Public Health Ontario | Santé publique Ontario

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SLOWING THE SPREAD

A CASE PRIORITIZATION MODEL TO MANAGE SURGING CASES OF COVID-19

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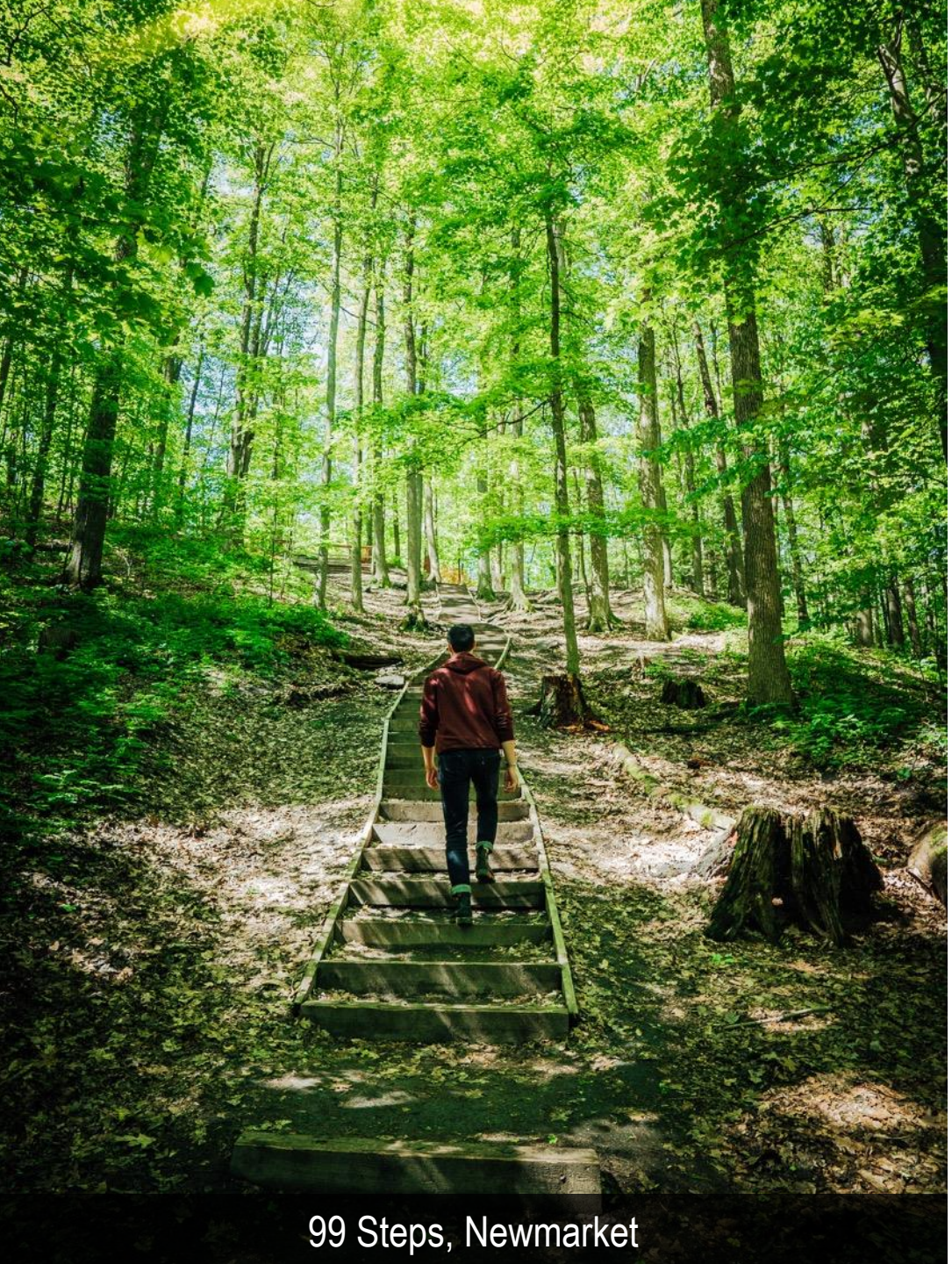
September 23rd, 2021

York Region



99 Steps, Newmarket

"Effective case and contact management is how we will blunt the curve"

Dr. Karim Kurji

OUTLINE

- Overview of York Region
- Response Structure
- York Region’s COVID-19 story
- Development and implementation of the prioritization model
- Key results
- Future planning

LEARNING OBJECTIVES

1. Identify the variables by which COVID-19 cases may be prioritized for investigation at the local level
2. Describe how York Region leveraged the Case and Contact Management system to prioritize cases during the surge of the third wave
3. Consider how to develop an agile approach to case investigation to enable an effective response to an evolving local situation

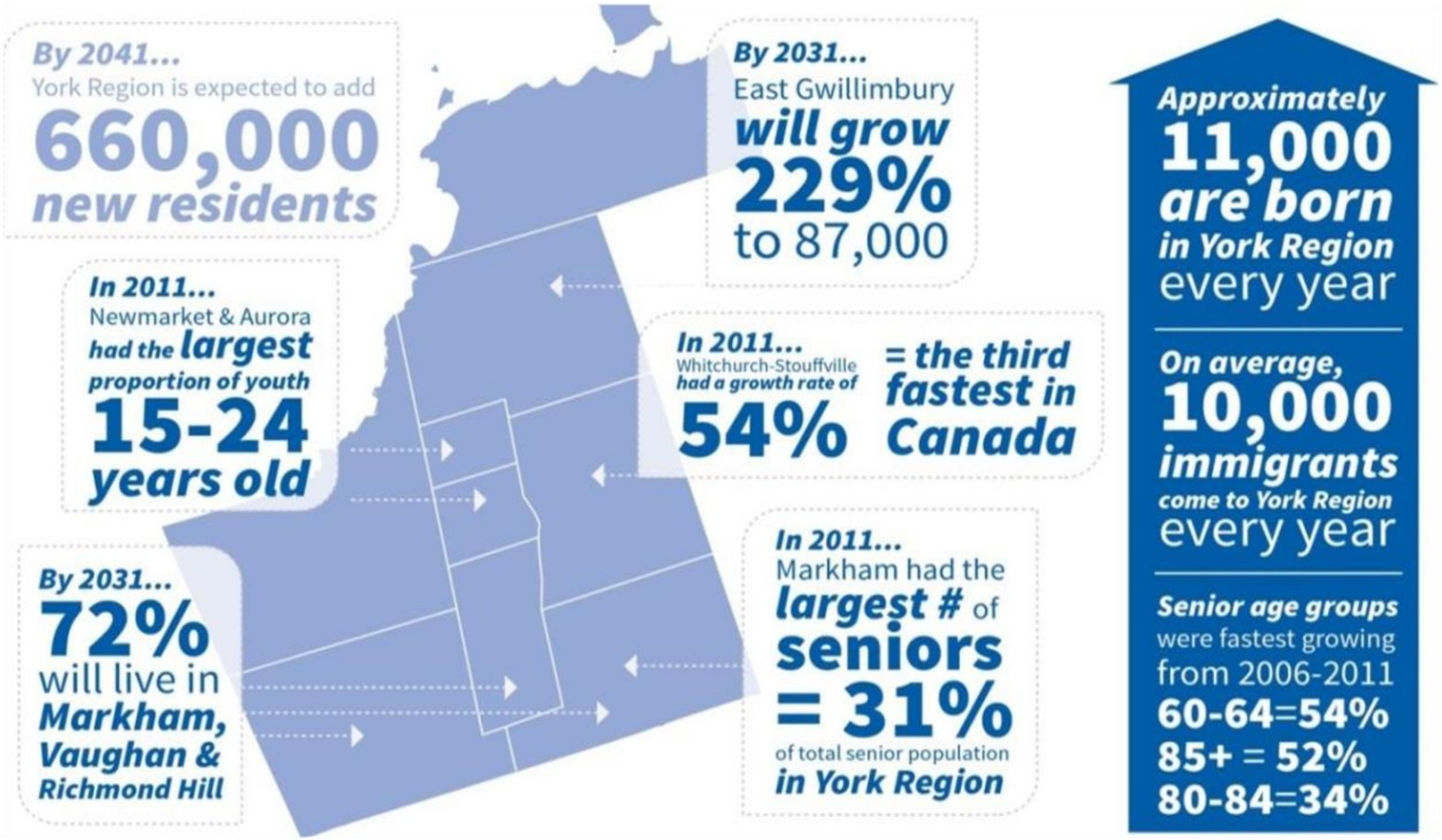
POLL QUESTION

YORK REGION

Almost 1.2 million residents call York Region home, making it one of the largest municipalities in Canada. Our geography – which is comprised of about 1,800 square kilometres over nine different municipalities – is as beautiful, interesting and diverse as our people.

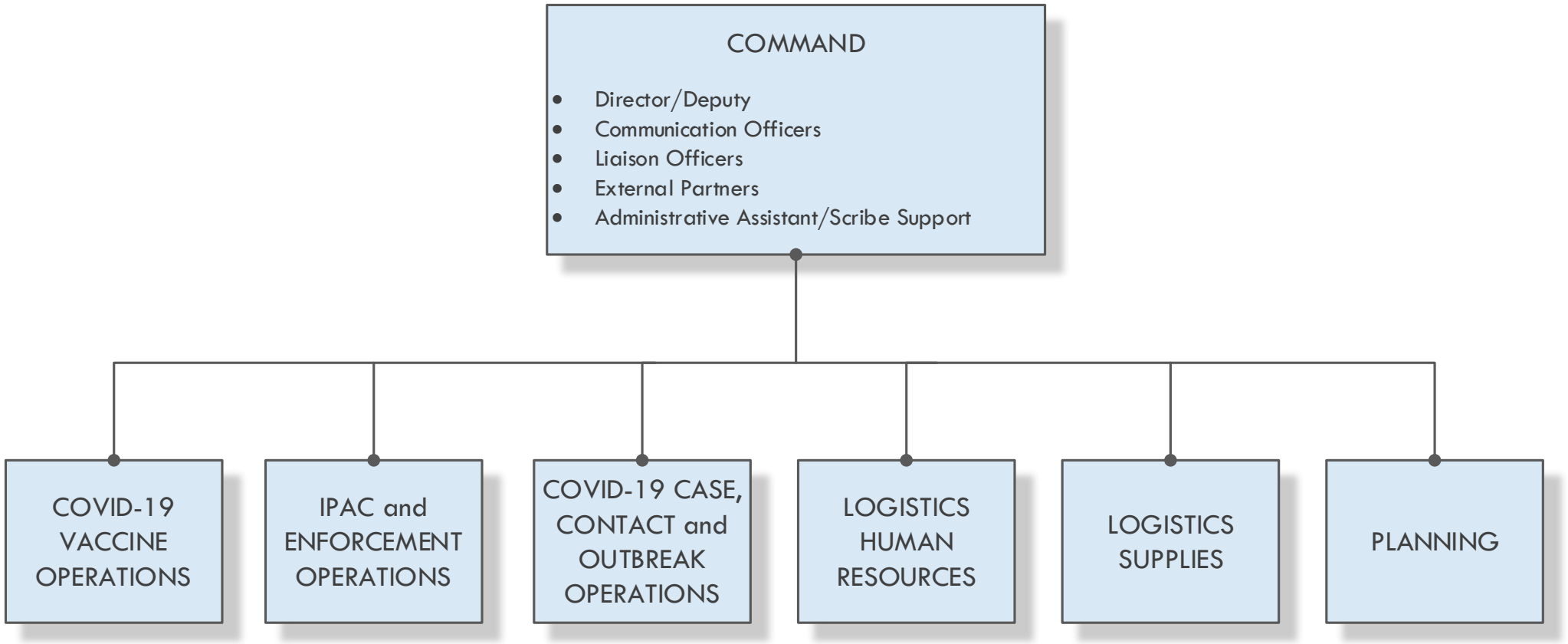
York Region stretches from Lake Simcoe in the north to Toronto in the south with Peel, Simcoe Muskoka and Durham Region health units bordering.

