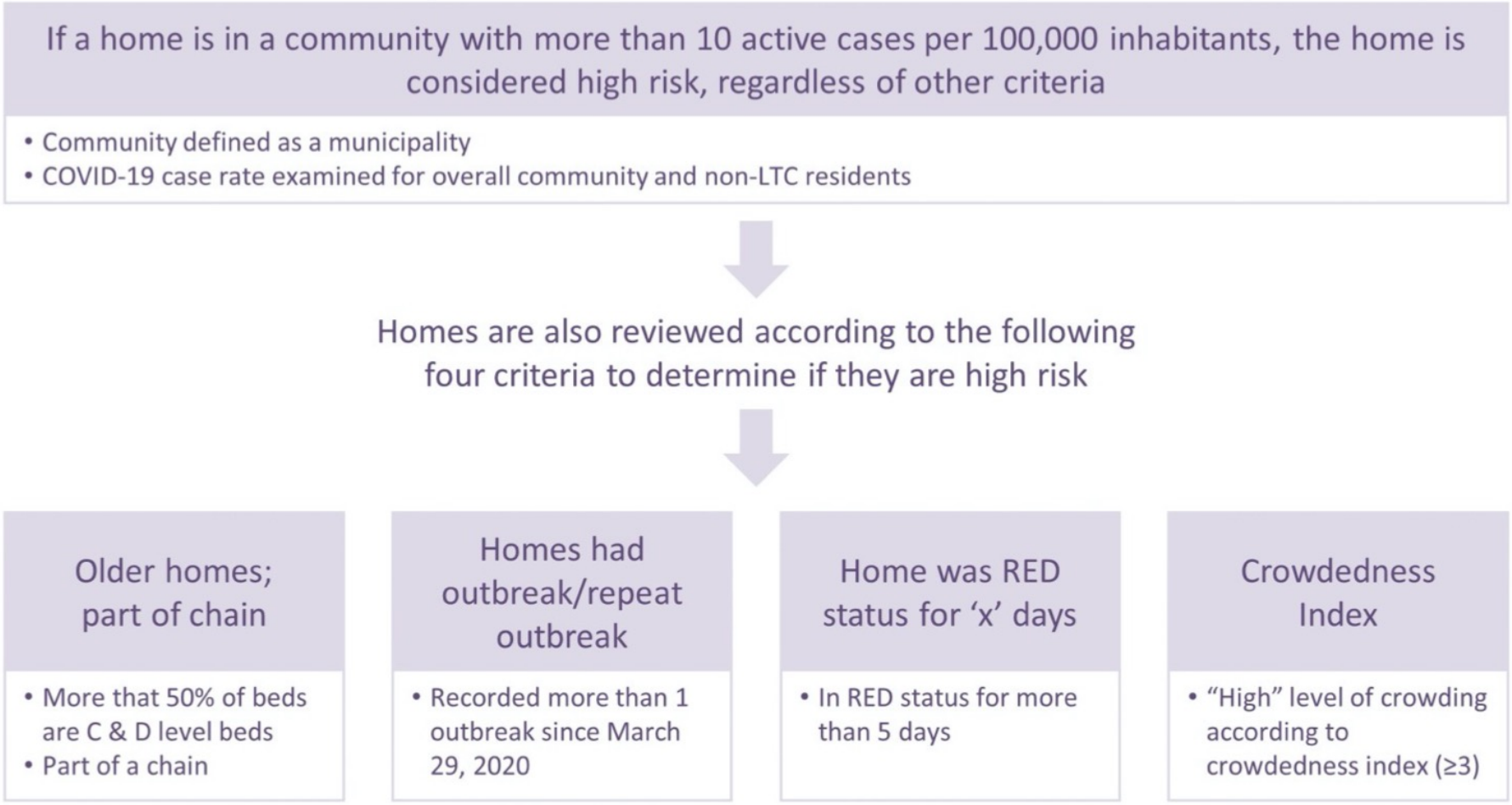
EVIDENCE-INFORMED SURVEILLANCE TOOLS

- Surveillance tools incorporate community incidence of COVID-19, older design standards, chain ownership and the crowding index



Science Briefs of the Ontario COVID-19 Science Advisory Table; 2021.

