

Managing long-term care home (LTCH) COVID-19 VOC outbreaks in the post-vaccine era

June 29, 2021

12:00 – 1:00 pm

Outline

Welcome and introductions

Presentation topics:

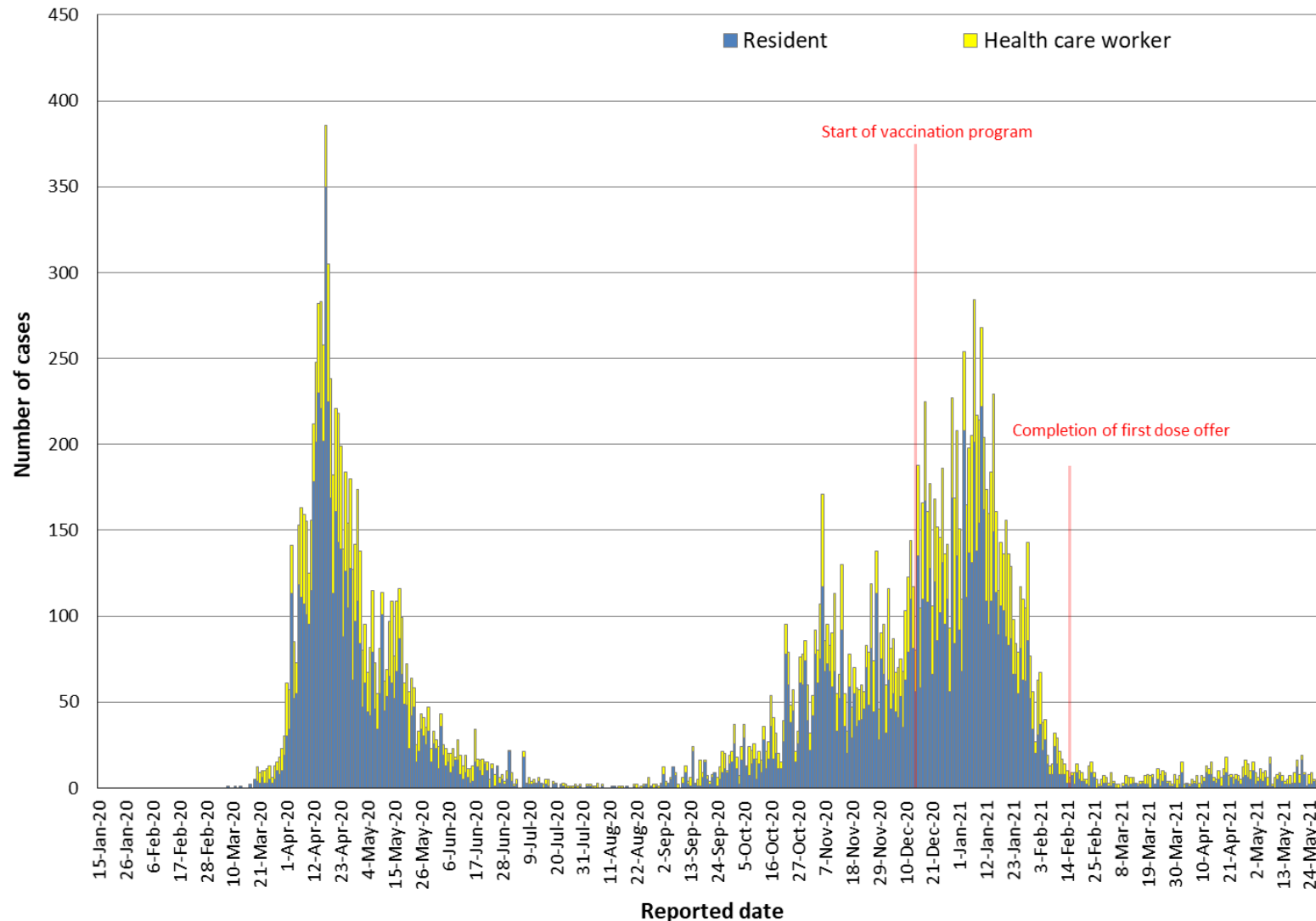
- LTCH context in Ontario (Camille Achonu, PHO)
- Toronto Public Health outbreak (Elizabeth Rea, TPH)
- Ottawa Public Health outbreak (Ellen Snyder, OPH)
- IPAC issues (Ellen Snyder, OPH)
- Lessons learned (Elizabeth Rea, TPH)

Q&As

Objectives

- Describe experiences/challenges/opportunities in managing VOC outbreaks in LTCHs
- Describe emerging best practices in prevention measures to better prevent and/or manage outbreaks in LTCHs
- Understand the importance of both IPAC measures and vaccination uptake in managing outbreaks

Figure 1: Overall number of COVID-19 LTCH health care workers and resident cases by reported date: Ontario, January 15, 2020 to May 31, 2021



Source: Ontario. Ministry of Health. Case and Contact Management Solution (CCM) [database]. Toronto, ON: Queen's Printer for Ontario; 2021 [extracted 2021 Jun 22].