YORK REGION'S POPULATION IS DIVERSE, GROWING AND AGING.

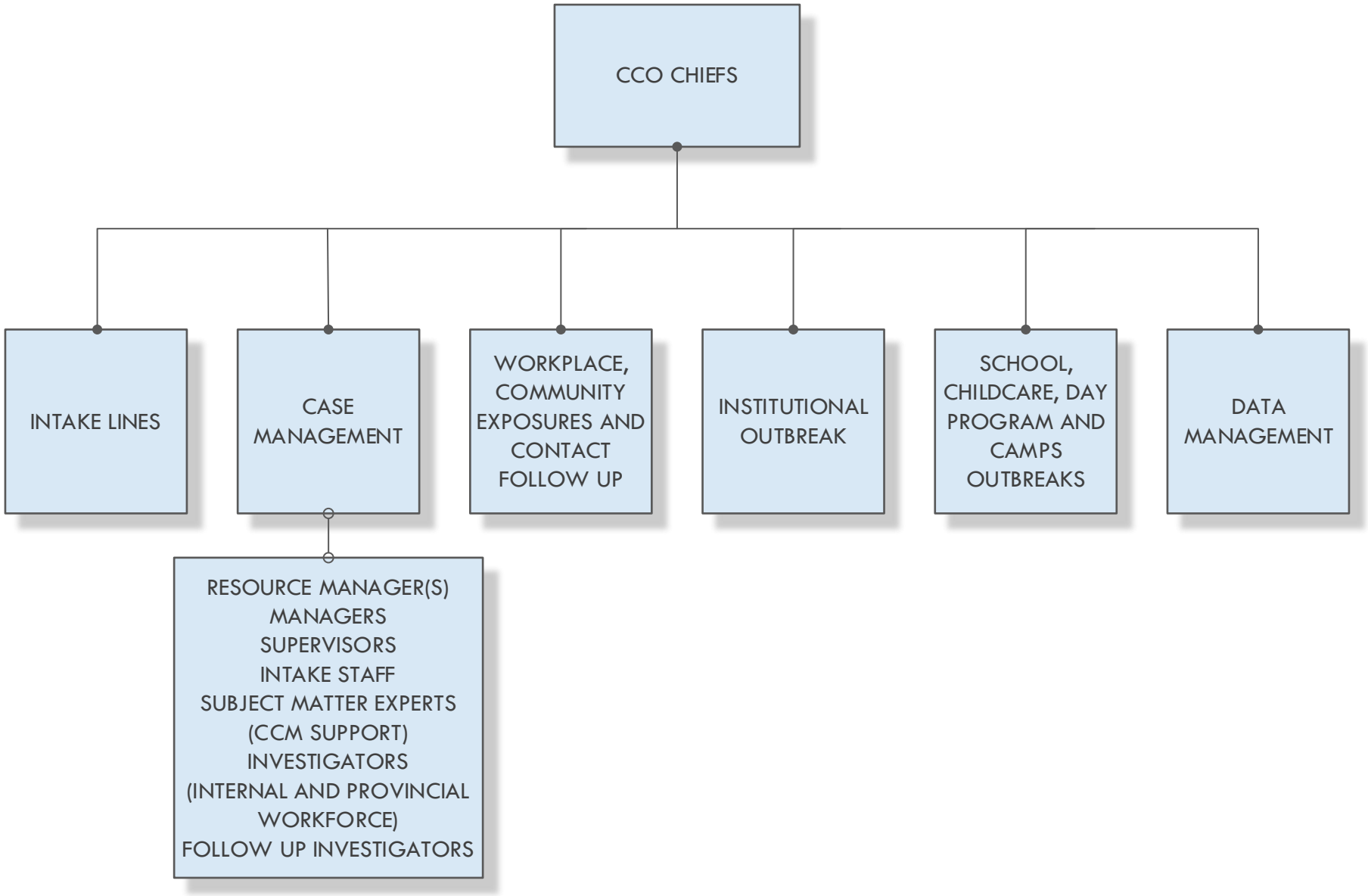


(York Region Public Health, 2015)