LIMITING CROWDING IN LTC HOMES

- Directive #3 was revised in June 2020 to limit admissions and further revised in October 2020 to limit occupancy to no more than two long-term care residents per room
- Occupancy dropped from ~78,000 to ~70,000

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SCIENCE TABLE
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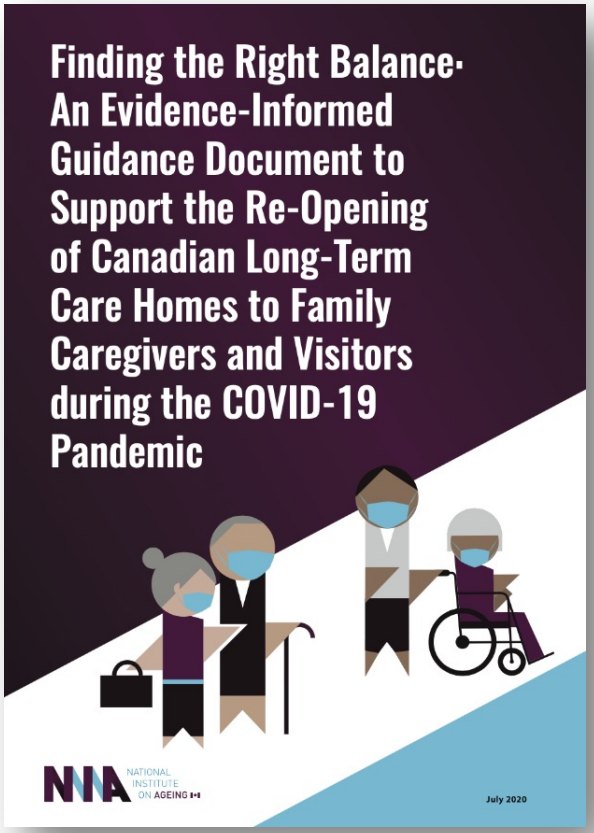
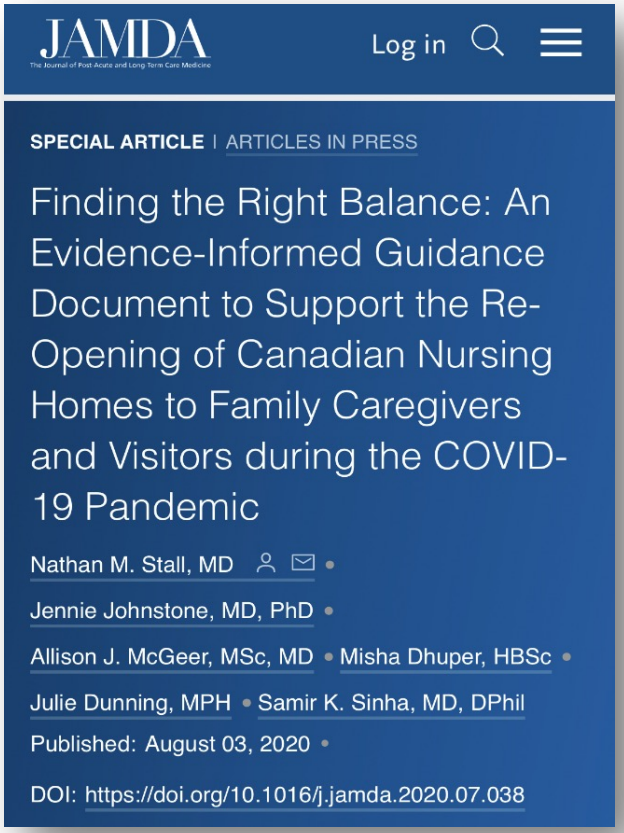
ESSENTIAL CAREGIVER POLICY

- LTC visitor policy revised allowing each resident to designate 1-2 essential family caregivers who can visit without time limits, including when a home is in outbreak





National Institute on Ageing, 2020
J Am Med Dir Assoc. 2020 Oct;21(10):1365-1370.e7.

