

## ENHANCED EPIDEMIOLOGICAL SUMMARY

# COVID-19 Regional Incidence and Time to Case Notification in Ontario

### Contents

Contents.....	1
Purpose .....	3
Ontario .....	4
Toronto .....	8
Central East .....	12
Central West .....	16
Eastern .....	20
North .....	24
South West.....	28
GTA.....	32
Non-GTA.....	36
Algoma Public Health .....	40
Brant County Health Unit.....	44
Chatham-Kent Public Health .....	48
City of Hamilton Public Health Services .....	52
Durham Region Health Department .....	56
Eastern Ontario Health Unit.....	60
Grey Bruce Health Unit .....	64
Haldimand-Norfolk Health Unit .....	68
Haliburton, Kawartha, Pine Ridge District Health Unit .....	72
Halton Region Public Health .....	76
Hastings Prince Edward Public Health .....	80
Huron Perth Public Health .....	84
Kingston, Frontenac and Lennox & Addington Public Health .....	88
Lambton Public Health.....	92
Leeds, Grenville & Lanark District Health Unit.....	96

Middlesex-London Health Unit .....	100
Niagara Region Public Health.....	104
North Bay Parry Sound District Health Unit.....	108
Northwestern Health Unit .....	112
Ottawa Public Health .....	116
Peel Public Health .....	120
Peterborough Public Health.....	124
Porcupine Health Unit.....	128
Public Health Sudbury & Districts .....	132
Renfrew County and District Health Unit .....	136
Simcoe Muskoka District Health Unit .....	140
Southwestern Public Health.....	144
Thunder Bay District Health Unit .....	148
Timiskaming Health Unit.....	152
Toronto Public Health .....	156
Waterloo Public Health and Emergency Services .....	160
Wellington-Dufferin-Guelph Public Health .....	164
Windsor-Essex County Health Unit.....	168
York Region Public Health .....	172
Methods .....	176
Limitations .....	178
References .....	179
Disclaimer.....	179
Citation.....	179
For Further Information .....	179
Public Health Ontario .....	179

**This report reflects cases that have been publicly reported up to 2020-07-06.**

**This report includes the most current information available from iPHIS and other local case management systems (iPHIS plus).**

**Full french translation is available upon request.**

## Purpose

This report provides a summary of the regional case counts of COVID-19, likely source of acquisition, and the timeliness of testing and investigation in Ontario. These regional measures provide important information to support and monitor re-opening across Ontario.

A brief description of the measures included in this report are summarized below. Additional details are outlined in the Methods section, found toward the end of this document.

### Case count

We measured the daily number of COVID-19 cases according to the date a case was publicly reported (i.e., the date the public health unit [PHU] reported the case to Public Health Ontario [PHO] plus one day to account for the delay in public reporting) and produced an epidemic curve using these counts over time. Examination of these epidemic curves can be used to determine the current trajectory of the epidemic in each region.

### Reproduction number

The reproduction number is the average number of secondary cases of infection generated by each person infected with COVID-19. A reproduction number greater than one means that the epidemic is growing in a region, while a reproduction number less than one means the epidemic is coming under control in a region.

### Likely source of acquisition

COVID-19 cases have been examined to determine whether a case travelled, was associated with an outbreak, was a contact of a case, had no known epidemiological link (sporadic community transmission), or where information was pending or missing. Tracking the number of cases with no known epidemiologic link provides insight into how well we are able to ascertain where cases are coming from and may reflect the effectiveness and timeliness of the contact tracing process, as well as indicate adherence to public health guidance by individuals who are asked to isolate.

### Timeliness of case presentation, testing, and investigation

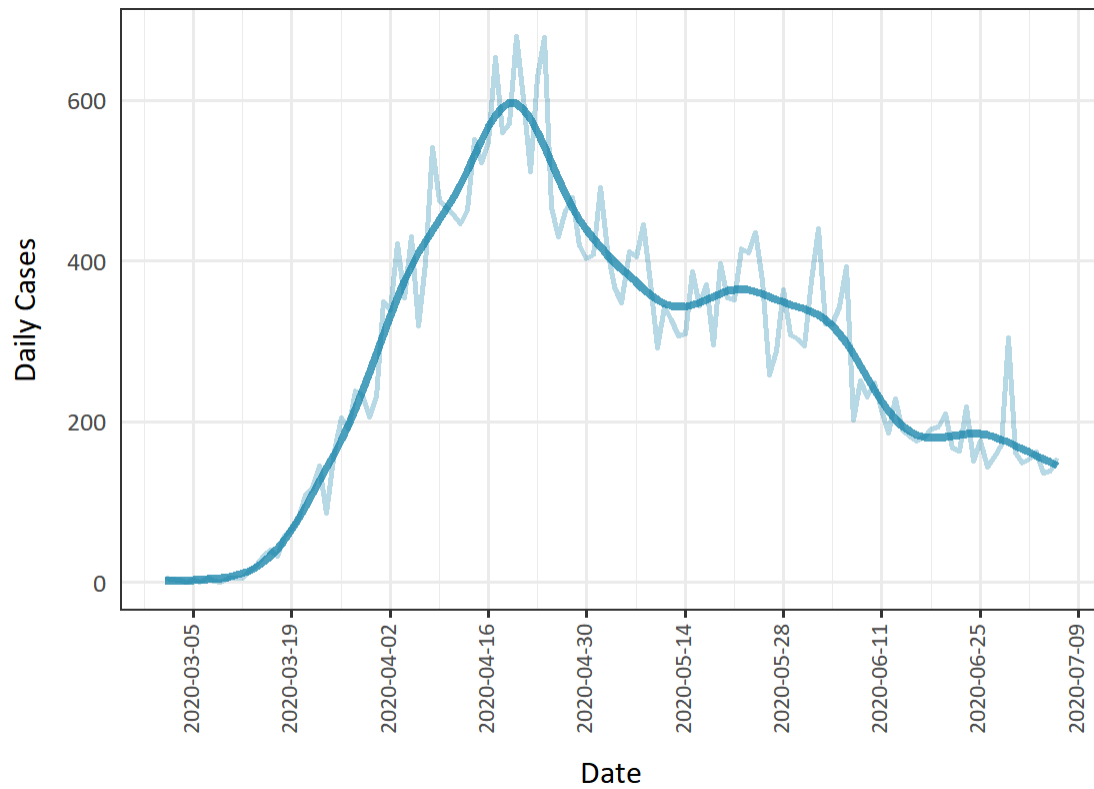
To halt transmission, it is crucial that potential cases are rapidly identified, tested, reported, and managed (which includes contact tracing). We examined three timeliness metrics. First, the proportion of cases that have a specimen collected for testing within 2 days of symptom onset. Second, the proportion of cases that had a positive result reported to the PHU within 1 day of specimen collection. Third, the proportion of cases for which case management began within 1 day of a positive result reported to the PHU.



Flow diagram of case presentation, testing, and investigation

## Ontario

### Epidemic Curve: Ontario



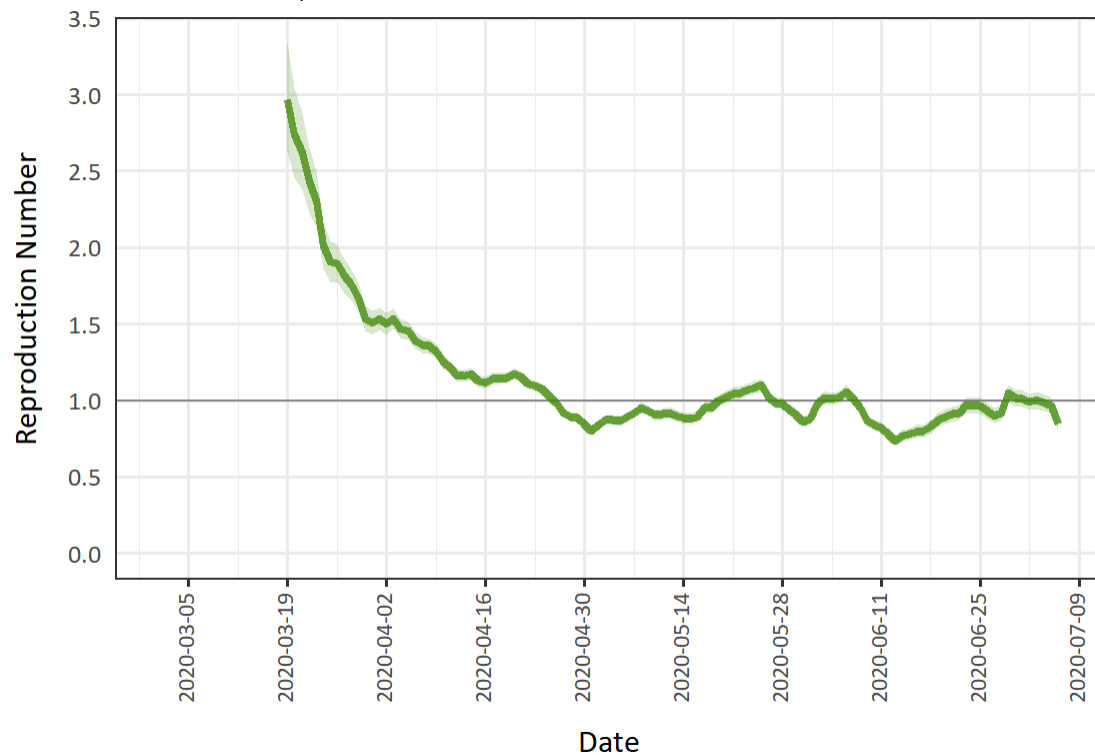
Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus



## Reproduction Number: Ontario

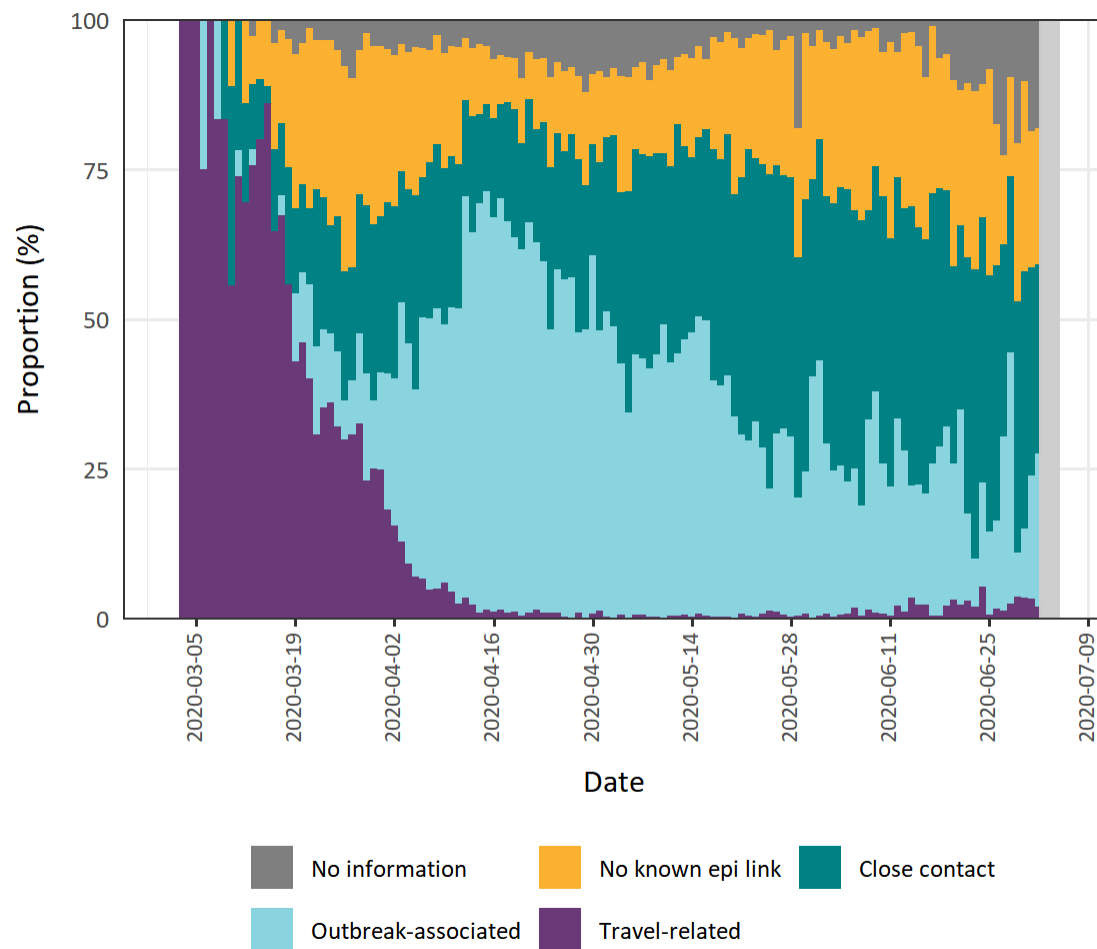
Jul 06 Re = 0.85, 95% CI: 0.80-0.90



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

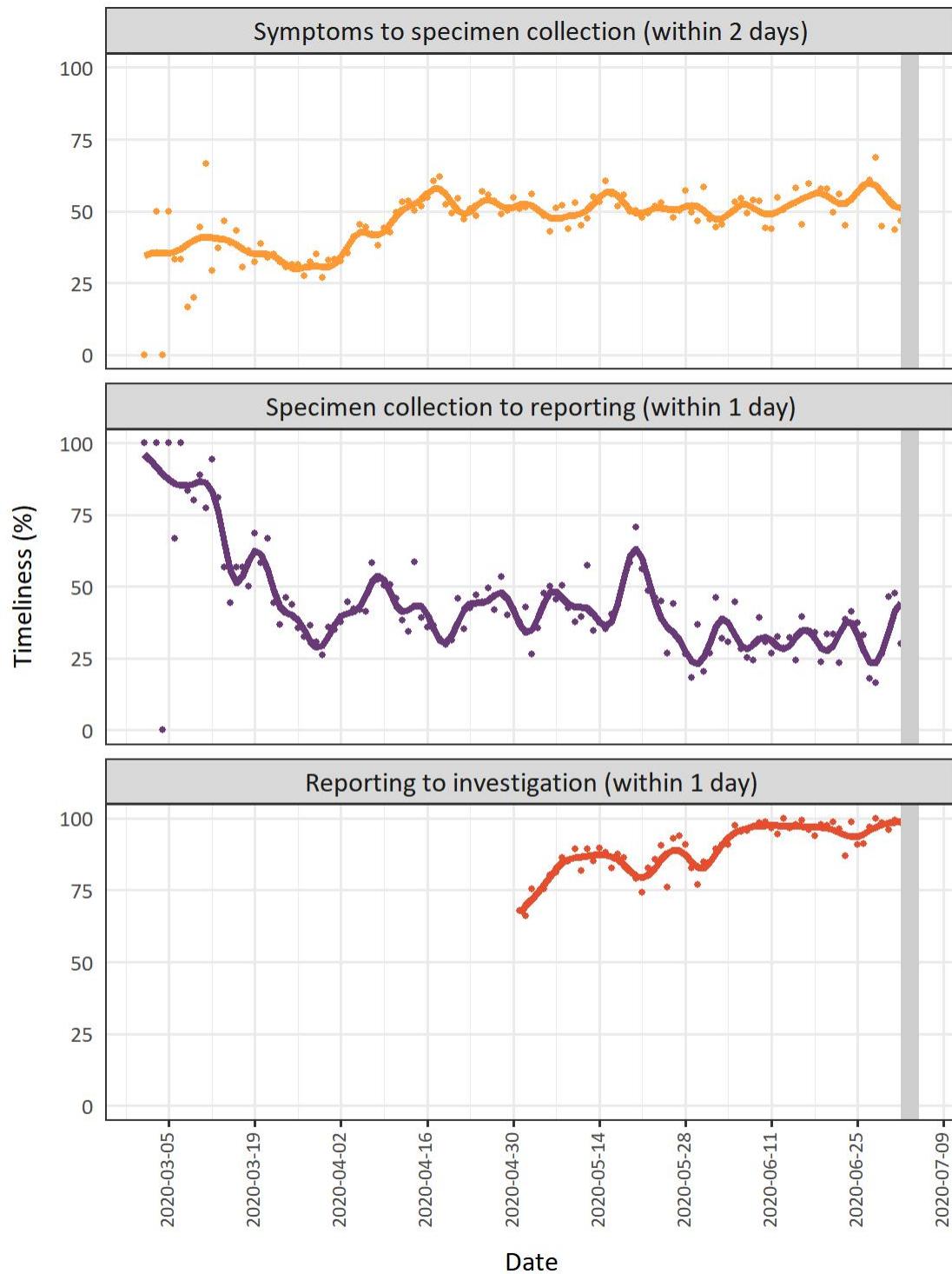
### Likely Acquisition: Ontario



Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Timeliness: Ontario

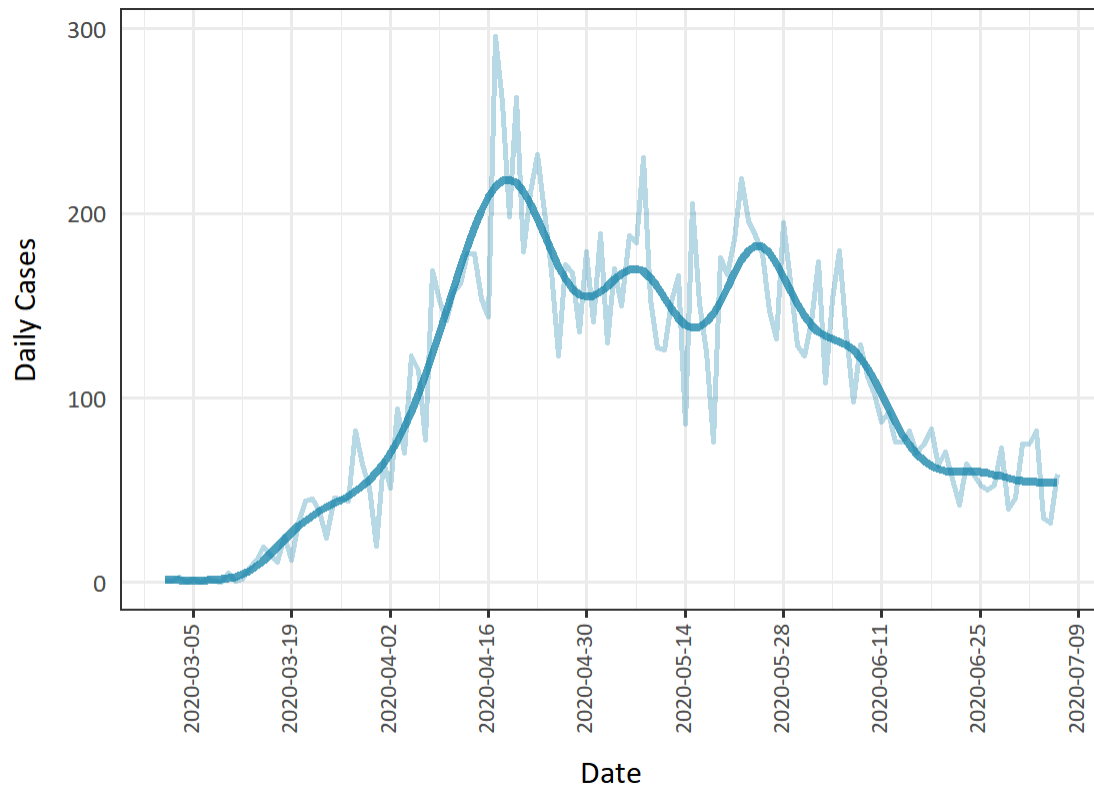


Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Toronto

### Epidemic Curve: Toronto



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

## Reproduction Number: Toronto

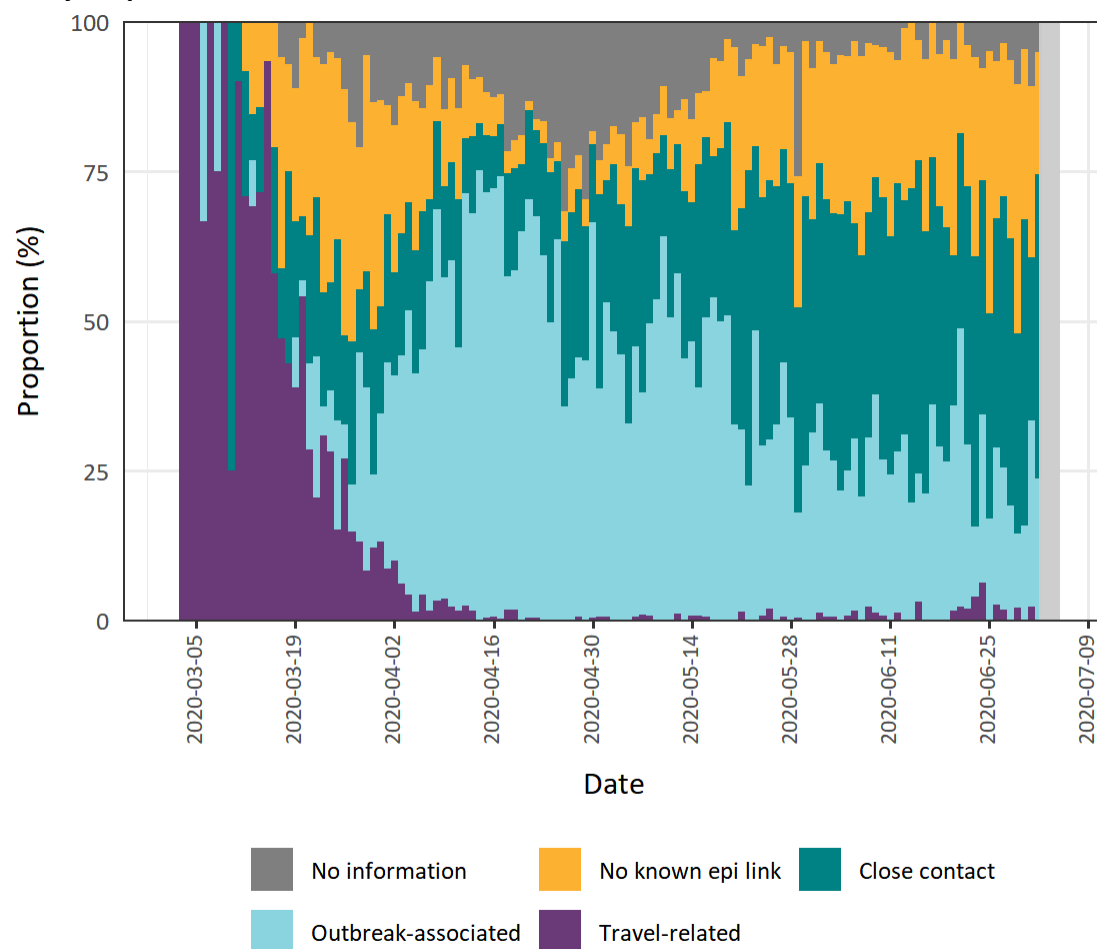
Jul 06 Re = 0.98, 95% CI: 0.89-1.1



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

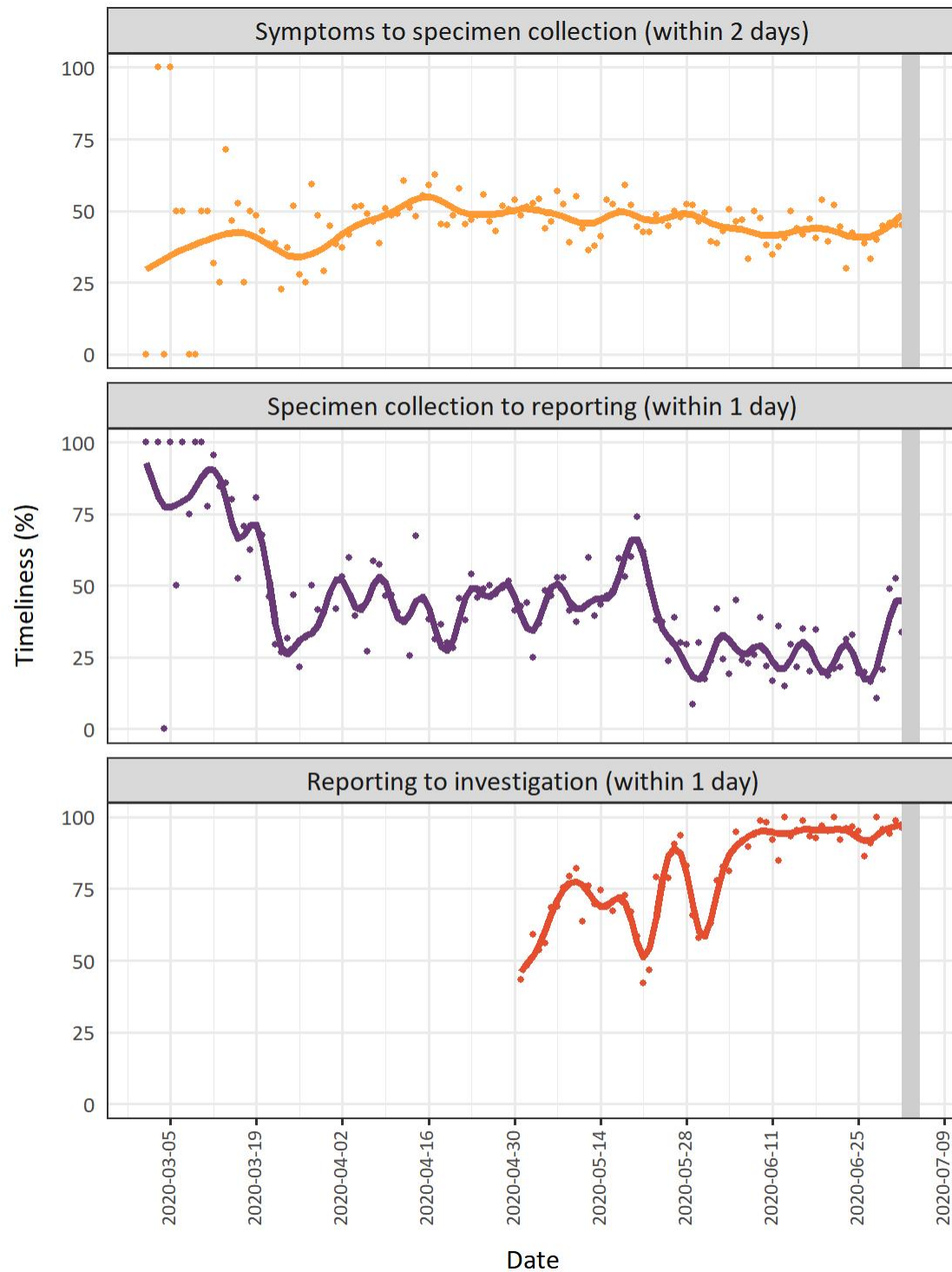
### Likely Acquisition: Toronto



Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Timeliness: Toronto

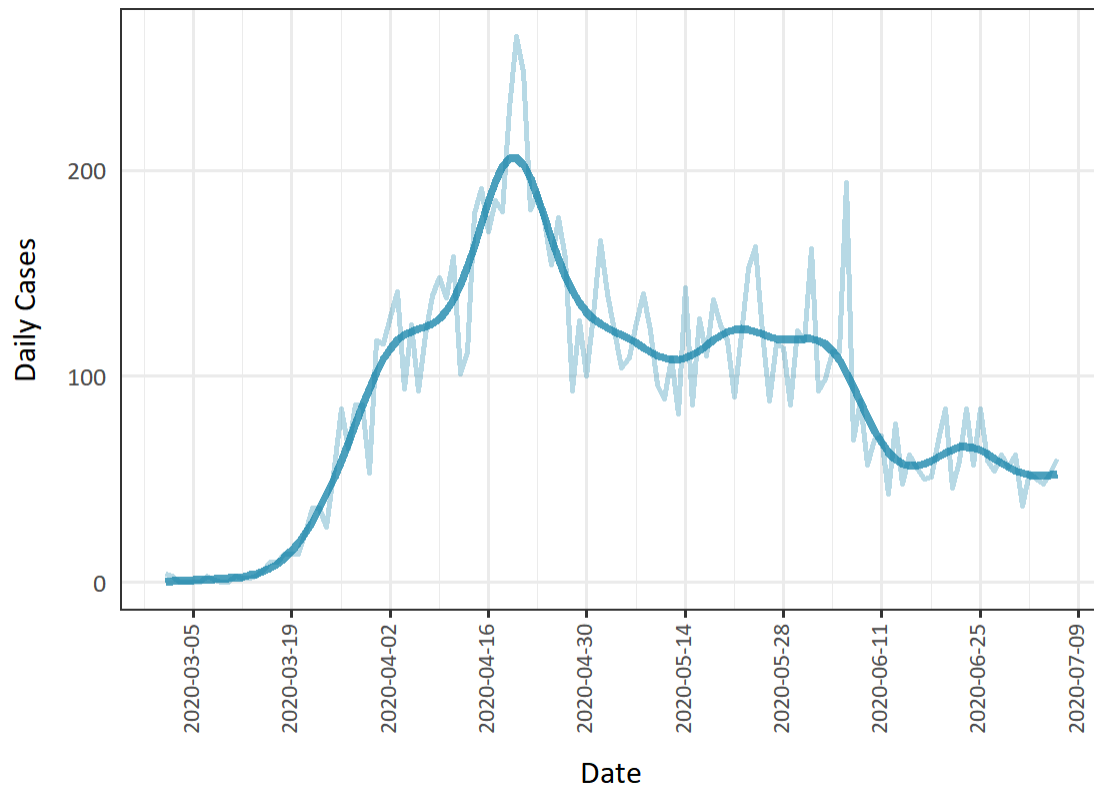


Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Central East

### Epidemic Curve: Central East



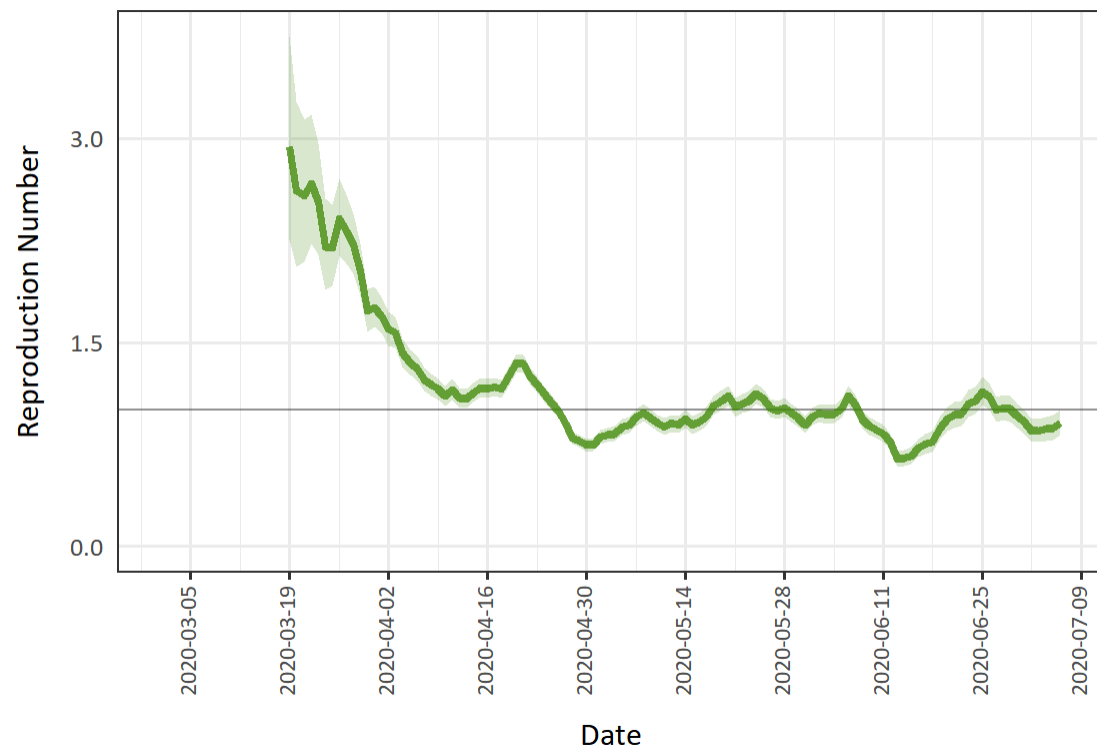
Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus



## Reproduction Number: Central East

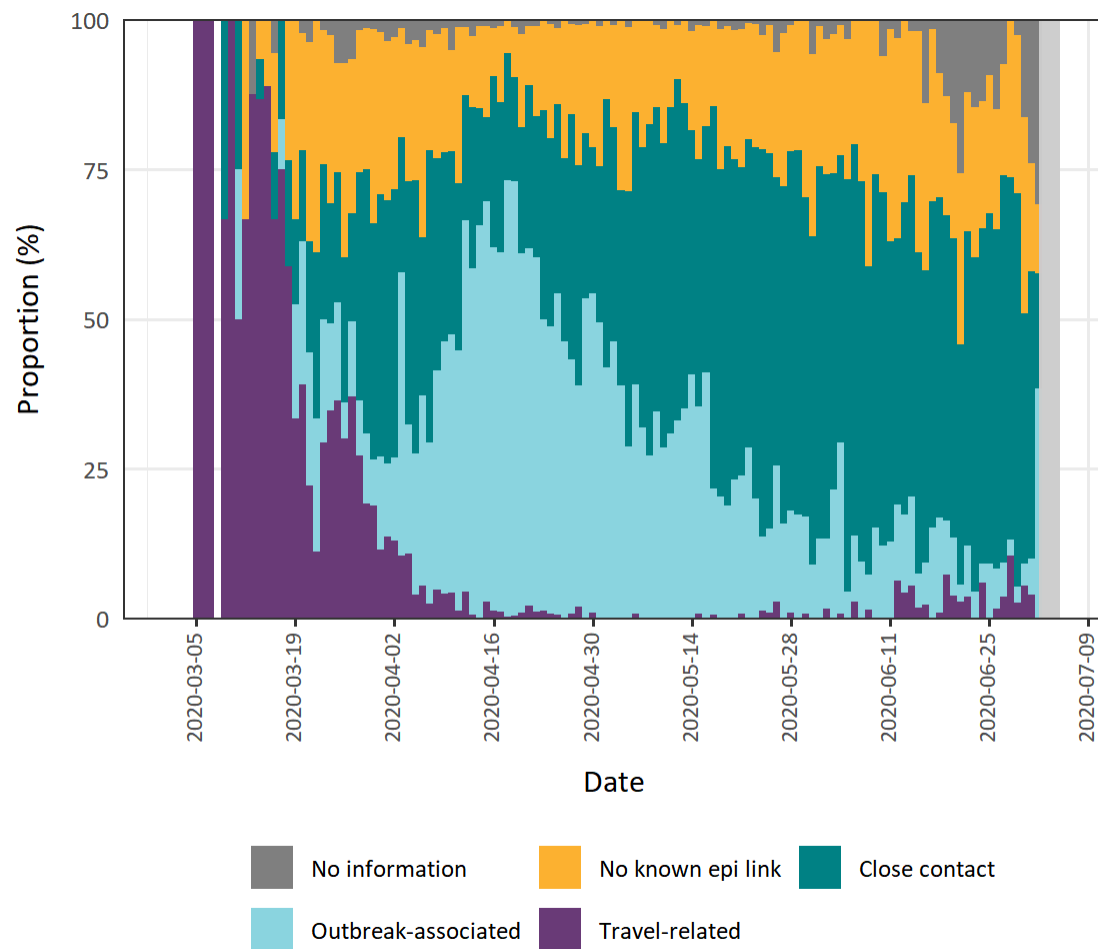
Jul 06 Re = 0.91, 95% CI: 0.82-1.0



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

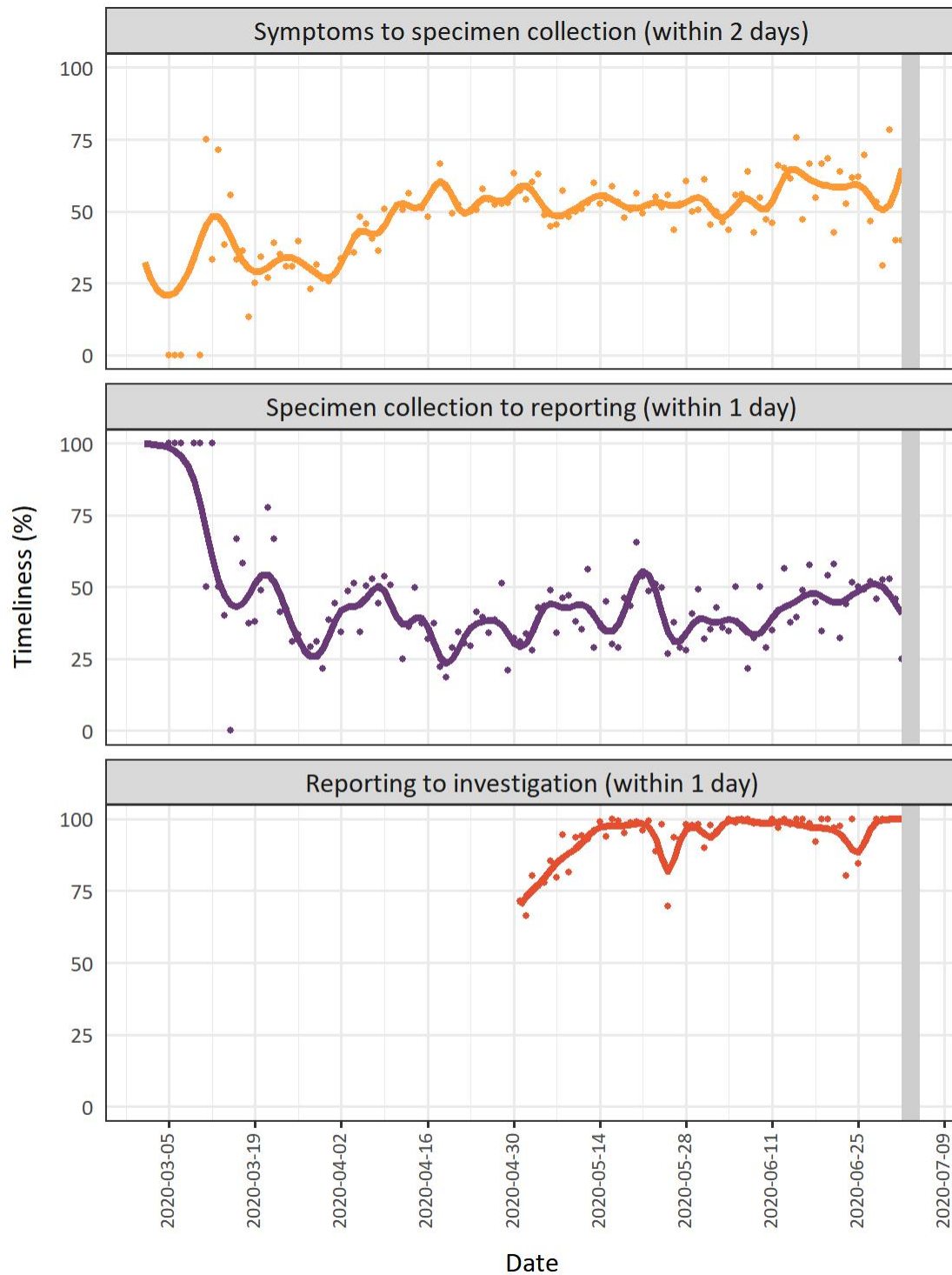
### Likely Acquisition: Central East



Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Timeliness: Central East

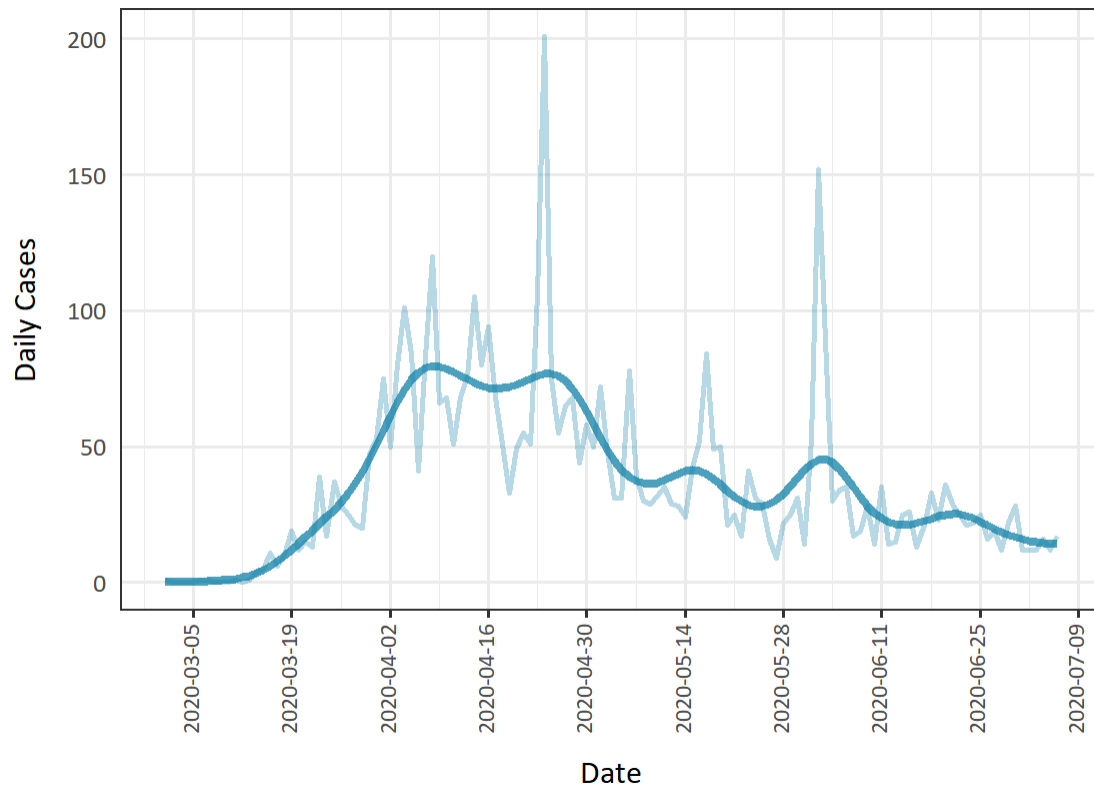


Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Central West

### Epidemic Curve: Central West

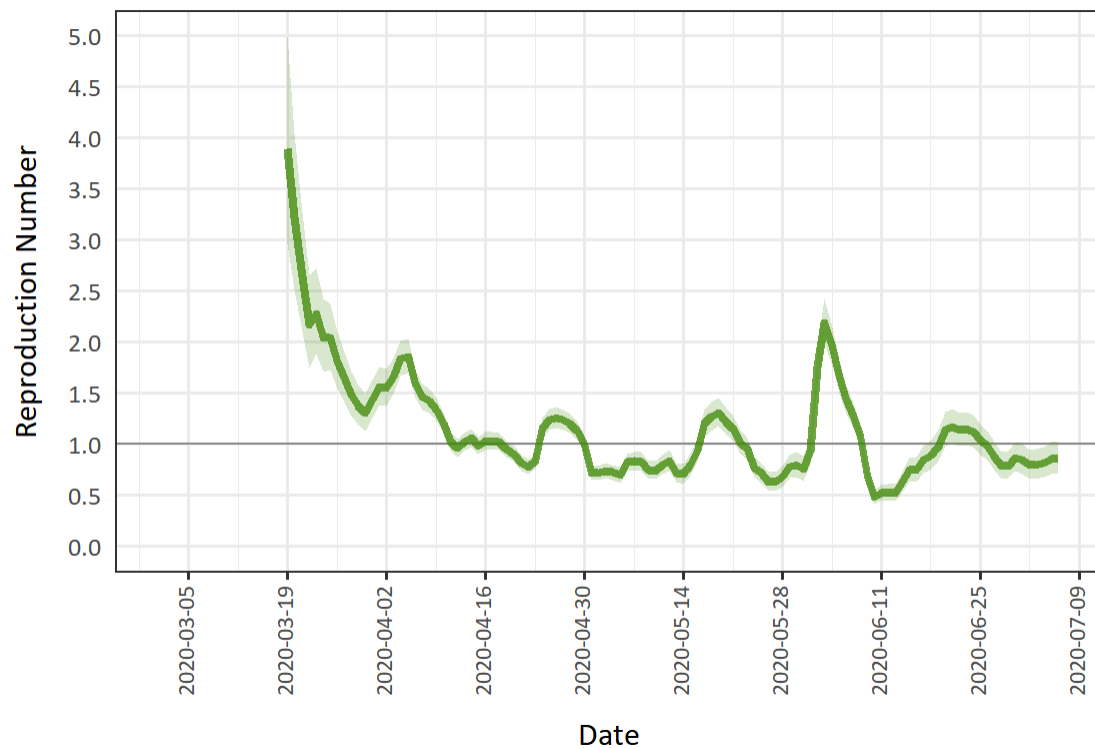


Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

## Reproduction Number: Central West

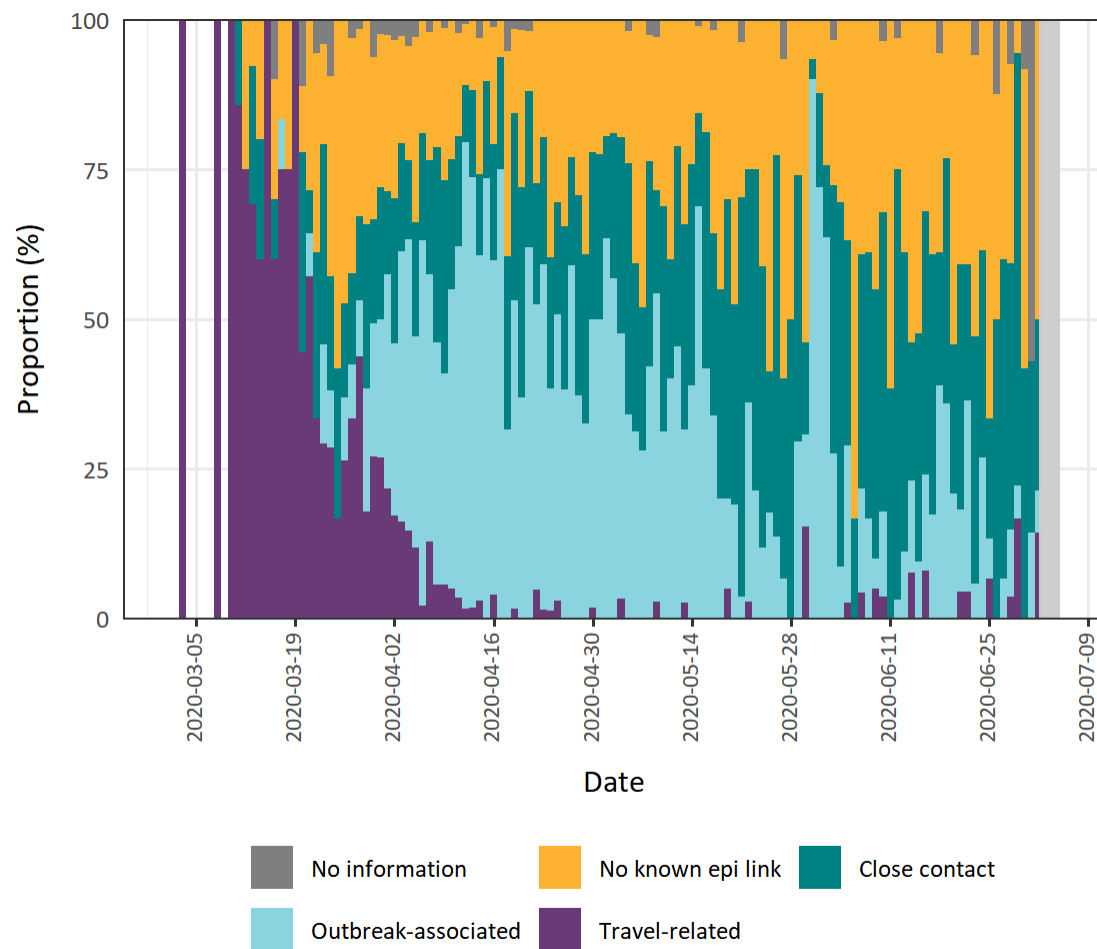
Jul 06 Re = 0.85, 95% CI: 0.70-1.0



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

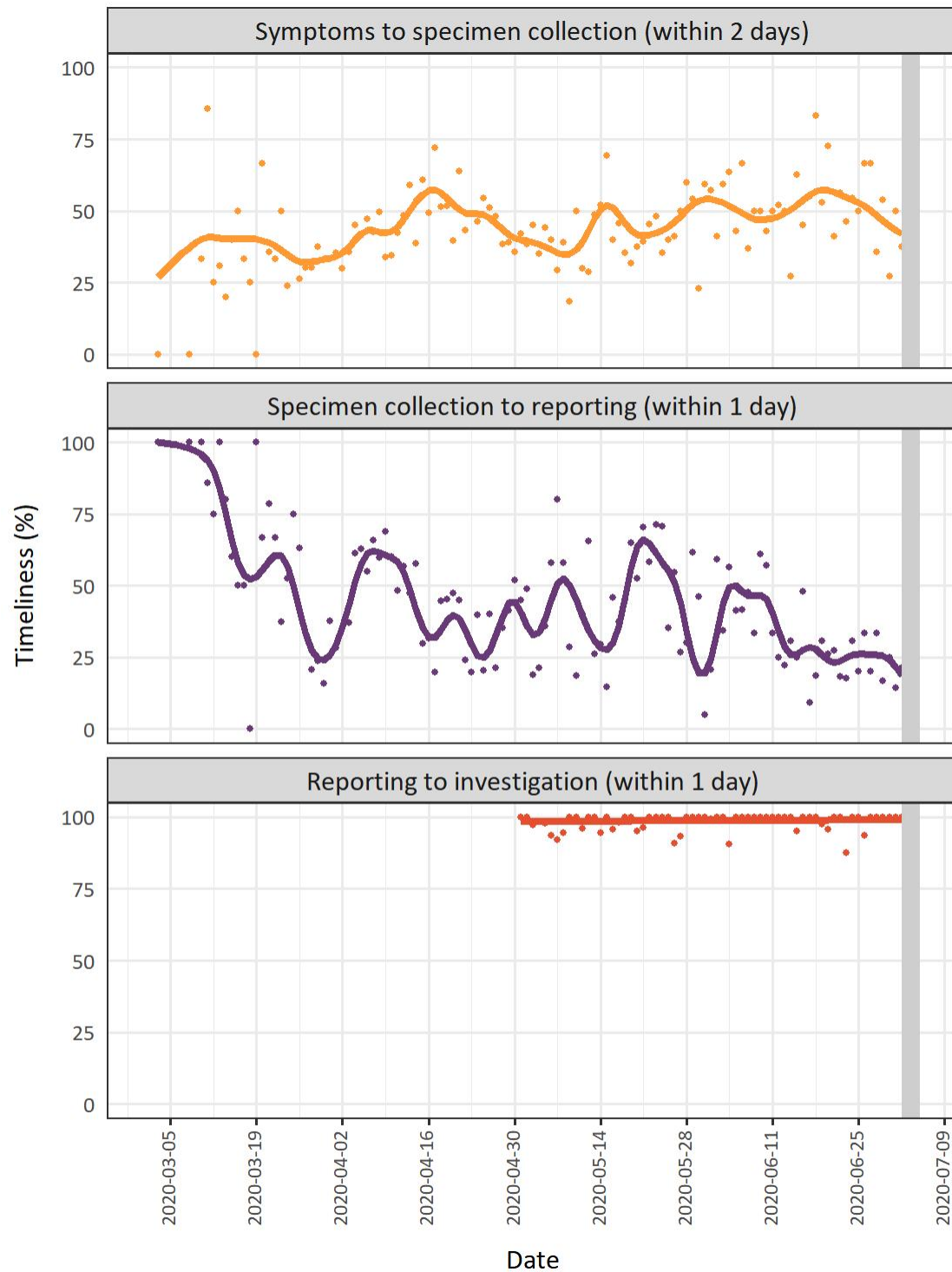
### Likely Acquisition: Central West



Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Timeliness: Central West

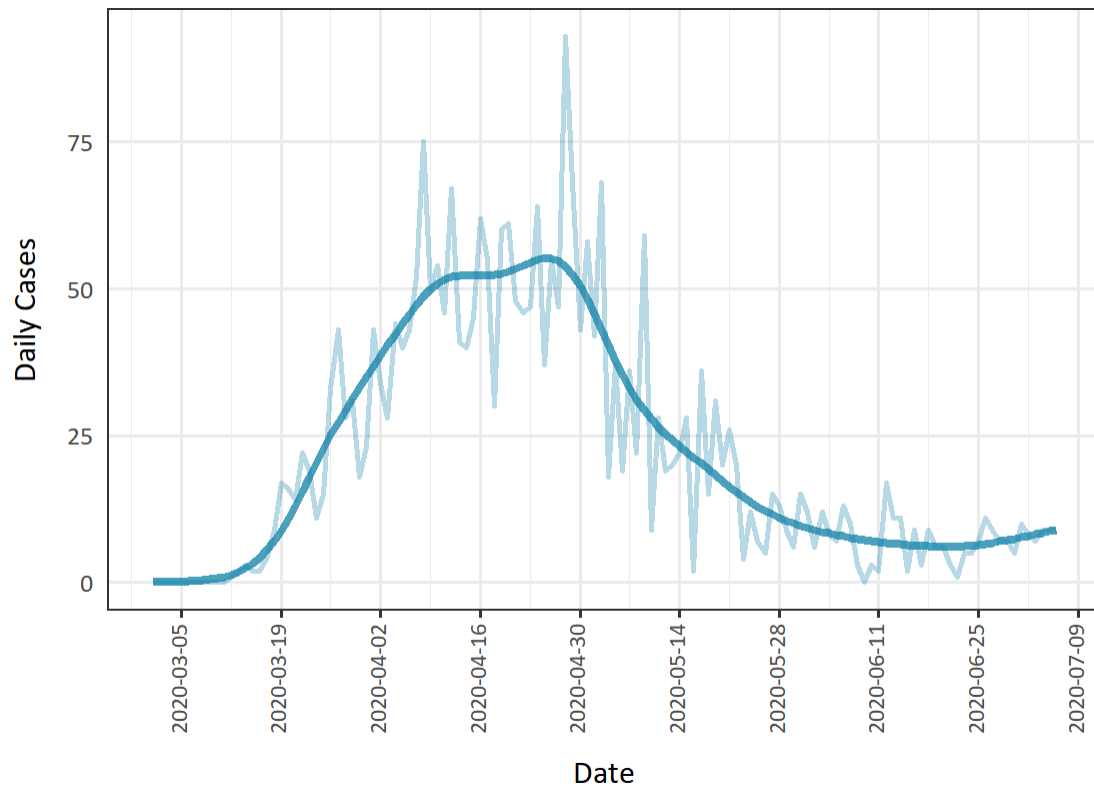


Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Eastern

### Epidemic Curve: Eastern



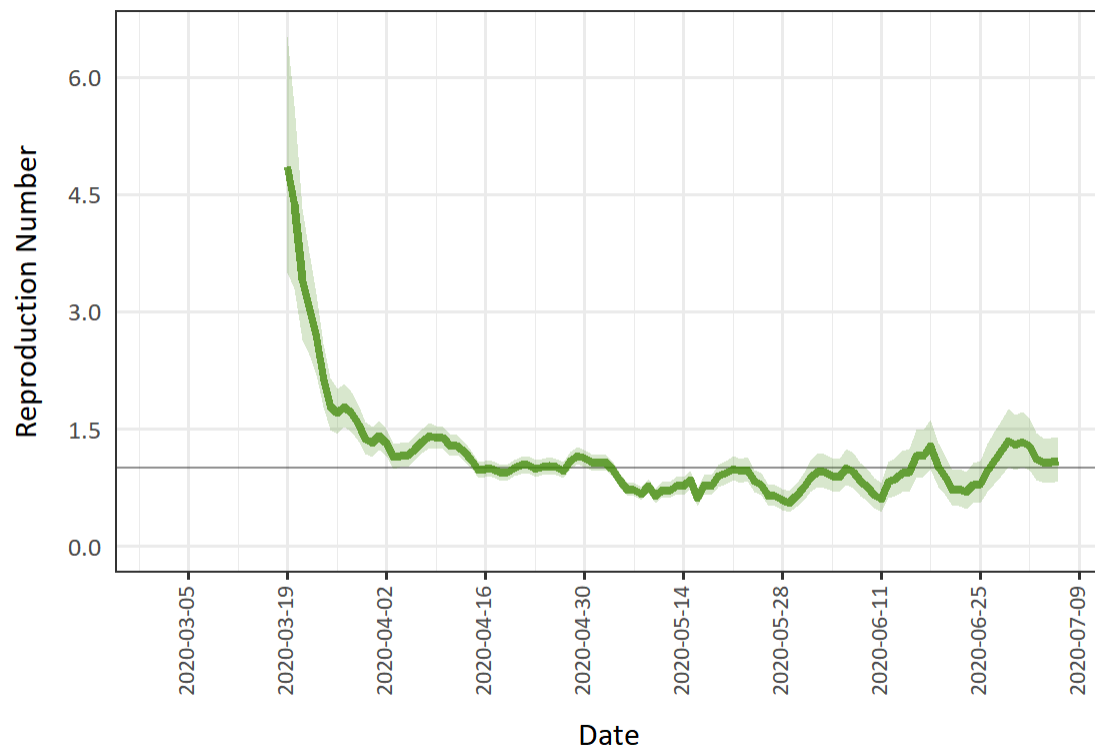
Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus



### Reproduction Number: Eastern

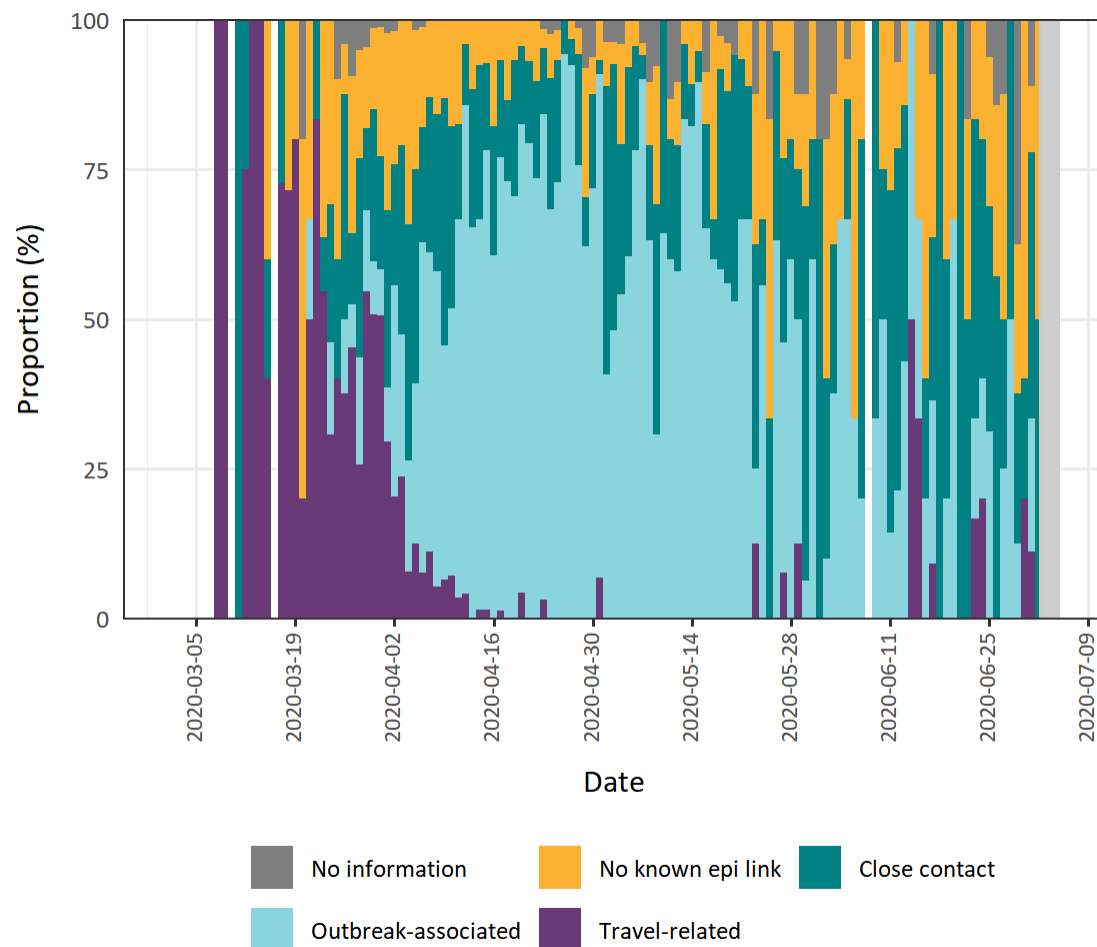
Jul 06 Re = 1.1, 95% CI: 0.84-1.4



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

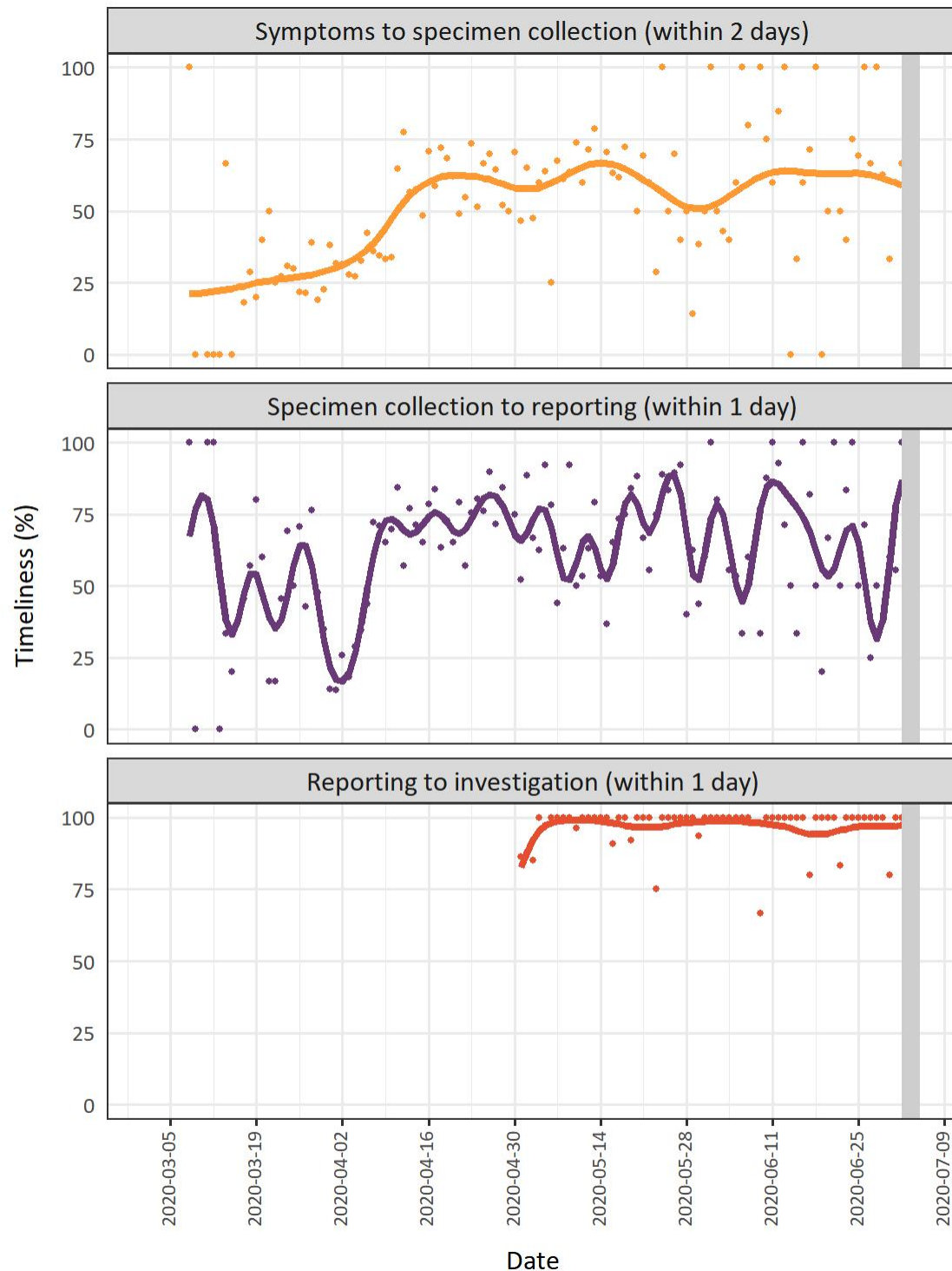
### Likely Acquisition: Eastern



Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Timeliness: Eastern

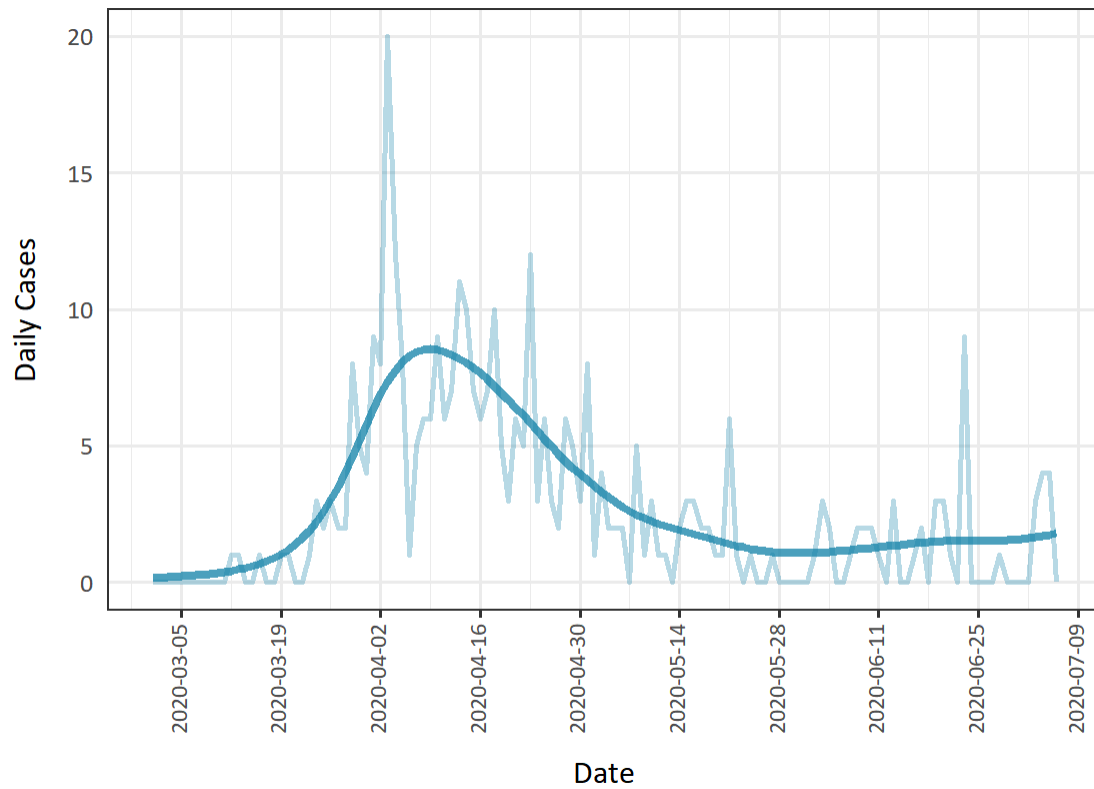


Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## North

### Epidemic Curve: North

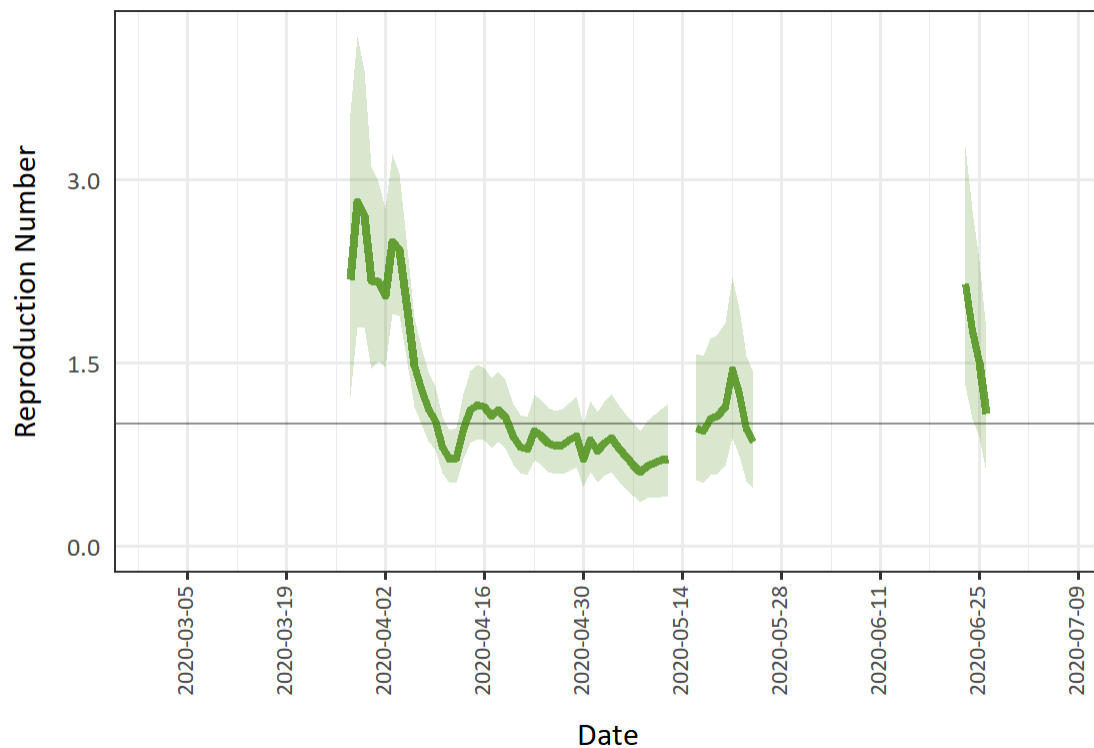


Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

## Reproduction Number: North

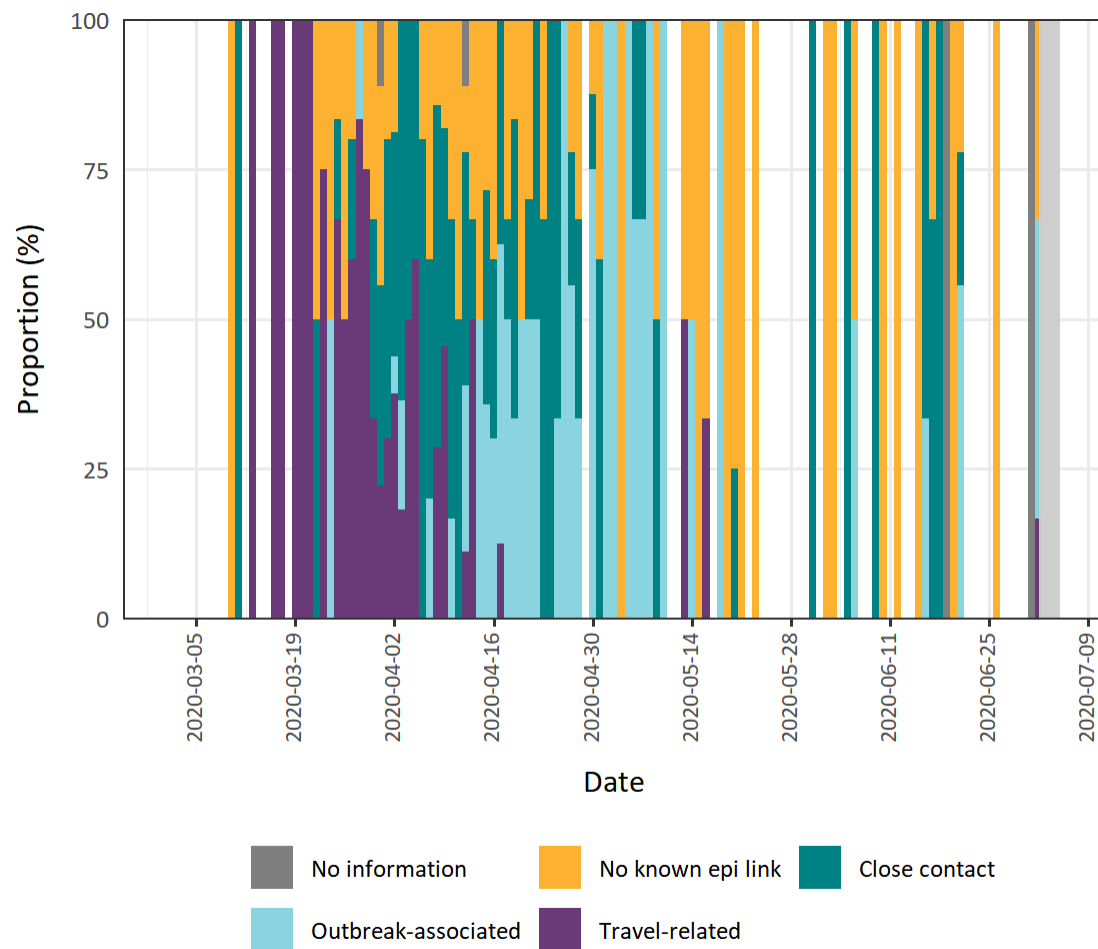
Jul 06 Re not provided: fewer than 12 cases in the 7 days prior to this date