YORK REGION PUBLIC HEALTH'S COVID-19 RESPONSE STRUCTURE

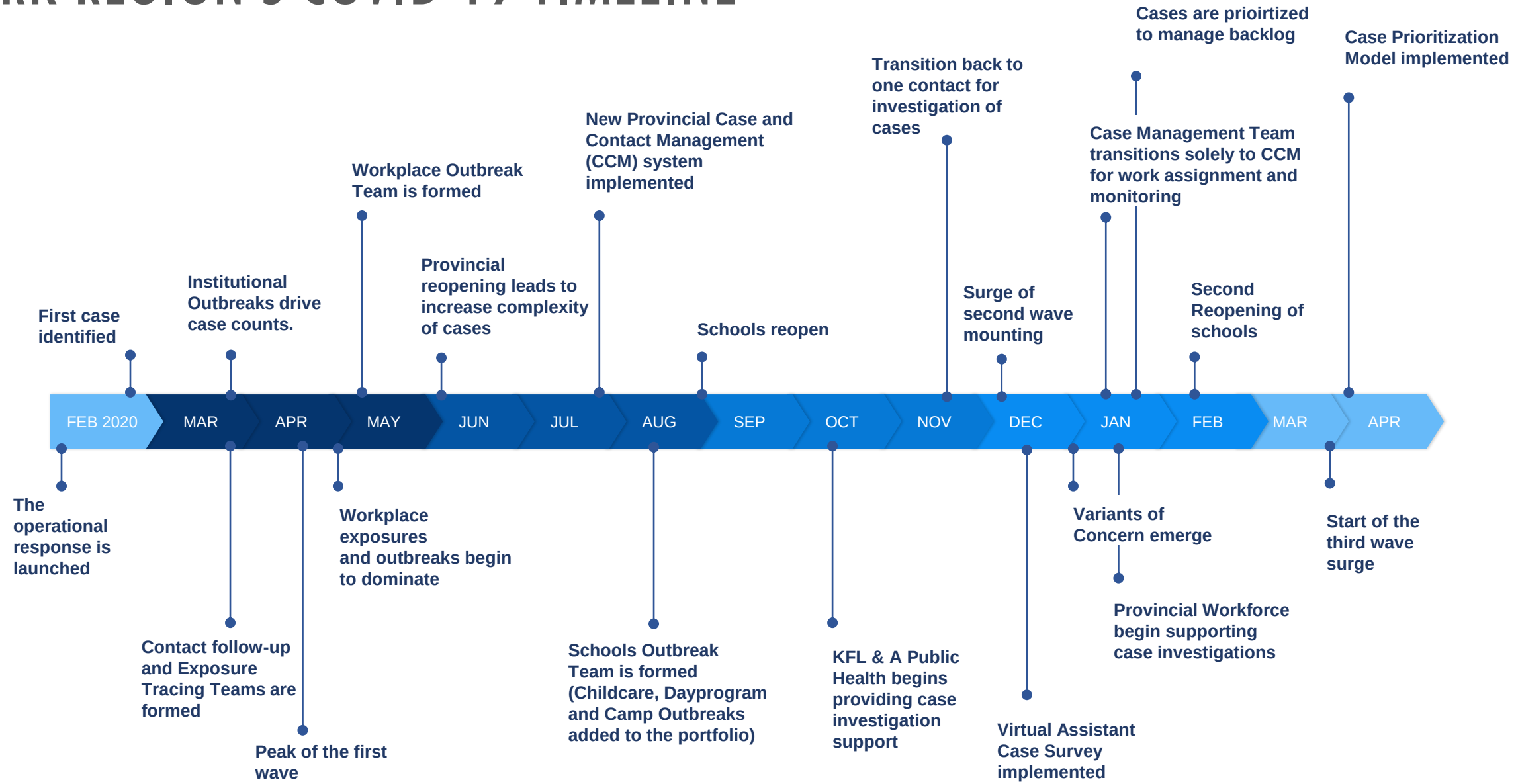


CASE, CONTACT AND OUTBREAK MANAGEMENT OPERATIONS



YORK REGION'S COVID-19 STORY

YORK REGION'S COVID-19 TIMELINE



EVOLUTION OF CASE INVESTIGATION

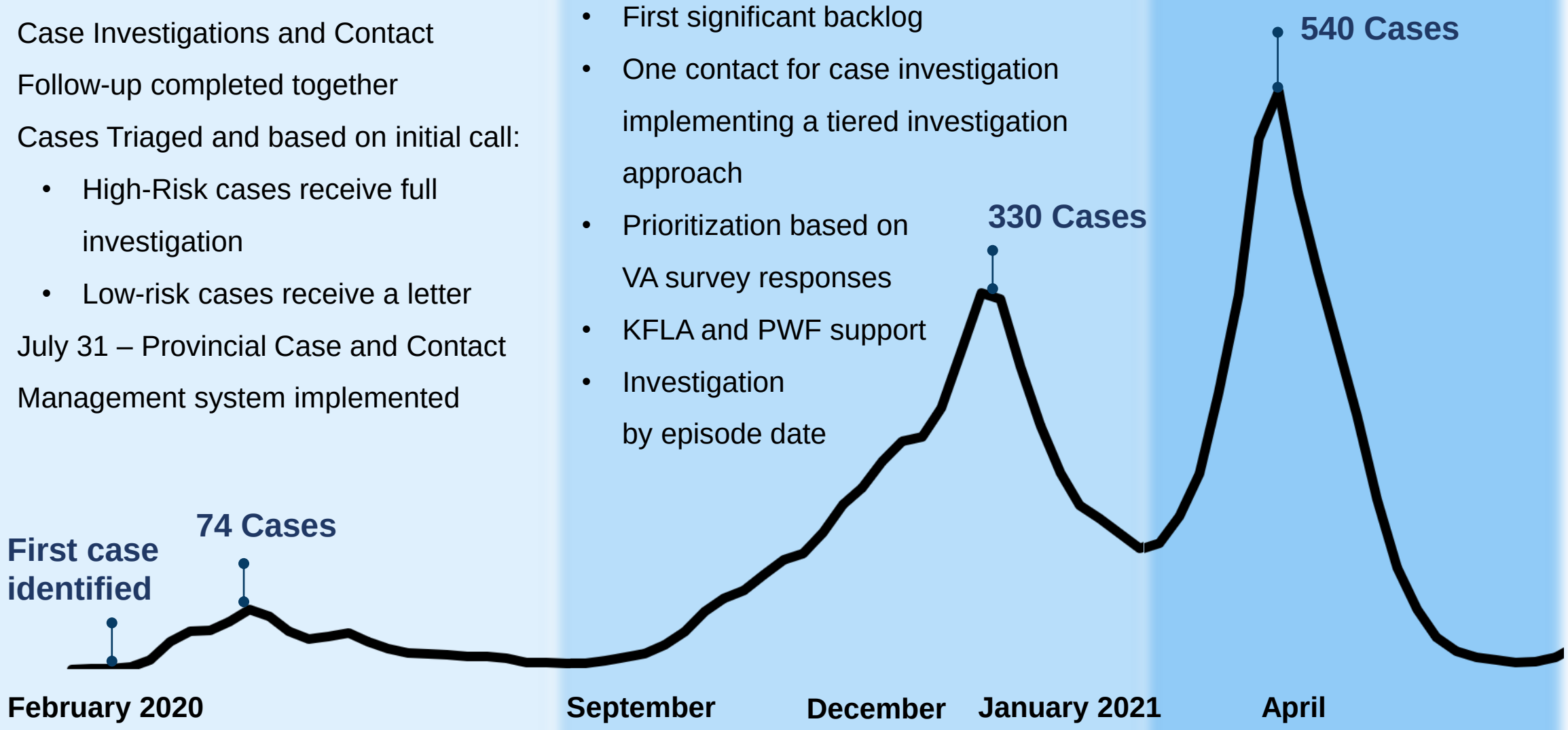
WAVE 1

- Case Investigations and Contact Follow-up completed together
- Cases Triaged and based on initial call:
  - High-Risk cases receive full investigation
  - Low-risk cases receive a letter
- July 31 – Provincial Case and Contact Management system implemented

WAVE 2

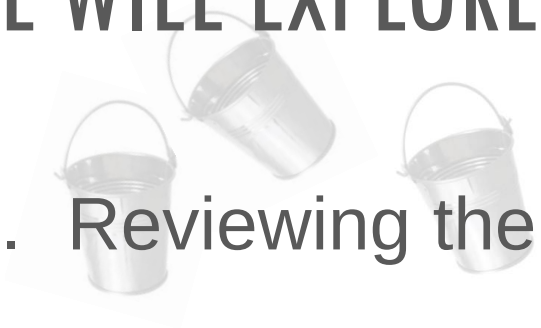
- First significant backlog
- One contact for case investigation implementing a tiered investigation approach
- Prioritization based on VA survey responses
- KFLA and PWF support
- Investigation by episode date

WAVE 3



HOW MIGHT WE FURTHER PRIORITIZE CASE INVESTIGATIONS?

WE WILL EXPLORE THE MODEL BY

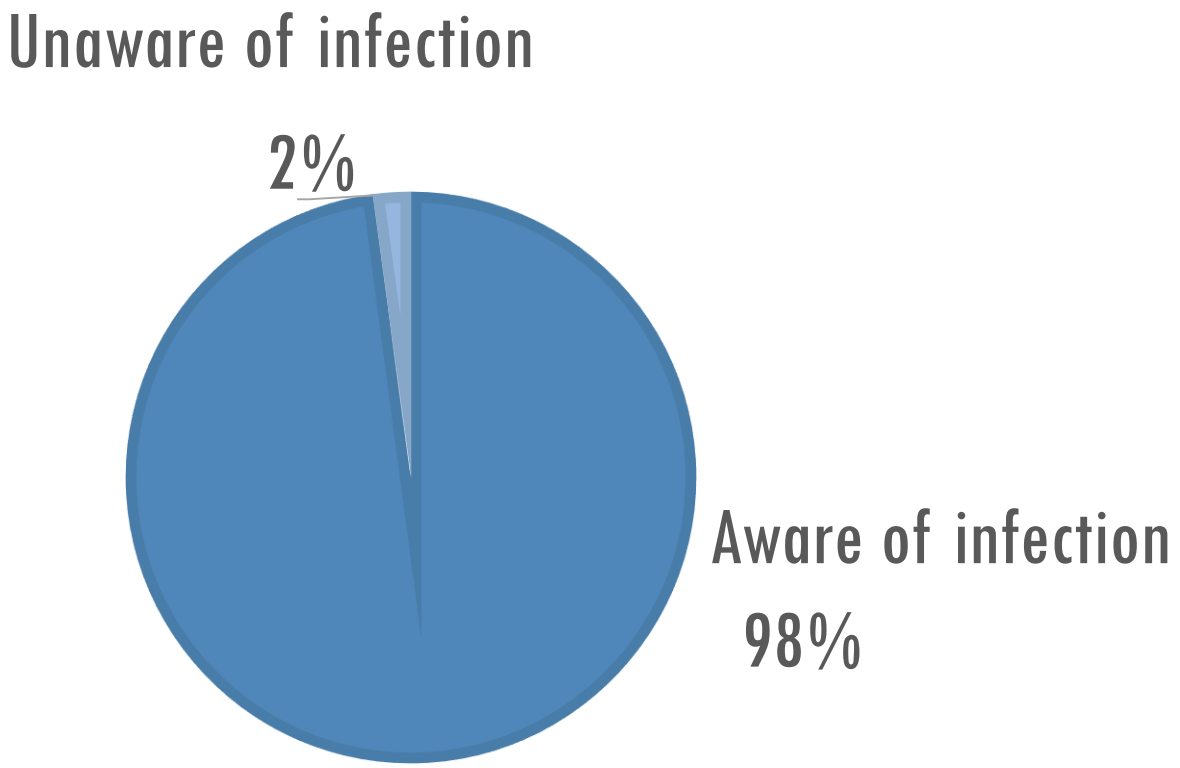


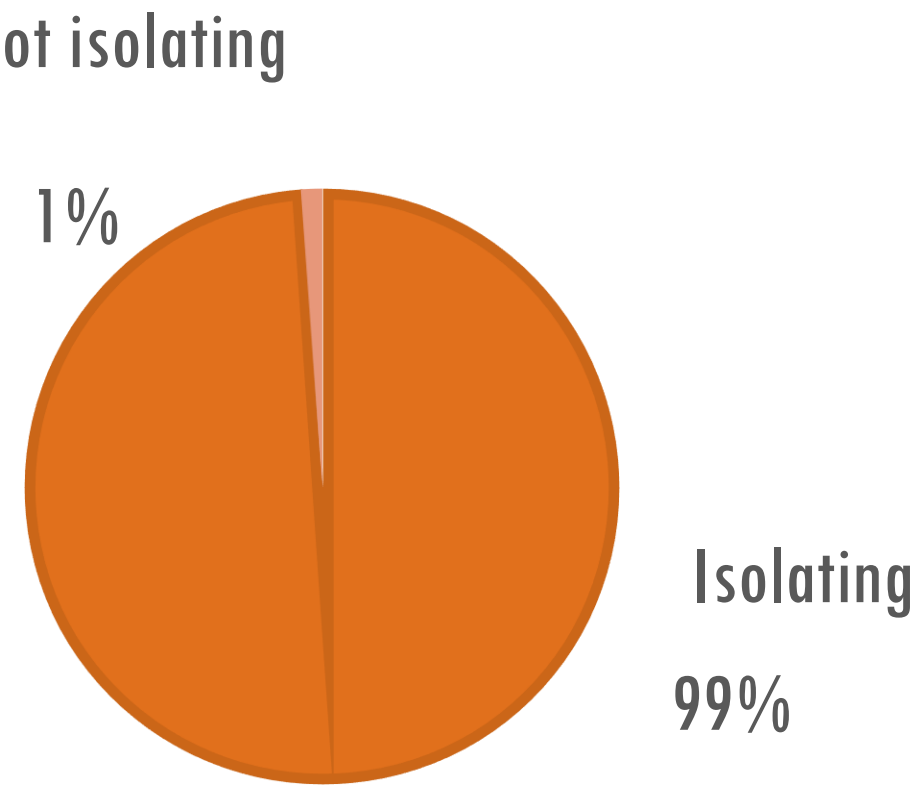
1. Reviewing the nine Levels of Priority