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MEASURES THAT COULD BE EFFECTIVE

1. Promote staff entry and retention in the sector by improving the conditions of work

2. Prevent LTC worker infection with community tailored approaches

3. Continue limits on occupancy/crowding in LTC homes

4. Detect LTC worker infection and prevent importation into LTC homes by prioritizing workers for testing and turnaround time, and by guaranteeing workers paid sick leave

MEASURES THAT COULD BE EFFECTIVE

5. Continue enhancing IPAC by securing one specialist per 200 beds in LTC homes

6. Support LTC staff COVID-19 vaccination

7. Pursue a more balanced and nuanced approach to public health measures and infection prevention in LTC homes, especially following COVID-19 vaccination

8. Continue optimizing data on LTC homes for the duration of the COVID-19 pandemic

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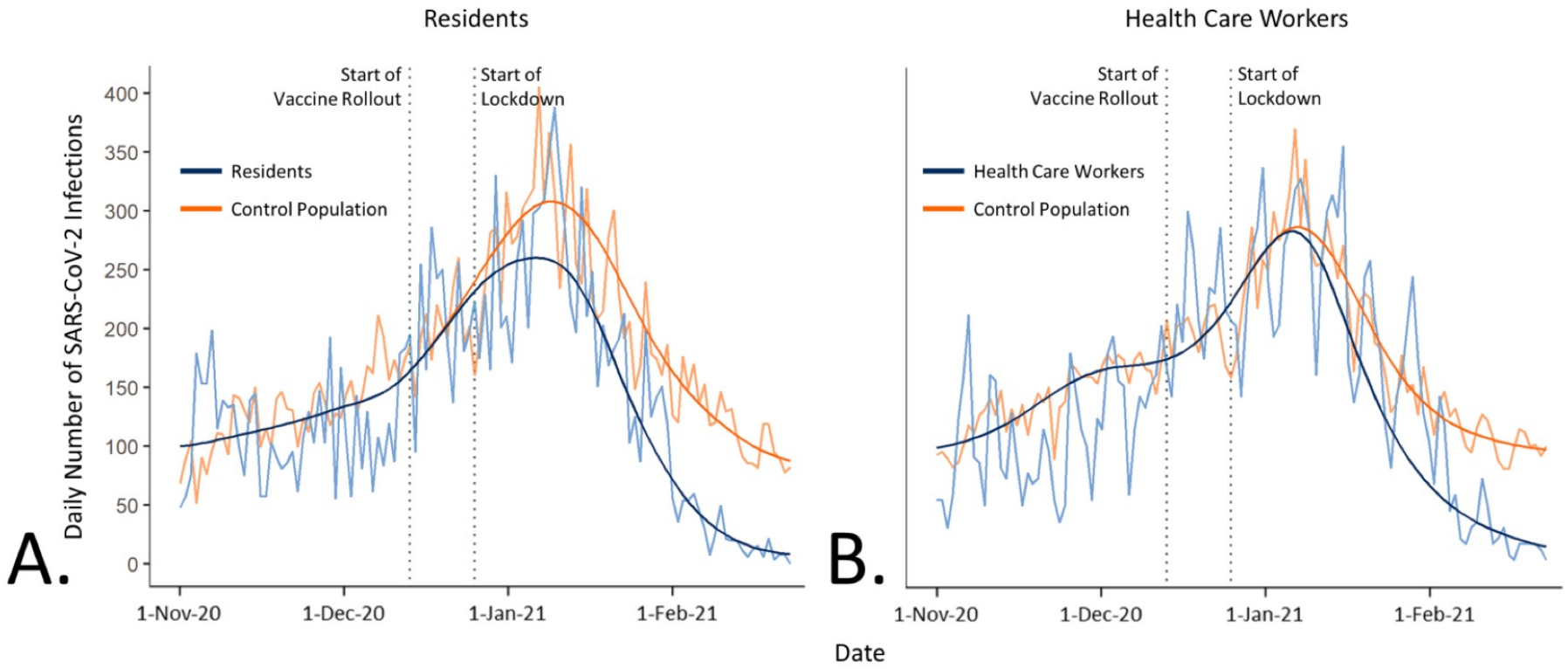
6. **What was the early impact of the COVID-19 vaccine rollout on Ontario's LTC homes?**