Table 1: Number of COVID-19 LTCH health care worker and resident cases by vaccine category: Ontario, December 14, 2020 to May 31, 2021

Vaccine Category	Number of health care workers cases	Percent of health care workers cases	Number of resident cases	Percent of resident cases	Total LTCH cases	Percent of LTCH cases
Breakthrough	27	1.3%	68	1.8%	95	1.6%
Partially vaccinated	81	3.8%	157	4.2%	238	4.1%
Vaccinated but not protected	241	11.2%	400	10.8%	641	10.9%
Not vaccinated Data Source: CCM	1806	83.8%	3094	83.2%	4900	83.4%
Total	2155	100.0%	3719	100.0%	5874	100.0%

Sources: Ontario. Ministry of Health. Case and Contact Management Solution (CCM) [database]. Toronto, ON: Queen's Printer for Ontario; 2021 [extracted 2021 Jun 22].

Ontario. Ministry of Health. COVax_{ON} [database]. Toronto, ON: Queen's Printer for Ontario; 2021 [extracted 2021 Jun 22].

Notes: The following COVID-19 cases were excluded as the timing of infection (i.e. date of symptom onset) relative to vaccination (i.e. date of dose administration) could not be determined:

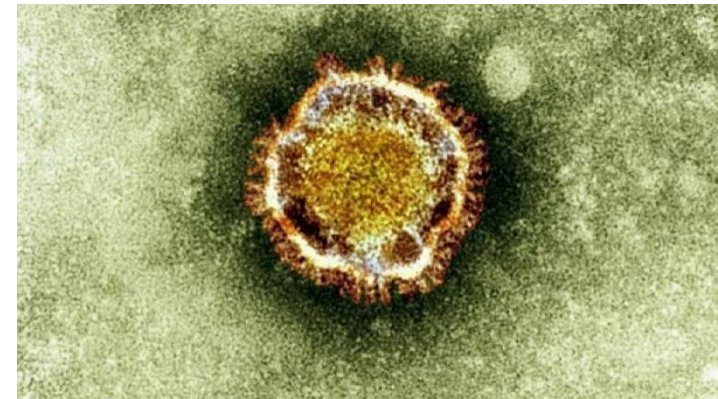
- Cases reported as asymptomatic and where no symptom information was reported. Asymptomatic cases were identified as those where no symptom information was reported or where symptom onset date was not available.
- Cases reported as re-positive or remote positive.

**DON'T
PANIC**



LTCH COVID-19 VOC outbreaks + vaccine

Dr Elizabeth Rea
AMOH, Toronto Public Health



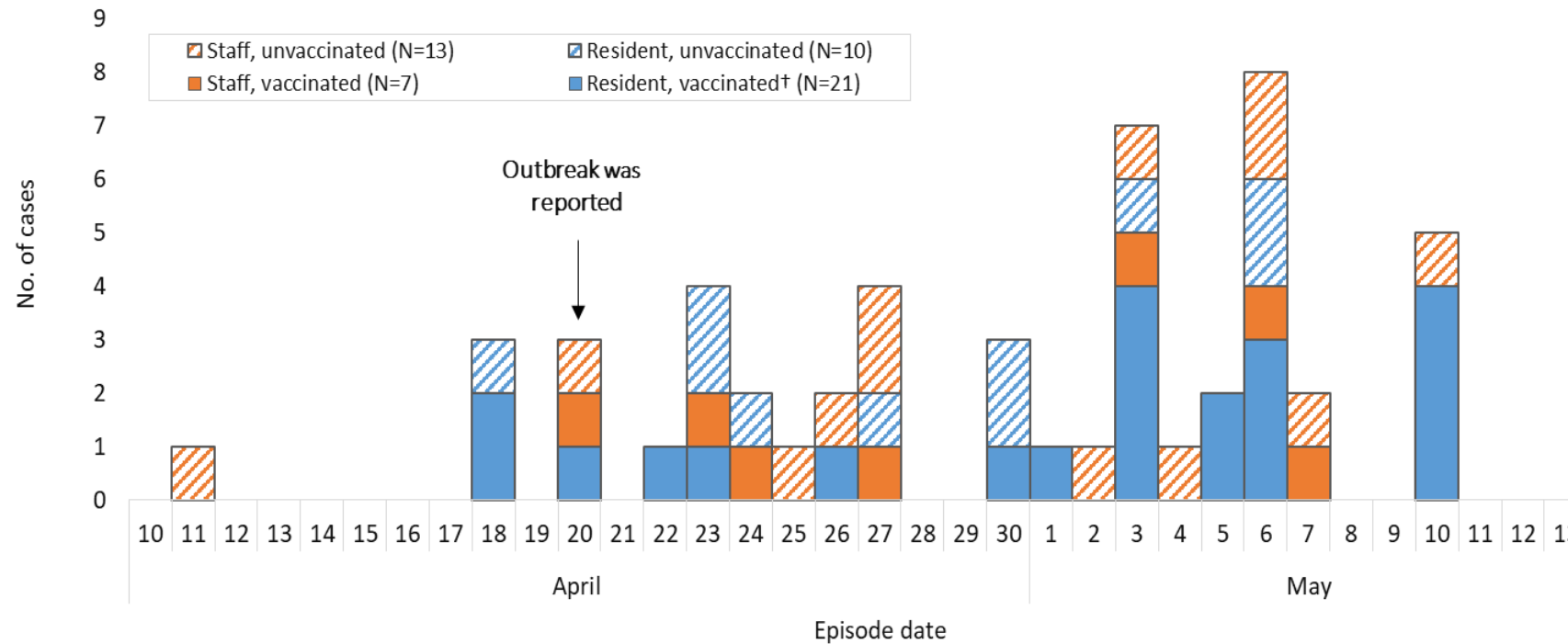
- Gamma, delta, beta, alpha LTCH outbreaks – experience in Toronto and Ottawa
- IPAC and outbreak control issues
- Key epi points, key policy points
- Questions and discussion