2. Look at how the model was implemented and how we leveraged the provincial Case and Contact Management (CCM) system

3. Consider the impact of the model

PRIOR TO CONTACT, MOST CASES WERE AWARE OF THEIR INFECTION AND HAD BEGUN ISOLATING



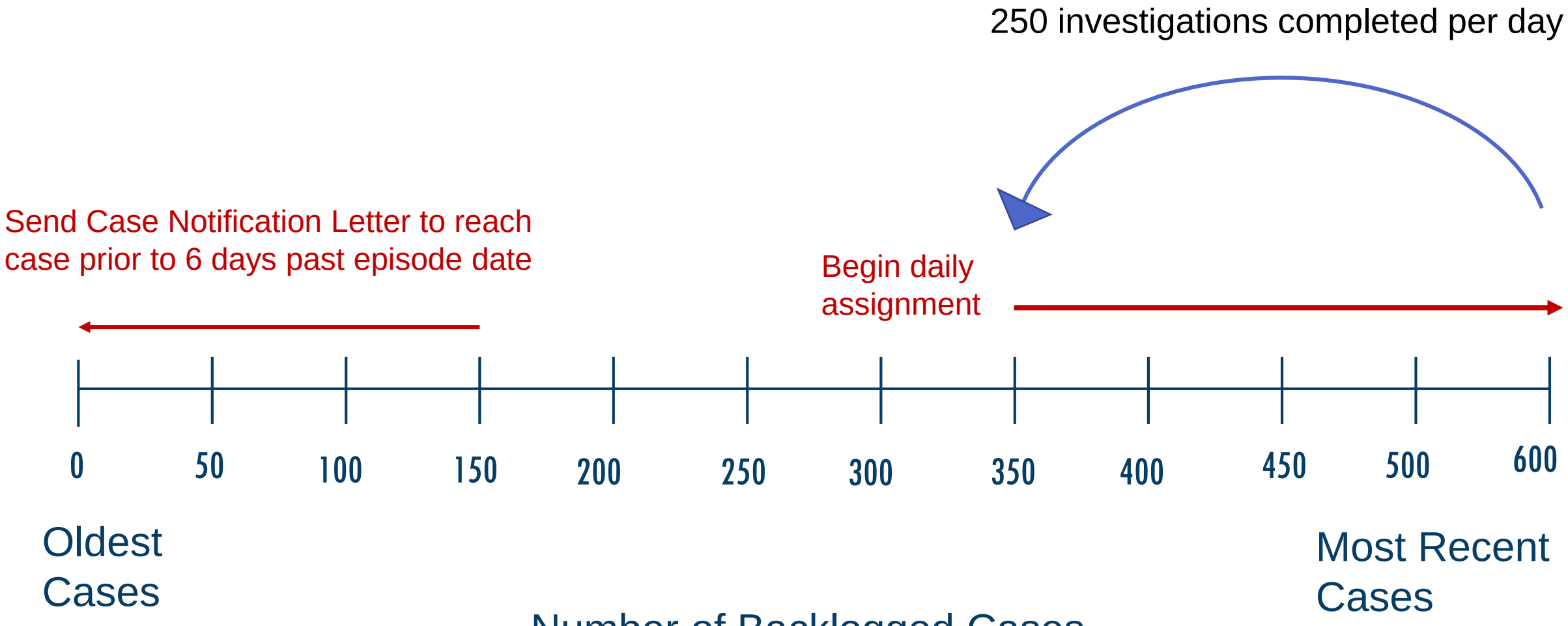


Data collected from cases investigated between March 15 and April 2, 2021

SIX DAYS FOR INVESTIGATION VALUE

May						
Mon	Tue	Wed	Thu	Fri	Sat	Sun
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20 EPISODE DATE	~~21~~ 1	~~22~~ 2	~~23~~ 3	~~24~~ 4
~~25~~ 5		27	28	29	30	31

MANAGING A BACKLOG



CASES ASSOCIATED WITH AN OUTBREAK

BUCKET	CASE CHARATERISTICS	BASED ON
 1	Linked to an outbreak	Outbreak linked within the CCM case investigation. Investigation Outbreak field in case investigation.
 2	Suspected to be linked to an outbreak or was present in a priority setting during period of communicability	Outbreak teams receiving notification of linked case. Task created within the case investigation to flag CM team to investigate.

RISK BASED ON VIRTUAL ASSISTANT CASE SURVEY RESPONSE

BUCKET	CASE CHARATERISTICS	BASED ON
 3	Potential transmission exposure in priority setting	Case report of an exposure in an institution, school, childcare, industrial, farm or health care setting, or if they attended a social gathering or attended their workplace during their period of communicability
 4	Living in a household of 6 or more individuals	Case reports through the Socio-Economic Status questions that they live in a household with six or more individuals
 5	Concerns related to case's ability to isolate at home	Case reporting that they are unable to safely isolate at home

NOW WHAT?

OBJECTIVE

Retrospectively assess the average number of contacts per case by:

- Geography (i.e., Forward Sortation Area (FSA))
- Age

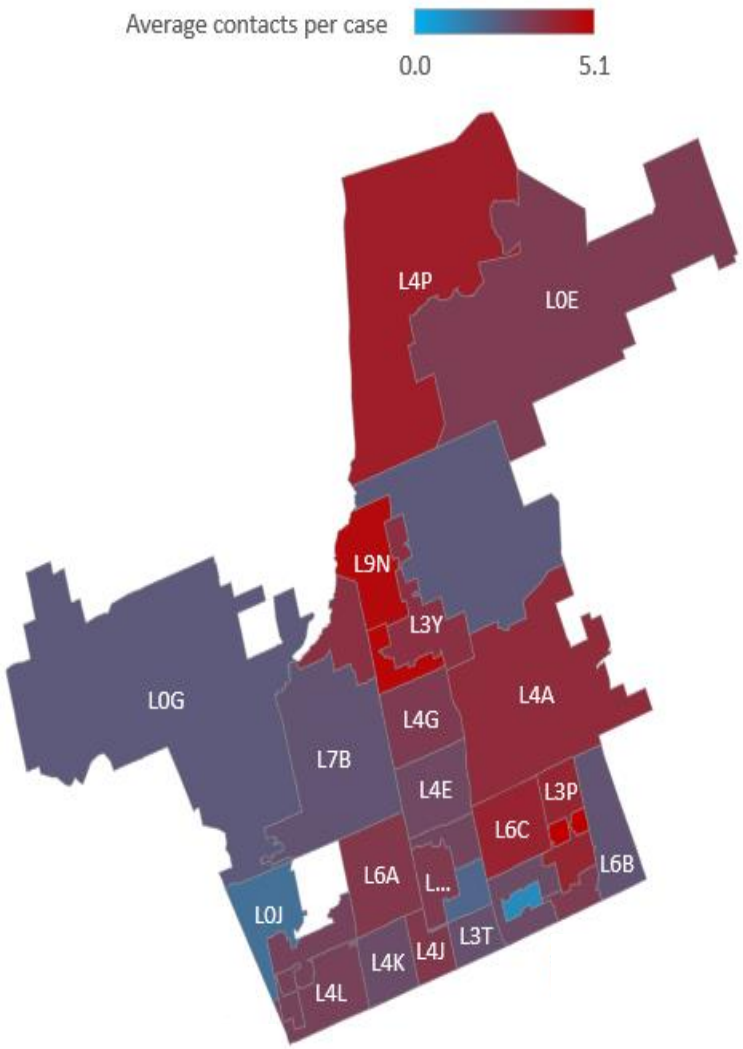
METHODS

- Merge case and contact data from the CCM system
- Identify number of close contacts per case
- Organize cases based on their residential FSA and age to identify average number of close contacts per case for both groups
- Cases linked to institutional exposures and outbreaks were excluded from the analysis

SAMPLE

- **2,081** confirmed cases reported between February 15 and March 15, 2021
- **6,967** close contacts linked to those confirmed cases