EARLY IMPACT OF COVID-19 VACCINATION

- As of February 23, 2021, >64,000 Ontario LTC residents (92%) received at least one dose of a COVID-19 vaccine, with >46,500 of residents having received both doses.
- Over 55,000 Ontario LTC staff (55%) also received at least one dose of a COVID-19 vaccine, with >44,600 having received both doses.



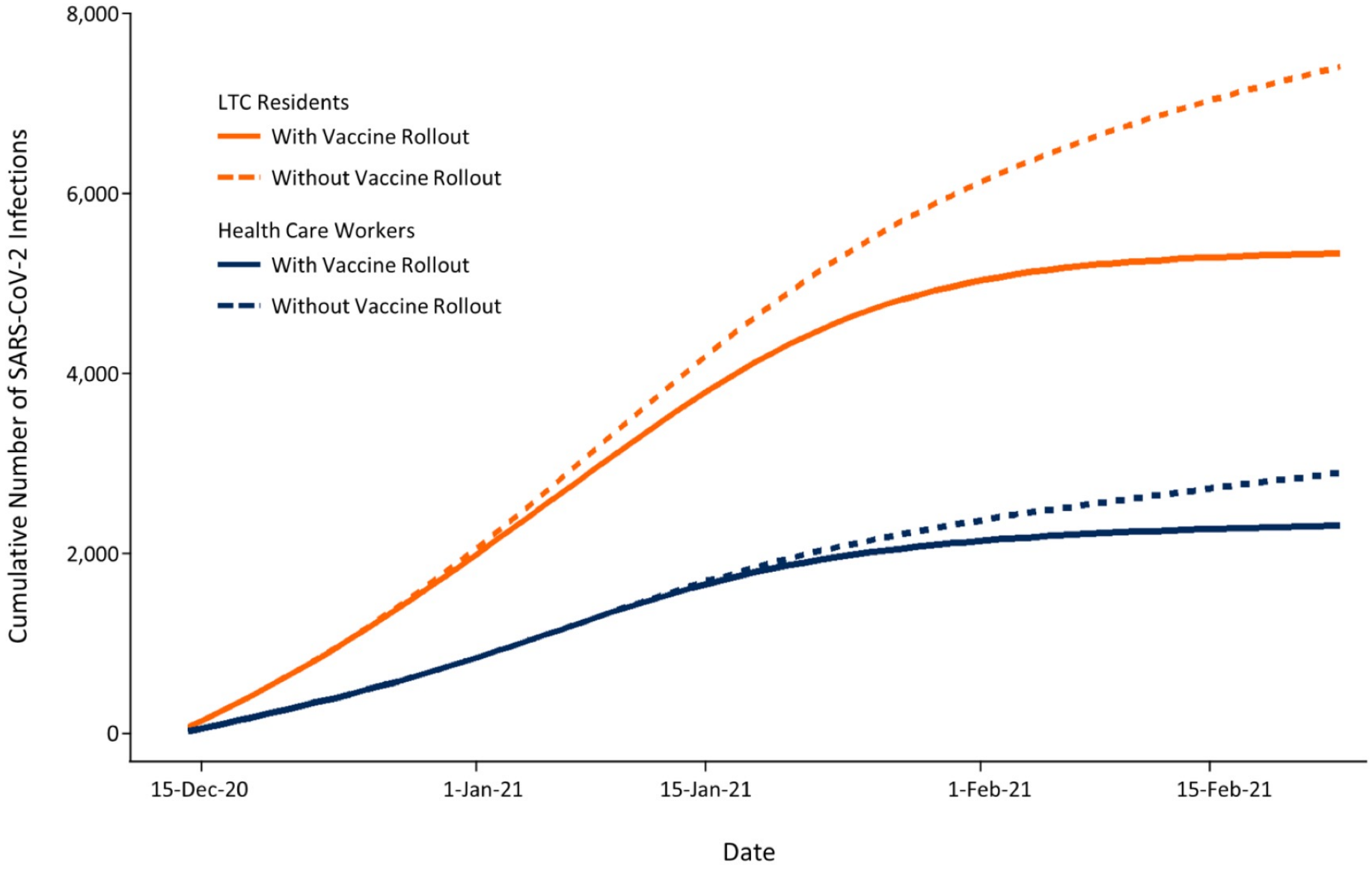
Science Briefs of the Ontario COVID-19 Science Advisory Table; 2021.