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

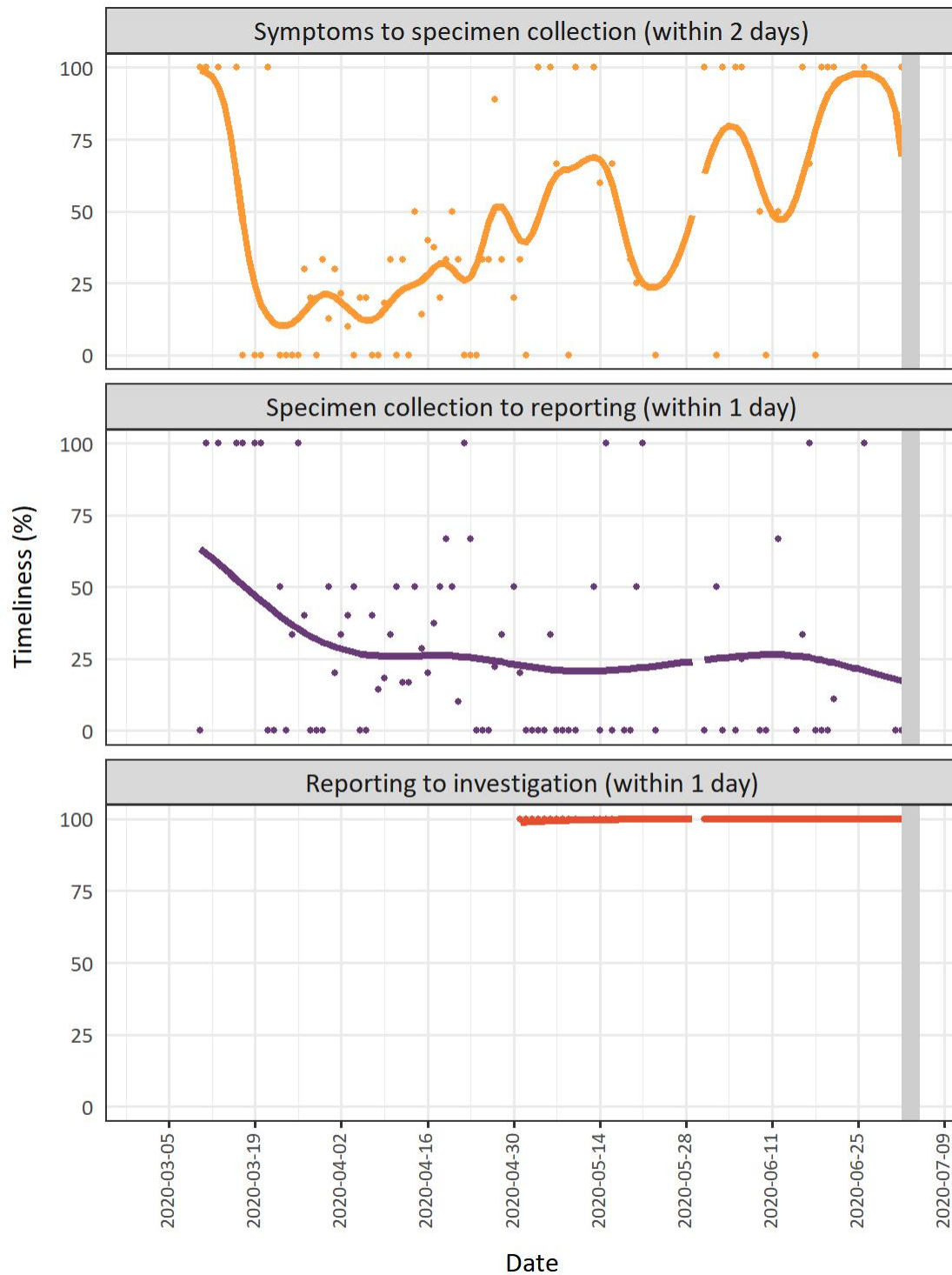
## Likely Acquisition: North



Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Timeliness: North

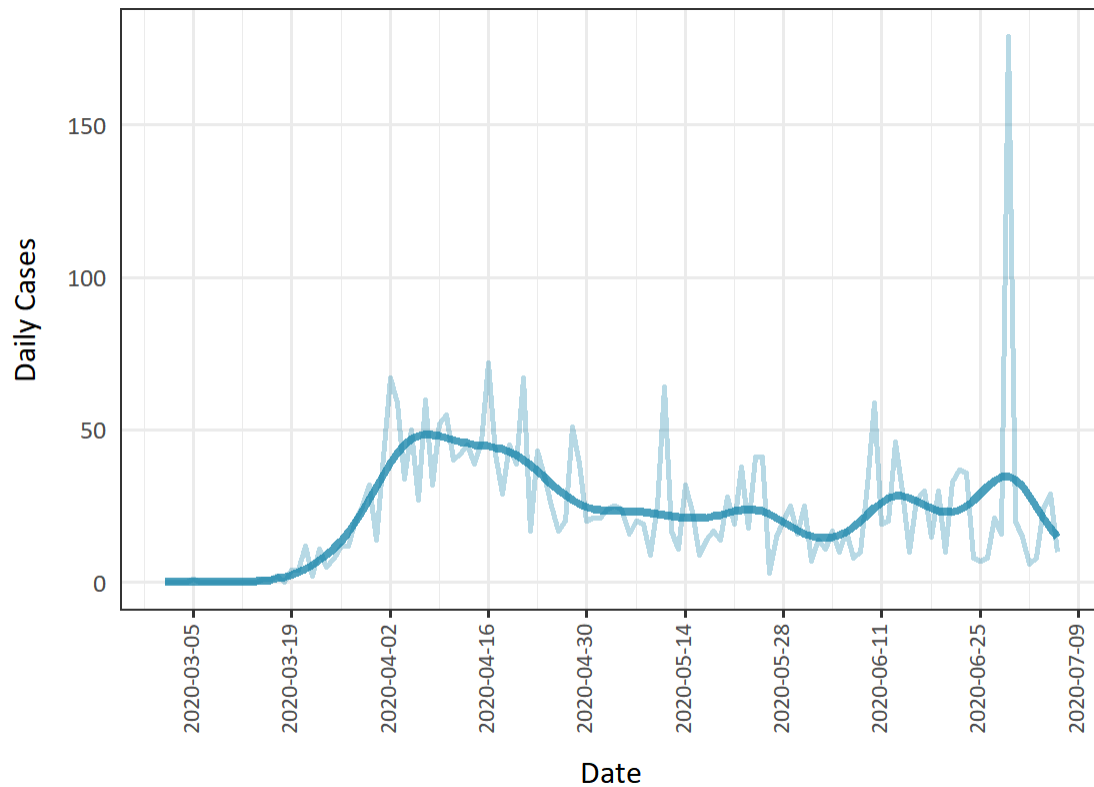


Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## South West

### Epidemic Curve: South West



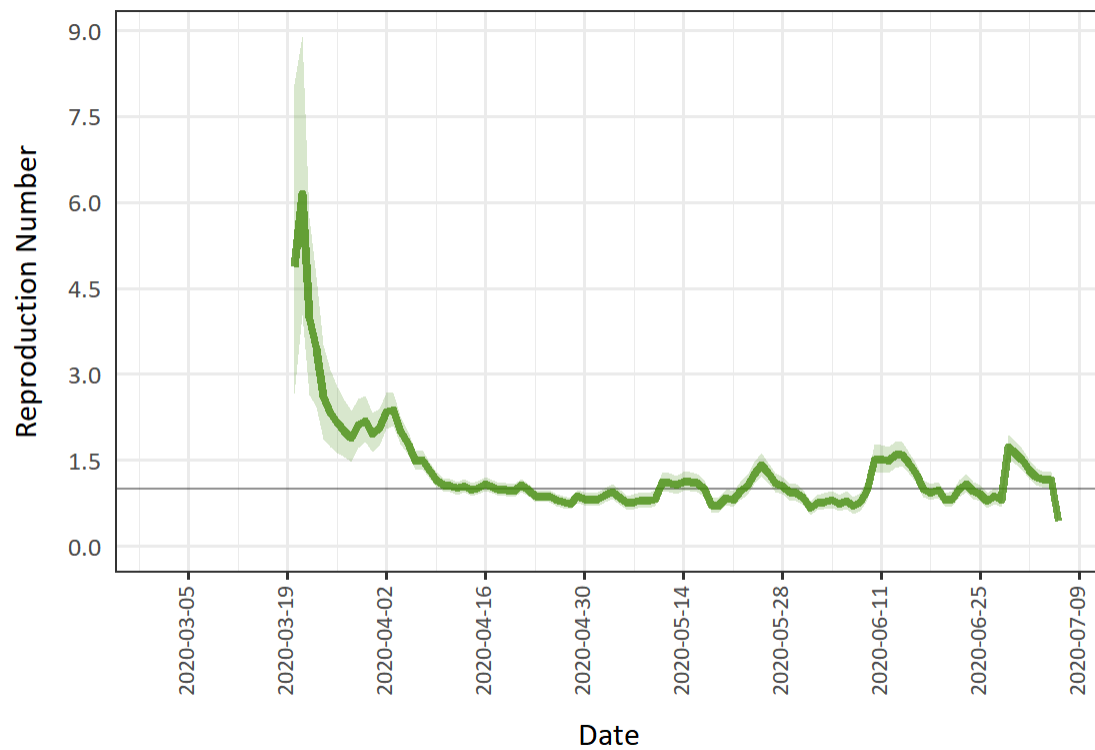
Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus



## Reproduction Number: South West

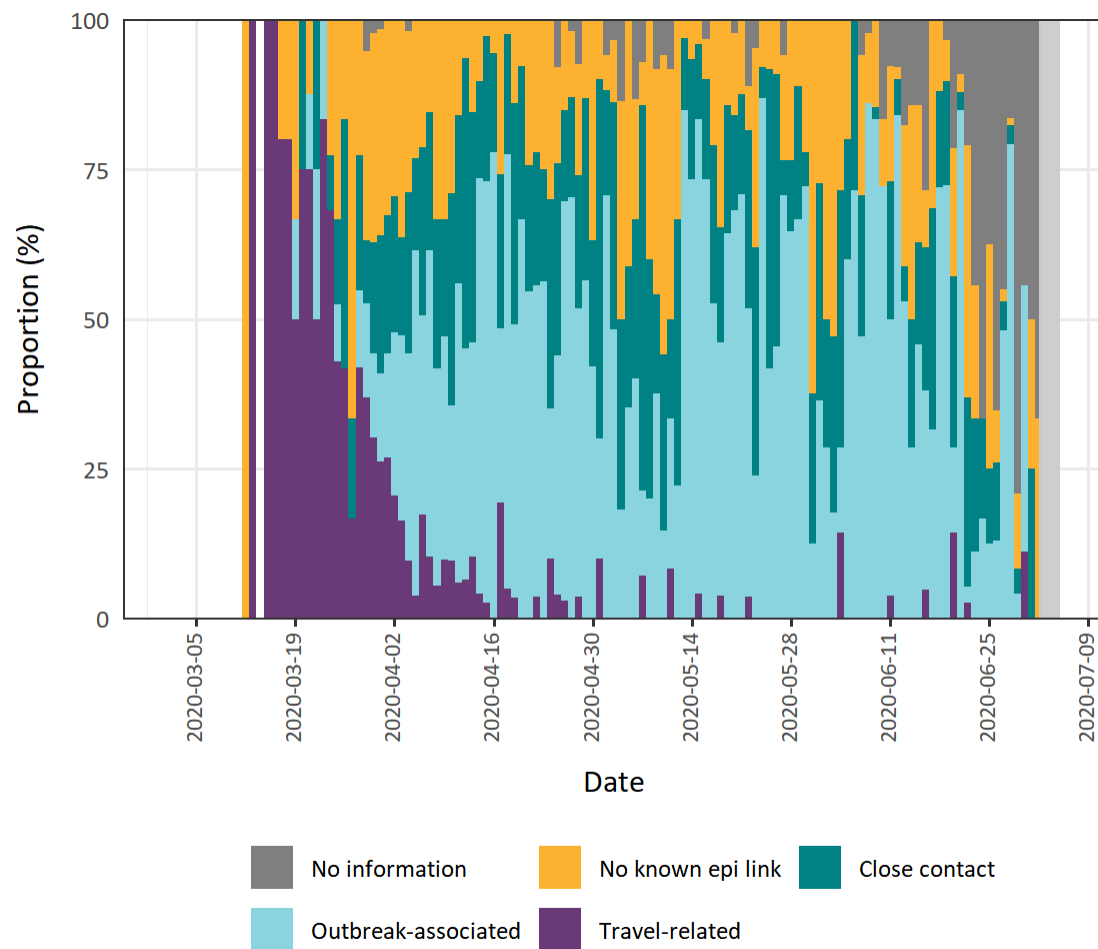
Jul 06 Re = 0.45, 95% CI: 0.37-0.53



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

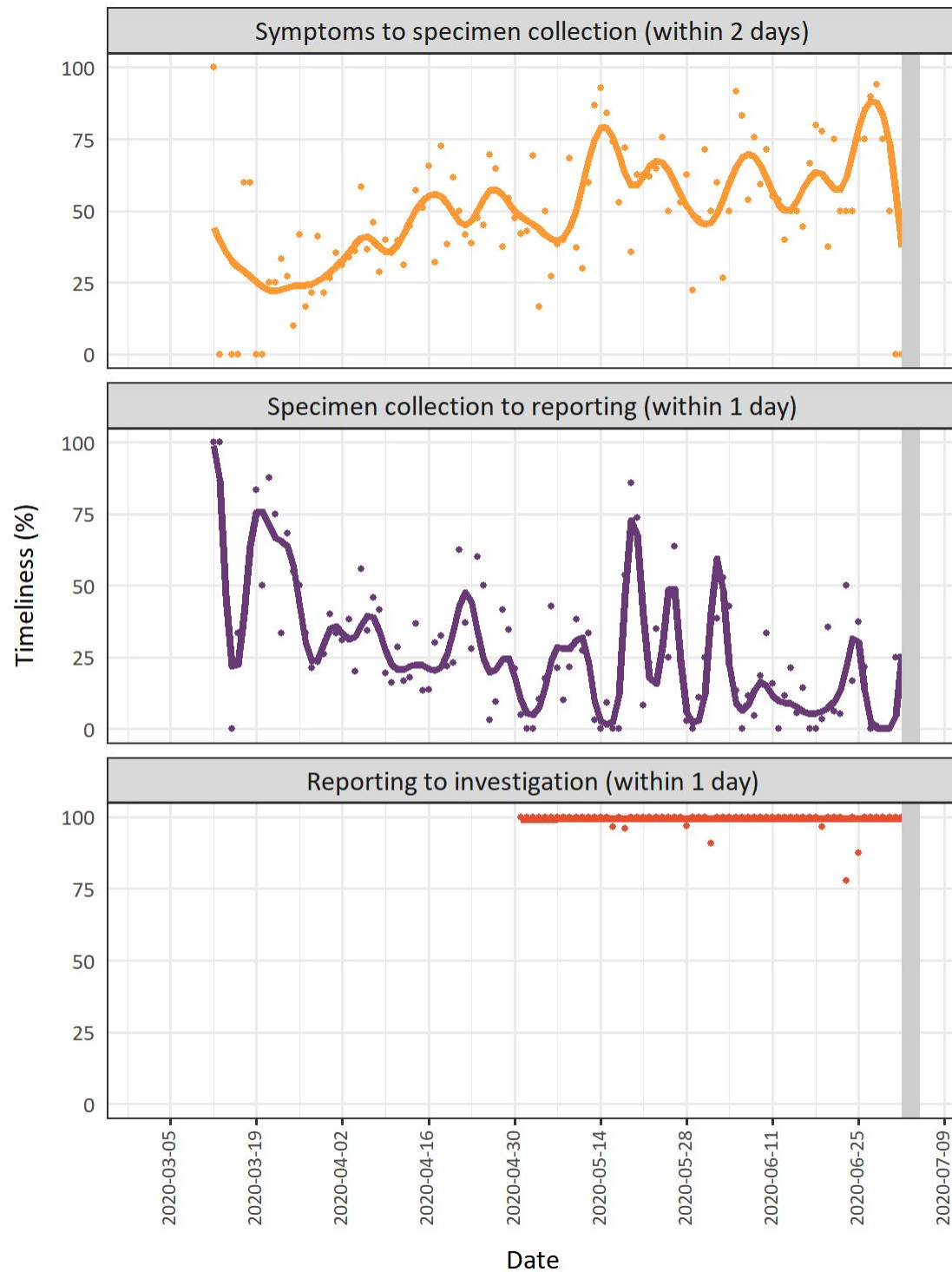
### Likely Acquisition: South West



Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Timeliness: South West

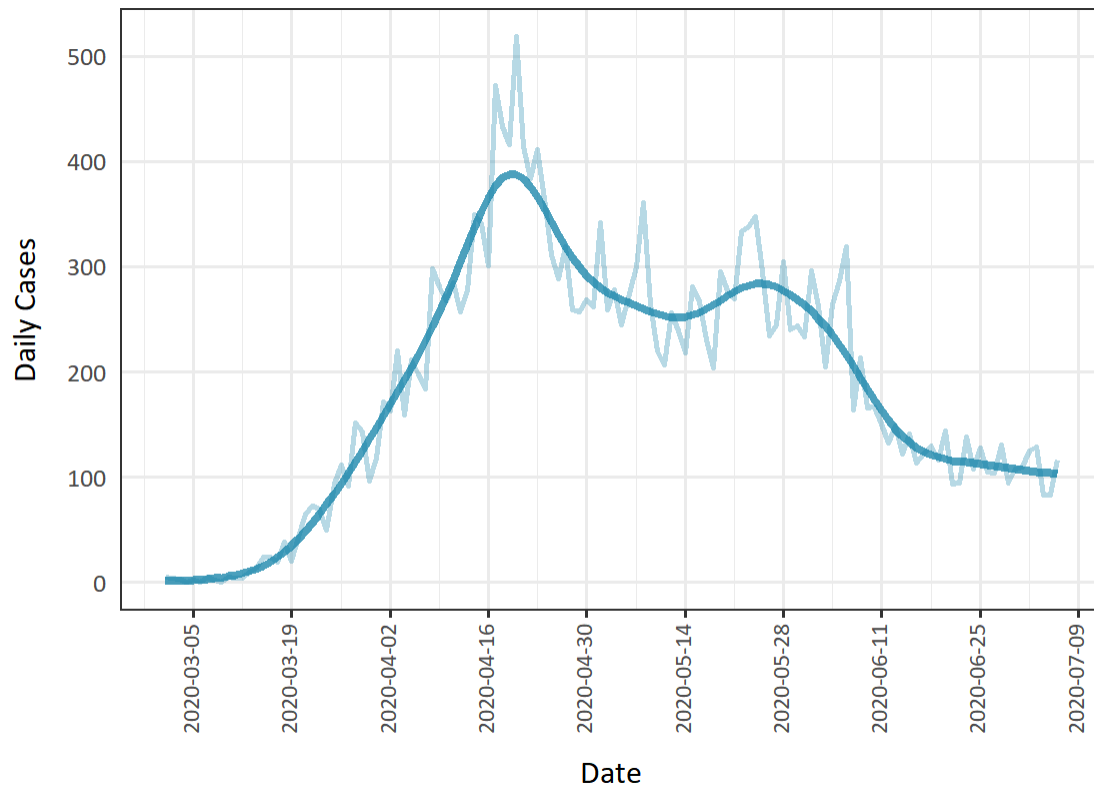


Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## GTA

### Epidemic Curve: GTA

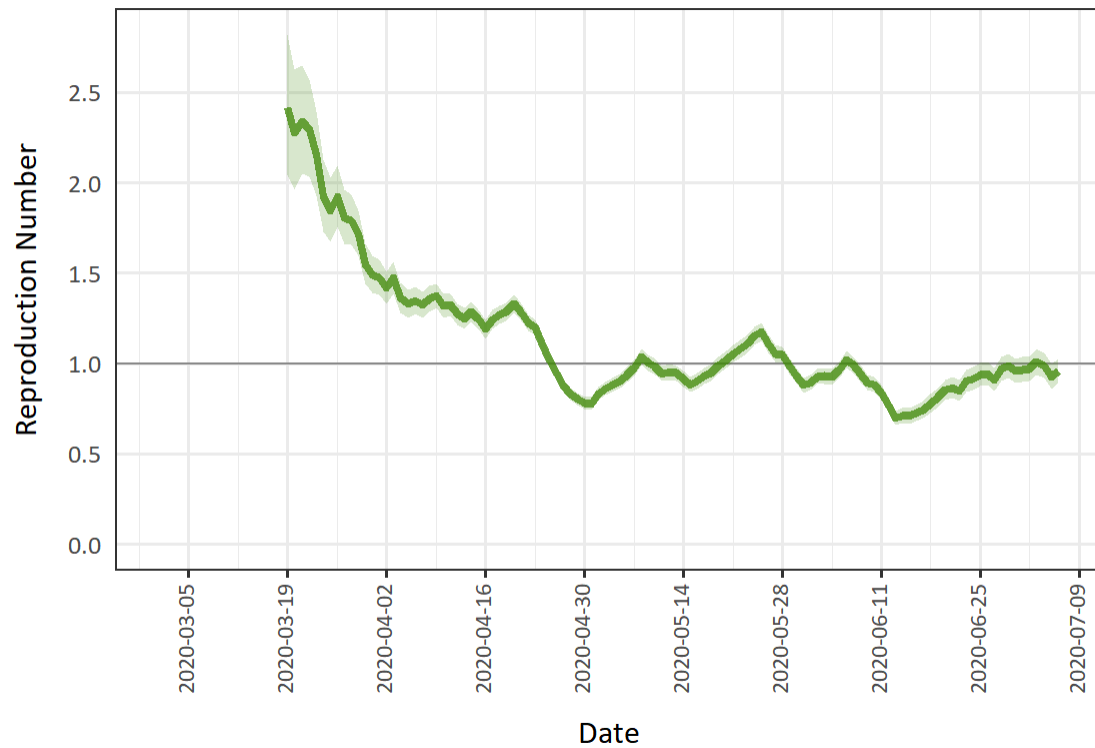


Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

## Reproduction Number: GTA

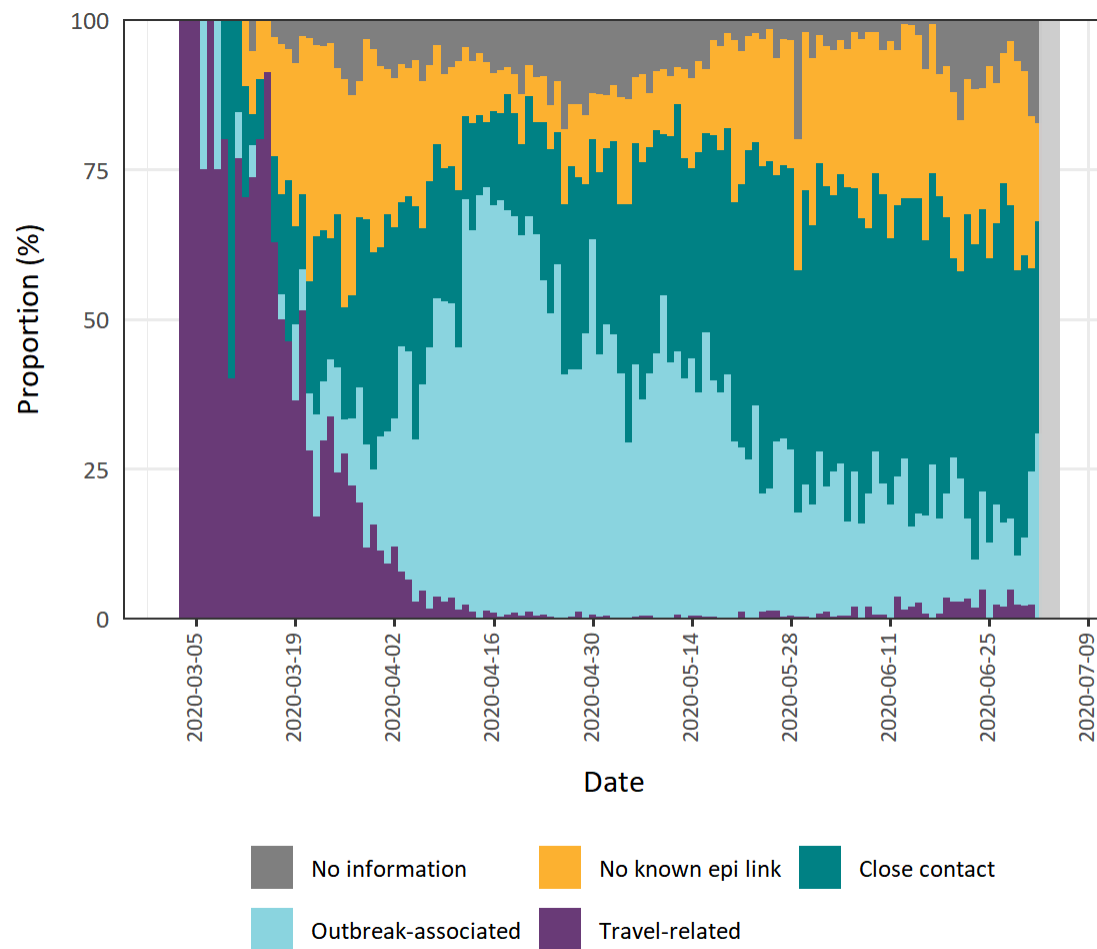
Jul 06 Re = 0.96, 95% CI: 0.89-1.0



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

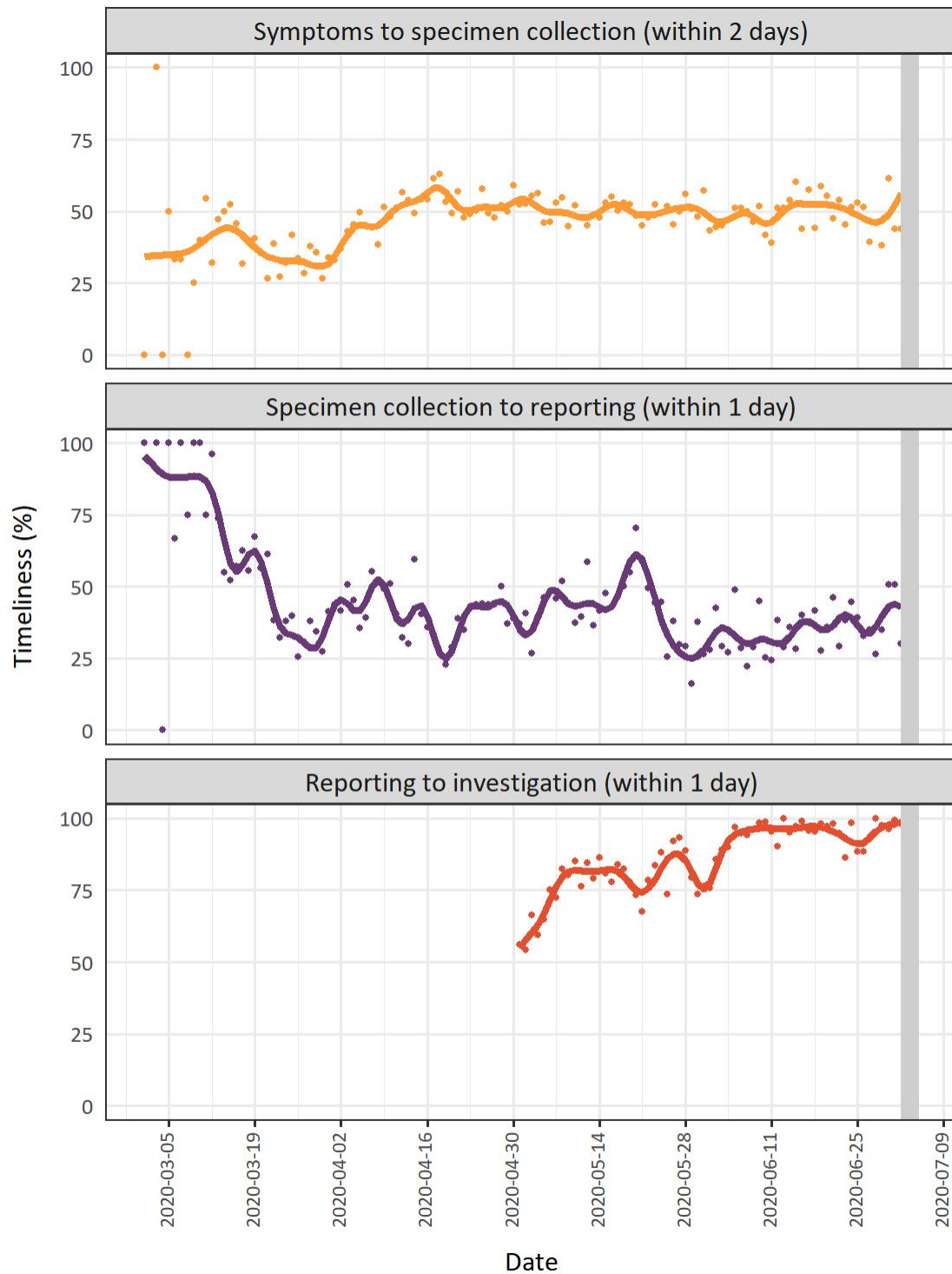
### Likely Acquisition: GTA



Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Timeliness: GTA

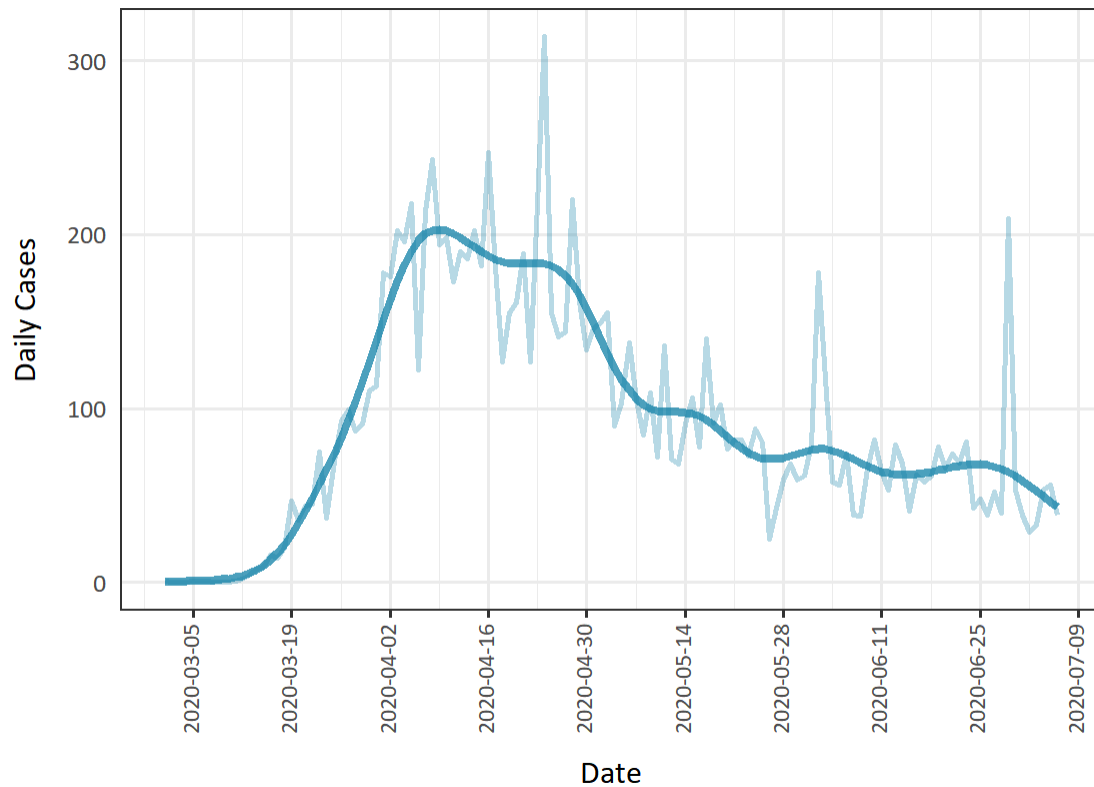


Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Non-GTA

### Epidemic Curve: Non-GTA



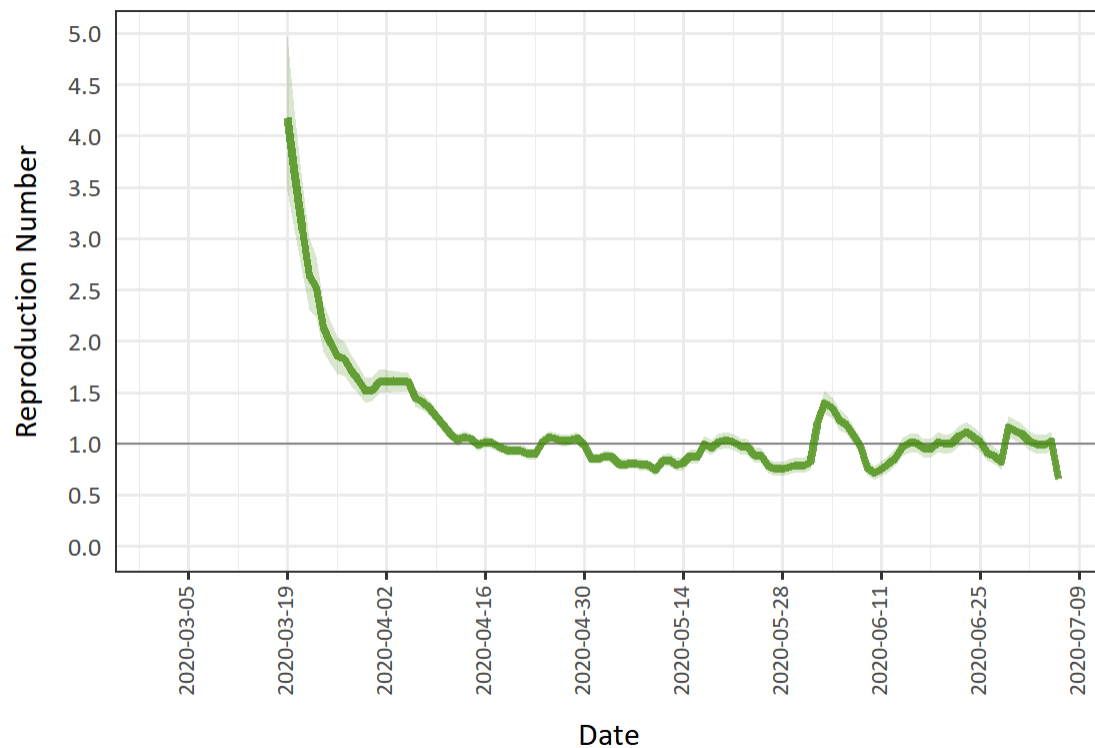
Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus



## Reproduction Number: Non-GTA

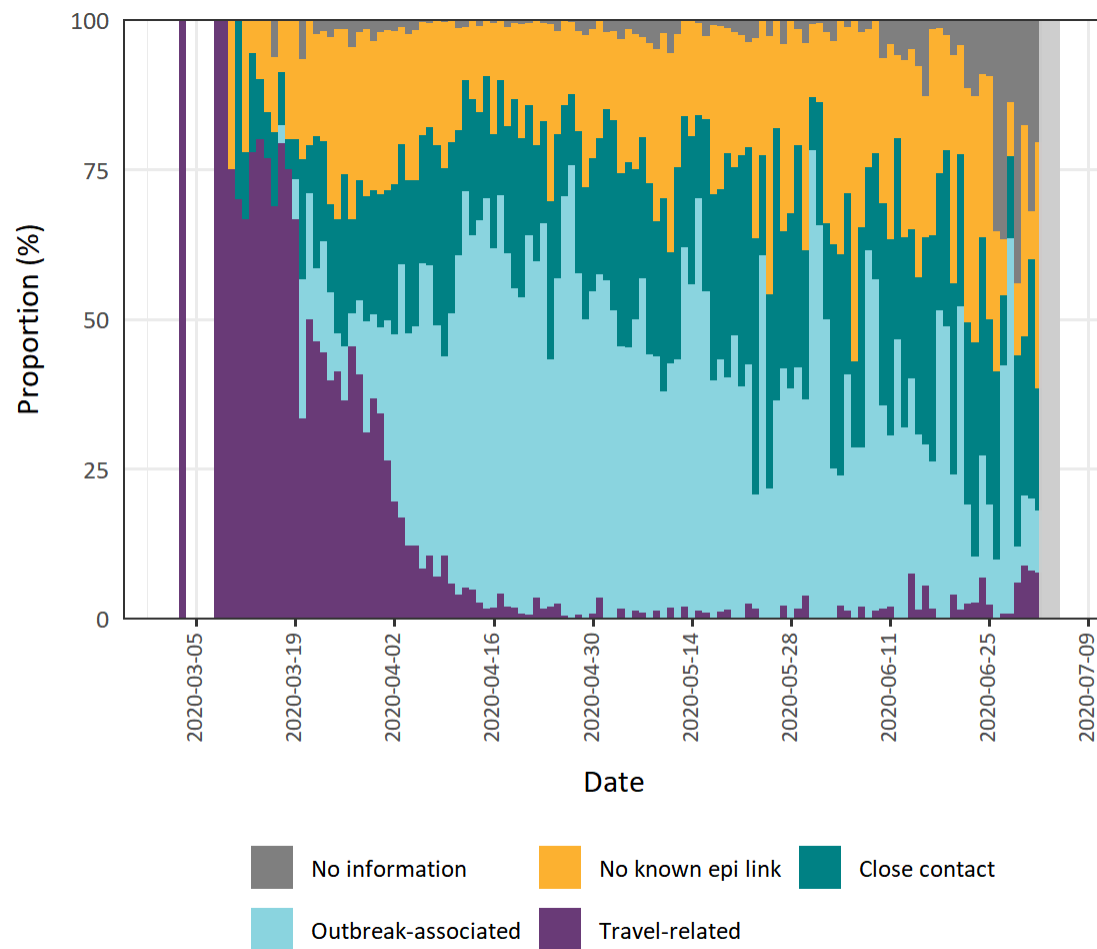
Jul 06 Re = 0.66, 95% CI: 0.58-0.73



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

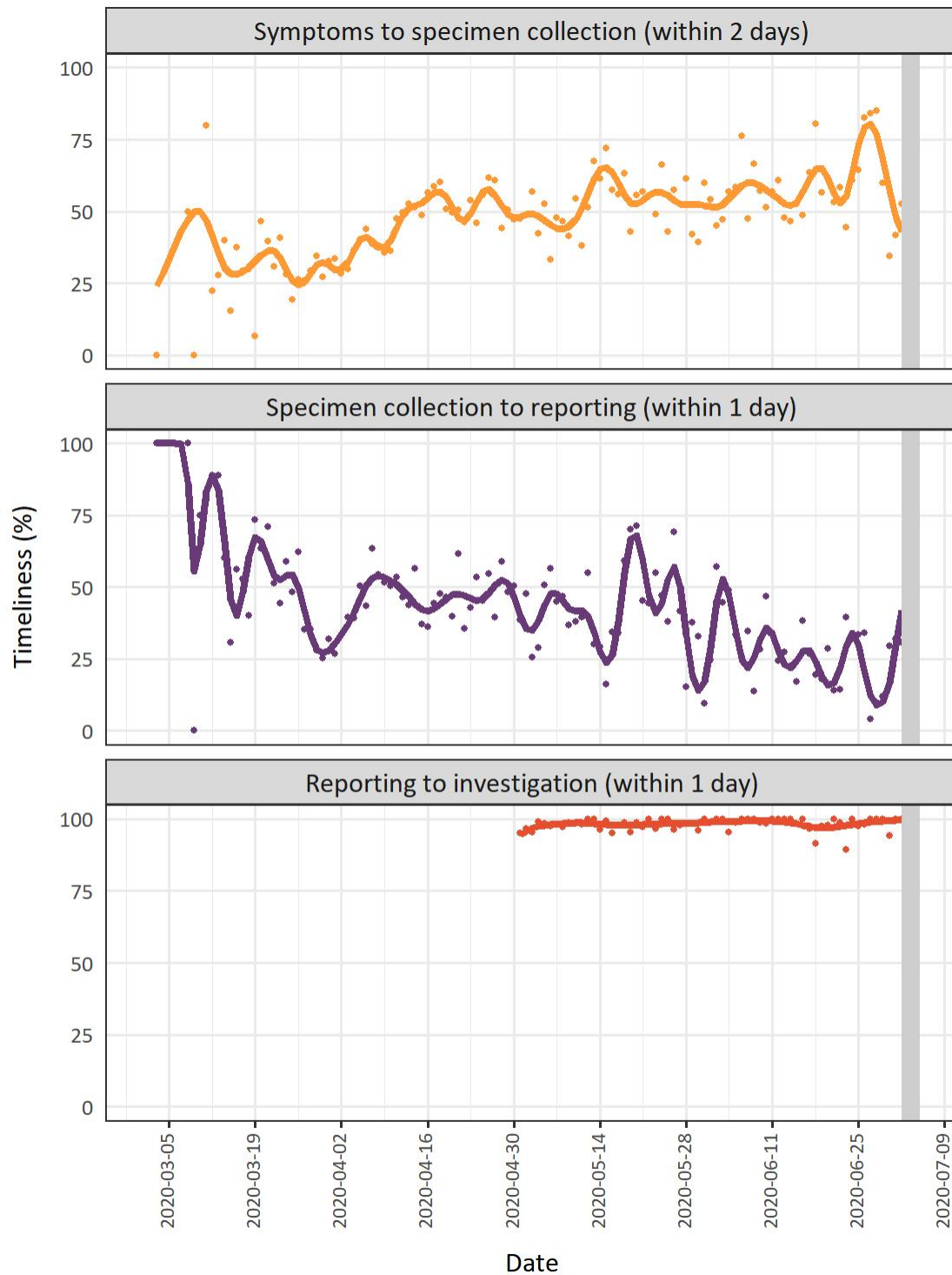
### Likely Acquisition: Non-GTA



Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Timeliness: Non-GTA

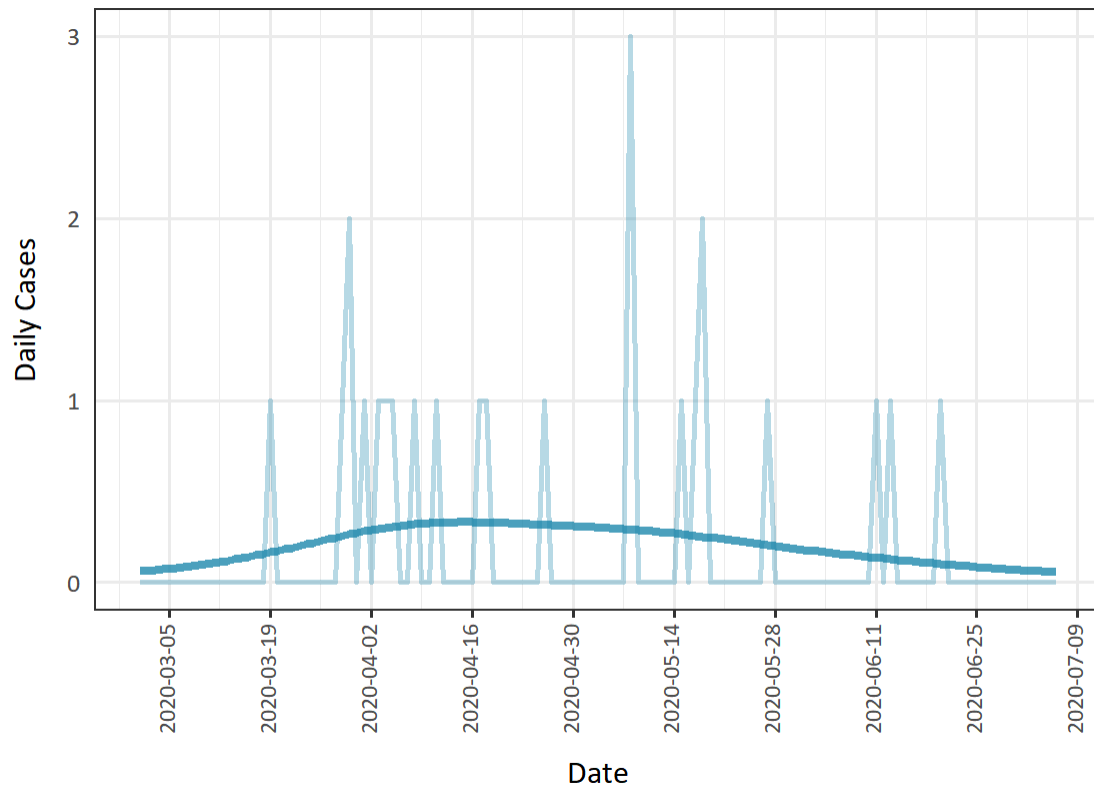


Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Algoma Public Health

### Epidemic Curve: Algoma Public Health

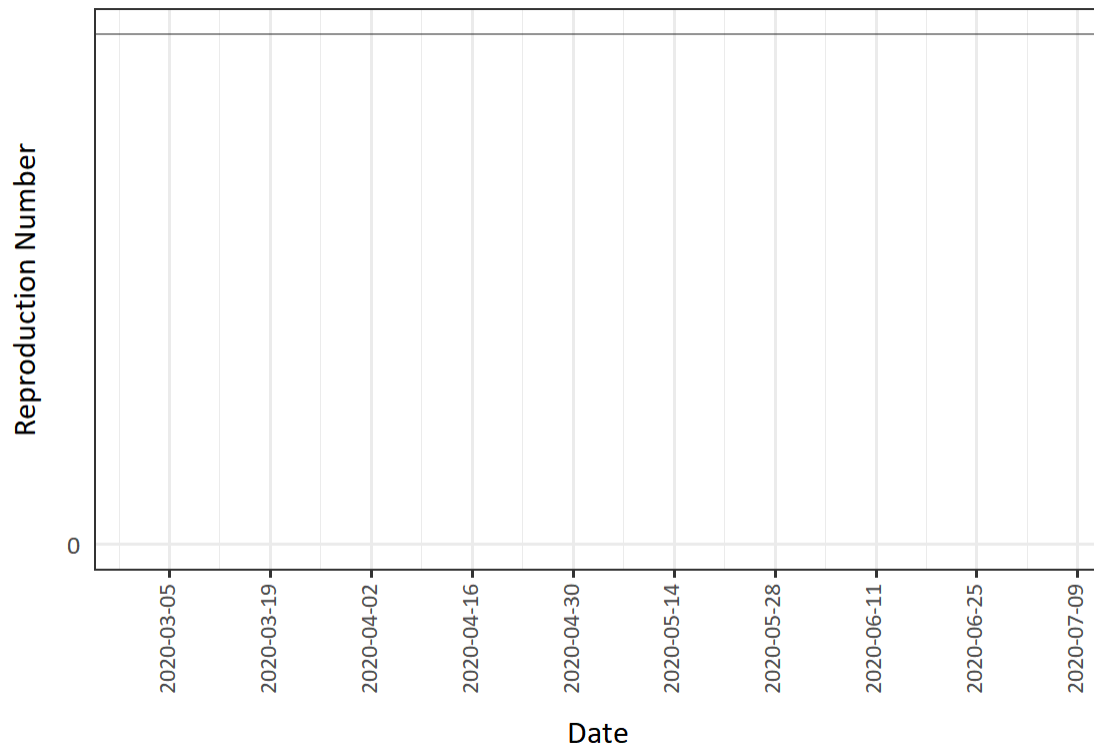


Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

## Reproduction Number: Algoma Public Health

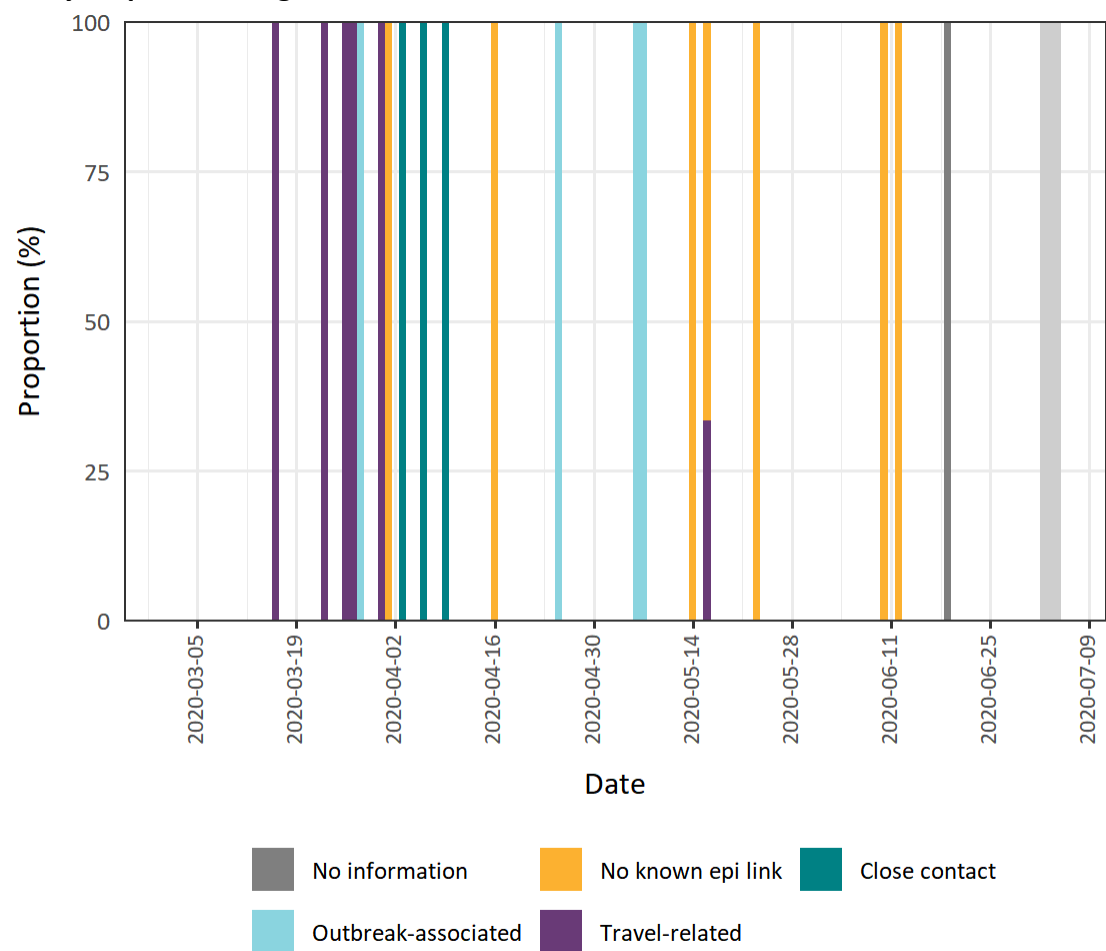
Jul 06 Re not provided: fewer than 12 cases in the 7 days prior to this date



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

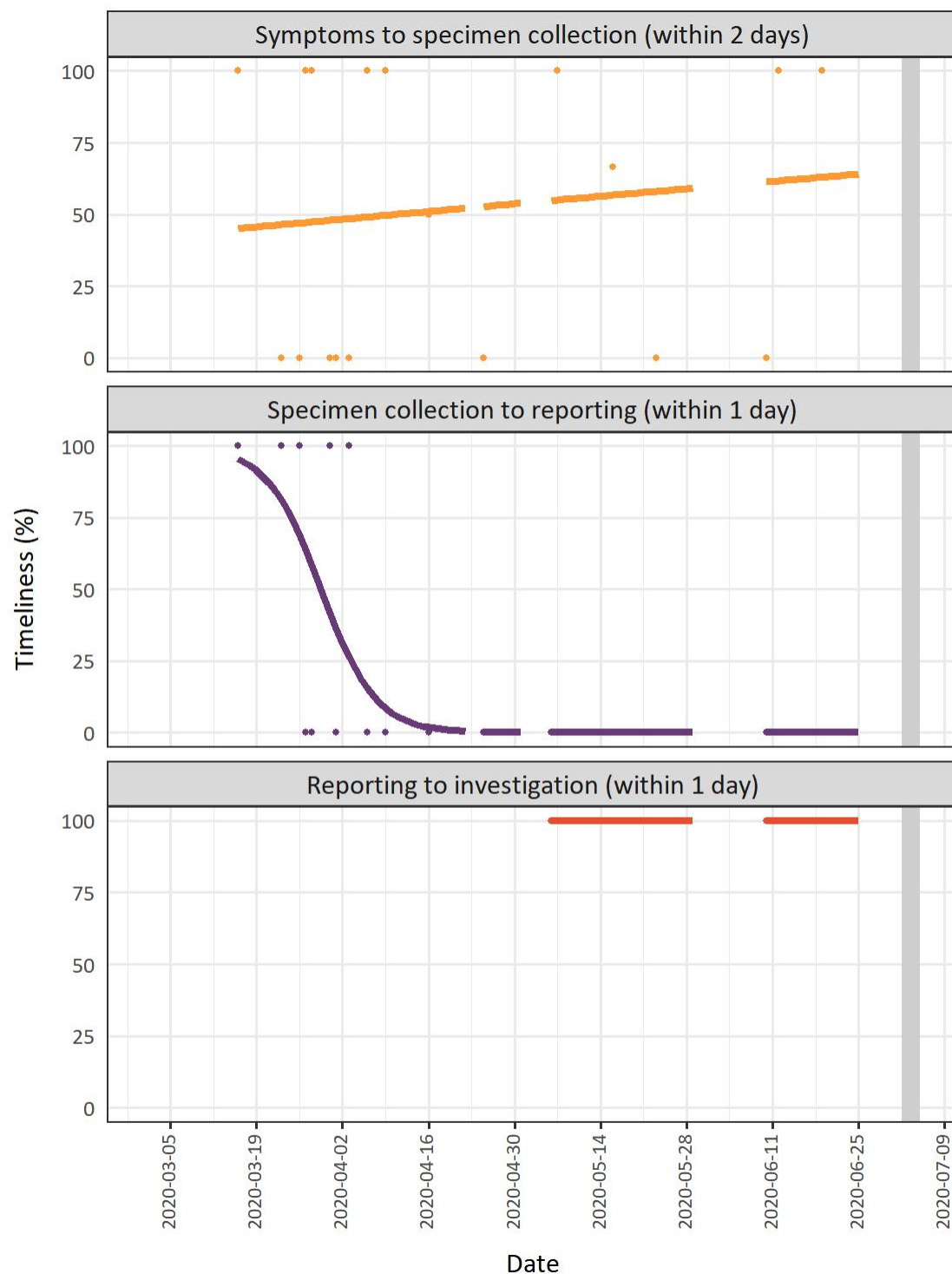
Likely Acquisition: Algoma Public Health



Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Timeliness: Algoma Public Health

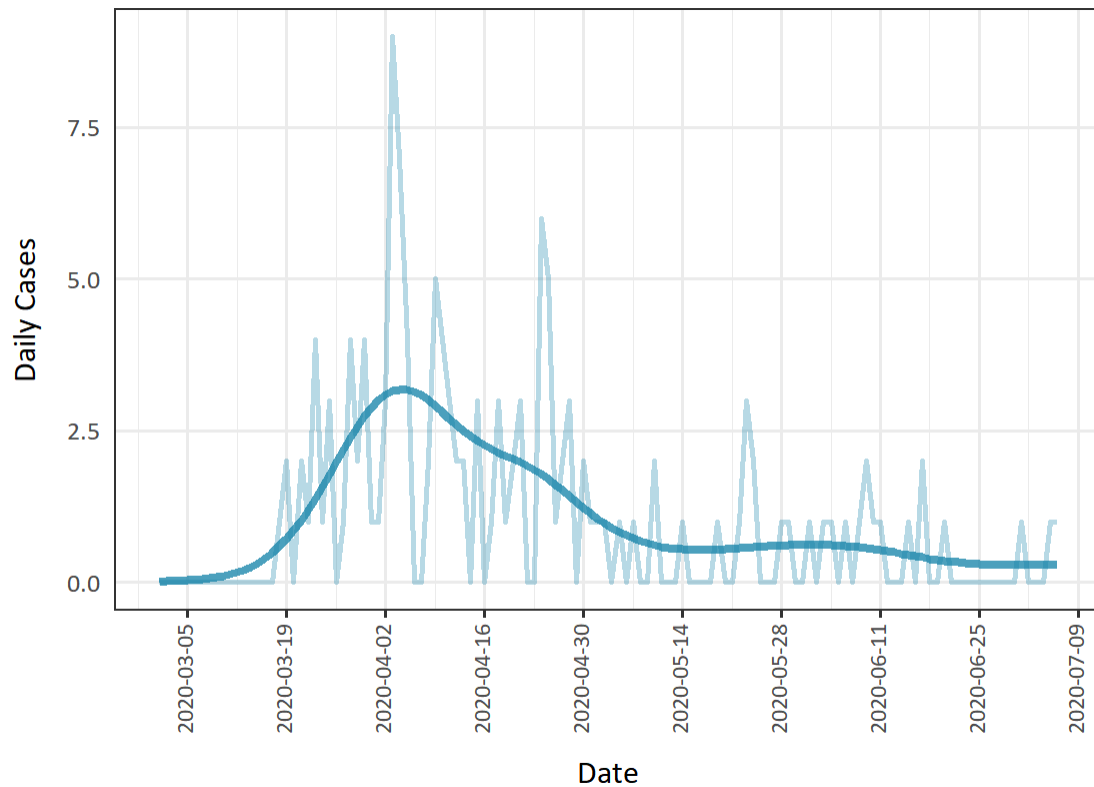


Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Brant County Health Unit

### Epidemic Curve: Brant County Health Unit



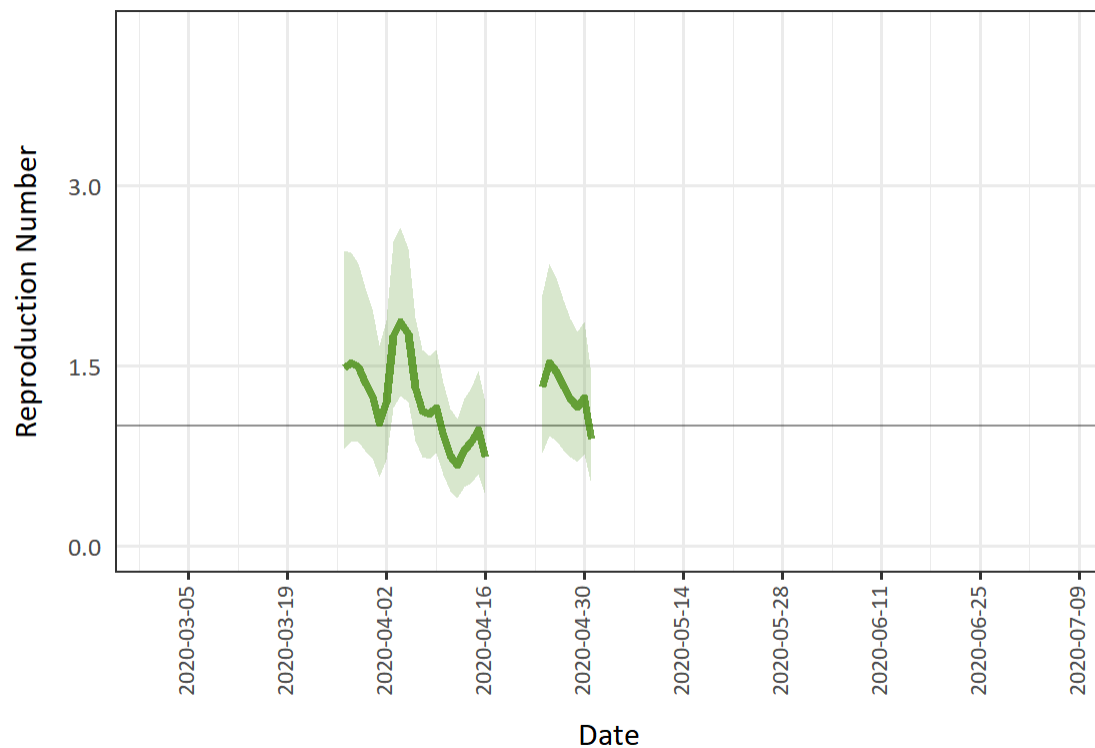
Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus



## Reproduction Number: Brant County Health Unit

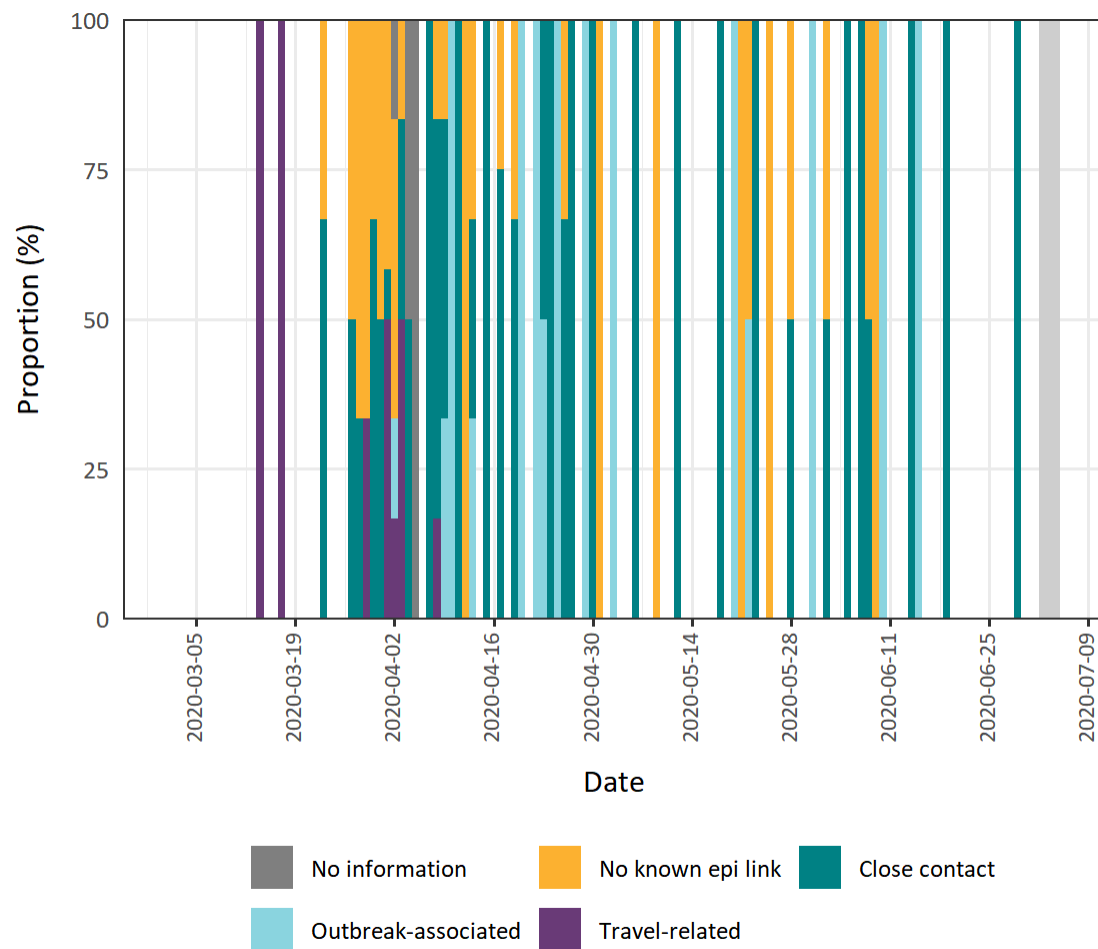
Jul 06 Re not provided: fewer than 12 cases in the 7 days prior to this date



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

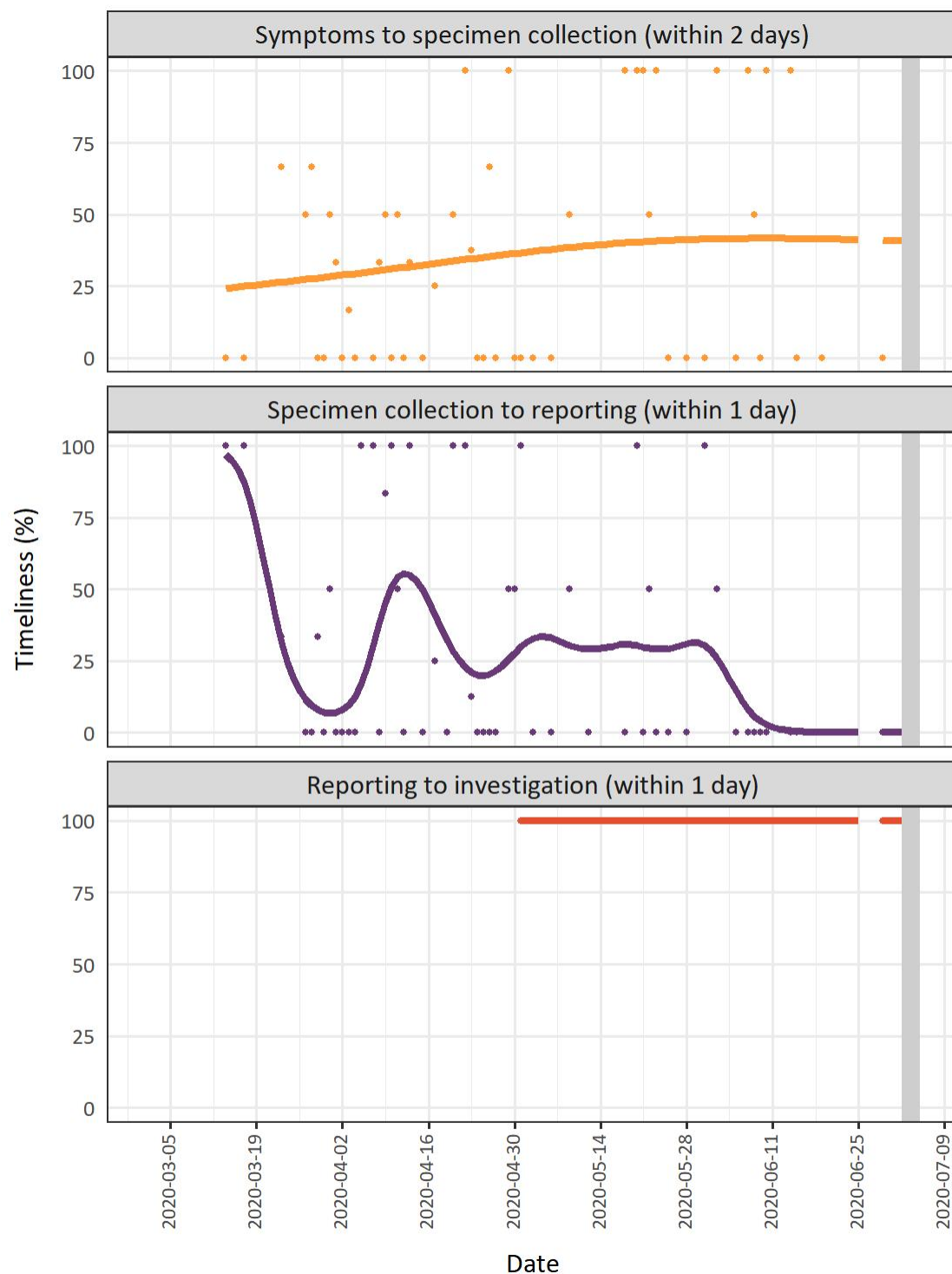
## Likely Acquisition: Brant County Health Unit



Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Timeliness: Brant County Health Unit

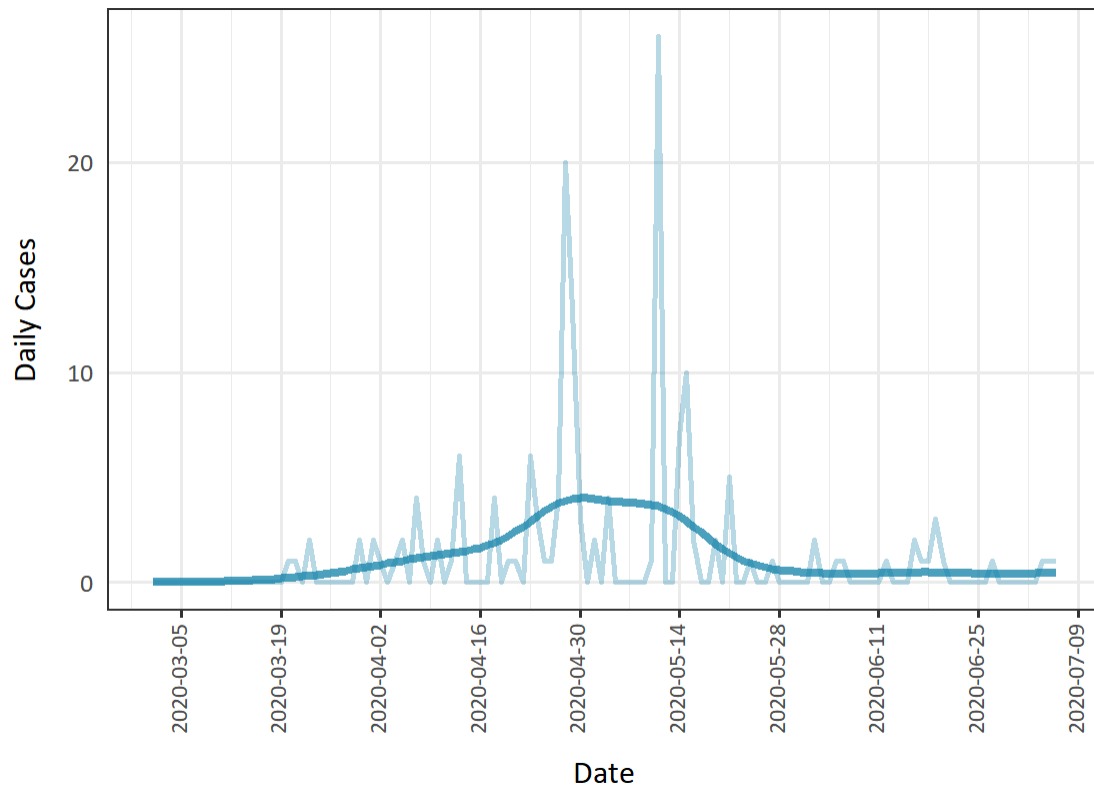


Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Chatham-Kent Public Health

### Epidemic Curve: Chatham-Kent Public Health

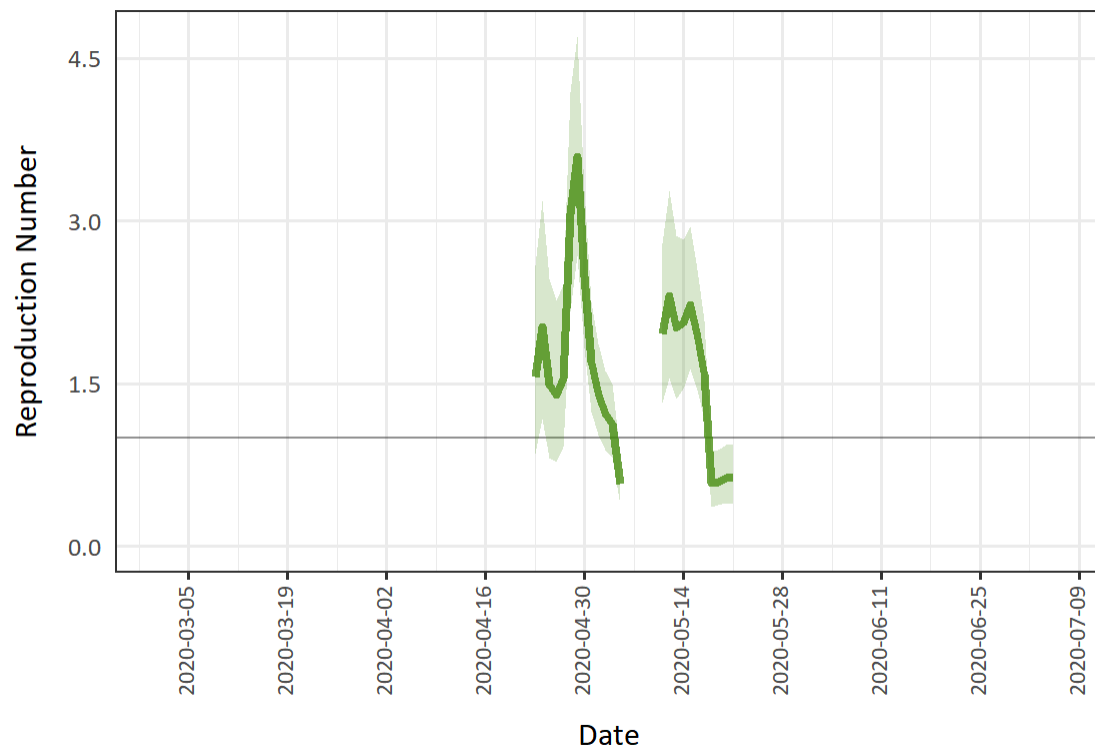


Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

## Reproduction Number: Chatham-Kent Public Health

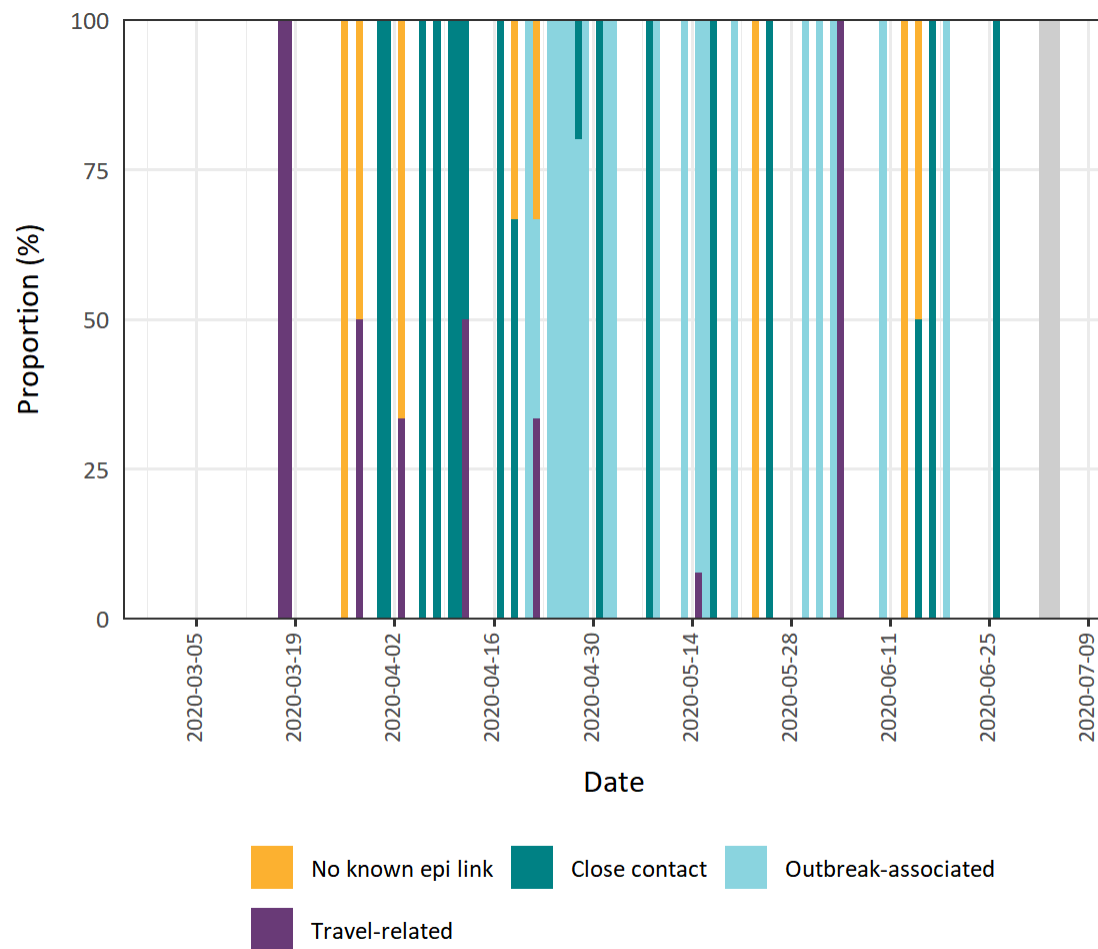
Jul 06 Re not provided: fewer than 12 cases in the 7 days prior to this date



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

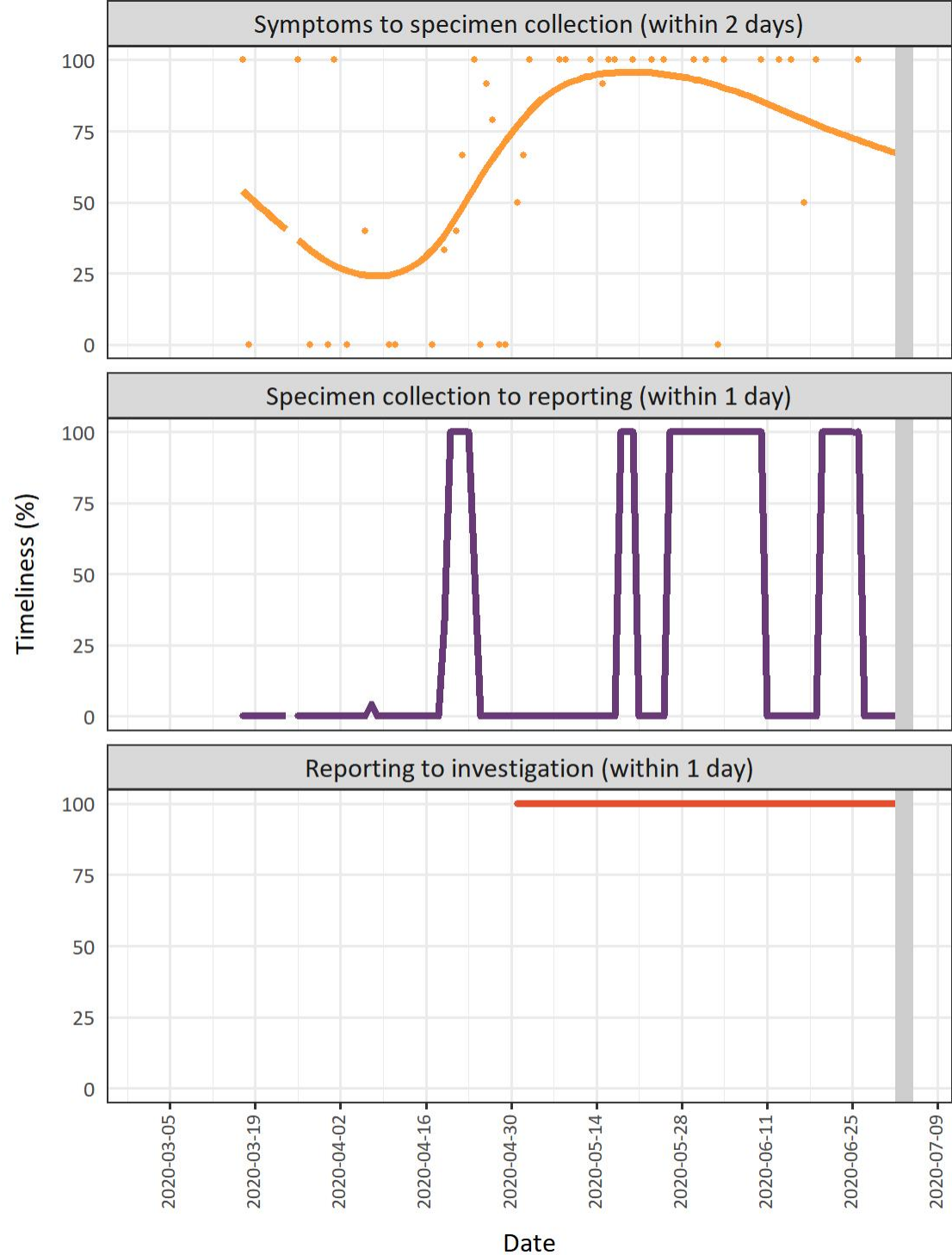
## Likely Acquisition: Chatham-Kent Public Health



Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

Timeliness: Chatham-Kent Public Health

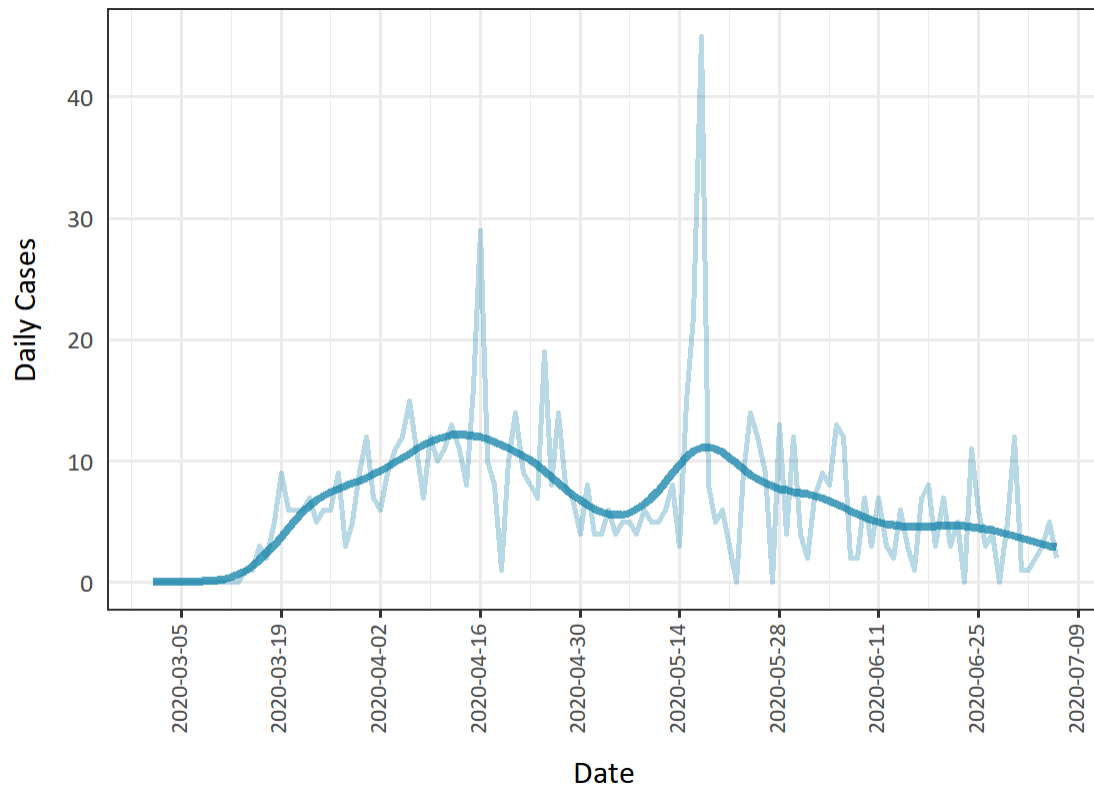


Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## City of Hamilton Public Health Services

### Epidemic Curve: City of Hamilton Public Health Services



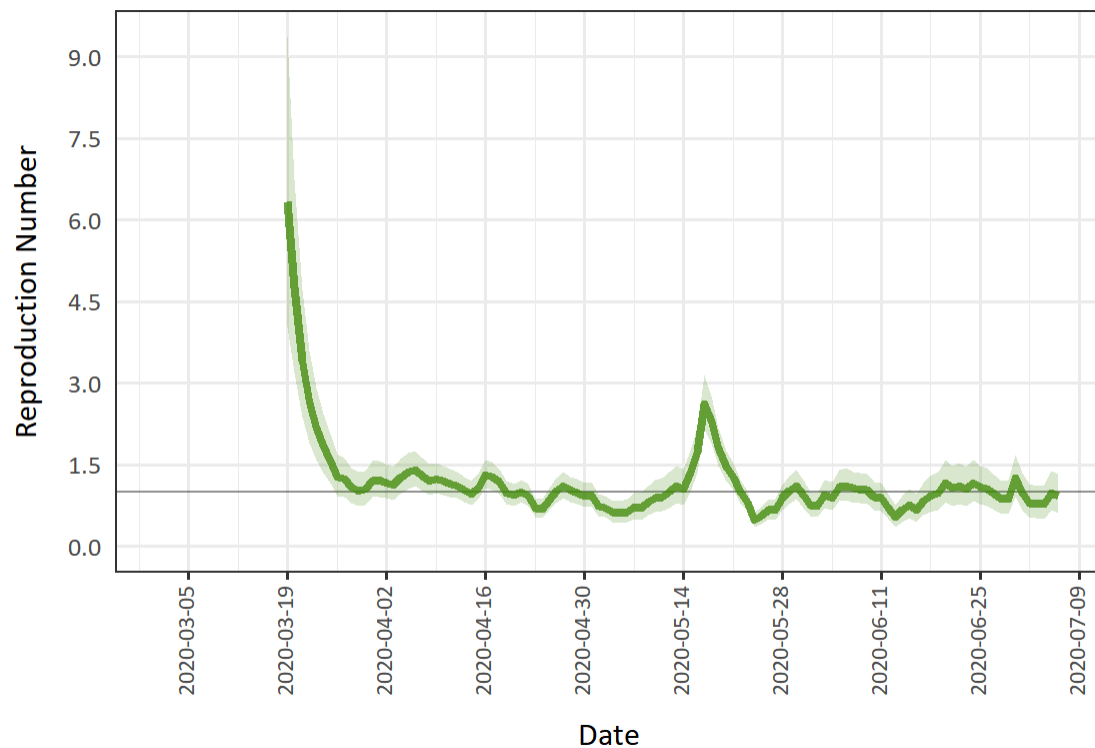
Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus



## Reproduction Number: City of Hamilton Public Health Services

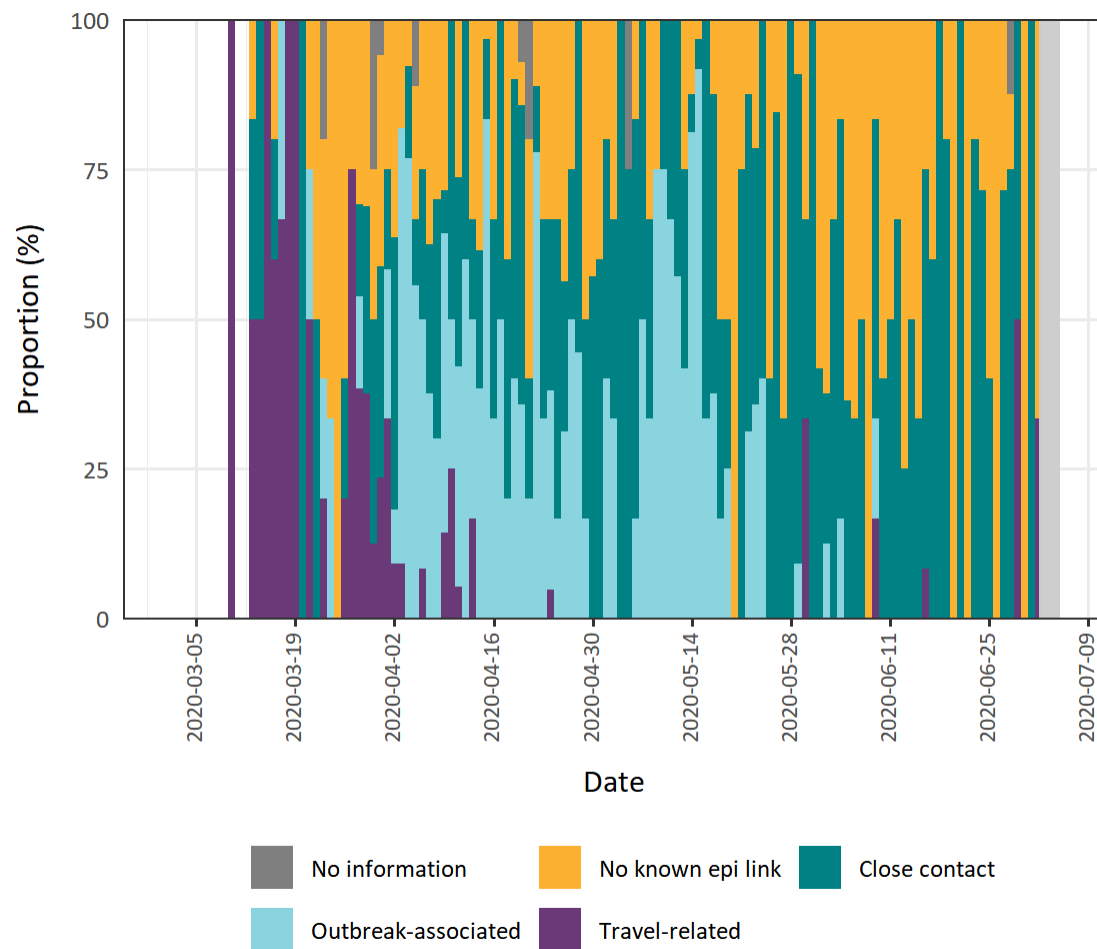
Jul 06 Re = 0.93, 95% CI: 0.62-1.3



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

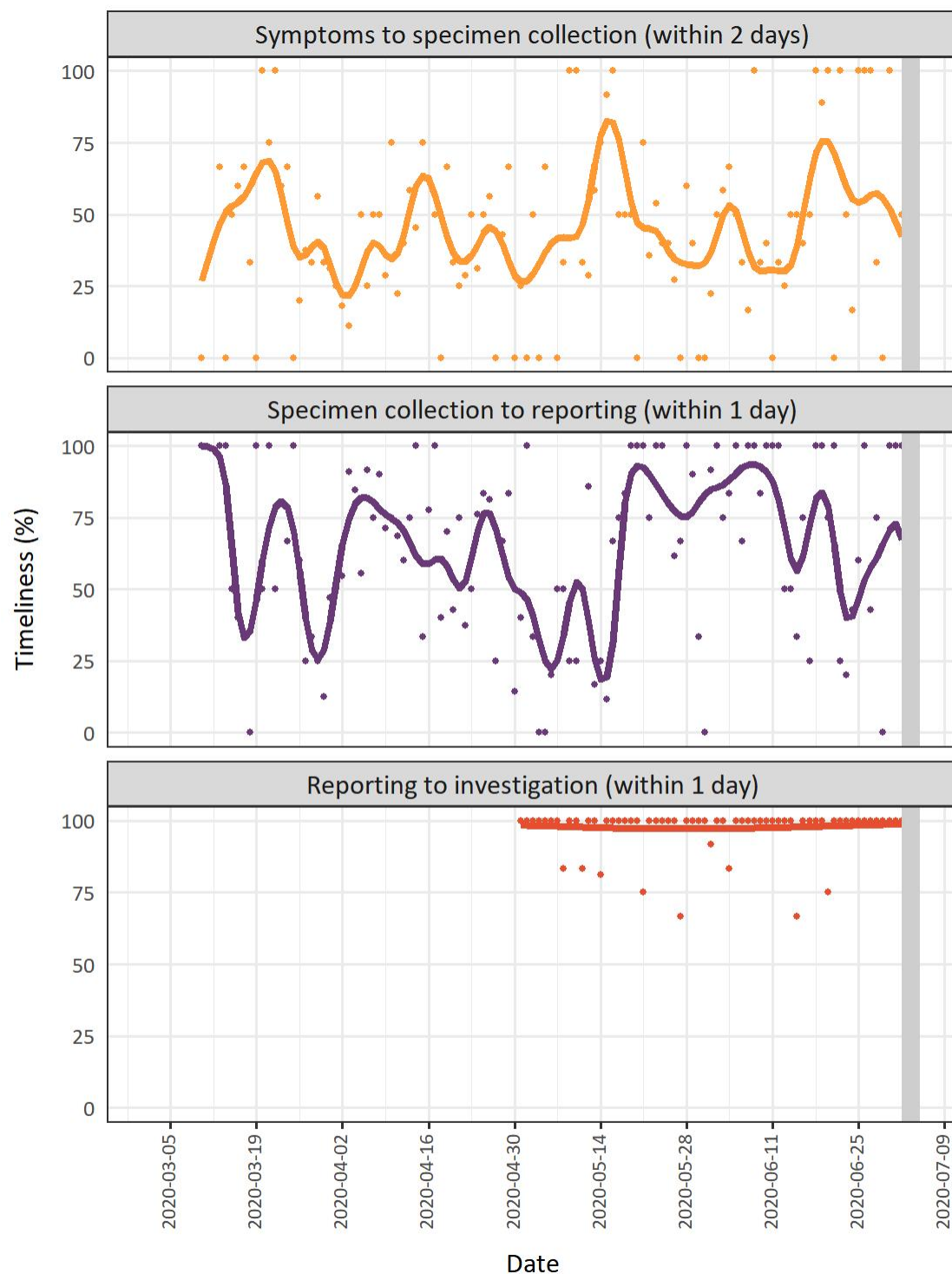
## Likely Acquisition: City of Hamilton Public Health Services



Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Timeliness: City of Hamilton Public Health Services

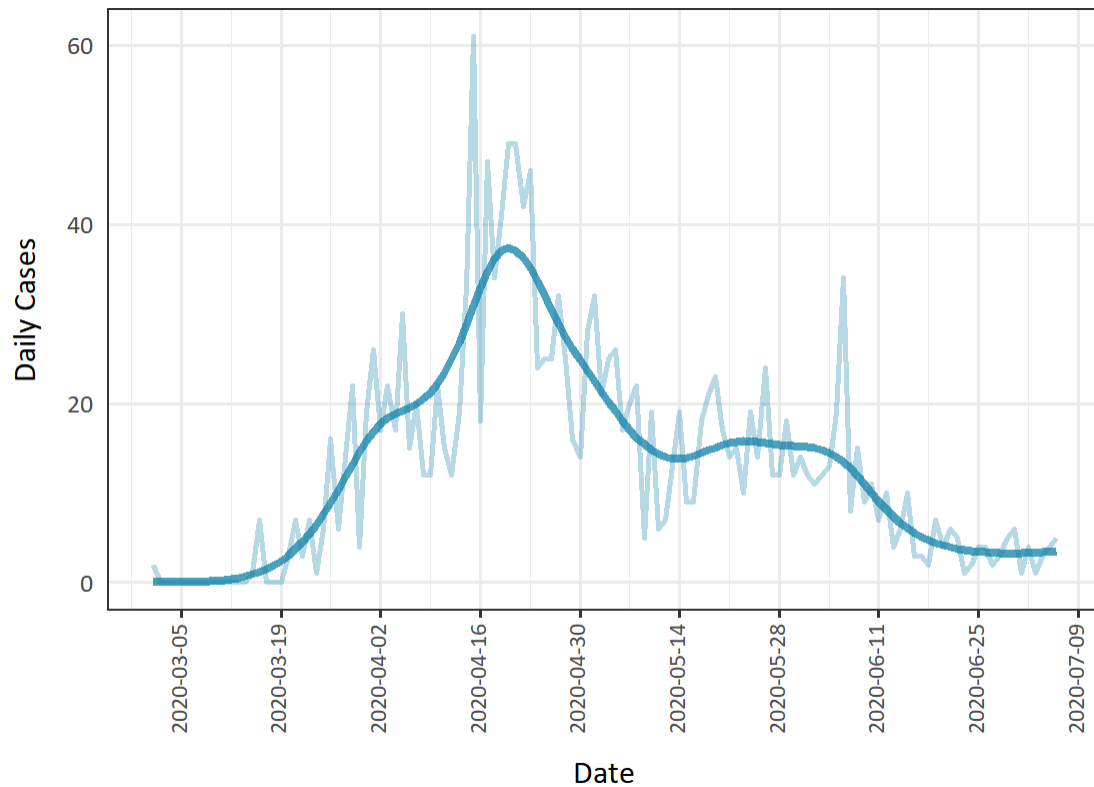


Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Durham Region Health Department

### Epidemic Curve: Durham Region Health Department

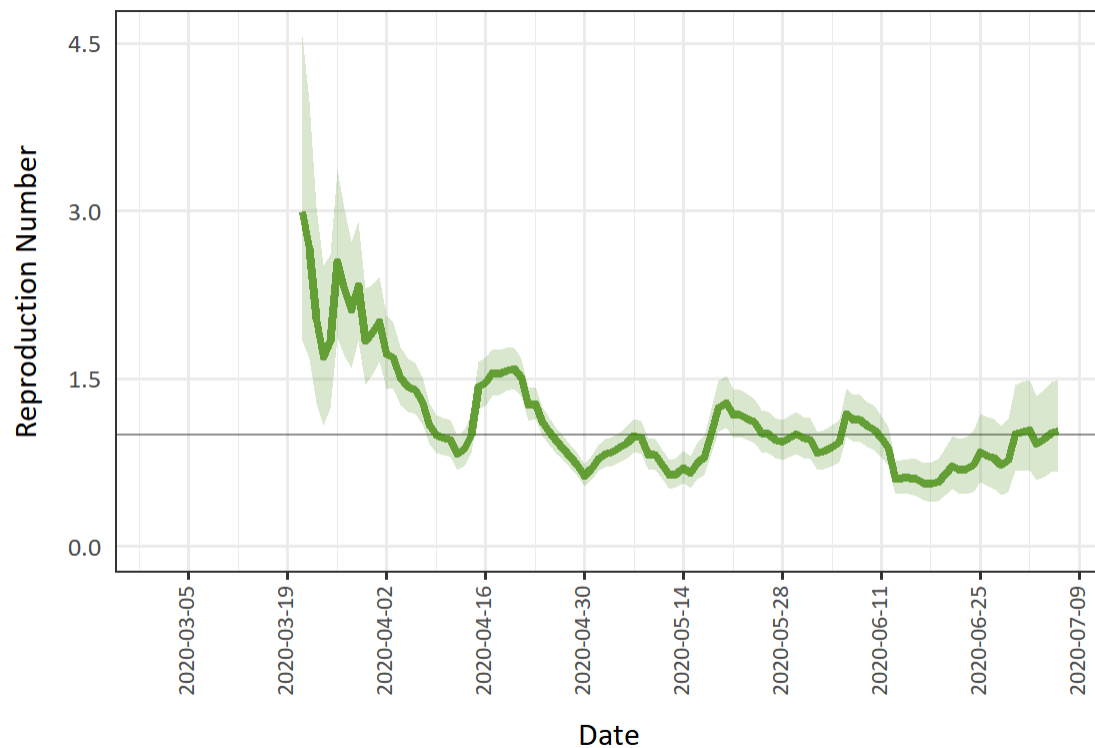


Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

## Reproduction Number: Durham Region Health Department

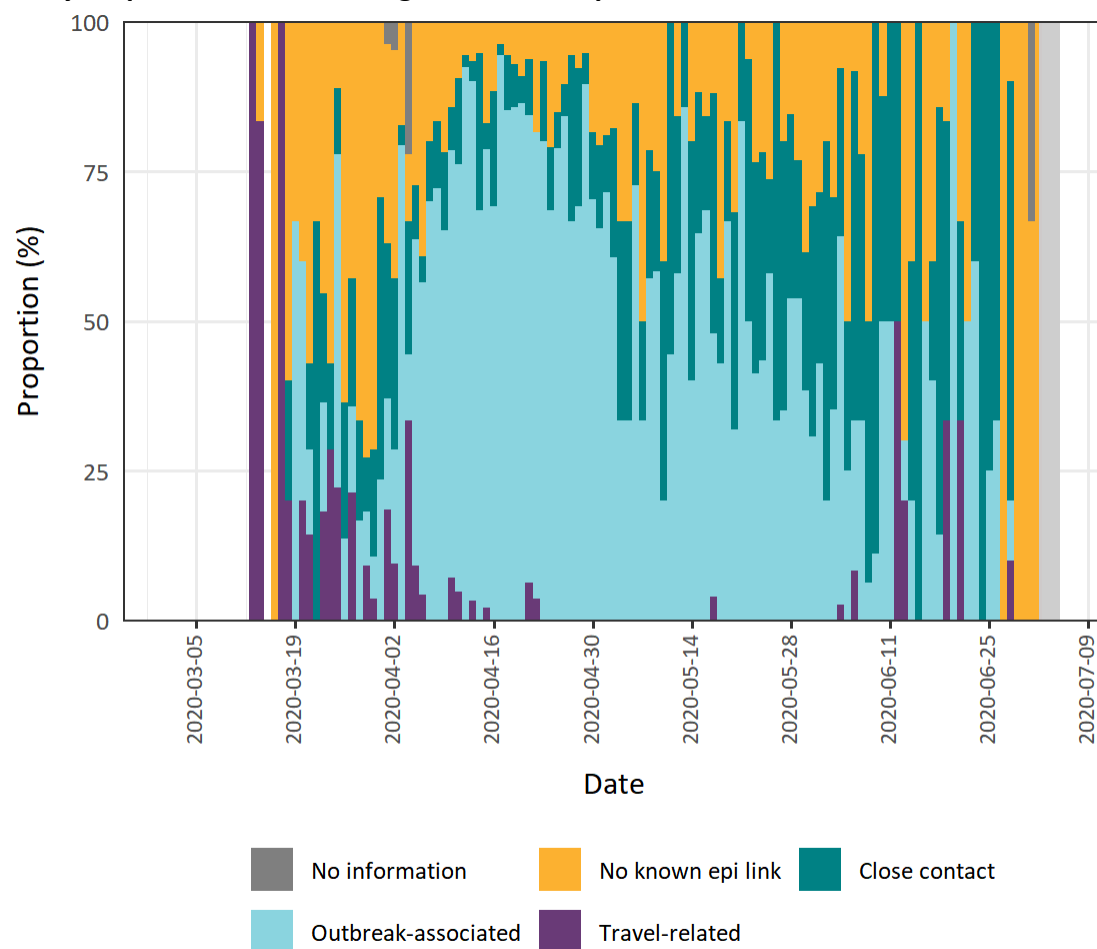
Jul 06 Re = 1.03, 95% CI: 0.67-1.5



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

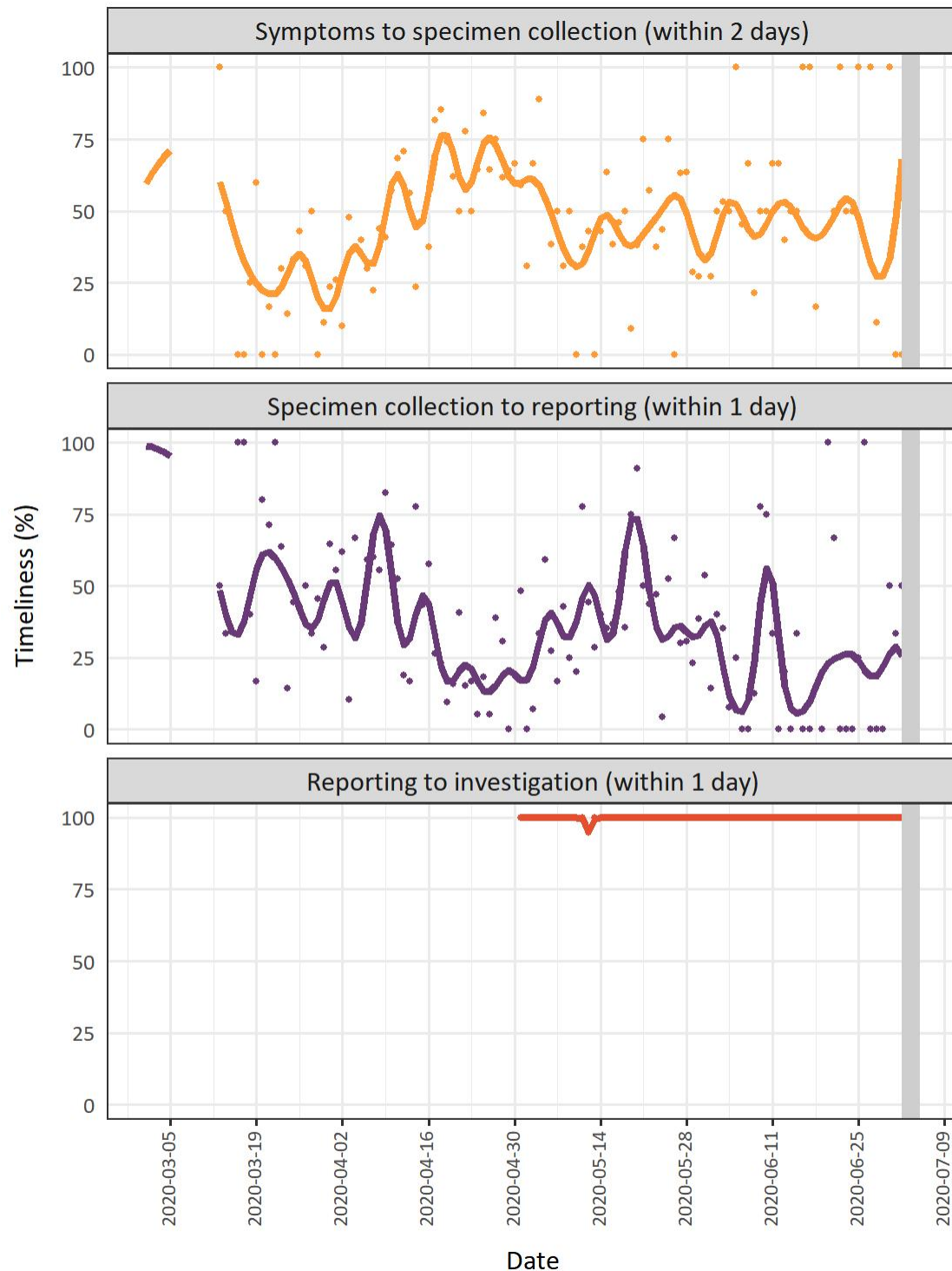
## Likely Acquisition: Durham Region Health Department



Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Timeliness: Durham Region Health Department

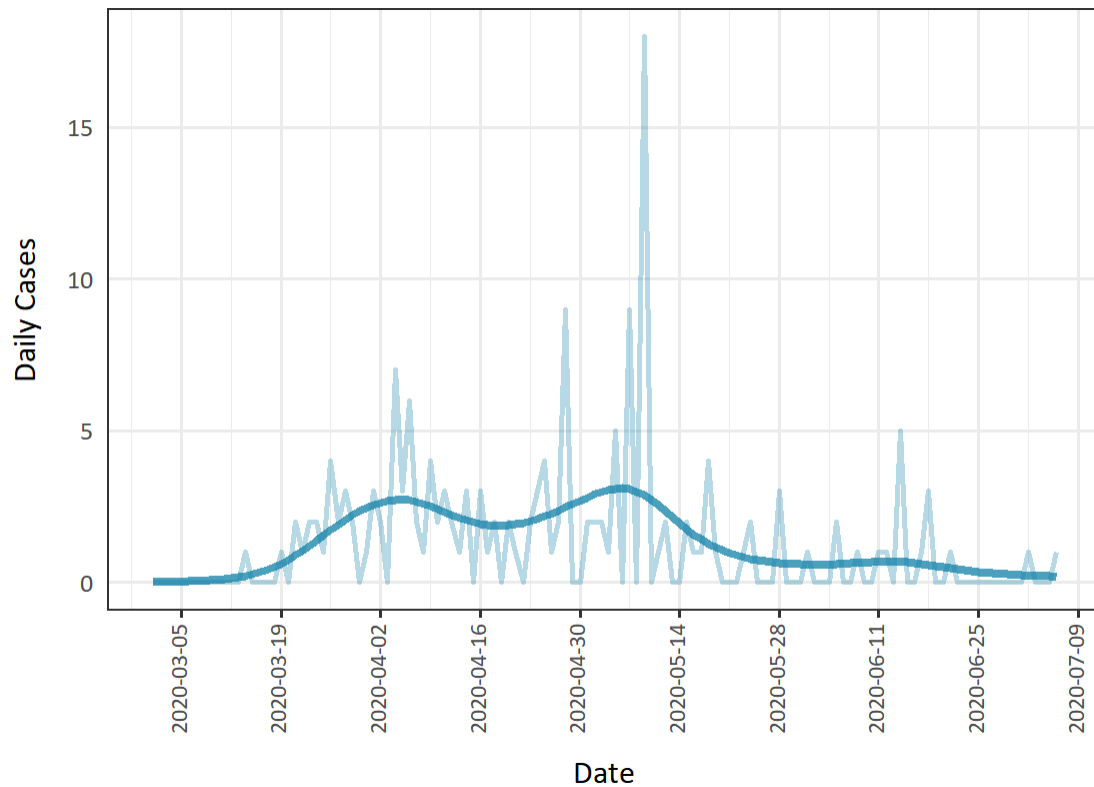


Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Eastern Ontario Health Unit

### Epidemic Curve: Eastern Ontario Health Unit



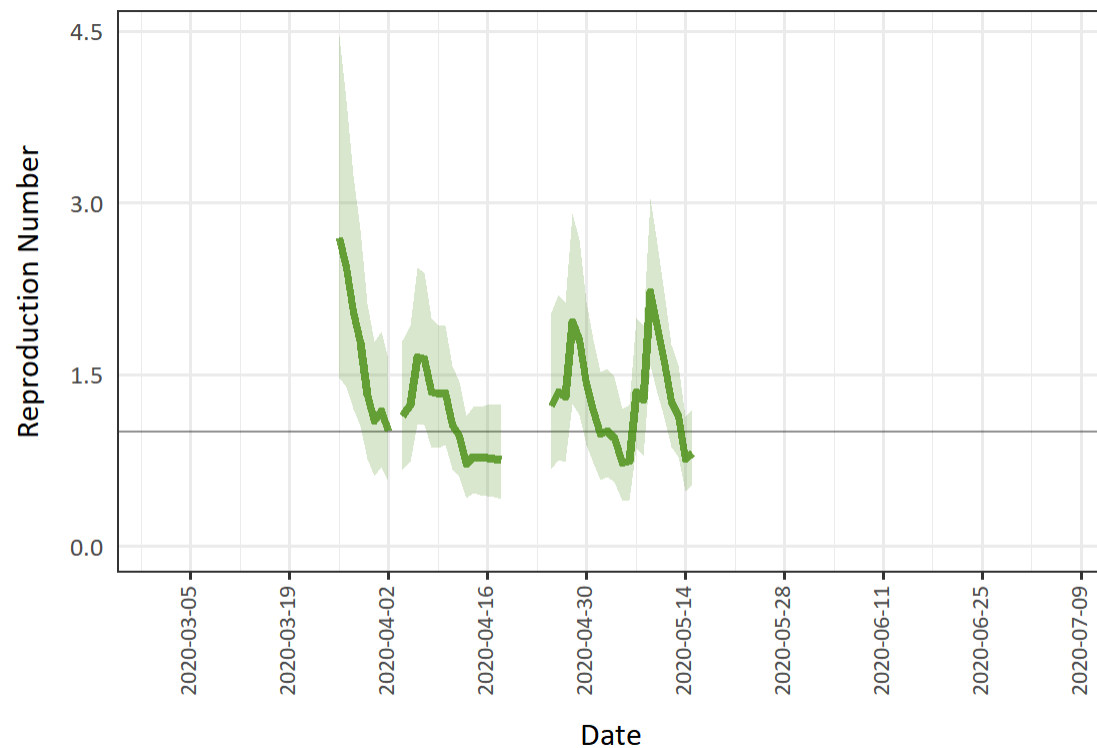
Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus



## Reproduction Number: Eastern Ontario Health Unit

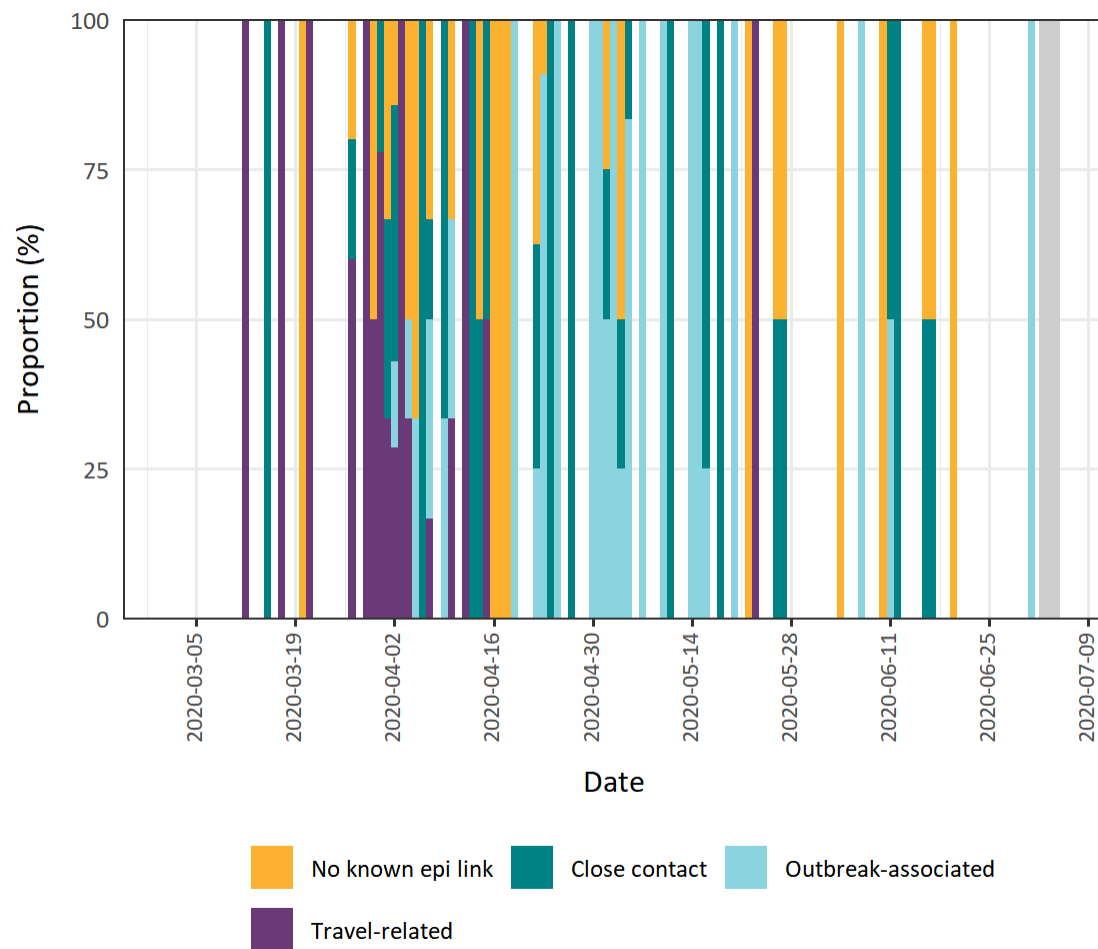
Jul 06 Re not provided: fewer than 12 cases in the 7 days prior to this date