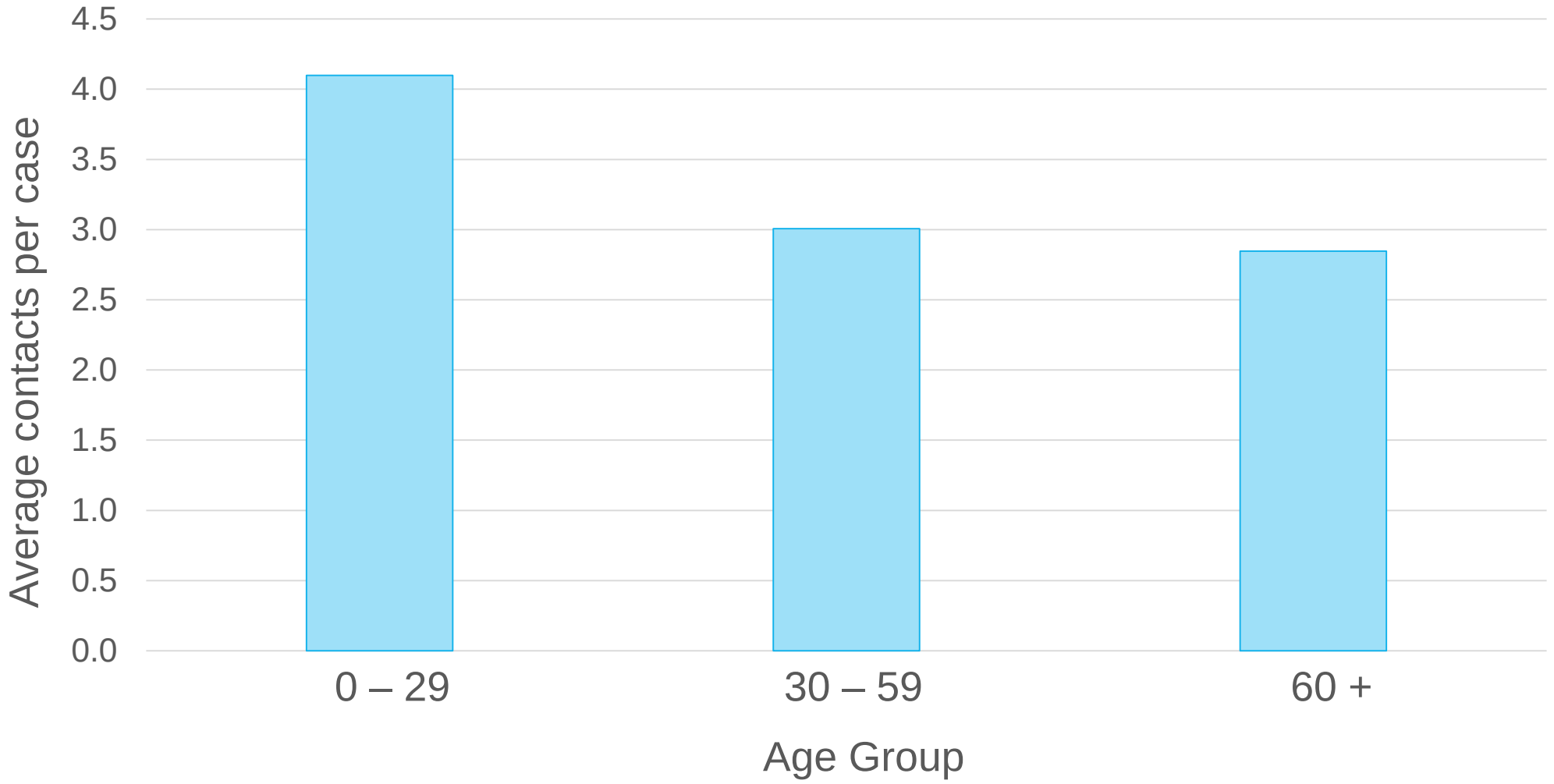
FSAs WITH THE HIGHEST AVERAGE NUMBER OF CONTACTS PER CASE



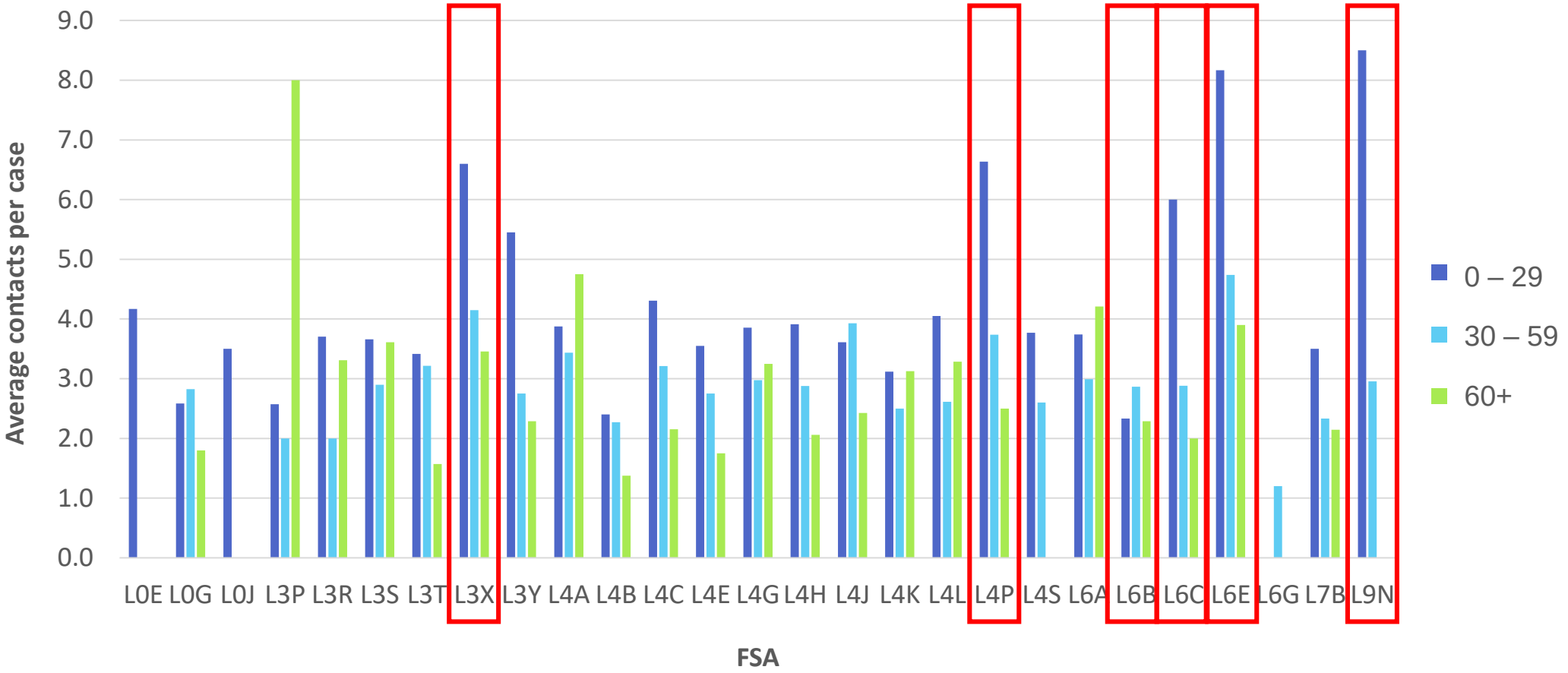
FSA	Average Number of Contacts per Case
L6E	5.1
L3X	4.9
L9N	4.8
L6C	4.2
L4P	4.1

*Note that some postal codes are suppressed due to small cell counts (defined as number of unique cases ≤ 5)

AVERAGE NUMBER OF CONTACTS PER CASE BY AGE



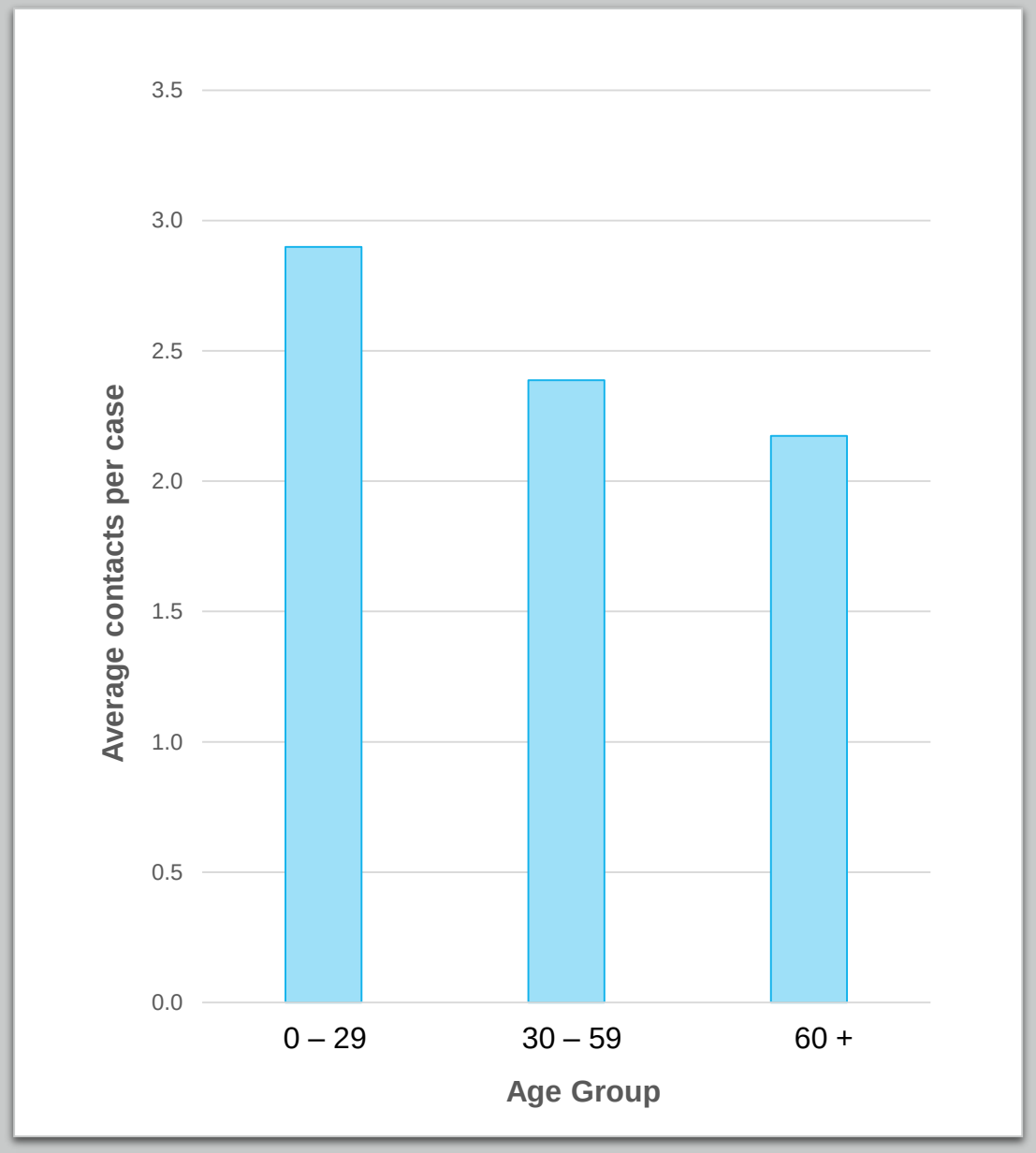
AVERAGE NUMBER OF CONTACTS PER CASE BY FSA AND AGE GROUP



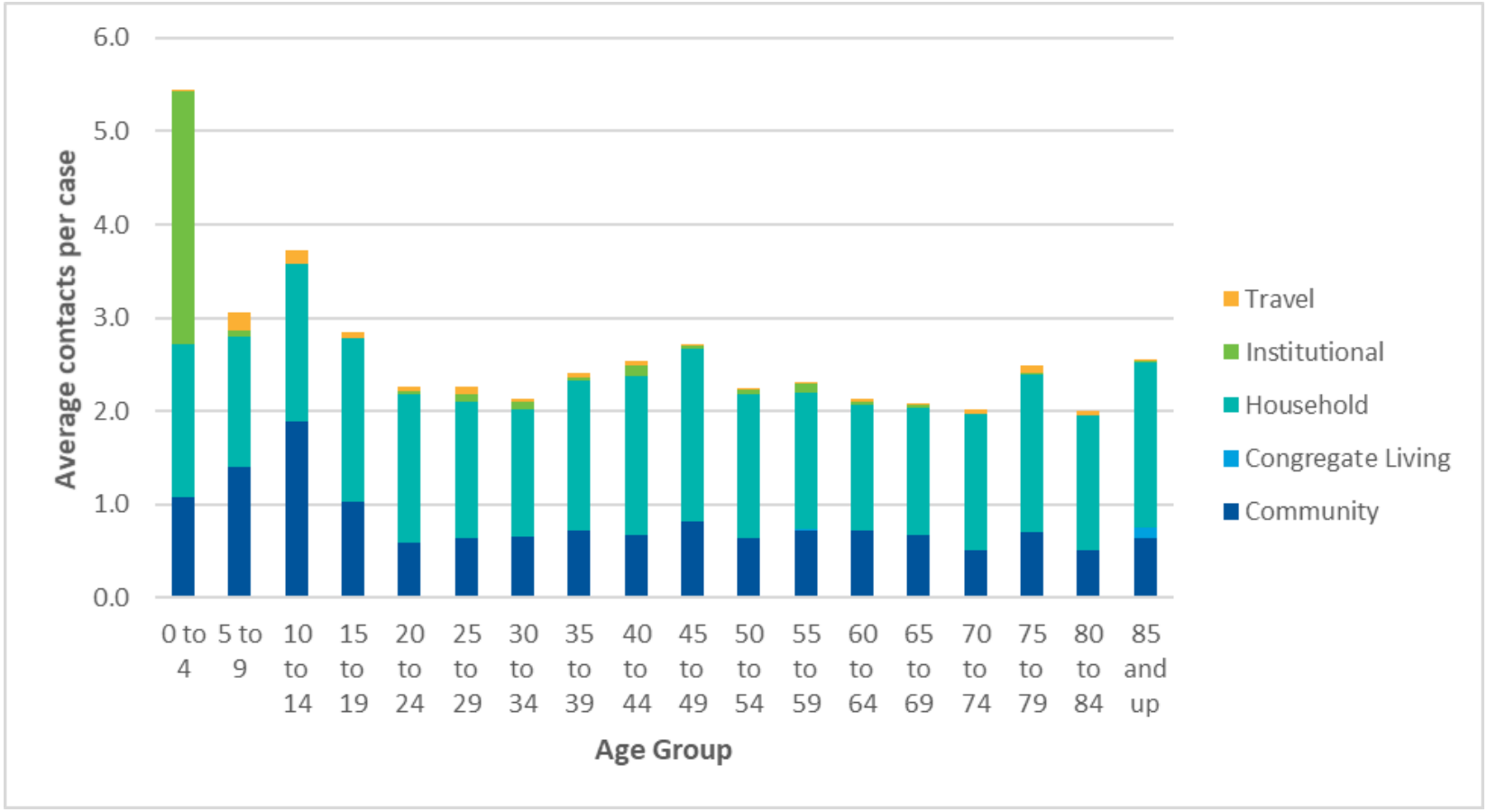
*Note that some postal codes are suppressed due to small cell counts (defined as number of unique cases ≤ 5)