EARLY IMPACT OF COVID-19 VACCINATION

	Residents	Health Care Workers	Total
Observed with Vaccine Rollout			
SARS-CoV-2 Infections	5,350	2,320	7,670
COVID-19 Hospitalizations	642	30	672
COVID-19 Deaths	1,091	2	1,093
Expected without Vaccine Rollout			
SARS-CoV-2 Infections	7,429	2,910	10,339
COVID-19 Hospitalizations	891	38	929
COVID-19 Deaths	1,706	3	1,709
Prevented by Vaccine Rollout			
SARS-CoV-2 Infections	2,079	590	2,669
COVID-19 Hospitalizations	249	8	257
COVID-19 Deaths	615	1	616

- The estimated number of infections in the statistical unvaccinated control populations were modelled based on fitted slopes of the epidemic curves of SARS-CoV-2 infections
  - For LTC residents: community-dwelling individuals aged ≥70 years
  - For LTC health care workers: working age population aged 18-64 years

EARLY IMPACT OF COVID-19 VACCINATION



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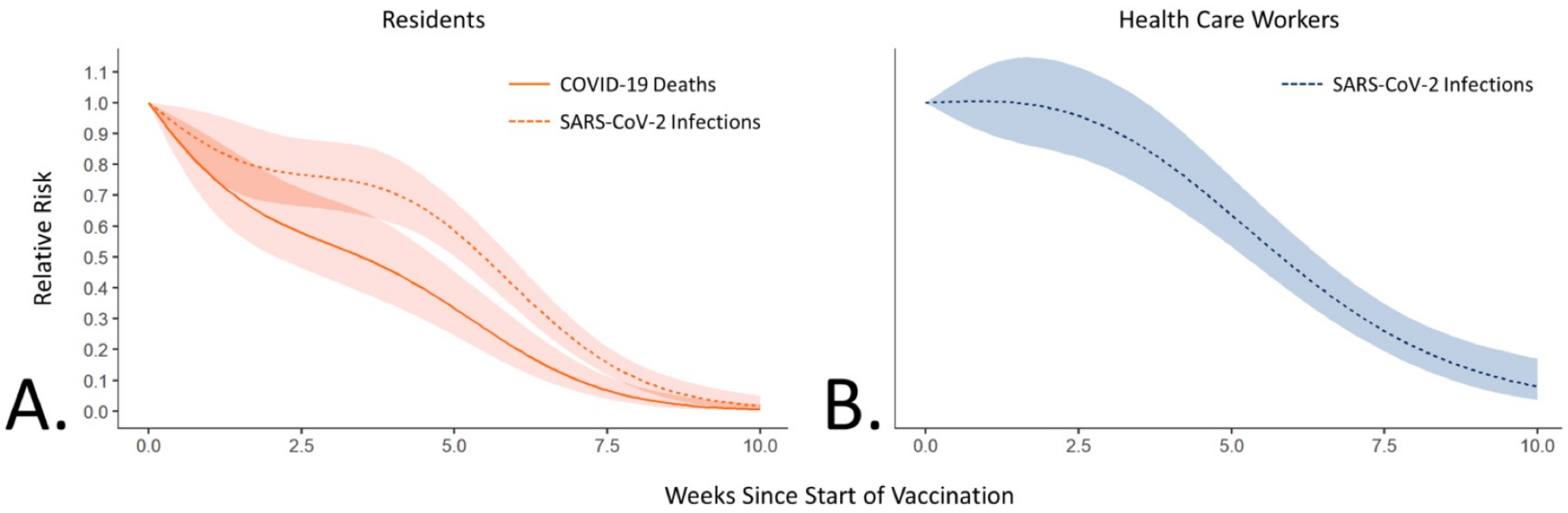
EARLY IMPACT OF COVID-19 VACCINATION