For Dr Rea and Dr Snyder's presentations:

- *No conflicts of interest*
- *This document was created by its author and/or external organization. PHO is not the owner of this content. Any application or use of the information in this document is the responsibility of the user. PHO assumes no liability resulting from any such application or use.*

COVID-19 gamma VOC (aka P.1. aka Brazil) Outbreak

Figure 1: Epidemic curve



*Episode date is the symptom onset date or specimen collection date if case was asymptomatic.

†Includes fully (N=20) and partially (N=1) vaccinated residents.

Medium-size LTCH – part of small private chain - several small outbreaks prior in pandemic
N=126 residents
2-dose immunization coverage 89% residents, 80% staff

Outbreak was not facility-wide

- 2/4 “outbreak” floors
- A 3rd floor had 2 early cases only – @ staff cross-covering from outbreak floors
- 1 floor no cases

Attack rates by location	Residents	Staff	Total
Attack rate (floors 2, 4)	47%	15%	27%
Attack rate (floors 2, 4, 5)	32%	11%	20%
Attack rate (all floors*)	25%	8%	14%

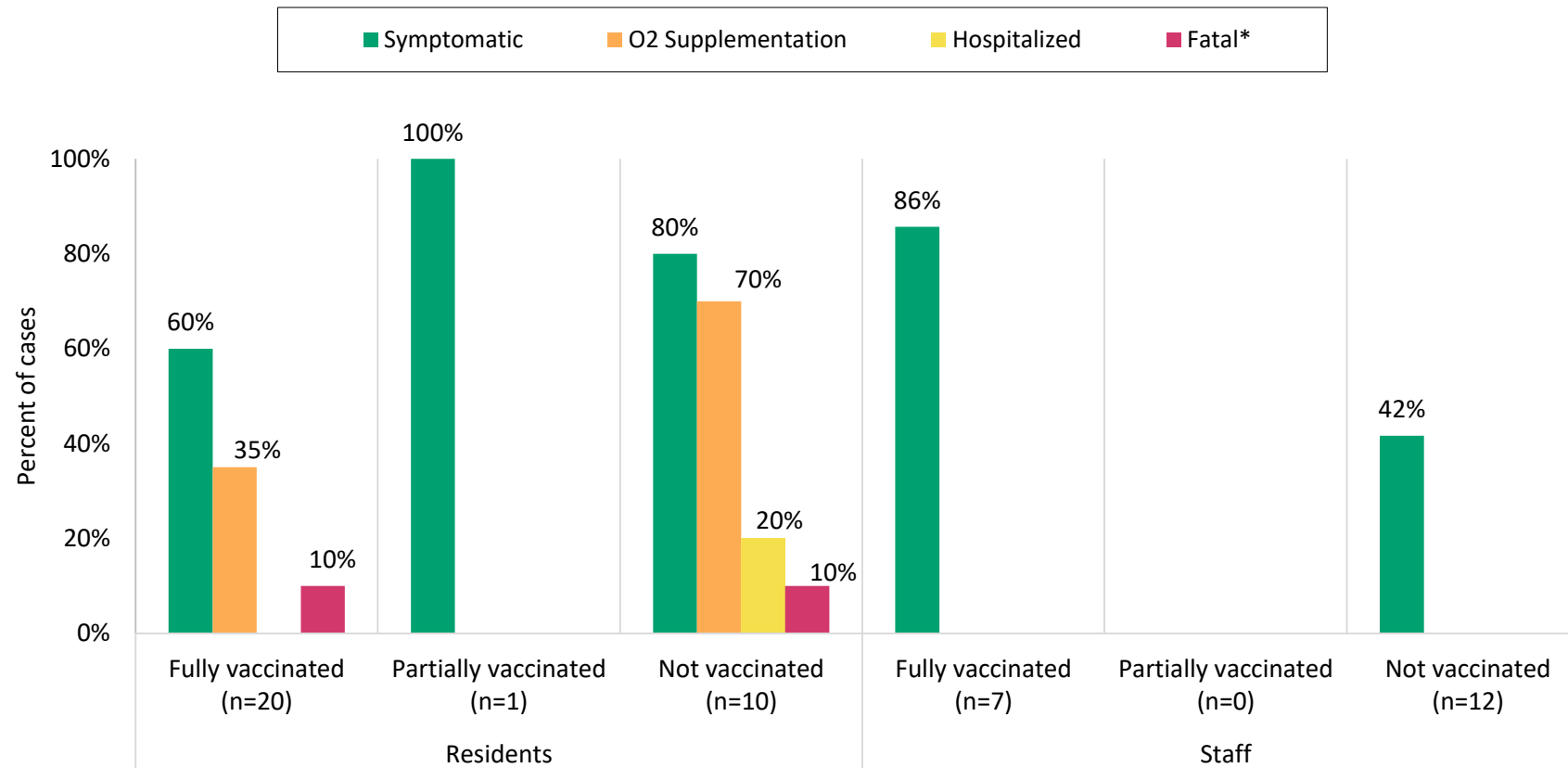
*This includes floors 2 to 5 and basement.

Gamma outbreak: propagation, mitigation

- Delayed identification of index case (staff)...would not have prevented 1st generation of cases
- Well-run baseline IPAC program, no major systematic issues*
- HVAC system in good shape
- Unvaccinated agency staff prolonged the outbreak (lower immunization rate, IPAC training / experience not as strong*)