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

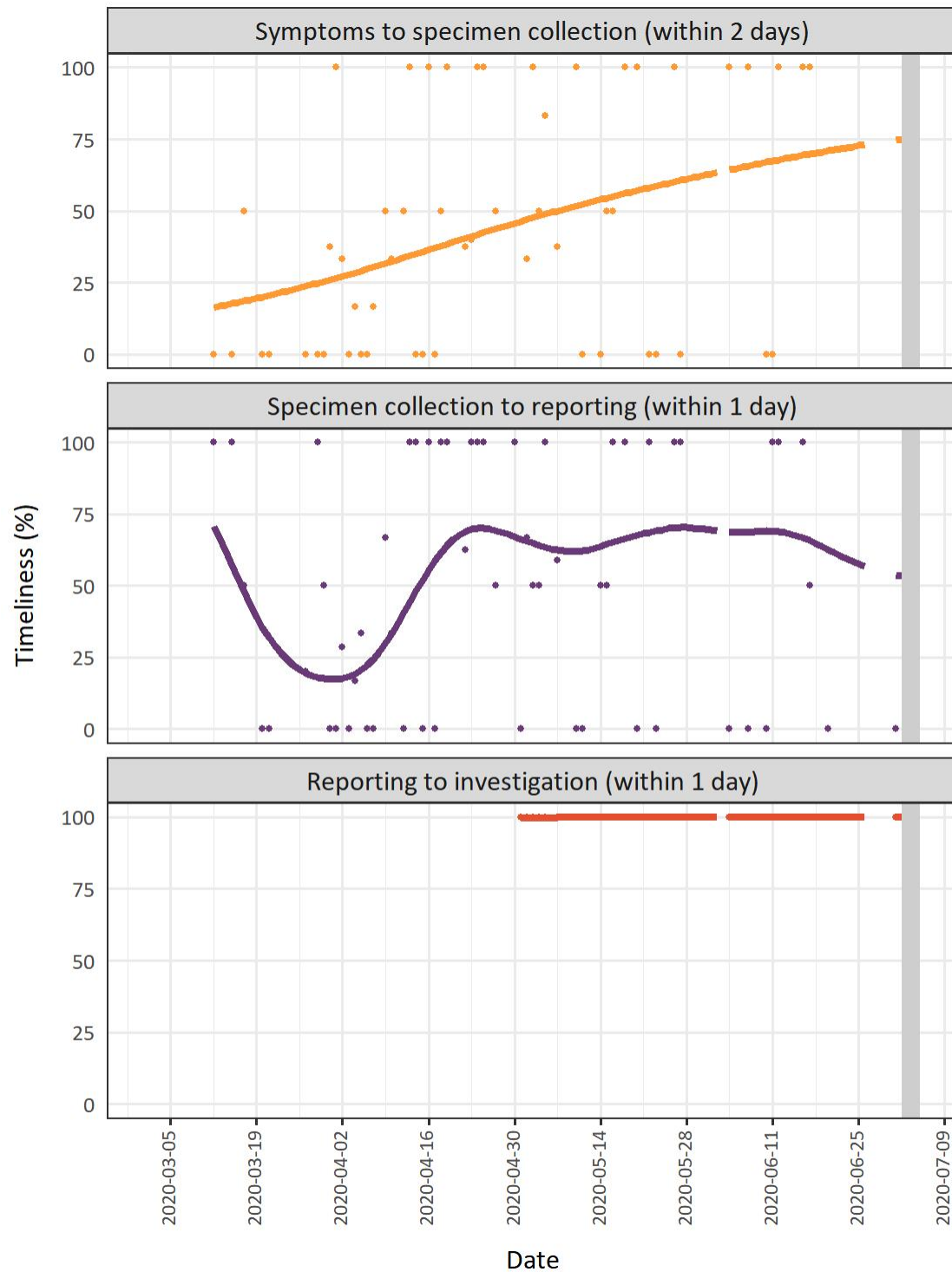
## Likely Acquisition: Eastern Ontario Health Unit



Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Timeliness: Eastern Ontario Health Unit

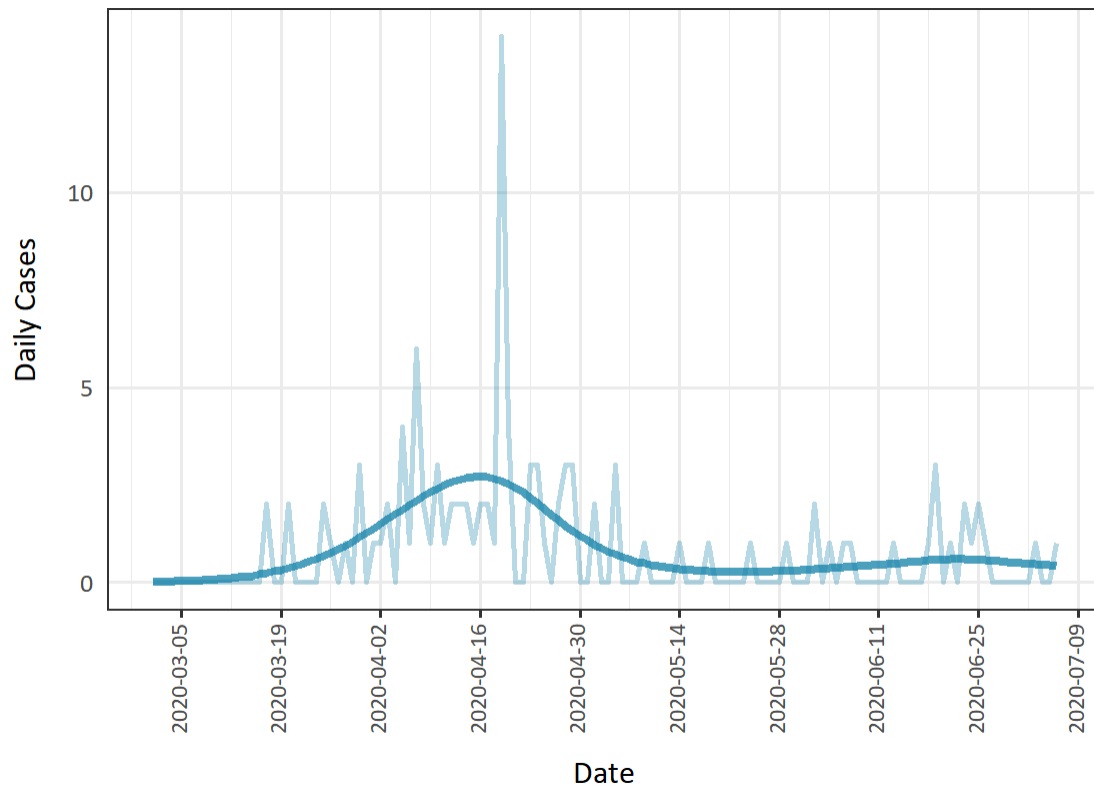


Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Grey Bruce Health Unit

### Epidemic Curve: Grey Bruce Health Unit

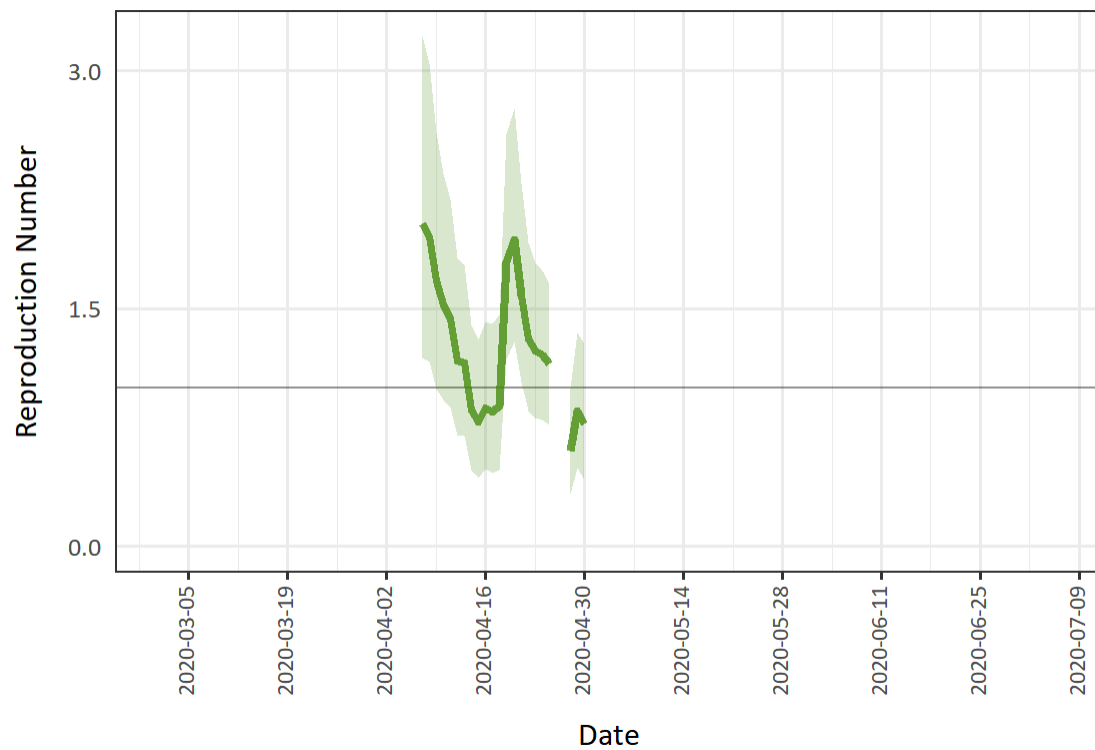


Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

## Reproduction Number: Grey Bruce Health Unit

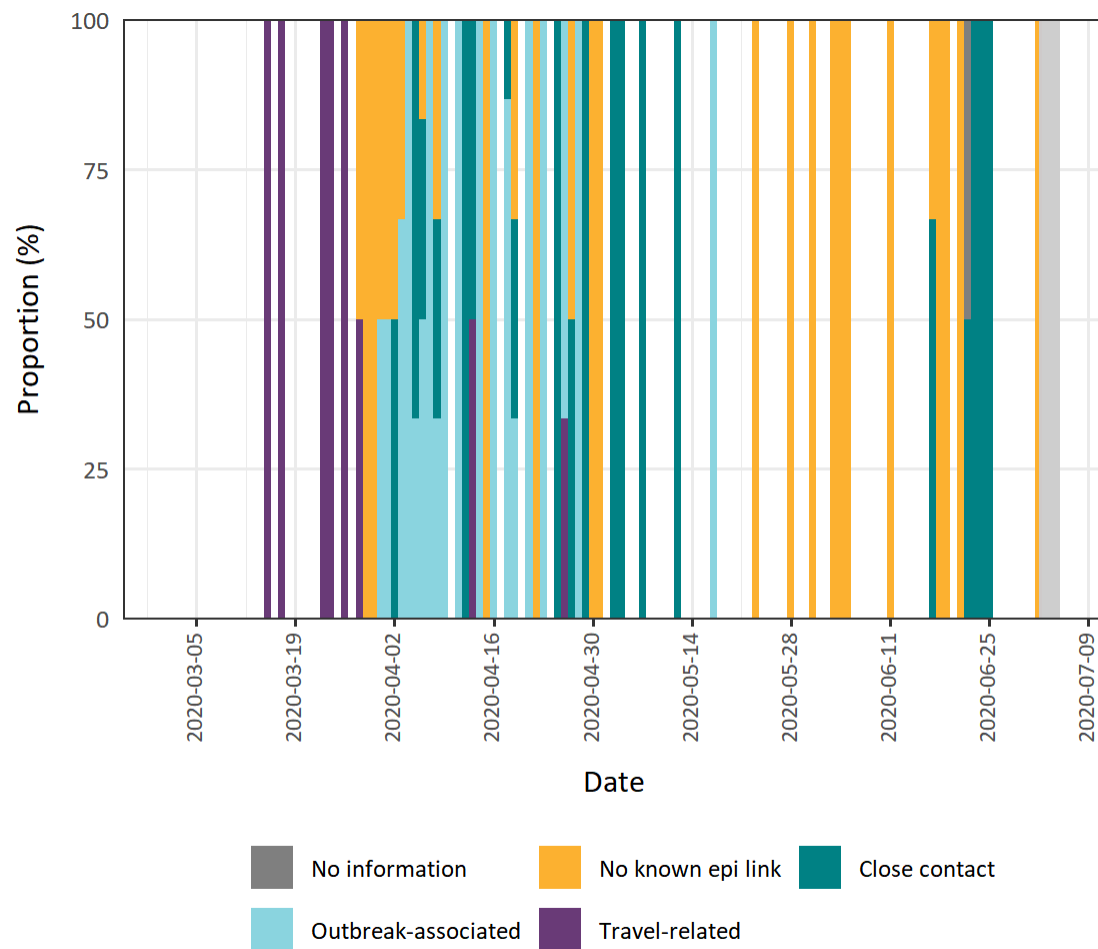
Jul 06 Re not provided: fewer than 12 cases in the 7 days prior to this date



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

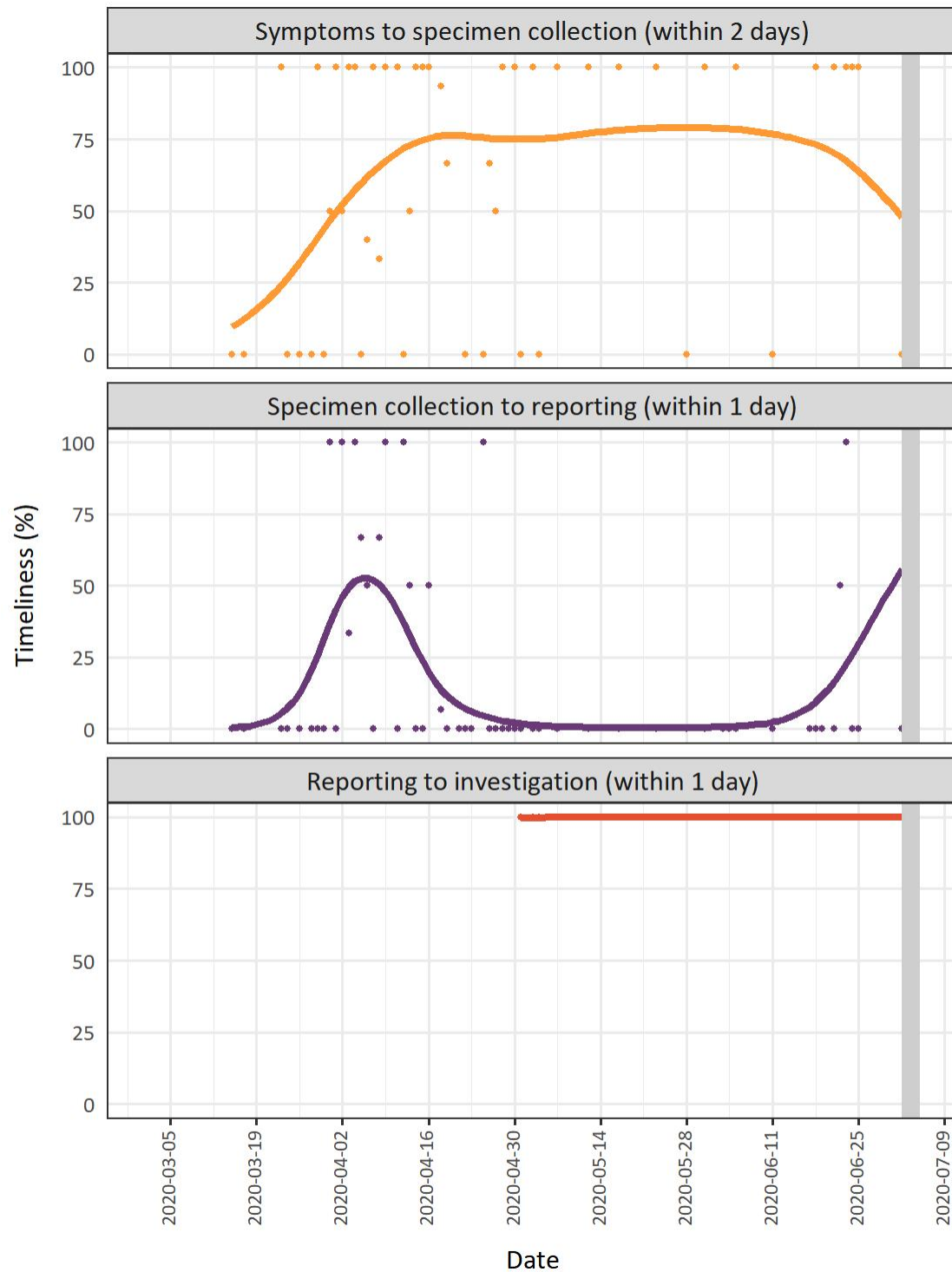
### Likely Acquisition: Grey Bruce Health Unit



Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Timeliness: Grey Bruce Health Unit

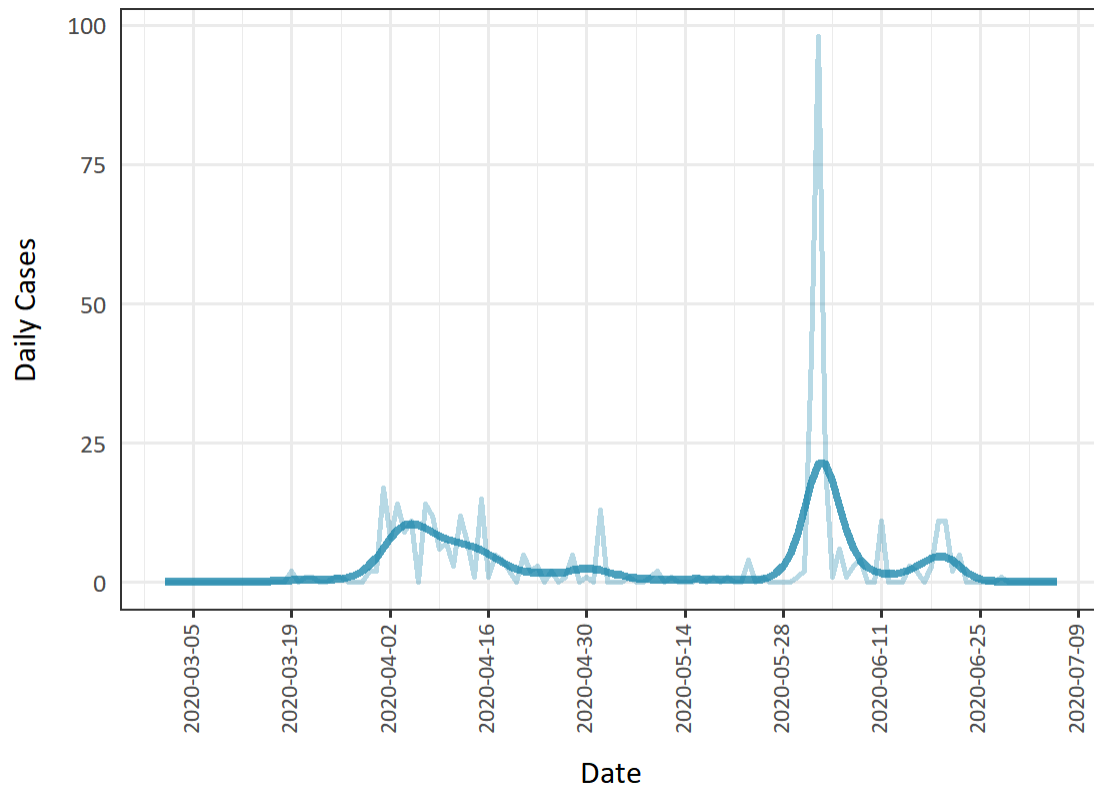


Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Haldimand-Norfolk Health Unit

### Epidemic Curve: Haldimand-Norfolk Health Unit



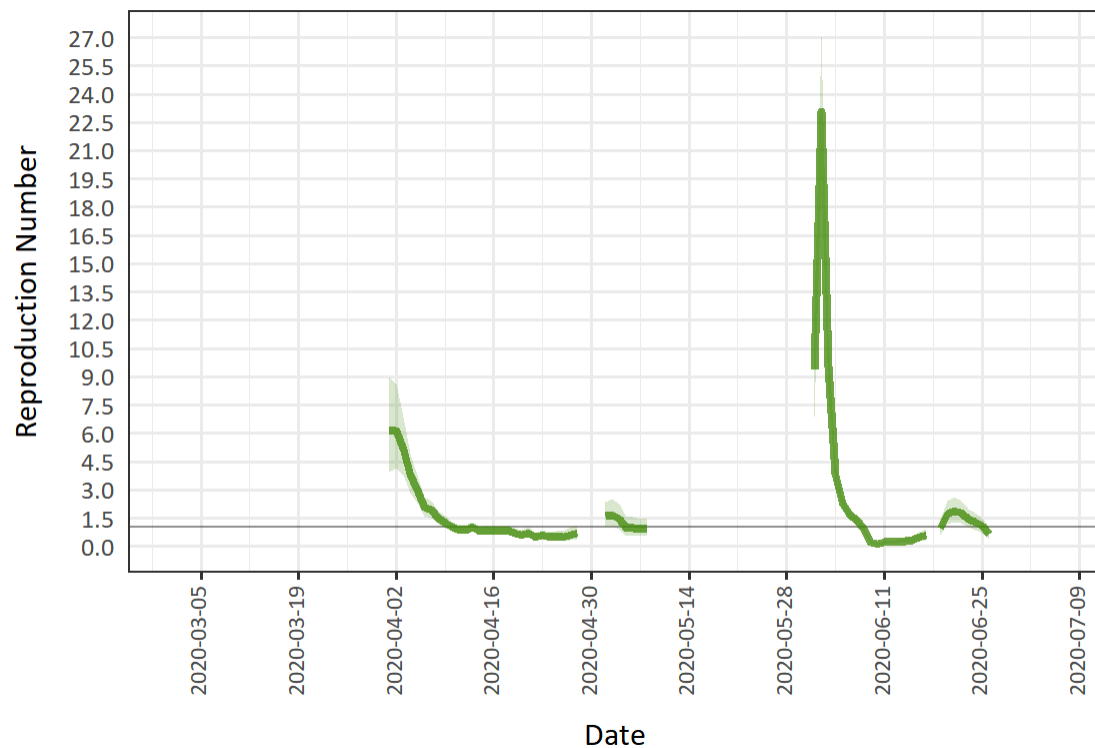
Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus



## Reproduction Number: Haldimand-Norfolk Health Unit

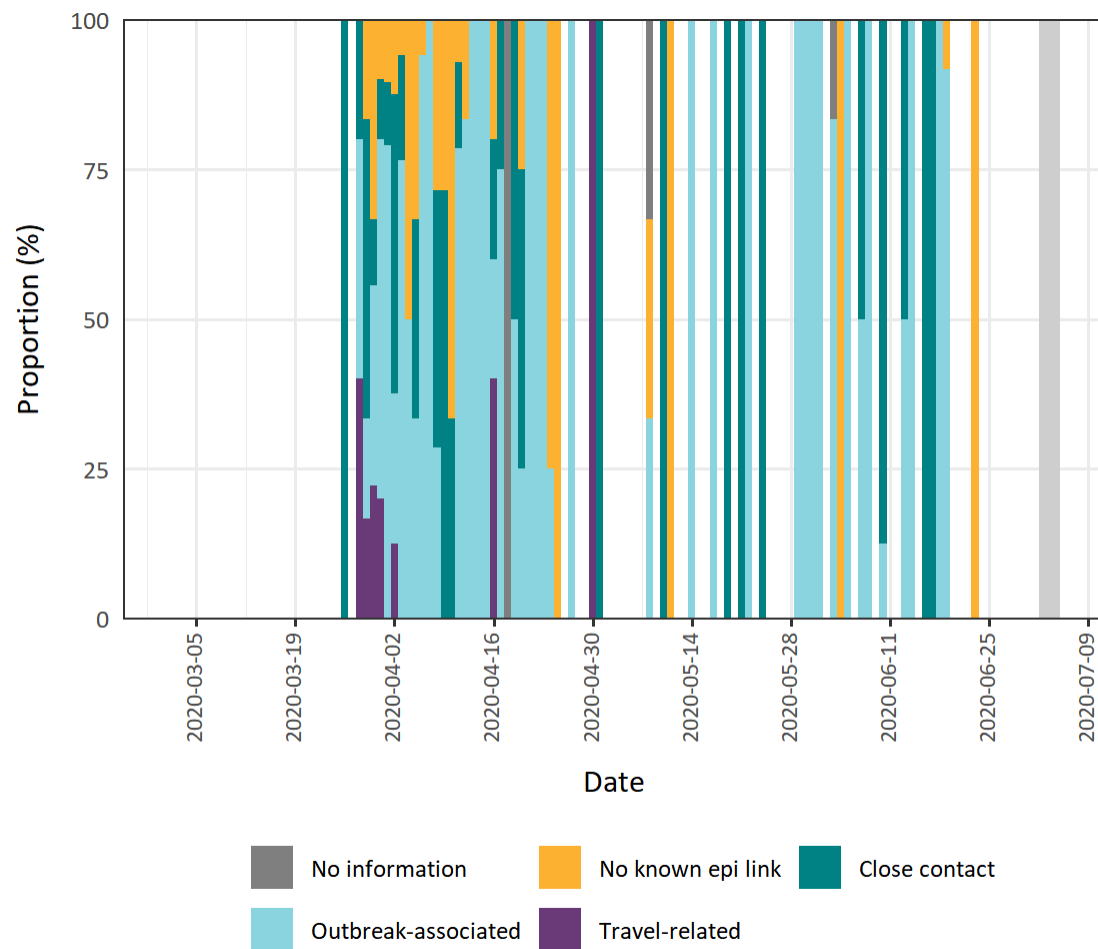
Jul 06 Re not provided: fewer than 12 cases in the 7 days prior to this date



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

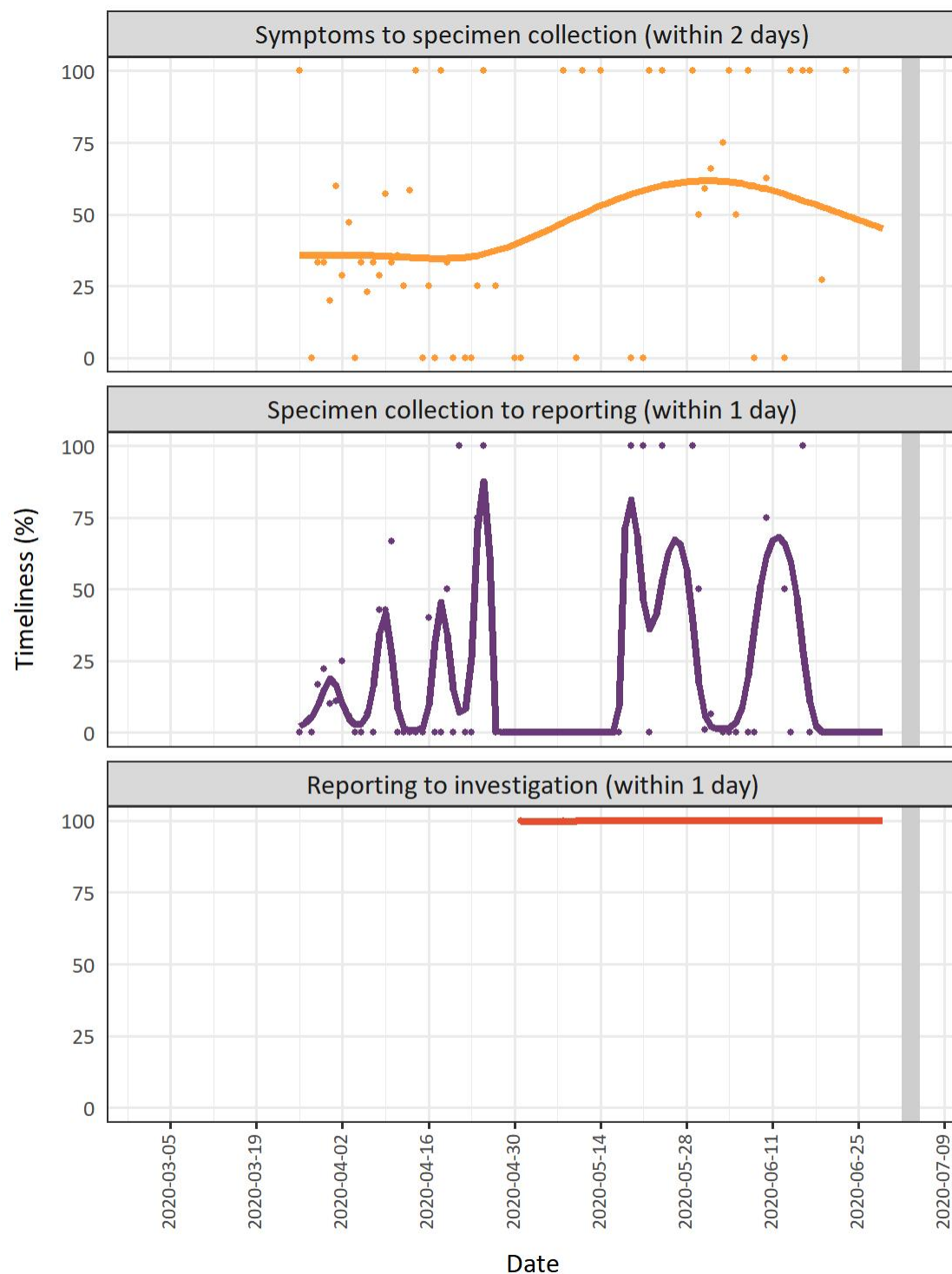
## Likely Acquisition: Haldimand-Norfolk Health Unit



Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Timeliness: Haldimand-Norfolk Health Unit

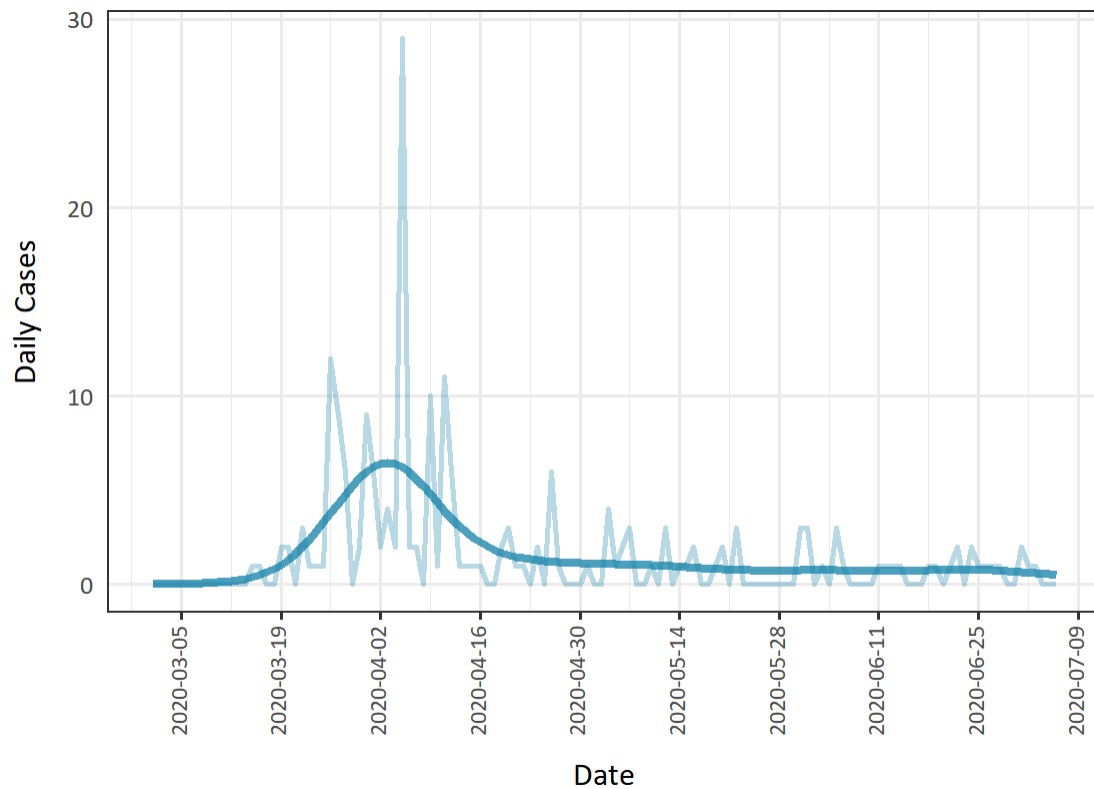


Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Haliburton, Kawartha, Pine Ridge District Health Unit

### Epidemic Curve: Haliburton, Kawartha, Pine Ridge District Health Unit

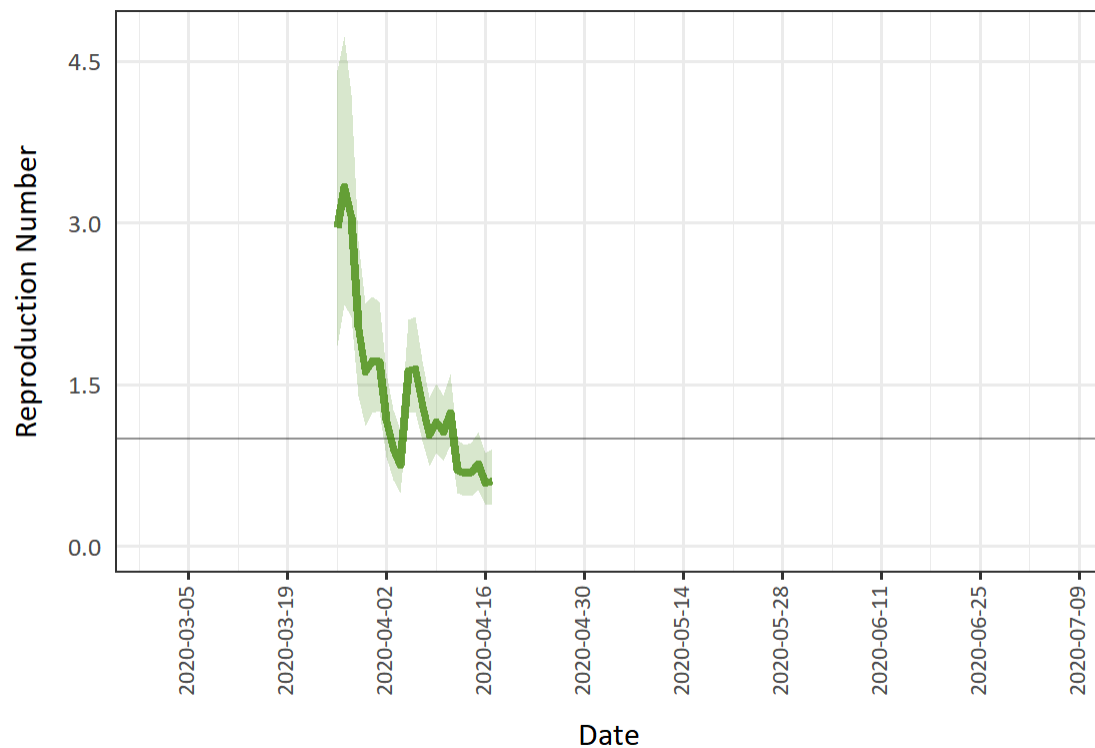


Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

### Reproduction Number: Haliburton, Kawartha, Pine Ridge District Health Unit

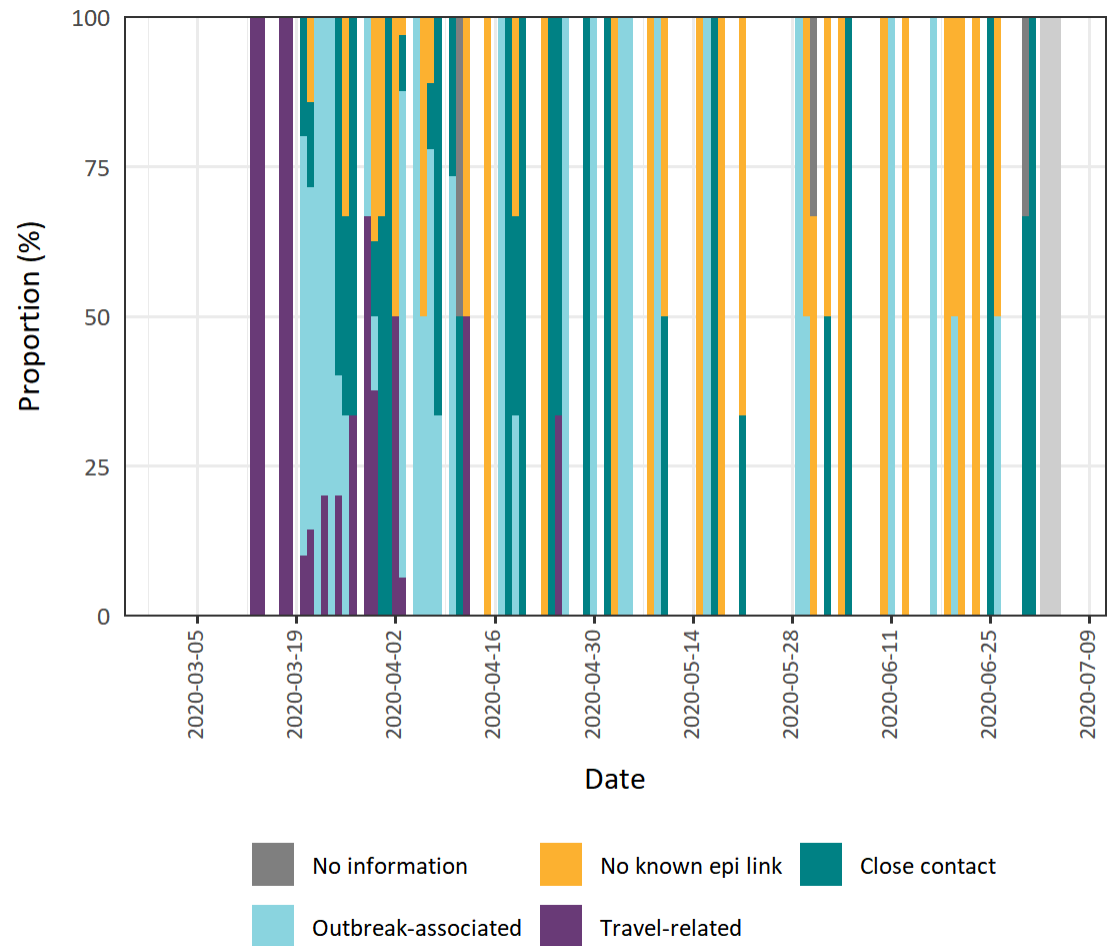
Jul 06 Re not provided: fewer than 12 cases in the 7 days prior to this date