SECOND SAMPLE

Average number of contacts per case for cases reported between January 15 and February 15, 2021



AGE CATEGORIES BY FIVE YEAR INCREMENTS



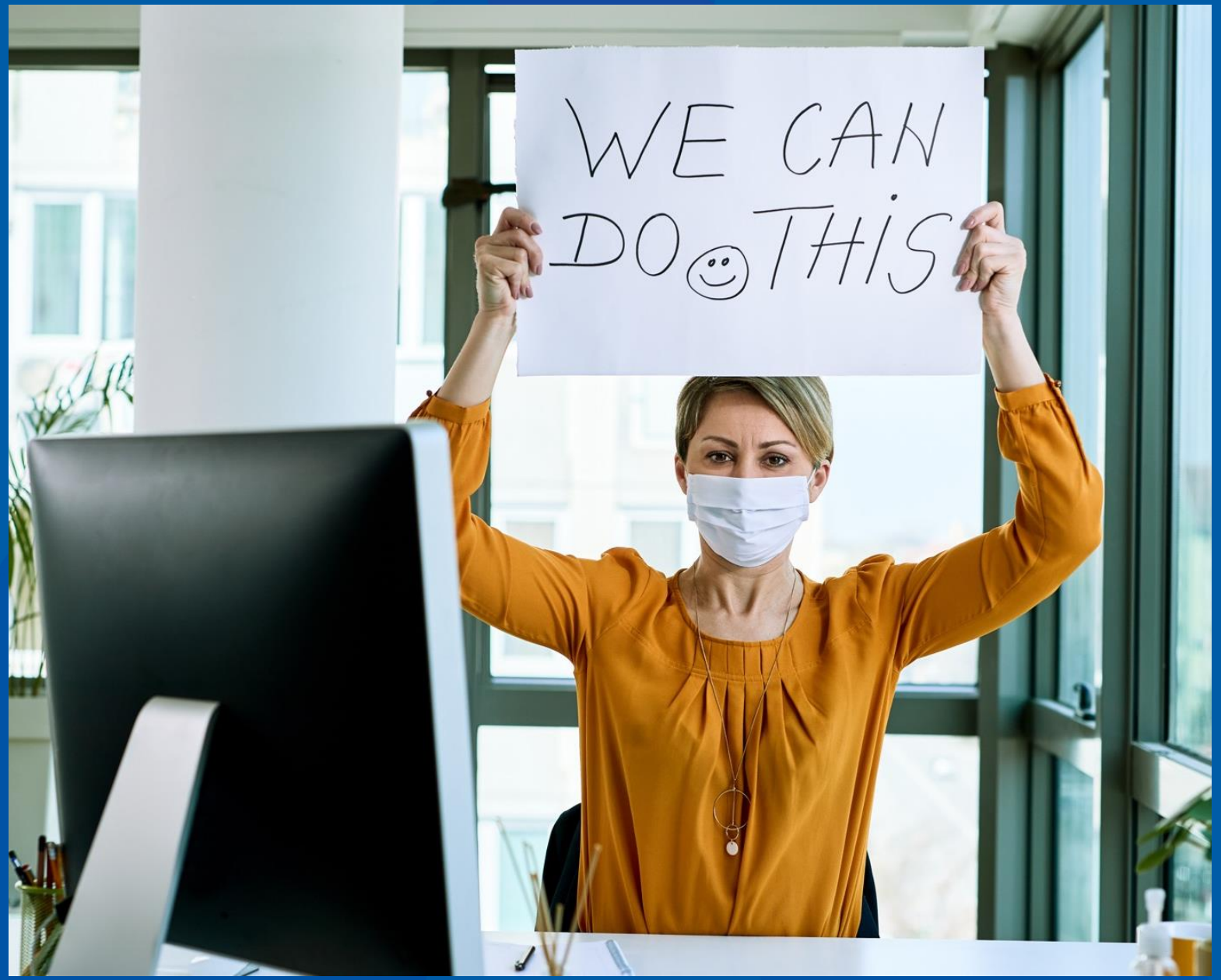
POTENTIAL IMPACT

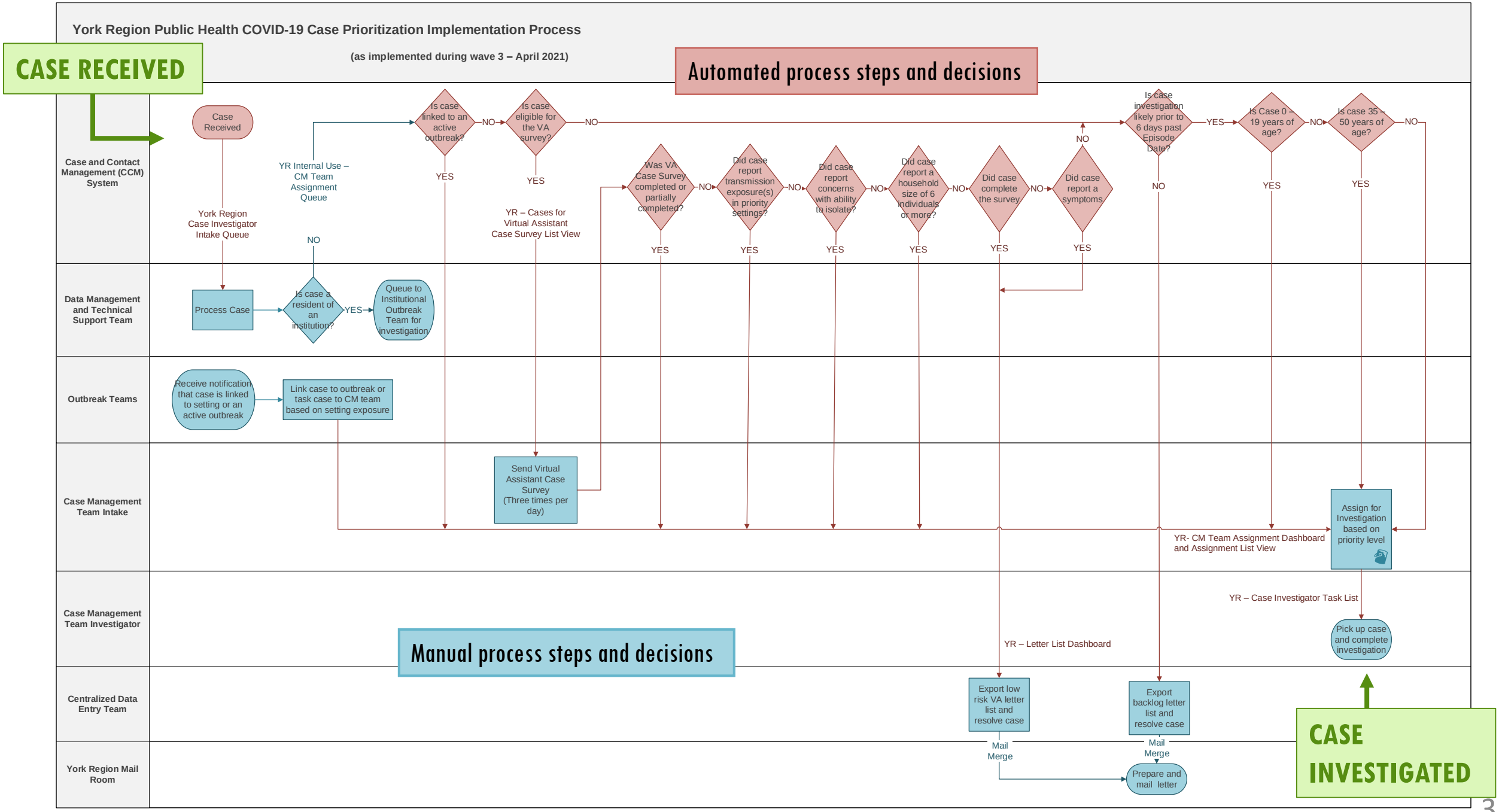
Approach to Investigation	Potential Number of Contacts Identified
Oldest Reported Date	662
Priority FSAs (L4L, L6A, L4K, L4J, L3S)	670 ↑ 8
Priority Age Groups	820 ↑ 158

AGE CATEGORY BUCKETS

BUCKET	CASE CHARATERISTICS	BASED ON	BUCKET 9
6	Within the 0 – 19 age category	Case's date of birth	Prioritization of cases within the age categories if a backlog exists at that level of prioritization 
7	Within the 35 – 50 age category	Case's date of birth	
8	Within the remainder of the age categories	Case's date of birth	