Immunization reduced severe illness from COVID-P1

Figure 2: Severity of illness of COVID-19 cases by vaccine status and role (resident/staff)



*One of the two fully vaccinated fatal residents was a palliative case.

Vaccine effectiveness vs gamma VOC

Roles (residents/staff) and outcome	Number (attack rate as %) by vaccine status		Total [‡] (vaccinated & unvaccinated)	Vaccine effectiveness [§] (95% CI)
	Fully vaccinated*	Unvaccinated [†]		
Residents	(n = 48)	(n = 12)	60	-
SARS-CoV-2 infection	19 (39.6)	10 (83.3)	29	52.5 (26.9-69.1)
Symptomatic	11 (22.9)	8 (66.7)	19	66.3 (33.8-82.1)
Severe illness[¶]	6 (12.5)	7 (58.3)	13	79.0 (47.9-91.2)
Staff	(n = 43)	(n = 40)	83	-
SARS-CoV-2 infection	4 (9.3)	11 (27.5)	15	66.2 (2.3-88.3)
Symptomatic	4 (9.3)	5 (12.5)	9	25.6 (-157.8-78.5)
Severe illness[¶]	0	0	0	-
Abbreviations: CI = confidence interval.				

*Fully vaccinated if received both doses ≥ 14 days before outbreak reported date on April 20 or first day of work for staff that started after.

[†]Unvaccinated if received no doses or a single dose less than 14 days before outbreak reported date on April 20 or first day of work for staff that started after.

[‡]Total excludes 16 staff and three residents (including one COVID-19 case) that only received a single dose ≥ 14 days before outbreak reported date on April 20 or first day of work for staff that started after.

[§]Calculated as $(1 - \text{relative risk of vaccinated versus unvaccinated}) \times 100\%$.