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

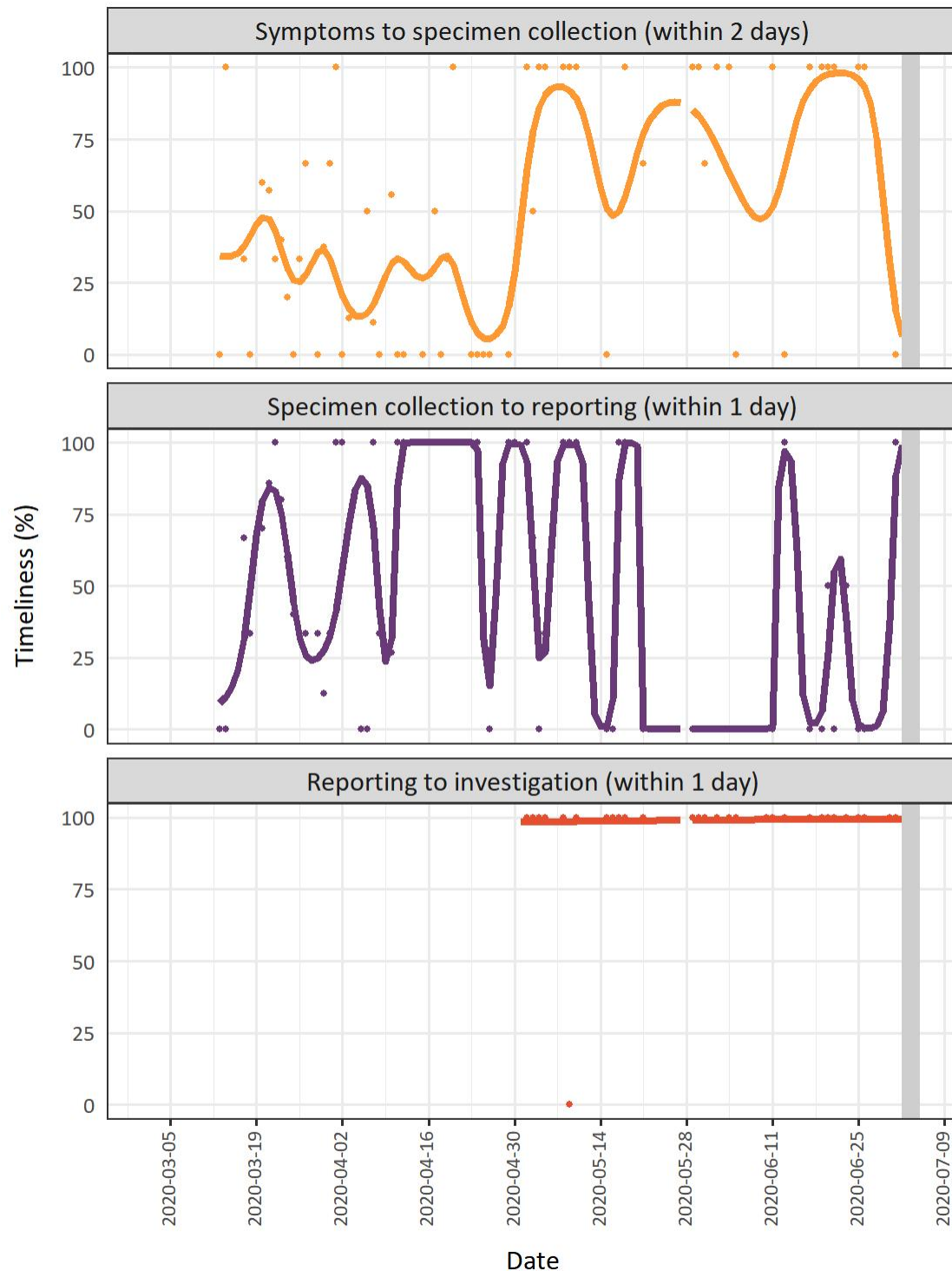
Likely Acquisition: Haliburton, Kawartha, Pine Ridge District Health Unit



Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

### Timeliness: Haliburton, Kawartha, Pine Ridge District Health Unit

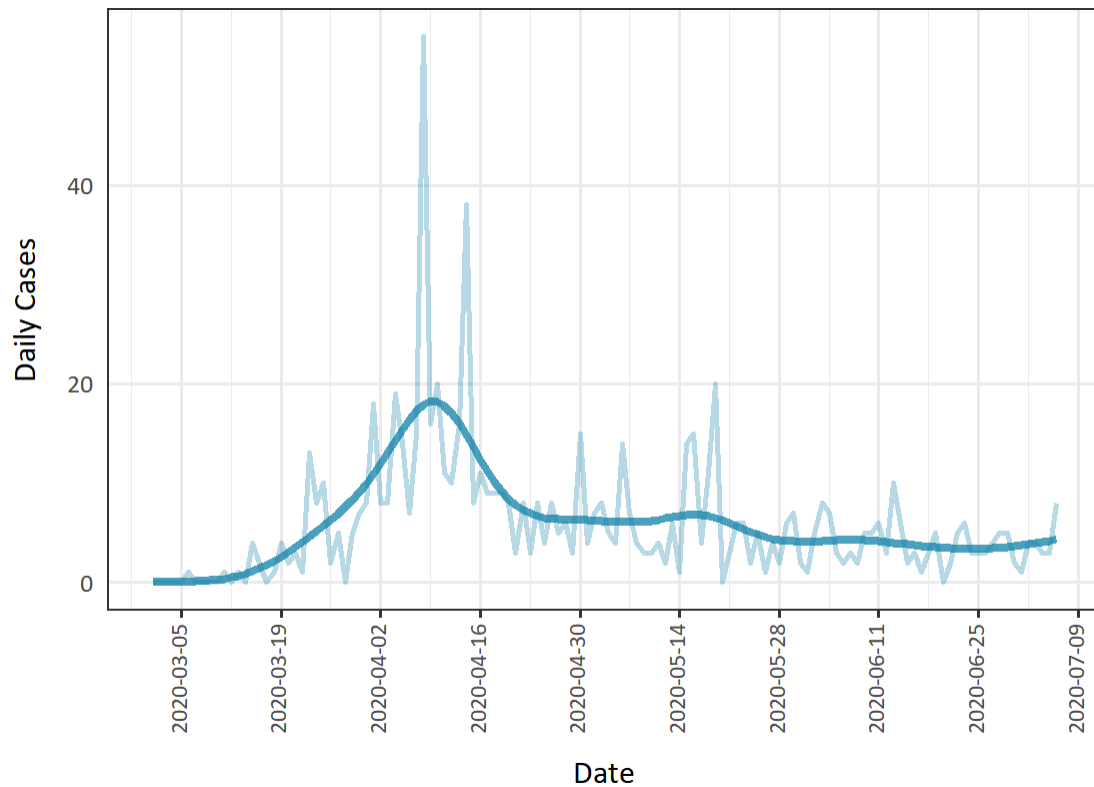


Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Halton Region Public Health

### Epidemic Curve: Halton Region Public Health



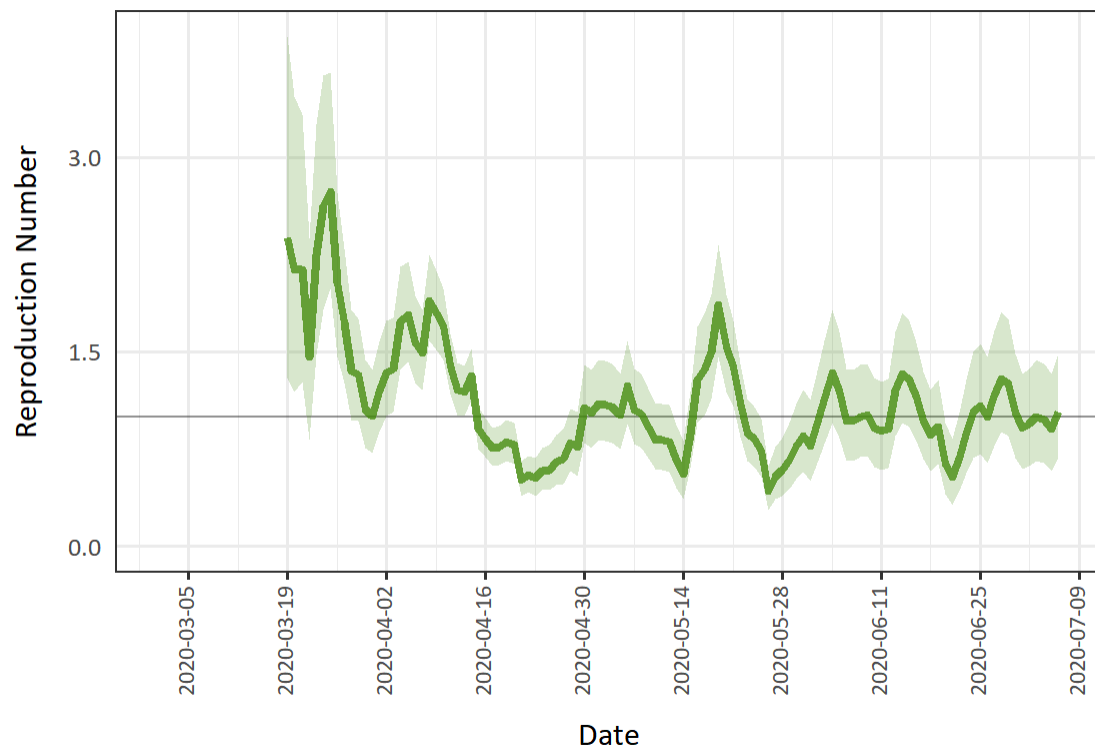
Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus



## Reproduction Number: Halton Region Public Health

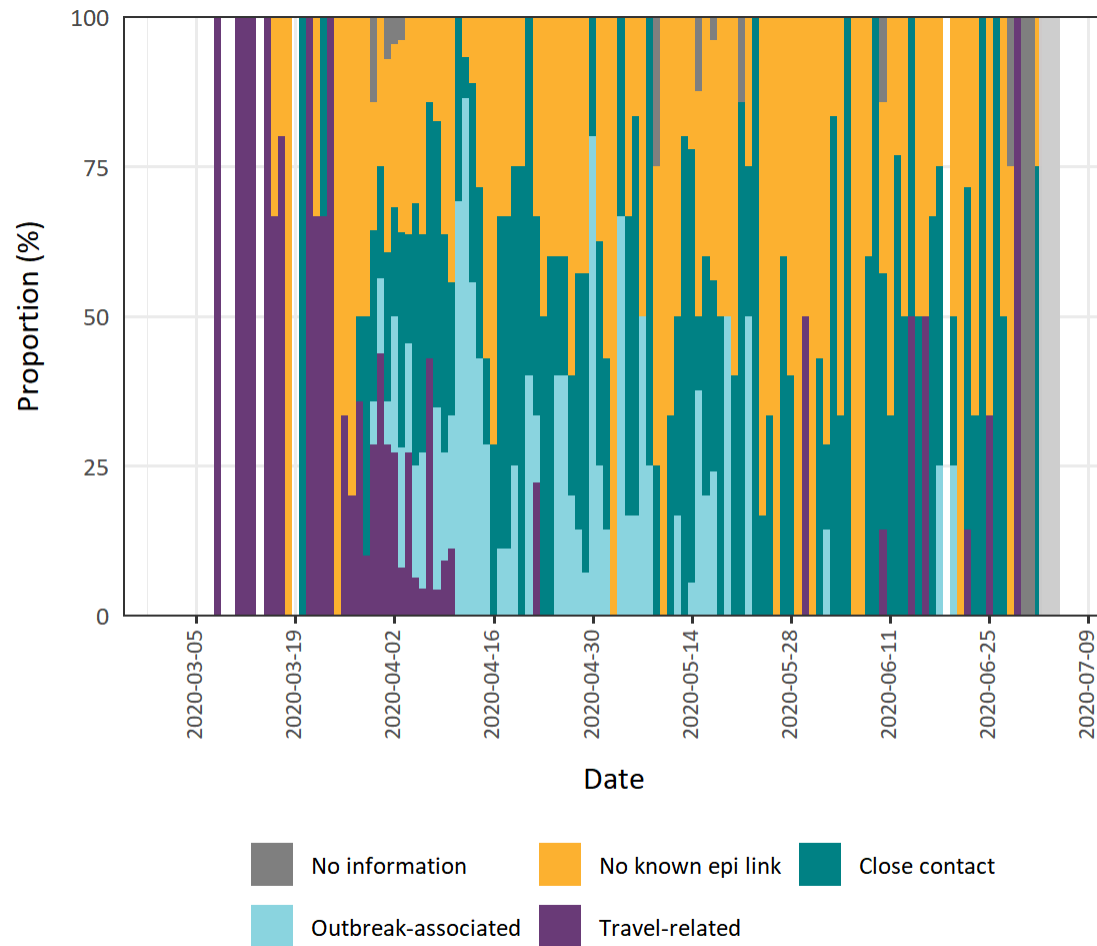
Jul 06 Re = 1.03, 95% CI: 0.68-1.5



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

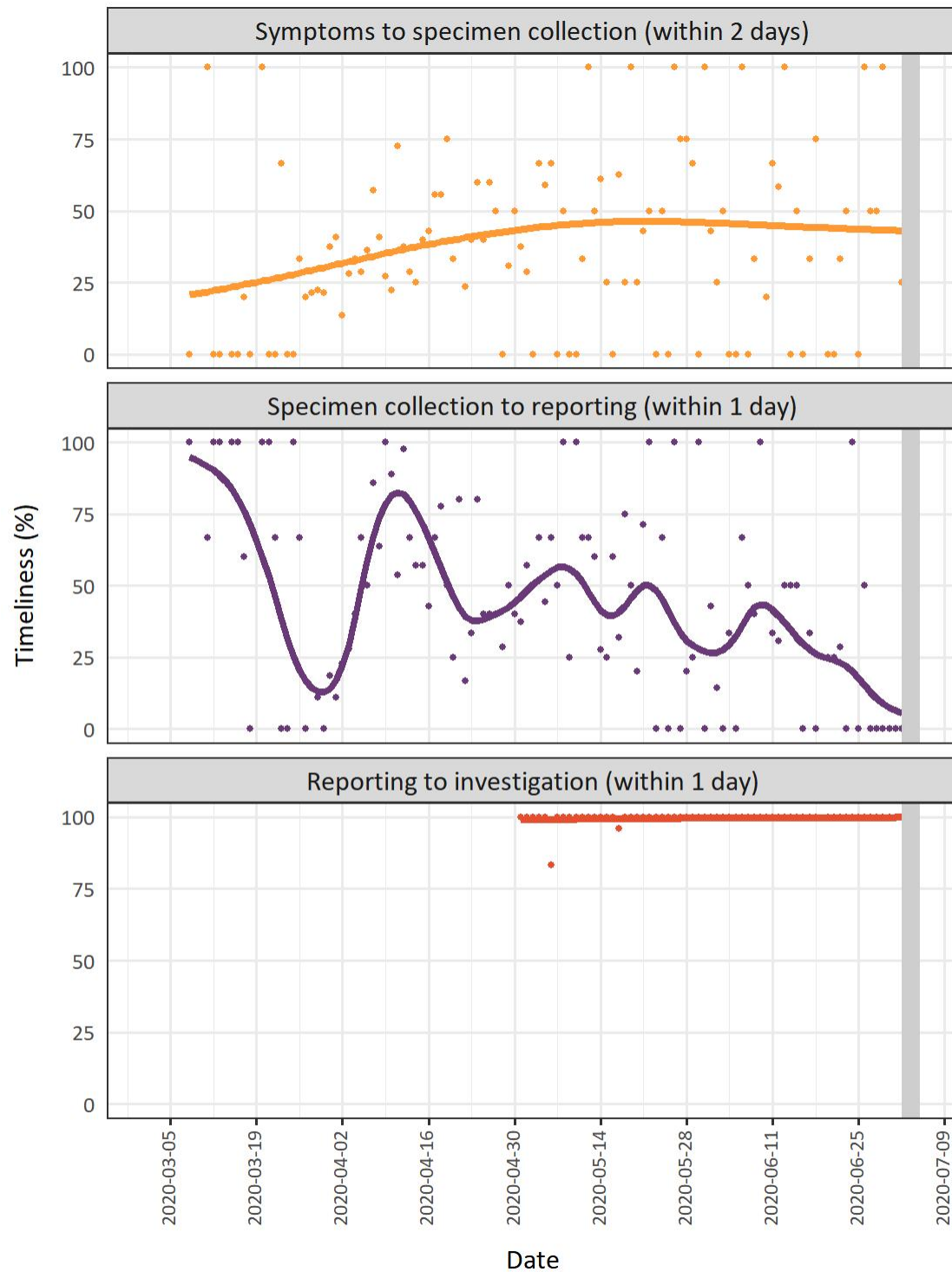
## Likely Acquisition: Halton Region Public Health



Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Timeliness: Halton Region Public Health

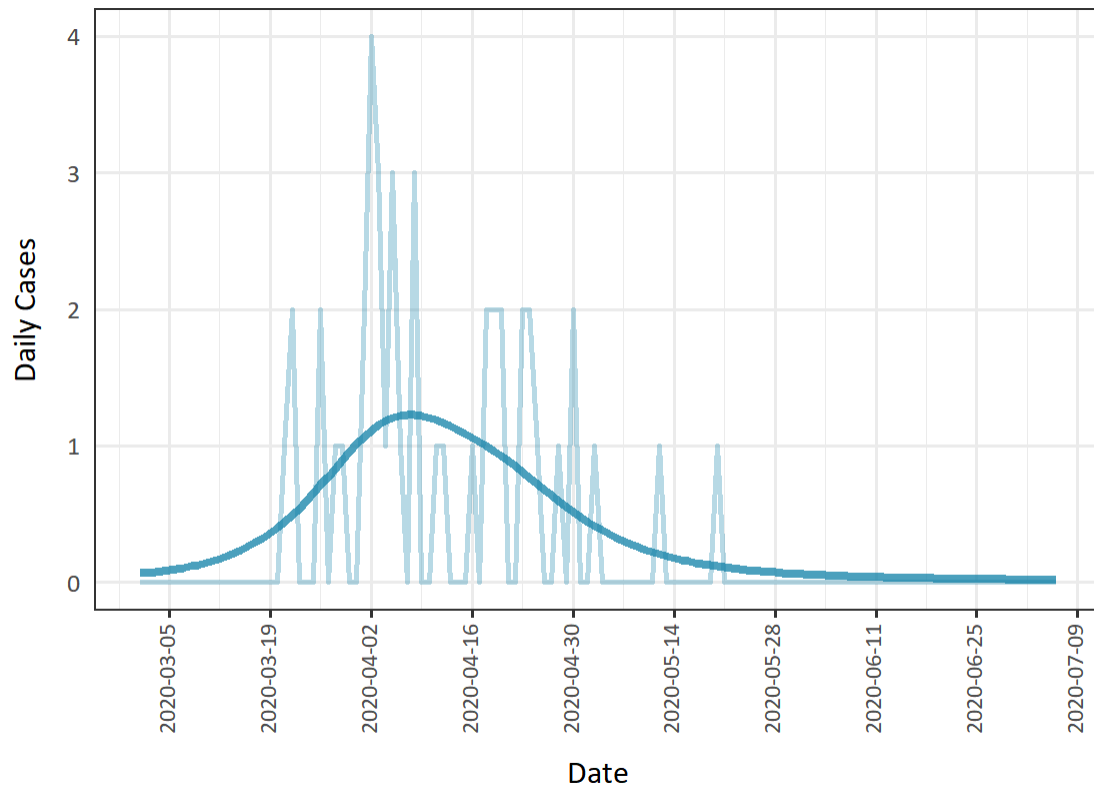


Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Hastings Prince Edward Public Health

### Epidemic Curve: Hastings Prince Edward Public Health

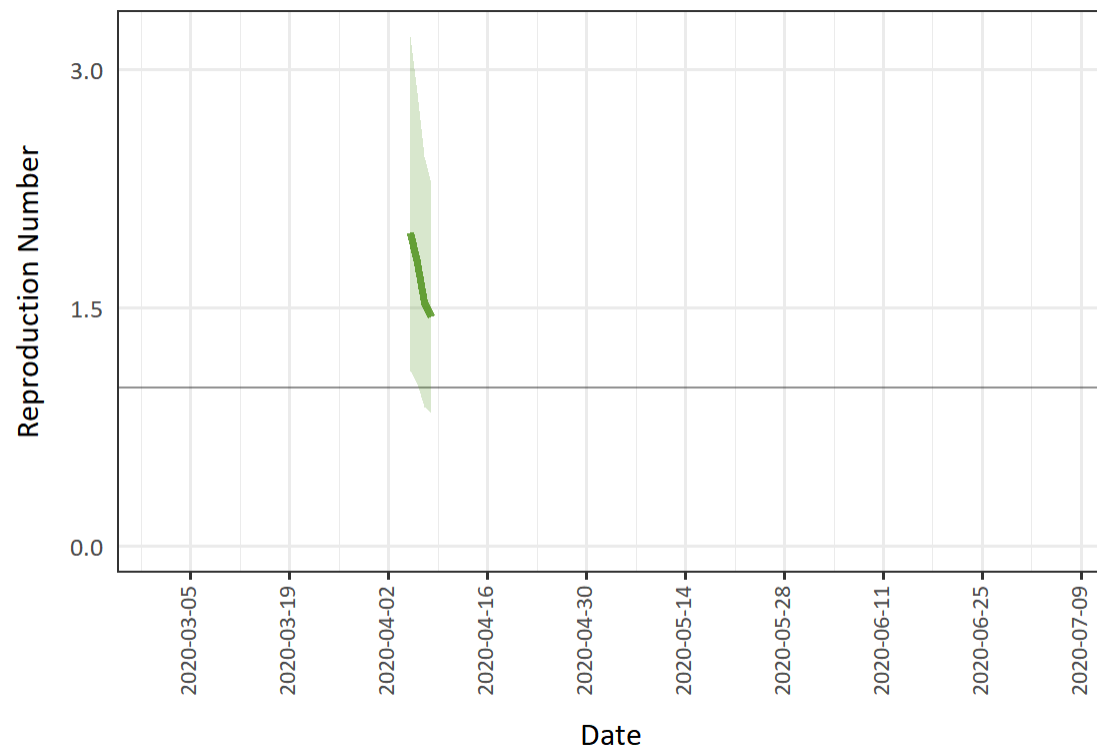


Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

## Reproduction Number: Hastings Prince Edward Public Health

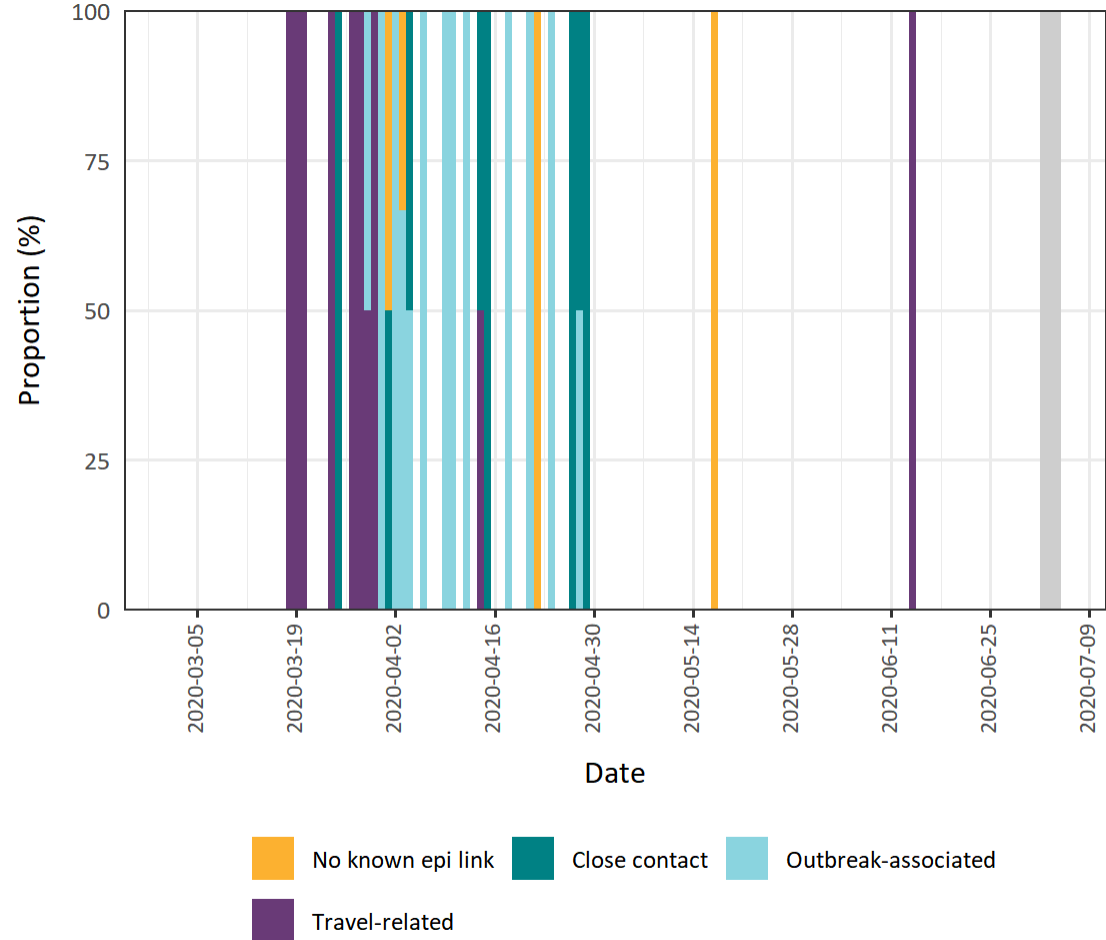
Jul 06 Re not provided: fewer than 12 cases in the 7 days prior to this date



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

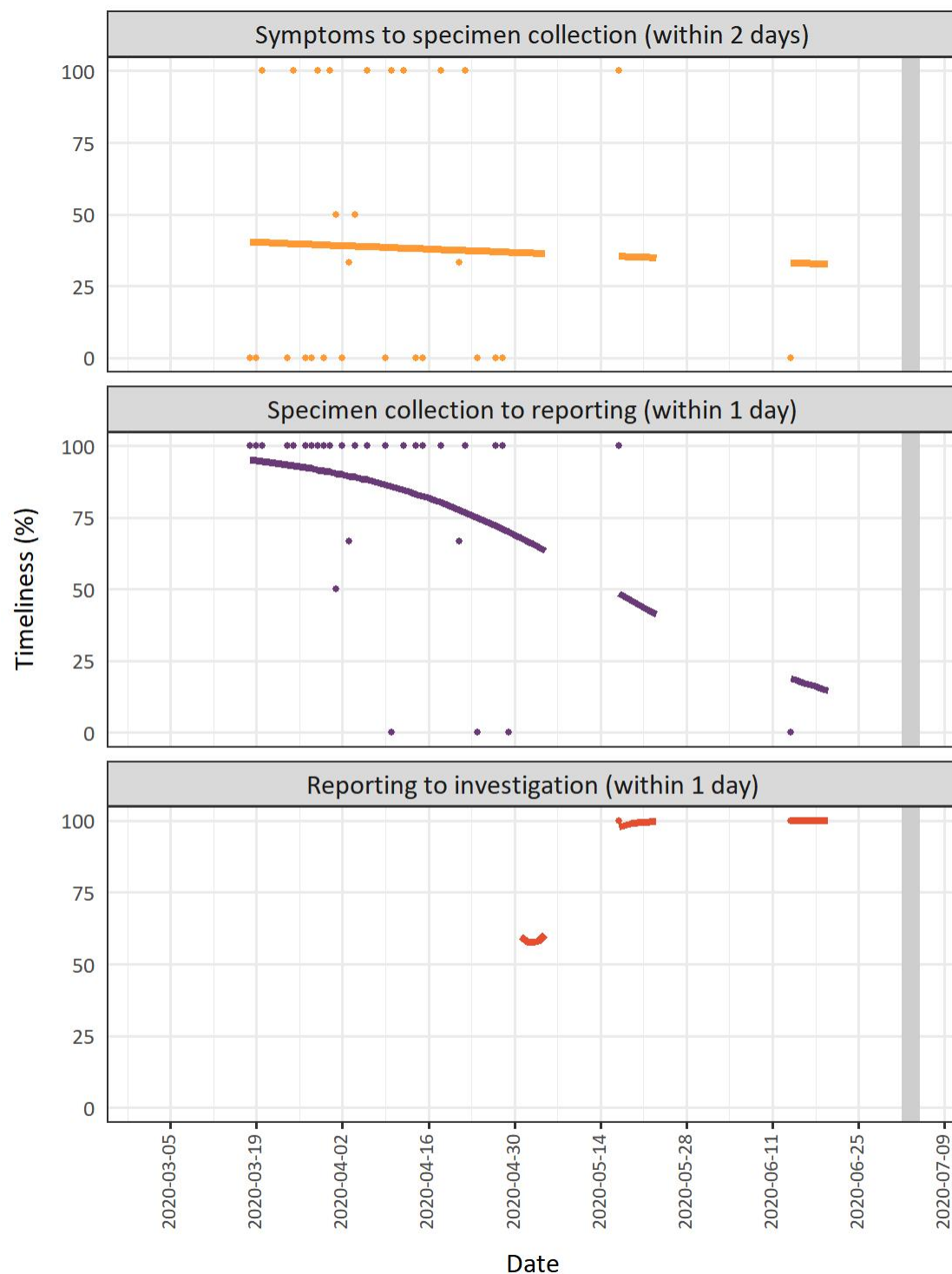
Likely Acquisition: Hastings Prince Edward Public Health



Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Timeliness: Hastings Prince Edward Public Health

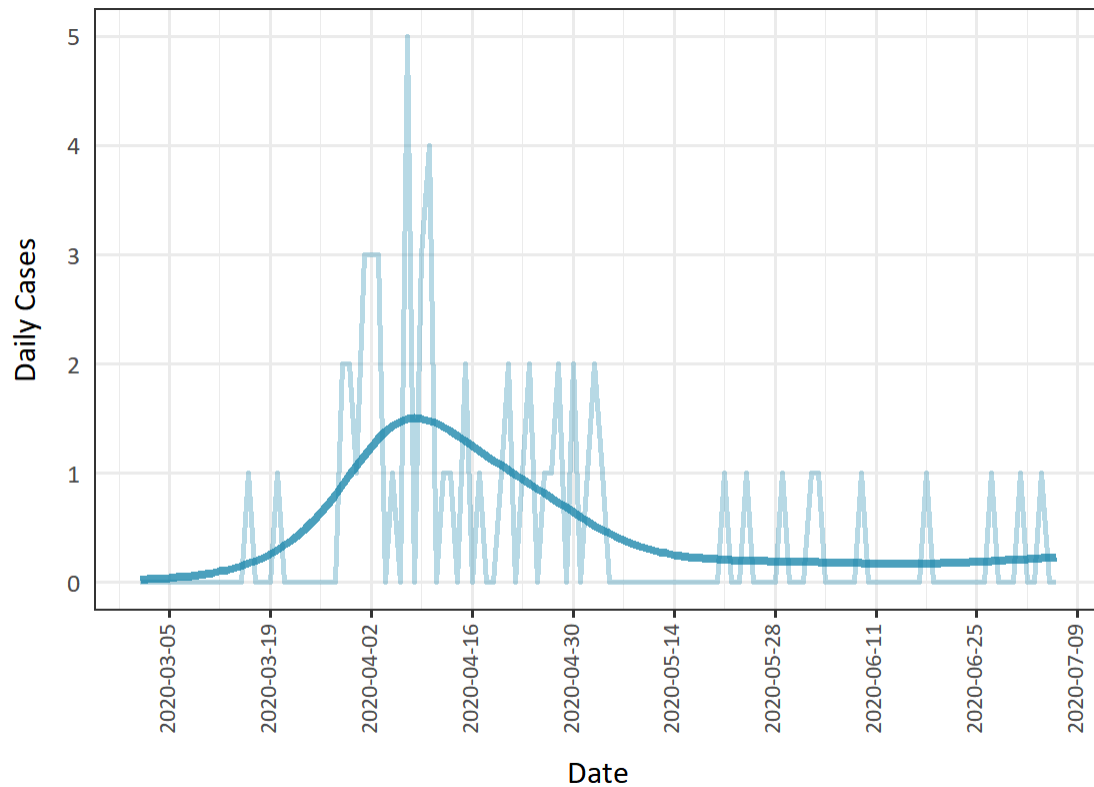


Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Huron Perth Public Health

### Epidemic Curve: Huron Perth Public Health



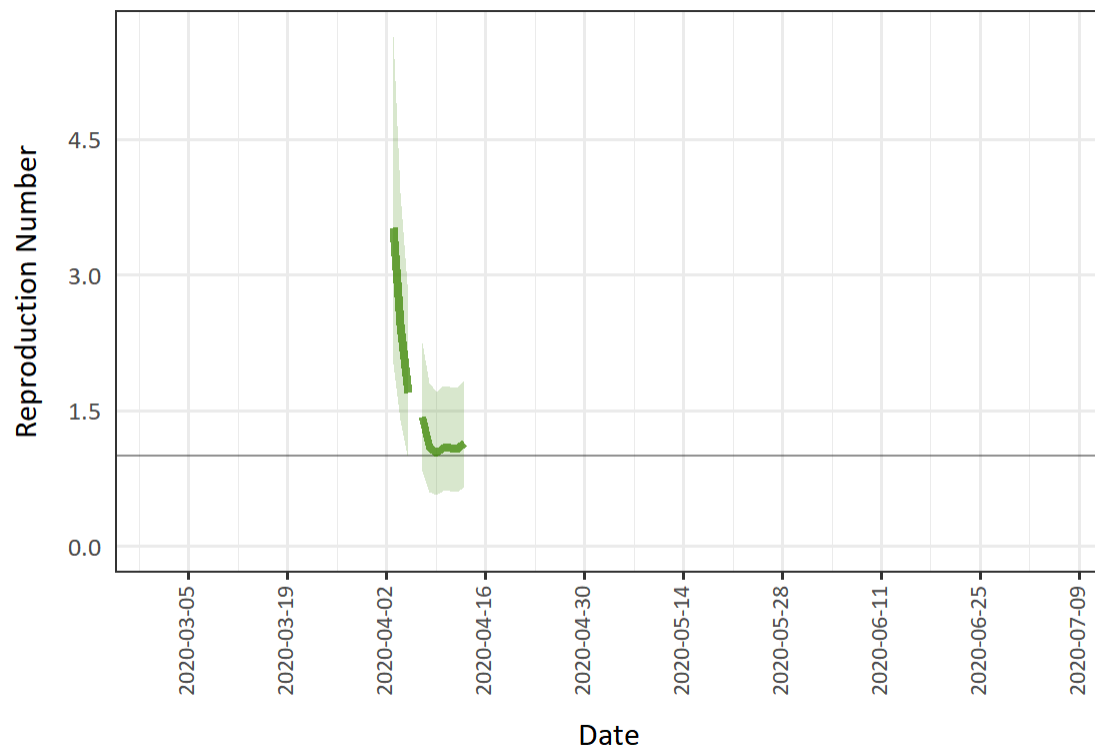
Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus



## Reproduction Number: Huron Perth Public Health

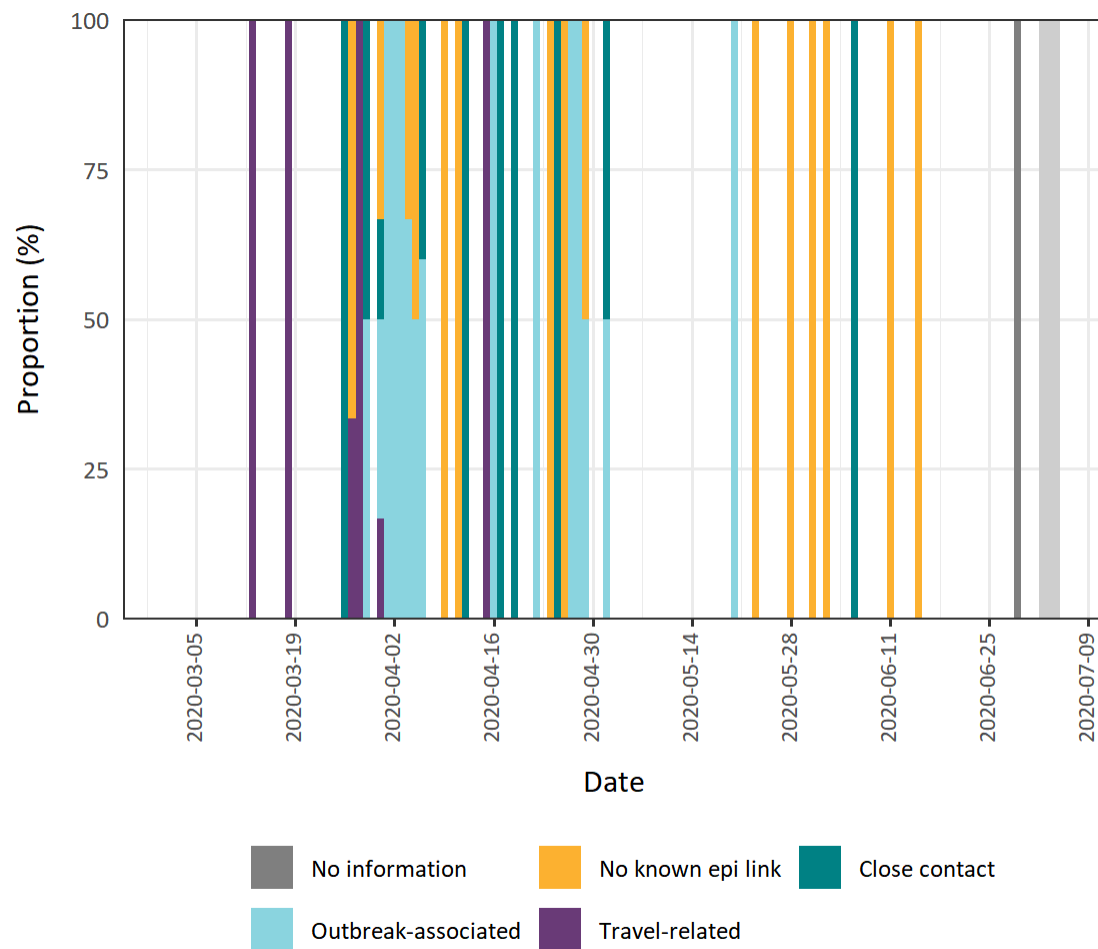
Jul 06 Re not provided: fewer than 12 cases in the 7 days prior to this date