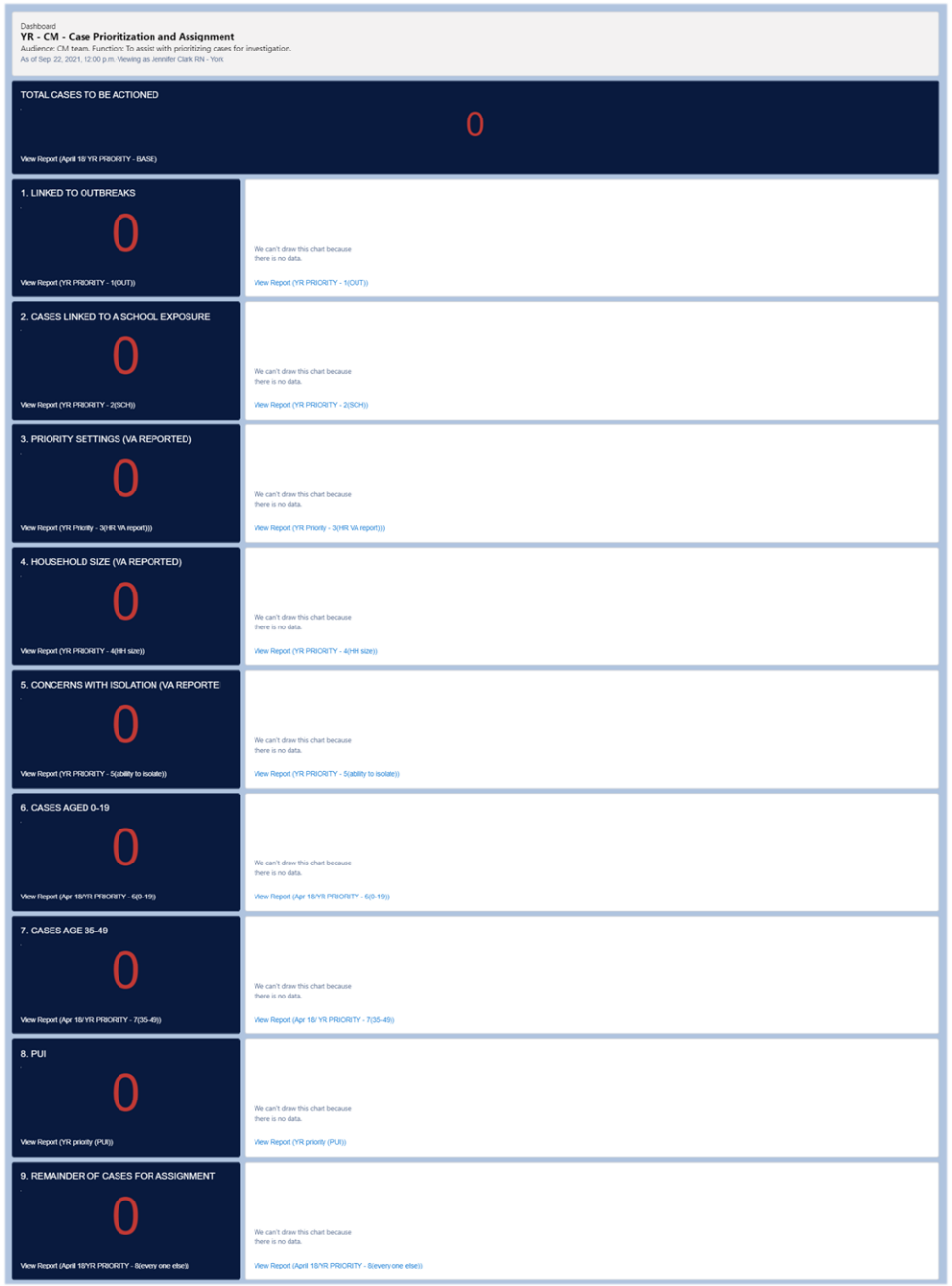
IMPLEMENTATION




York Region Public Health COVID-19 Case Prioritization Implementation Process
(as implemented during wave 3 – April 2021)
CASE RECEIVED
Automated process steps and decisions
Manual process steps and decisions
CASE INVESTIGATED
Case and Contact Management (CCM) System
Data Management and Technical Support Team
Outbreak Teams
Case Management Team Intake
Case Management Team Investigator
Centralized Data Entry Team
York Region Mail Room
Case Received
York Region Case Investigator Intake Queue
Process Case
Is case a resident of an institution?
YES
Queue to Institutional Outbreak Team for investigation
NO
YR Internal Use – CM Team Assignment Queue
Receive notification that case is linked to setting or an active outbreak
Link case to outbreak or task case to CM team based on setting exposure
Is case linked to an active outbreak?
NO
YES
Is case eligible for the VA survey?
NO
YES
YR – Cases for Virtual Assistant Case Survey List View
Send Virtual Assistant Case Survey (Three times per day)
Was VA Case Survey completed or partially completed?
NO
YES
Did case report transmission exposure(s) in priority settings?
NO
YES
Did case report concerns with ability to isolate?
NO
YES
Did case report a household size of 6 individuals or more?
NO
YES
Did case complete the survey
NO
YES
Did case report a symptoms
NO
YES
Is case investigation likely prior to 6 days past Episode Date?
YES
NO
Is Case 0 – 19 years of age?
NO
YES
Is case 35 – 50 years of age?
NO
YES
YR- CM Team Assignment Dashboard and Assignment List View
Assign for Investigation based on priority level
YR – Case Investigator Task List
Pick up case and complete investigation
YR – Letter List Dashboard
Export low risk VA letter list and resolve case
Export backlog letter list and resolve case
Mail Merge
Mail Merge
Prepare and mail letter

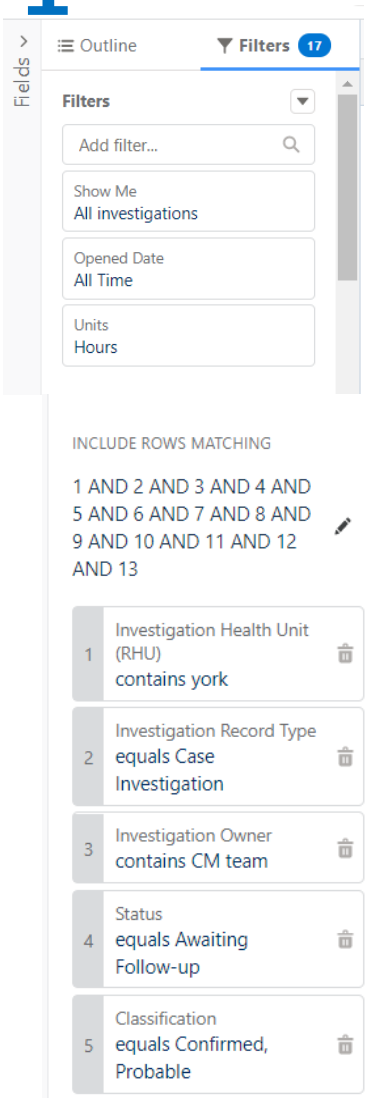
CASE MANAGEMENT TEAM ASSIGNMENT DASHBOARD

Cases assigned within the team from the top bucket or row to the bottom



THE REPORT FILTERS ARE THE KEY

1



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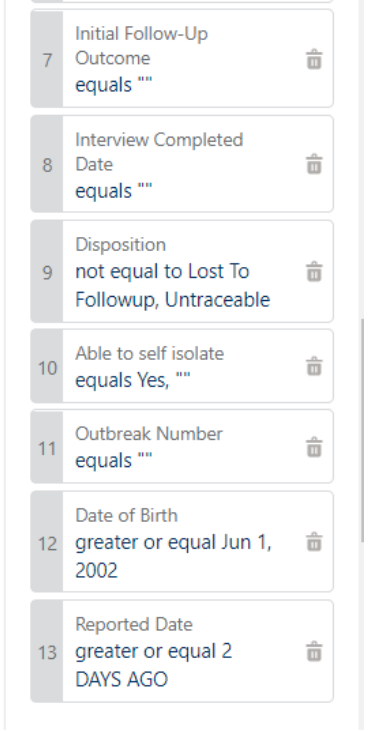

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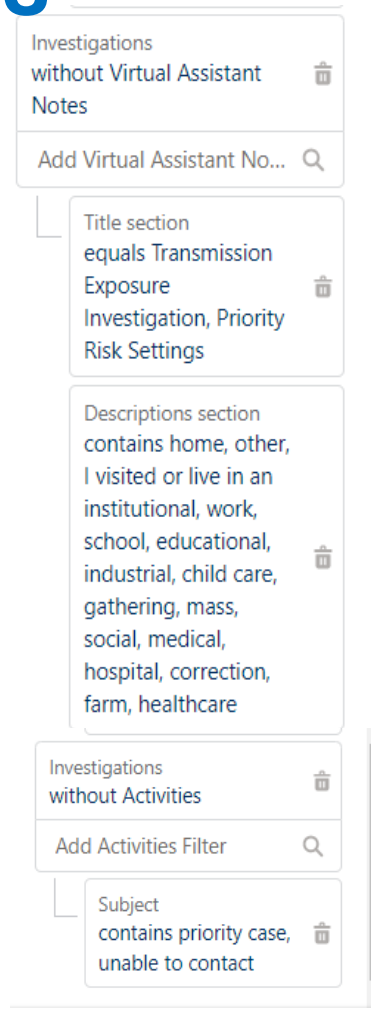
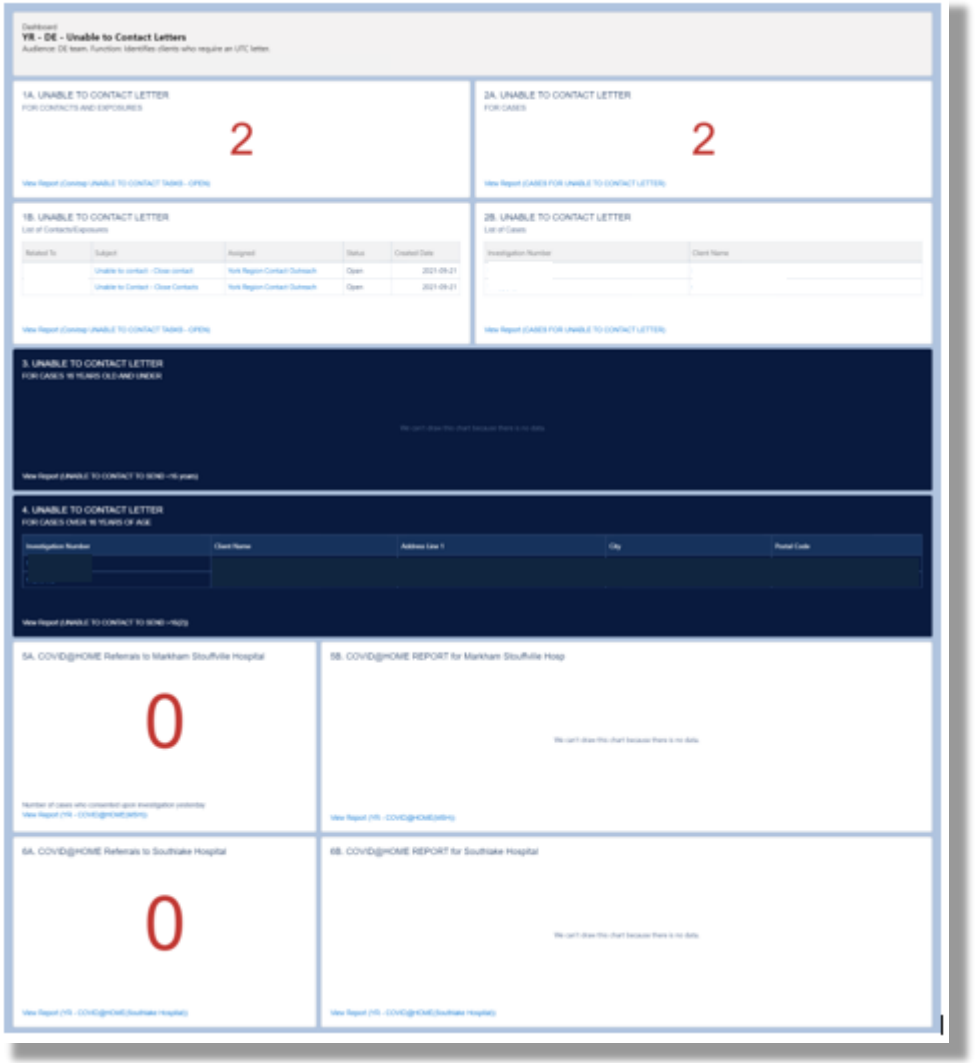


1. Capture York Region confirmed/probable and Person Under Investigation cases
2. Eliminate cases that have already been assigned or actioned
3. Eliminate cases from earlier buckets
4. Capture cases that match the criteria of this bucket
5. Avoid cases that belong in subsequent priority buckets

LETTER PREP AND DATA ENTRY DASHBOARD

Supports listing and preparing reports for cases to receive appropriate letters.