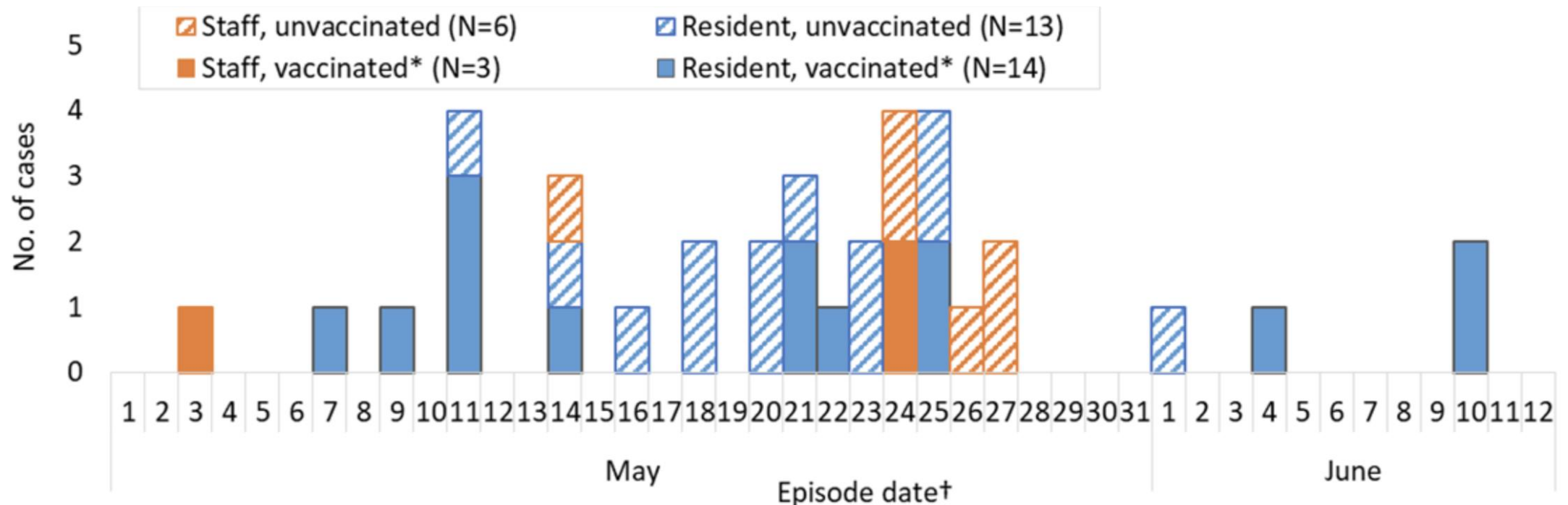
[¶] Severe illness defined as the presence of hypoxemia, hospitalization, or death due to COVID-19.

Gamma outbreak: severe illness / death

- 2 hospitalizations (1 ICU) – both unvaccinated
- 3 cases died (ages 86-95 years):
 - a fully vaccinated case, in palliative care prior to COVID-19 infection
 - a fully vaccinated case, declining prior to outbreak
 - an unvaccinated case: cause of death Anorexia, COVID-19, advanced dementia

And also: delta VOC outbreak in a LTCH

- Almost entirely confined to 2/9 floors
- 27 resident cases, 9 staff cases



Source: Outbreak Line List, as of June 15, 2021.

*All three staff are partially vaccinated (received only one dose ≥ 14 days before May 7). All residents are fully vaccinated (received both doses ≥ 14 days before May 7).

†Episode date is the symptom onset date or specimen collection date if case was asymptomatic.

at onset of outbreak:

- Overall residents 80% 2-dose, 9% 1-dose only
- Overall staff 49% 2-dose, 28% 1-dose only
- Main outbreak floors 2-dose coverage: 30/45 residents, 5/29 staff

- 4 deaths – 3 unvaccinated, 1 vaccinated (COVID impact unclear)
- “much milder than outbreaks in wave 2”

Vaccine Effectiveness vs delta COVID-19

Roles (residents/staff) and outcome	Number (attack rate as %) by vaccine status		Total [‡] (Vaccinated & Unvaccinated)	Vaccine effectiveness [§] (95% CI)
	Fully vaccinated*	Unvaccinated [†]		
Residents	(n = 29)	(n = 14)	43	-
SARS-CoV-2 infection	13 (44.8)	12 (85.7)	25	47.7 (17.4-66.9)
Symptomatic	7 (24.1)	9 (64.3)	16	62.5 (20.2-82.3)
Severe illness [¶]	1 (3.4)	4 (28.6)	5	87.9 (1.8-98.5)
Staff	(n = 9)	(n = 48)	57	-
SARS-CoV-2 infection	0 (-)	5 (10.4)	5	100.0
Symptomatic	0 (-)	3 (6.3)	3	100.0
Severe illness [¶]	0 (-)	0 (-)	0	-

Abbreviations: CI = confidence interval.

*Fully vaccinated if received both doses ≥14 days before outbreak reported date on May 7.

† Unvaccinated if received no doses or a single dose less than 14 days before outbreak reported date on May 7.