- Estimated relative reduction in the risk of SARS-CoV-2 infection was 89% among LTC residents and 79% in healthcare workers
- The estimated relative risk reduction of COVID-19 deaths was 96% among LTC residents

EARLY IMPACT OF COVID-19 VACCINATION

- As of May 21, 2021, an estimated 96% of LTC residents are fully immunized, and 99% of essential caregivers and 87% of staff have received at least their first dose

After over a year spent separated from loved ones and confined in their rooms, long-term-care residents are finally free to reunite with family outdoors.

'I am ecstatic': Relaxing of rules means long-term-care residents can now enj...

A change to visitation guidelines allows residents to meet with two general visitors and two essential caregivers outdoors.

thestar.com

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SCIENCE TABLE
COVID-19 ADVISORY FOR ONTARIO

Sinai Health System

OUTLINE

1. What do we know about the first, second and third waves of COVID-19 in Ontario LTC homes?

2. Which risk factors are associated with COVID-19 outbreaks in Ontario LTC homes and the extent and death rates associated with outbreaks?

3. What has been the impact of the COVID-19 pandemic on the general health and wellbeing of LTC residents?

4. How has the existing Ontario evidence on COVID-19 in LTC settings been used to support public health interventions and policy changes in these settings?

5. What are the measures that could be effective in supporting Ontario's LTC comes for the remainder of the COVID-19 pandemic and beyond?

6. What was the early impact of the COVID-19 vaccine rollout on Ontario's LTC homes?

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- Kevin Brown MSc, PhD
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- Shengli Shi, MD, MSc, PhD
- Ashleigh R. Tuite, PhD, MPH
- Jonathan Zipursky, MD
- Jagadish Rangrej, M.Sc. MMath
- Sping Wang, PhD
- Adi Kabler, B. Eng
- Paula Rochon MD, MPH
- Michael Hillmer MSc, PhD
- David Fisman, MD, MPH
- Isaac Bogoch, MD, MS
- Lauren Lapointe-Shaw, MD, PhD
- Janine McCready, MD
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- Adrienne Chan, MD, MPH
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- Gary Garber, MD
- Peter Jüni, MD, FESC
- Antonina Maltsev, BCom
- Jennie Johnstone MD, PhD

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SCIENCE TABLE
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Sinai Health System

COVID-19 and Ontario's Long-Term Care Homes

Nathan Stall MD, FRCPC

Geriatrician, Mount Sinai Hospital
PhD Candidate, Departments of Medicine and Health Policy & Evaluation
Assistant Scientific Director, Ontario's COVID-19 Science Advisory Table

2021 Ben and Hilda Katz Lecture in Geriatrics
SINAI HEALTH/UHN MEDICAL GRAND ROUNDS
May 26, 2021

@NathanStall