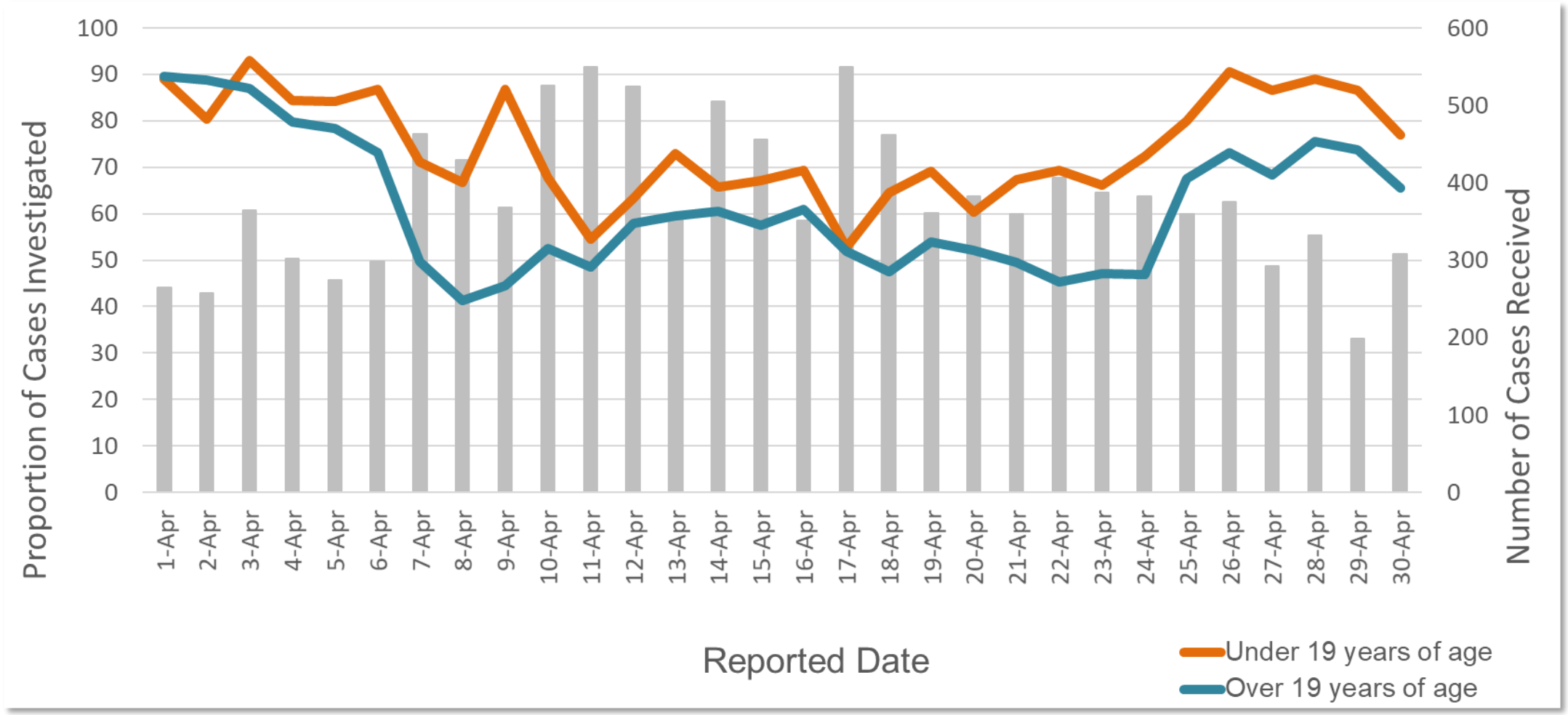
MONITORING DASHBOARD

Provides key statistics to monitoring cases awaiting outreach and work in progress outstanding work and work that has happened that day.

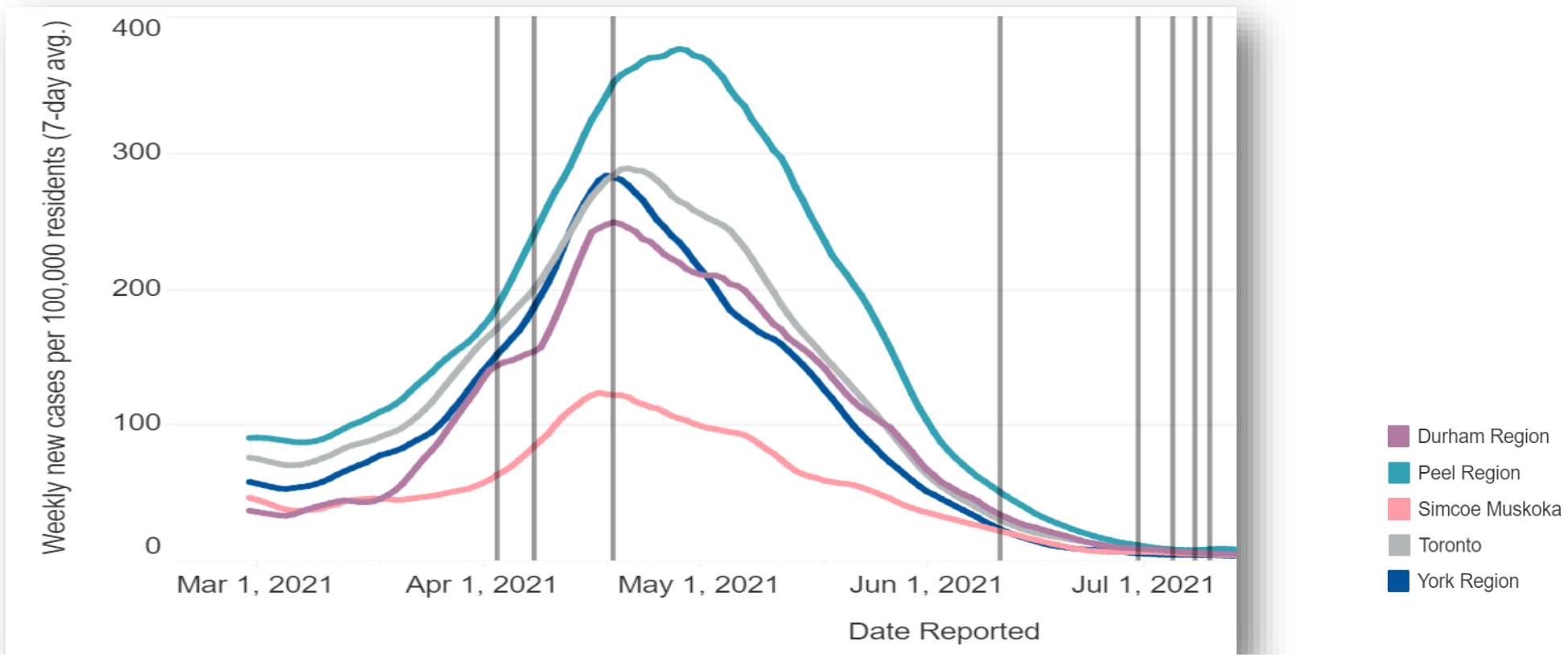
DURING THE MONTH OF APRIL

- 11,629 confirmed cases
- 84.9% received the virtual assistant survey
- 47.4% that received the survey partially completed or completed the form
- 8.7% received a letter based on no risk factors identified through the VA
- 7.7% of cases received a letter due unsuccessful contact attempts
- 26% received a letter due to the backlog of cases
- 61.4% received a full investigation

PROPORTION OF CASES INVESTIGATED BY AGE GROUP



THIRD WAVE CASE DECLINE



Data Notes:

Extracted from the provincial Case and Contact Management system (CCM) and local investigation data.

PHU cases data from Open Government Licence - Ontario.

Rates use population estimates sourced from Ontario Ministry of Health, IntelliHEALTH Ontario, 2020

FUTURE PLANNING

York Region Public Health's response will continue to be nimble, reflect the changing dynamics of the pandemic locally and leverage all available data to continue making evidence-based decision. As we enter the 4th wave, we remain focused on:

- Adjusting our prioritization model to reflect new data and realities (e.g., highly immunized population, CCM V13, school back in session)
- Maximizing the use of automation where possible – Virtual Assistant, Robocalls, Mass texting
- Remaining committed to leveraging our dedication to continuous quality improvement – recognized nationally via Excellence Canada for our excellence in this area

WITH SPECIAL THANKS TO

The whole of Case, Contact and Outbreak Operations

The Strategic Operations Support Team

Meghan O’Neill, Statistical Data Analyst

and

Dr. Kurji

Your expert, calm and encouraging leadership has carried us through

May retirement repay the commitment of your career!

REFERENCES

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Liu P., McQuarrie L., Song Y,. &Colijn C. 2021 Modelling the impact of household size distribution on the transmission dynamics of COVID-19. *J. R. Soc. Interface 18*: 20210036. https://doi.org/10.1098/rsif.2021.0036

Public Health Agency of Canada (2021, July 5). *Updated: Public health management of cases and contacts associated with COVID-19.* https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection/health-professionals/interim-guidance-cases-contacts.html

THANK YOU

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York Region


York Region