‡ Total excludes 20 staff (including two COVID-19 cases) and one resident that only received a single dose ≥14 days before outbreak reported date on May 7 and 9 staff with unknown vaccine status (no cases).

§ Calculated as (1–relative risk of vaccinated versus unvaccinated) x100%.

¶ Severe illness defined as anyone reported with hypoxemia, hospitalization, or death due to COVID-19.

Many thanks to:

@ TPH: outbreak and case investigation teams, Dana Al-Bargash

@ UHN IPAC Hub: Leah Gitterman, Chantal Williams

@ Trillium IPAC Hub: Madeleine Ashcroft and team

@ the LTCHs: DOCs and Administrators, IPAC leads, staff

And all the residents and families

***Learning exchange:
Managing long-term care home
variant of concern (VOC) outbreaks
in the post-vaccine era***

**Ellen Snyder MD CCFP MSc
Resident Physician PGY5
June 29th 2021**

The setting

- Private LTCH with 7 outbreaks since the beginning of the pandemic
- 139 residents and 243 staff
- OPH IPAC inspection occurred April 12th:
 - Good cohorting of staff and residents
 - Multiple PPE breeches observed
 - Regional IPAC assisted with training and auditing starting April 15th
- Designated isolation wing (1W) is divided into 2 adjacent areas:
 - COVID+ residents
 - Residents being re-admitted from hospital as per Directive 3

The people

- 20 new staff were onboarded just before the outbreak occurred and could have been less familiar with the facility and its IPAC procedures
- Vaccination with Pfizer. Resident vaccinations occurred in January 2021

Facility-wide vaccinations	2 doses	1 or more doses	0 doses
Residents n=139	138 (99.3%)	0	1
Staff n=243	122 (50.2%)	204 (83.9%)	39 (16.0%)

Outbreak overview

- Outbreak declared April 11 2021, after a staff and resident tested positive for COVID-19
- Outbreak measures initiated and facility-wide testing for case-finding undertaken repeatedly throughout the outbreak
- All Beta Variant B.1.351 genomes sequenced were highly related

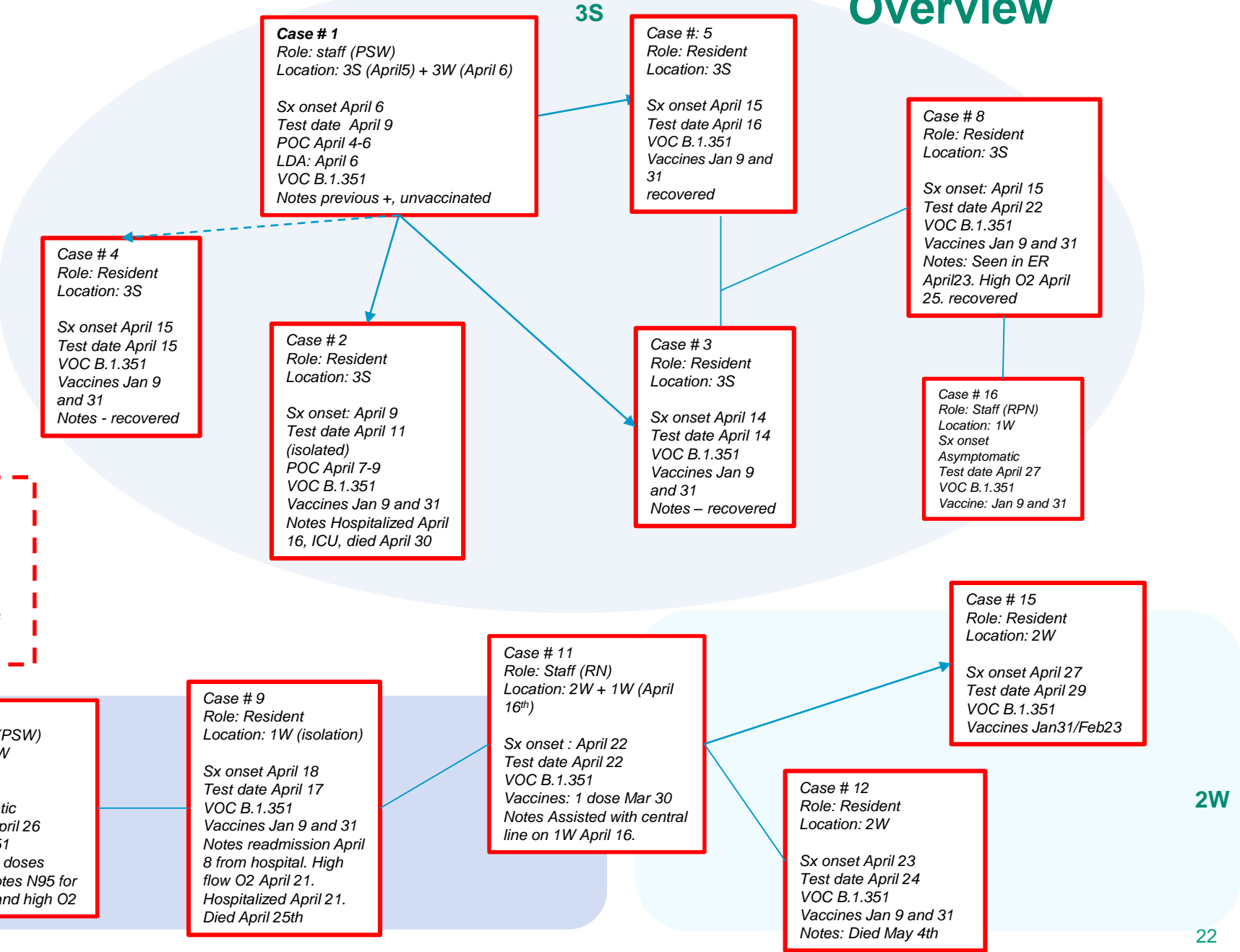
Resident cases = 9	Staff cases = 9
9 B.1.351	4 B.1.351
	1 screen E484K+ N501Y+
3 residents died	1 B117
	1 B.1.617.2
	2 none – low level positive

Overview

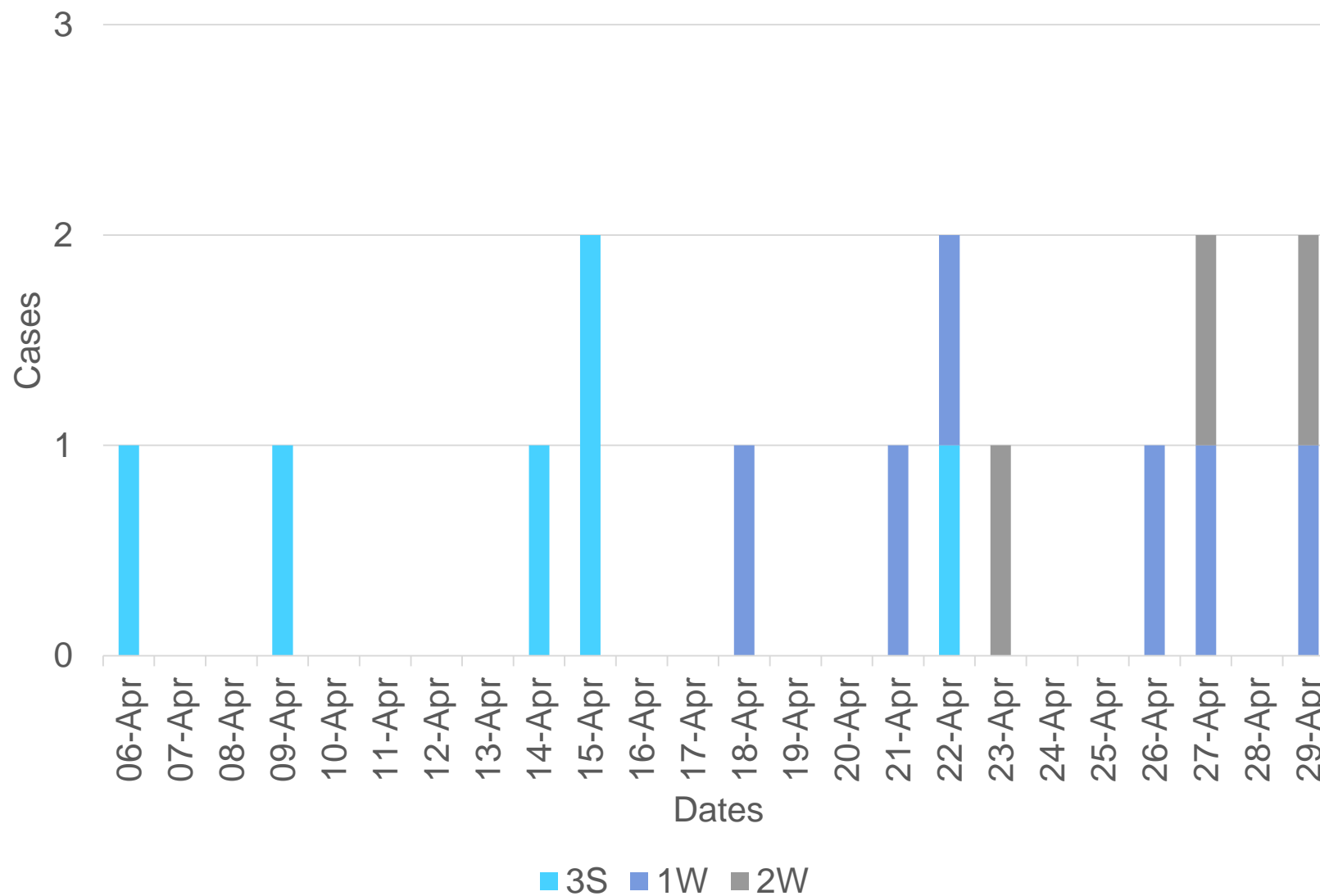
<p>Case # 7 Role: Staff Location: 1S (April 12) Sx onset April 10 (during shift) Test date April 12 POC April 8-12 LDA April 12 VOC none low level + Vaccine: 1 dose April 9</p>	<p>Case # 6 Role: Staff (PSW) Location: 3S April 13 Sx onset: Asymptomatic Test date April 19 POC April 17-19th VOC none Vaccines: Dec 1 and Jan</p>
<p>Case # 14 Role: Staff Housekeeping Location: 2S 2N Sx onset: April 24 Test date April 26 POC April 22-24 VOC B117 Vaccines: none</p>	<p>Case # 18 Role: Staff (Housekeeping) Location: Sx onset asymptomatic Test date April 29 POC April 27-29 VOC B1.617.2 Vaccine: none</p>

Case # 17
 Role: Staff (RPN)
 Location: 1W COVID

Sx onset : Asymptomatic
 Test date April 29
 VOC Mutation E484K+
 N501Y +
 Vaccines: 1 dose Feb 26
 Notes contact with all + residents.



Epidemiological curve by location



Symptom severity among staff and residents

- Despite vaccination, several residents experienced severe symptoms
- Staff were asymptomatic or had mild symptoms

	Asymptomatic	Mild	Severe
Residents (9) 2 doses	1	4	4 (2 hospitalized, 3 died)
Staff (4) 2 doses 1 dose Unvaccinated	2	1 1	

Additional recent VOC outbreaks in Ottawa

■ Alpha variant B117 outbreak: May 10 - June 9

- LTCH with 142 staff and 118 residents
 - Resident vaccination: 100% fully vaccinated
 - Staff vaccination:
 - 2 doses 106 staff (74.6%)
 - 1 dose 129 staff (90.8%)

	Vaccination	Cases	Deaths
Resident	2 doses	6	2
	1 dose	2	2
Staff	2 doses	0	
	1 dose	2	
	0 doses	3	

■ Alpha variant B117 outbreak: May 19th (ongoing)

- LTCH with 250 staff and 134 residents:
 - Resident vaccination: 100% fully vaccinated
 - Staff vaccination:
 - 2 doses 173 staff (69.2%)
 - 1 dose 196 staff (78.4%)

	Vaccination	Cases	Deaths
Resident	2 doses	10	2
	1 dose		
Staff	2 doses	7	
	1 dose	10	
	0 doses	14	

Acknowledgments

- Ottawa PHMU
- OPH IPAC team
- Champlain Regional IPAC Team
- The LTCHs

Outbreak and control measures

- Cohorting by floor and COVID status
 - Moving residents for isolation may increase transmission
 - Baseline cohorting of staff supports outbreak control
- Staff training, experience and auditing are important for proper outbreak control
- Frequency of testing during outbreaks allows for timely case finding
- Review extent of droplet and contact precautions and when to lift them.
- Working closely with facility, PHU, IPAC supports is essential to managing these outbreaks

Take home epi messages:

- Significant VOC outbreaks less common, smaller, but still likely
- Overall impact in highly-immunized LTCHs not as bad as feared (?)
- Immunization didn't prevent transmission, but less severe illness
 - Severity may vary with strain-specific vaccine-escape capacity
 - Attribution of deaths can be difficult
- Resident breakthrough cases > staff breakthroughs
 - Related to co-morbidities, immune impairment → implications for congregate setting with younger, healthier residents?
- (Unimmunized) staff cases play key role in duration of outbreak

- Very transmissible – further along spectrum of droplets $\leftarrow \rightarrow$ aerosols?
 - importance of ventilation, along with strong IPAC practices
- Mixed outbreaks likely (eg several concurrent introductions of alpha; only beta/gamma/delta spread)...role of WGS to understand transmission patterns
- Staff index + prolongation cases \rightarrow high staff immunization critical
 - including agency staff, new staff, students!
- Booster doses for LTCH residents given lower VE + VOC?
- Major funding implications: cohorting staff at baseline, ventilation/HVAC



Questions and Answers

For More Information About This Presentation, Contact:

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