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

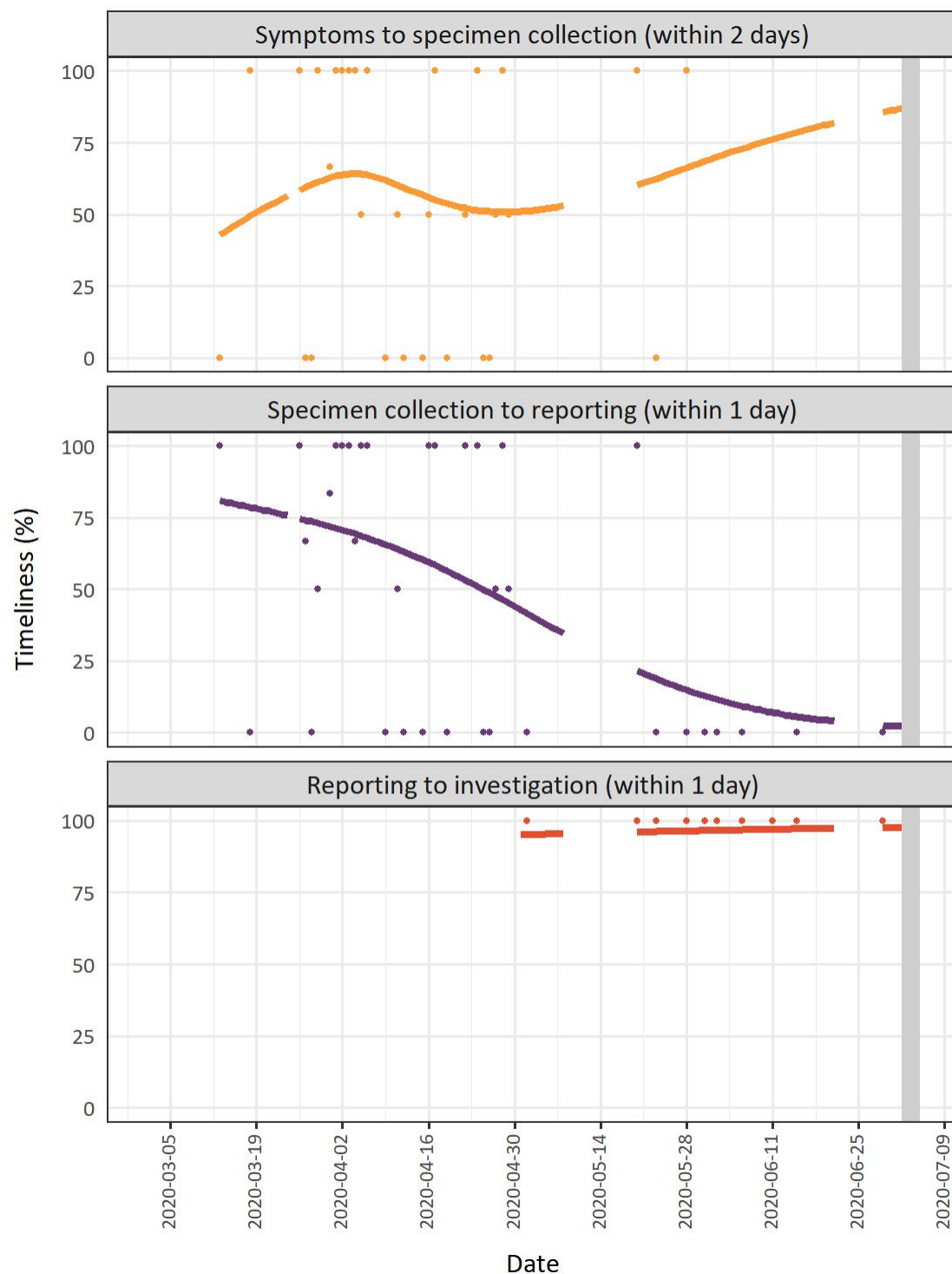
## Likely Acquisition: Huron Perth Public Health



Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Timeliness: Huron Perth Public Health

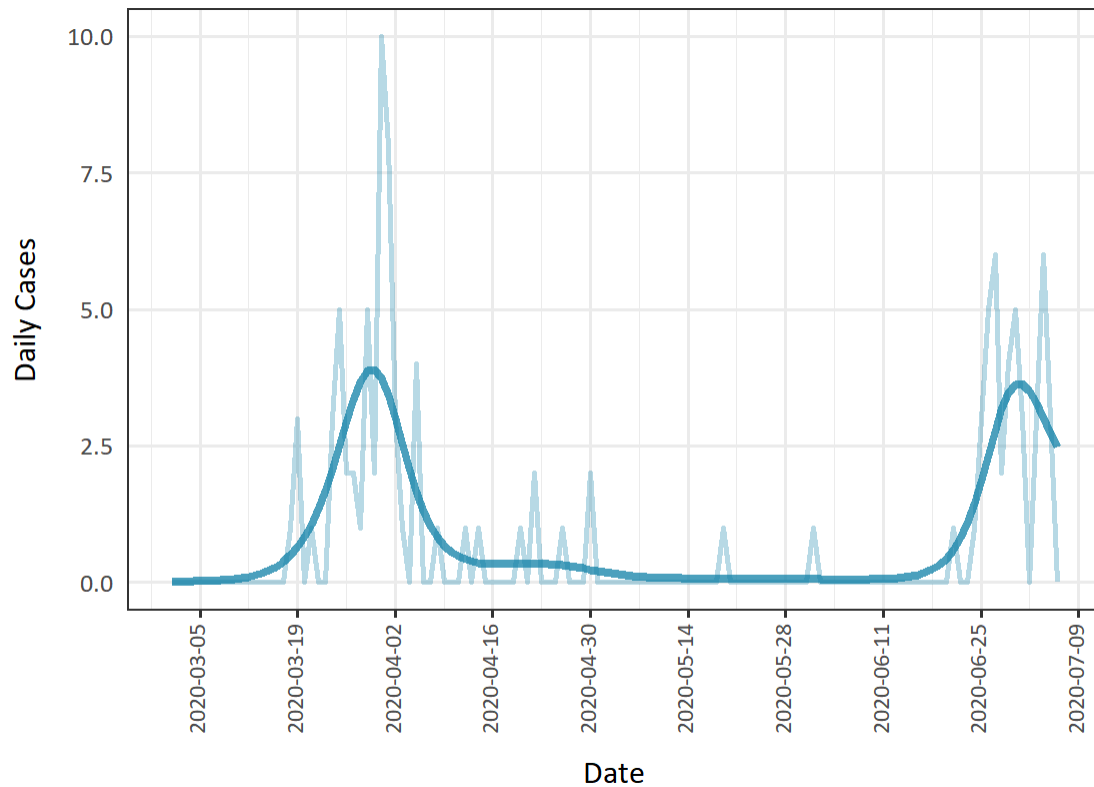


Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Kingston, Frontenac and Lennox & Addington Public Health

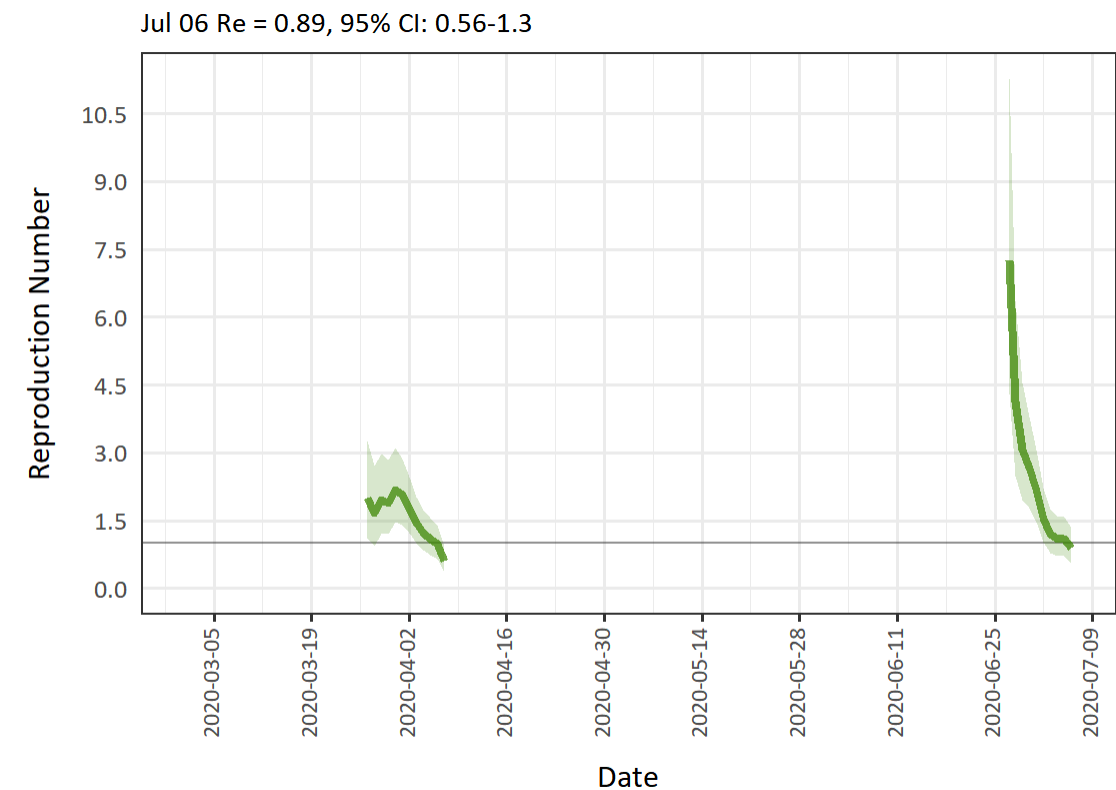
### Epidemic Curve: Kingston, Frontenac and Lennox & Addington Public Health



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

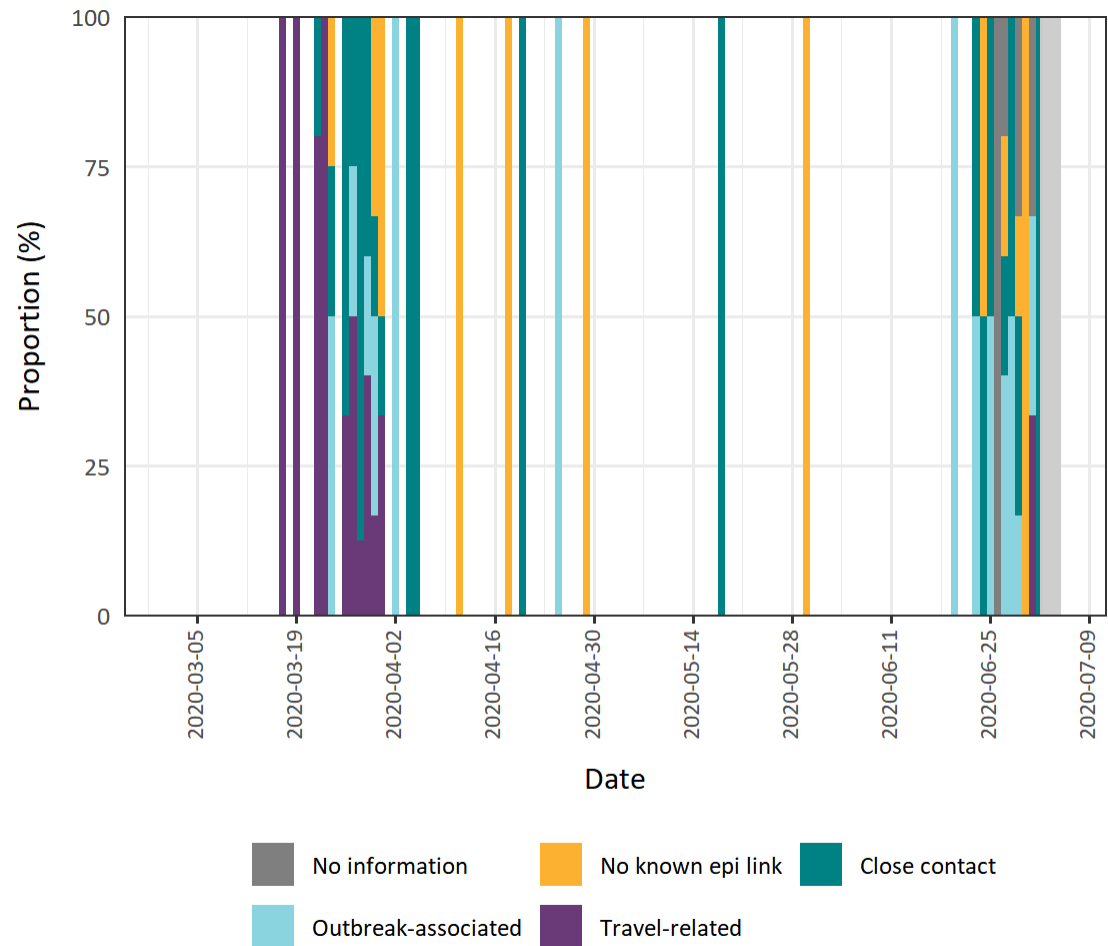
### Reproduction Number: Kingston, Frontenac and Lennox & Addington Public Health



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

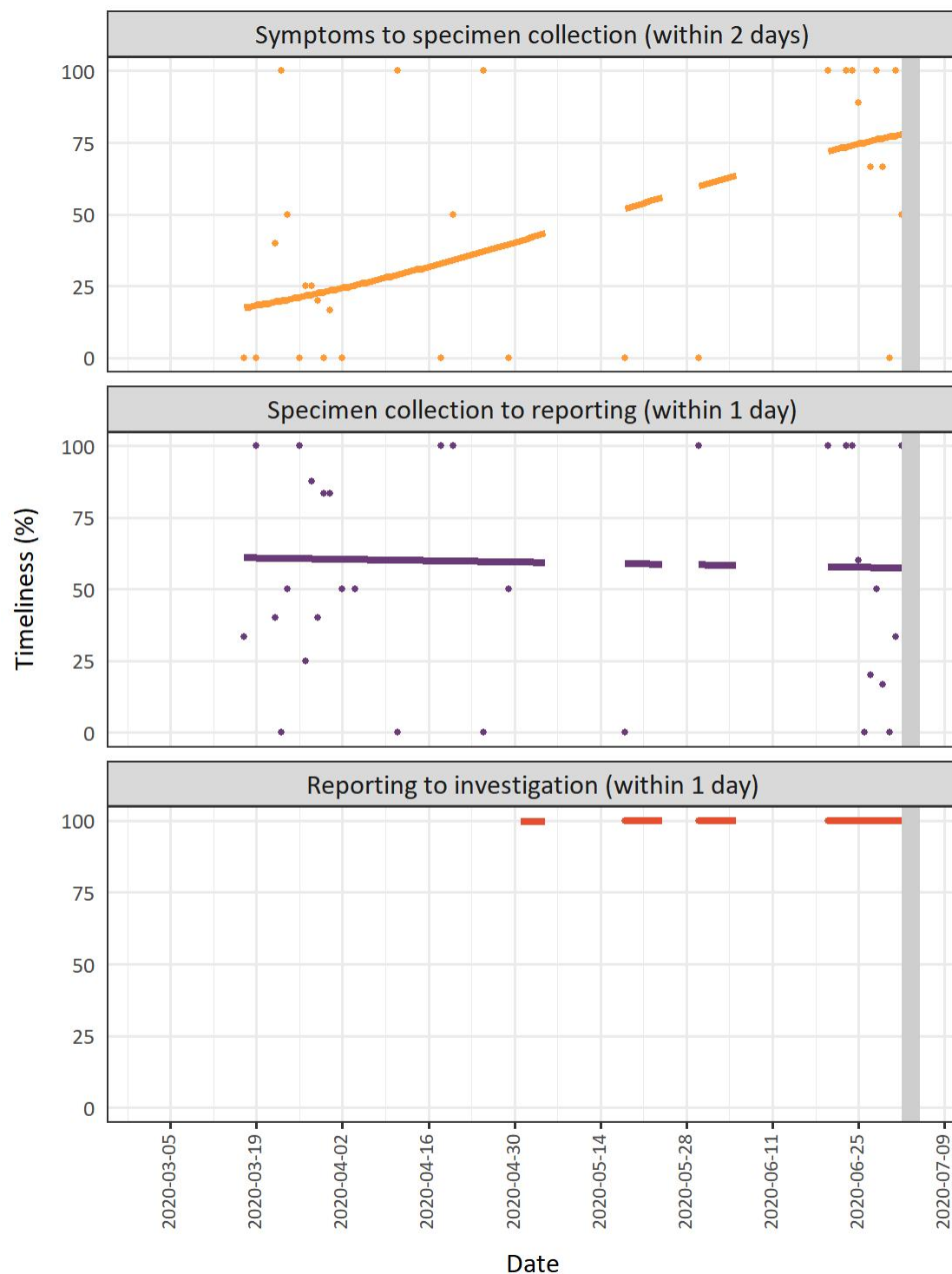
Likely Acquisition: Kingston, Frontenac and Lennox & Addington Public Health



Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

### Timeliness: Kingston, Frontenac and Lennox & Addington Public Health

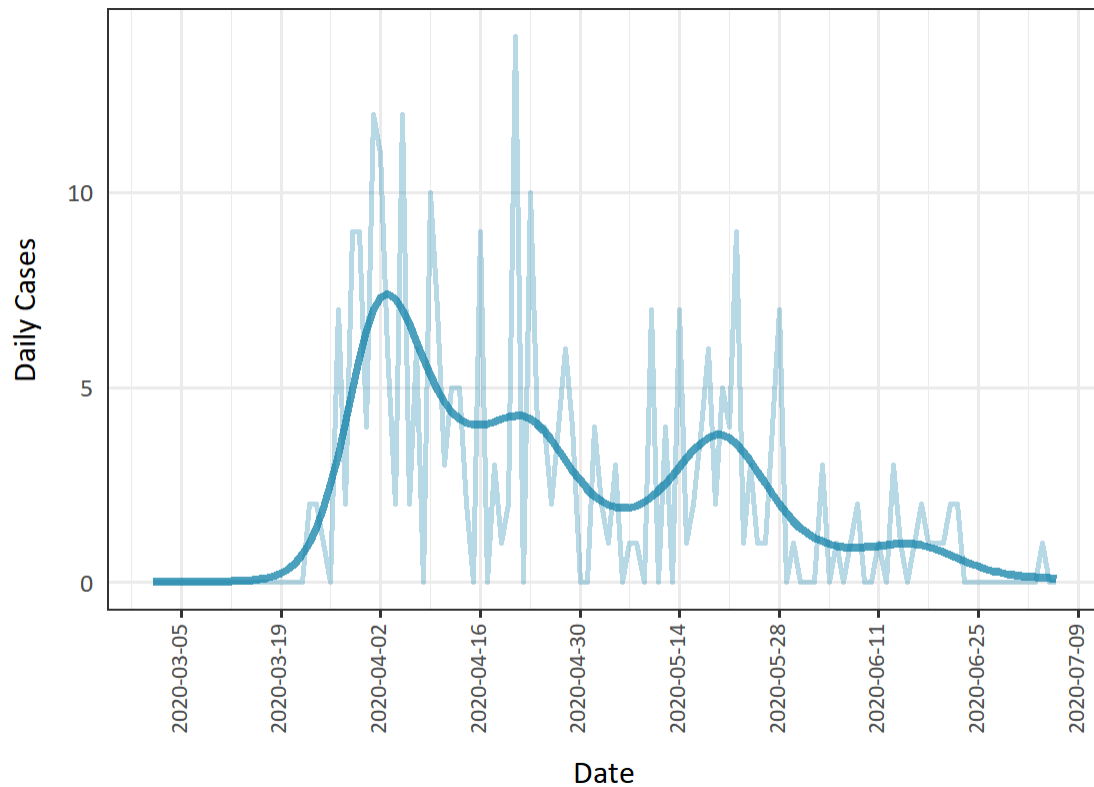


Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Lambton Public Health

### Epidemic Curve: Lambton Public Health

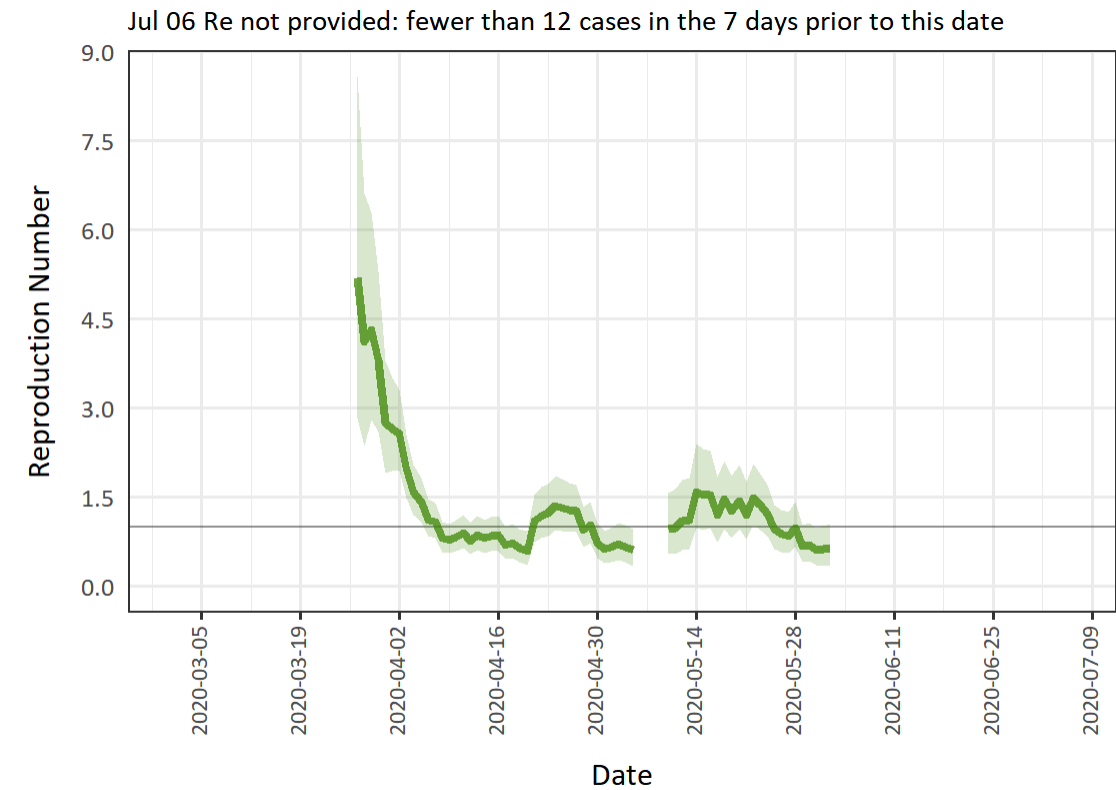


Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus



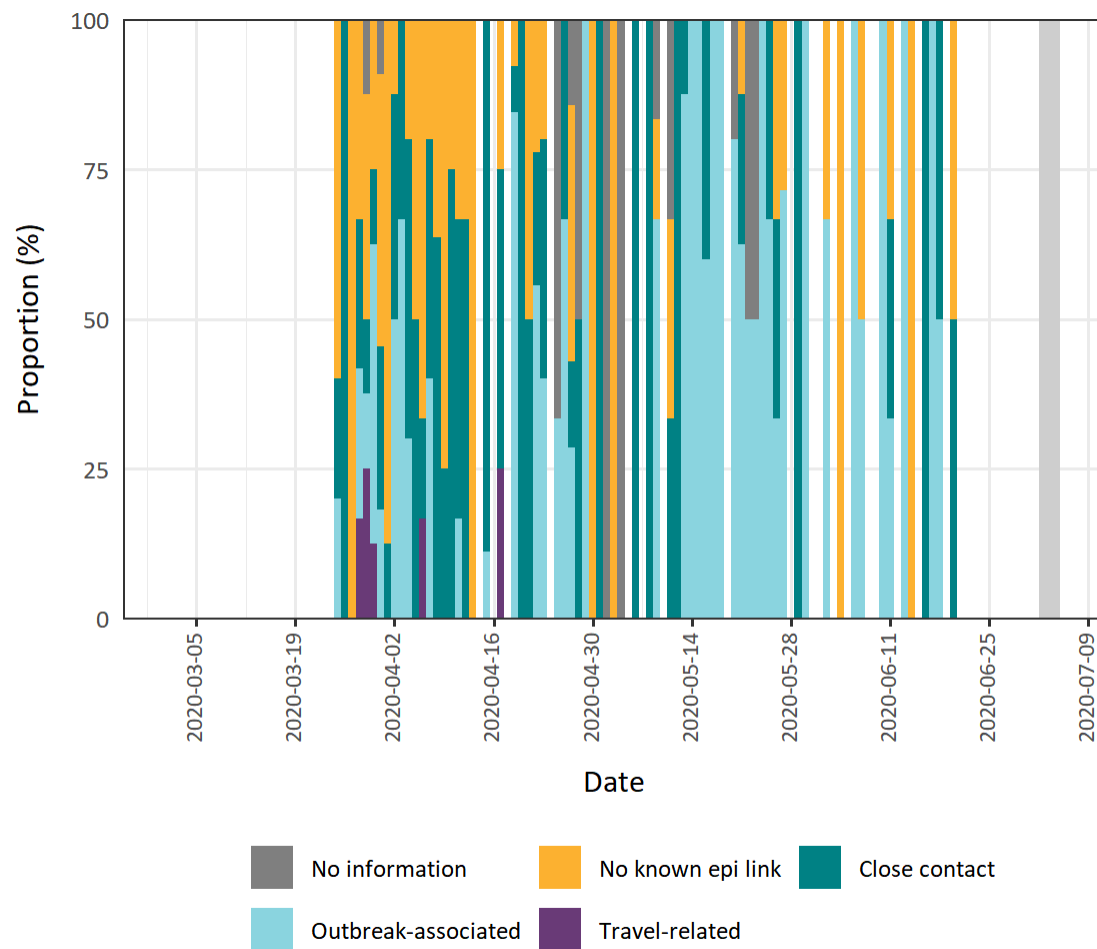
## Reproduction Number: Lambton Public Health



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

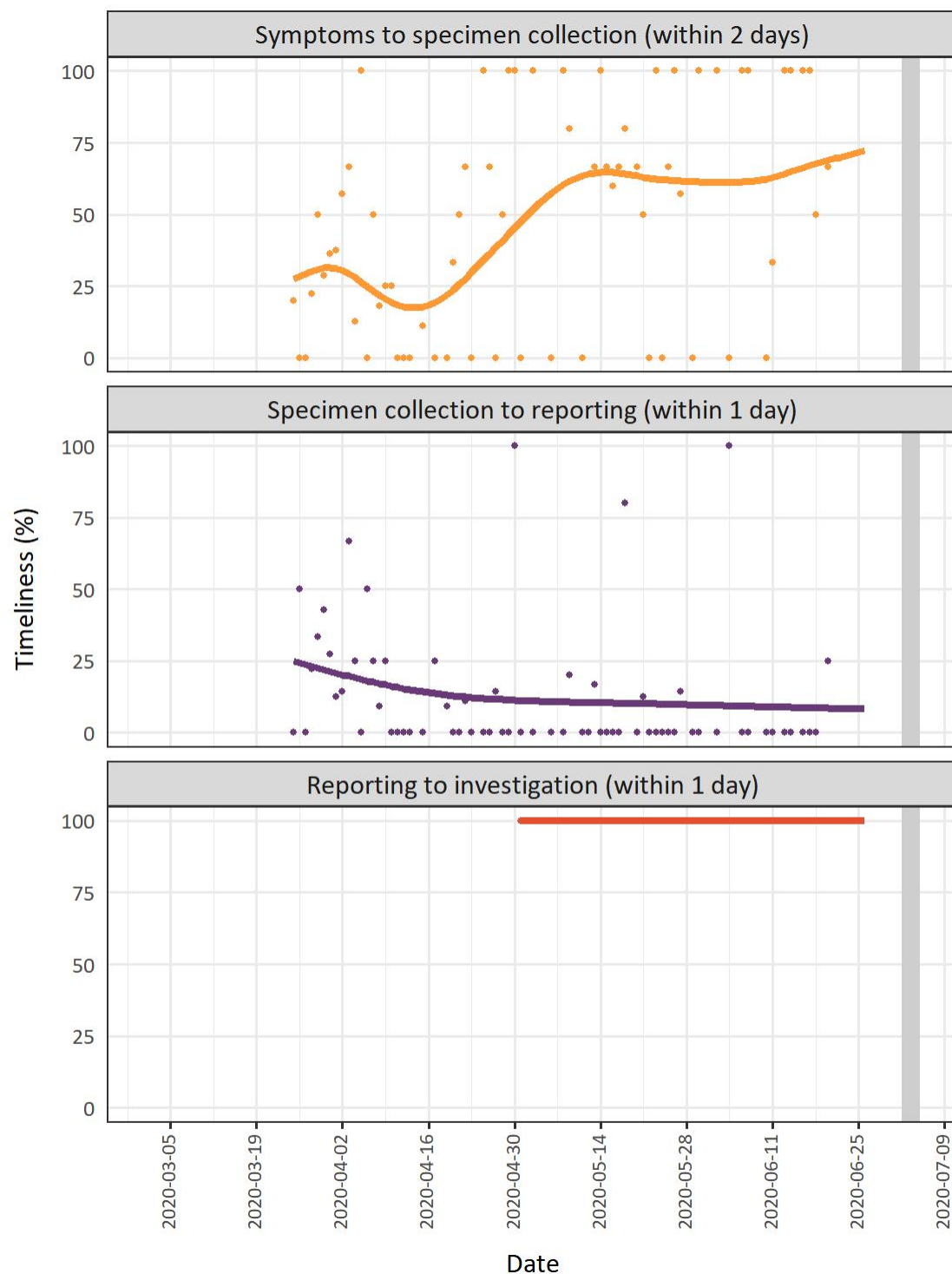
## Likely Acquisition: Lambton Public Health



Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Timeliness: Lambton Public Health

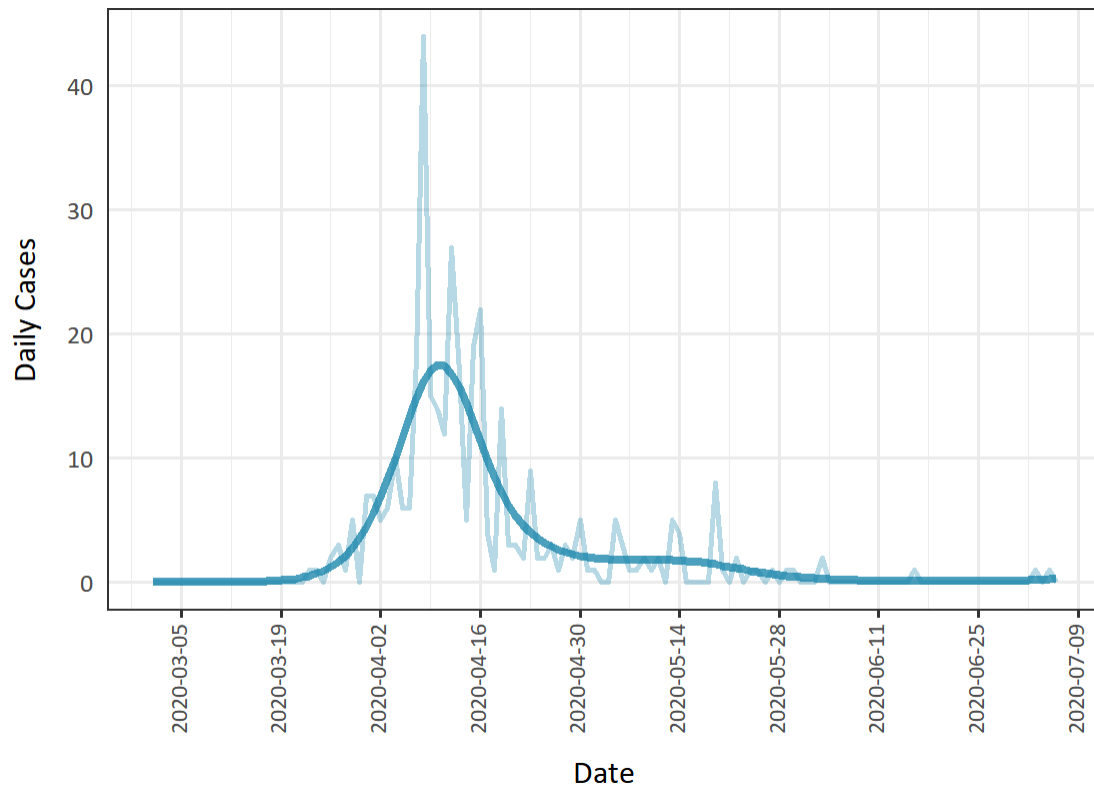


Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Leeds, Grenville & Lanark District Health Unit

### Epidemic Curve: Leeds, Grenville & Lanark District Health Unit

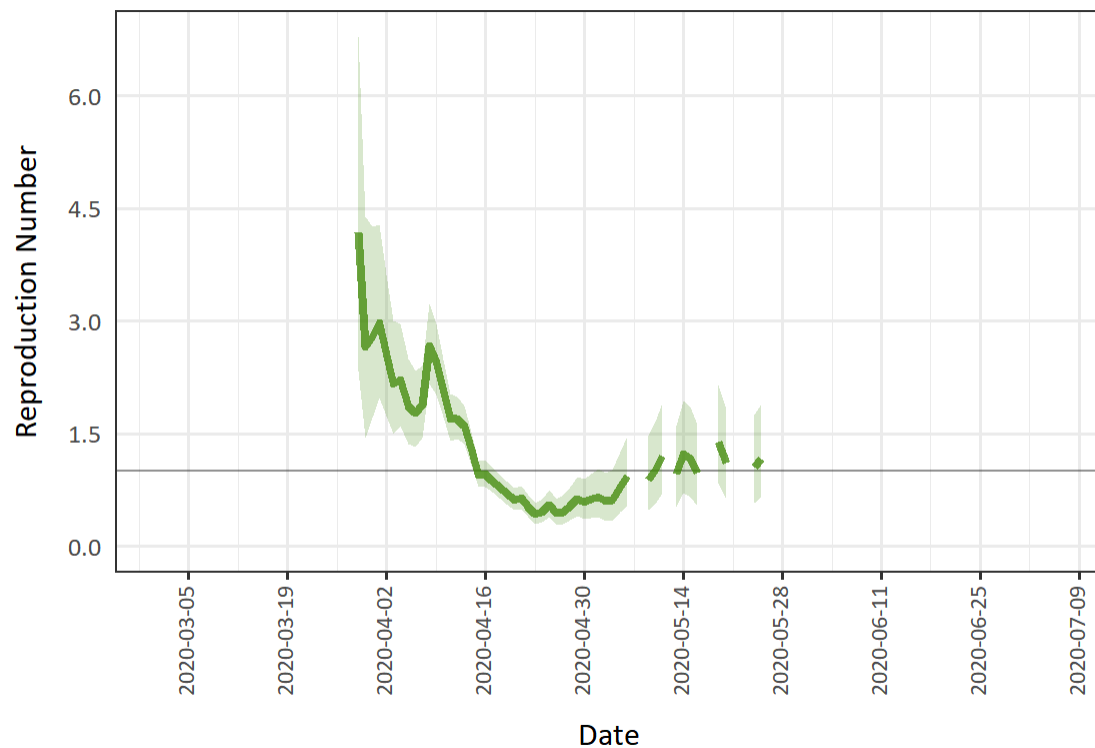


Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

## Reproduction Number: Leeds, Grenville & Lanark District Health Unit

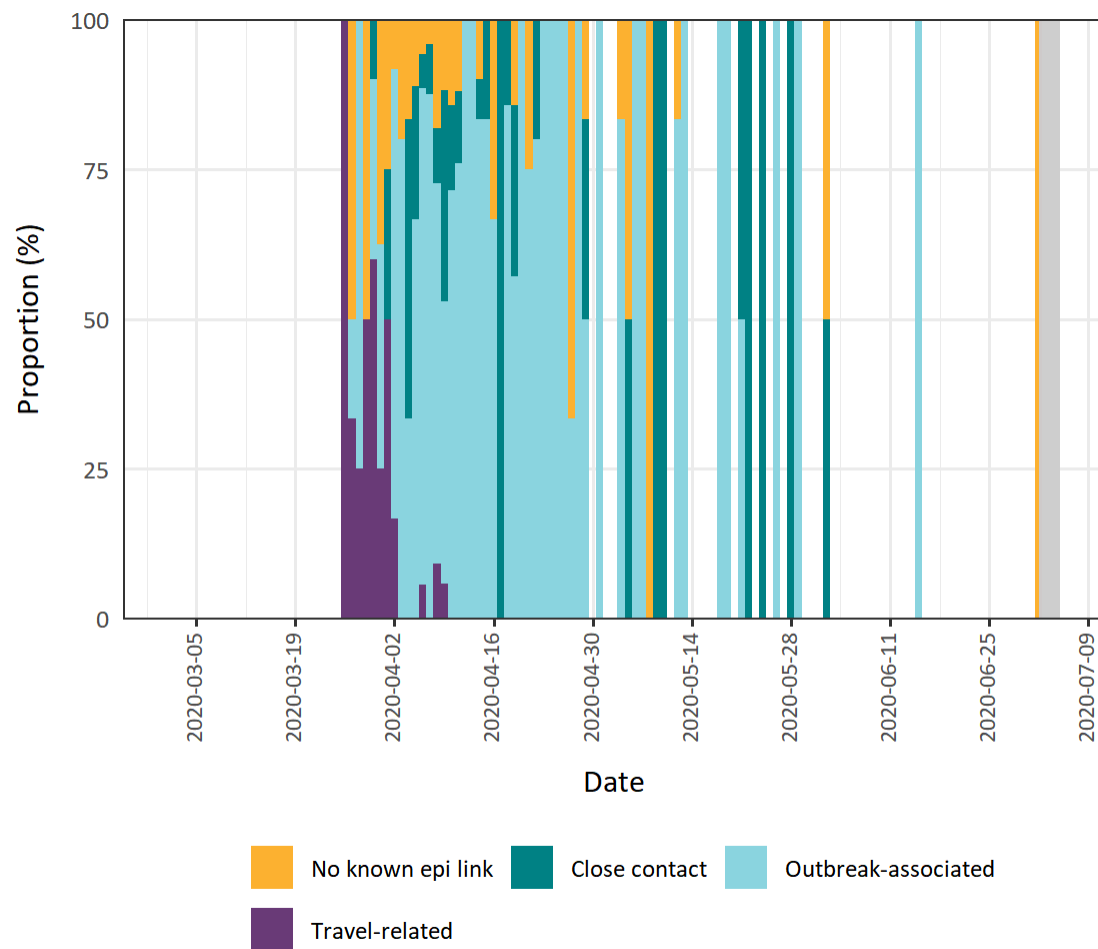
Jul 06 Re not provided: fewer than 12 cases in the 7 days prior to this date



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

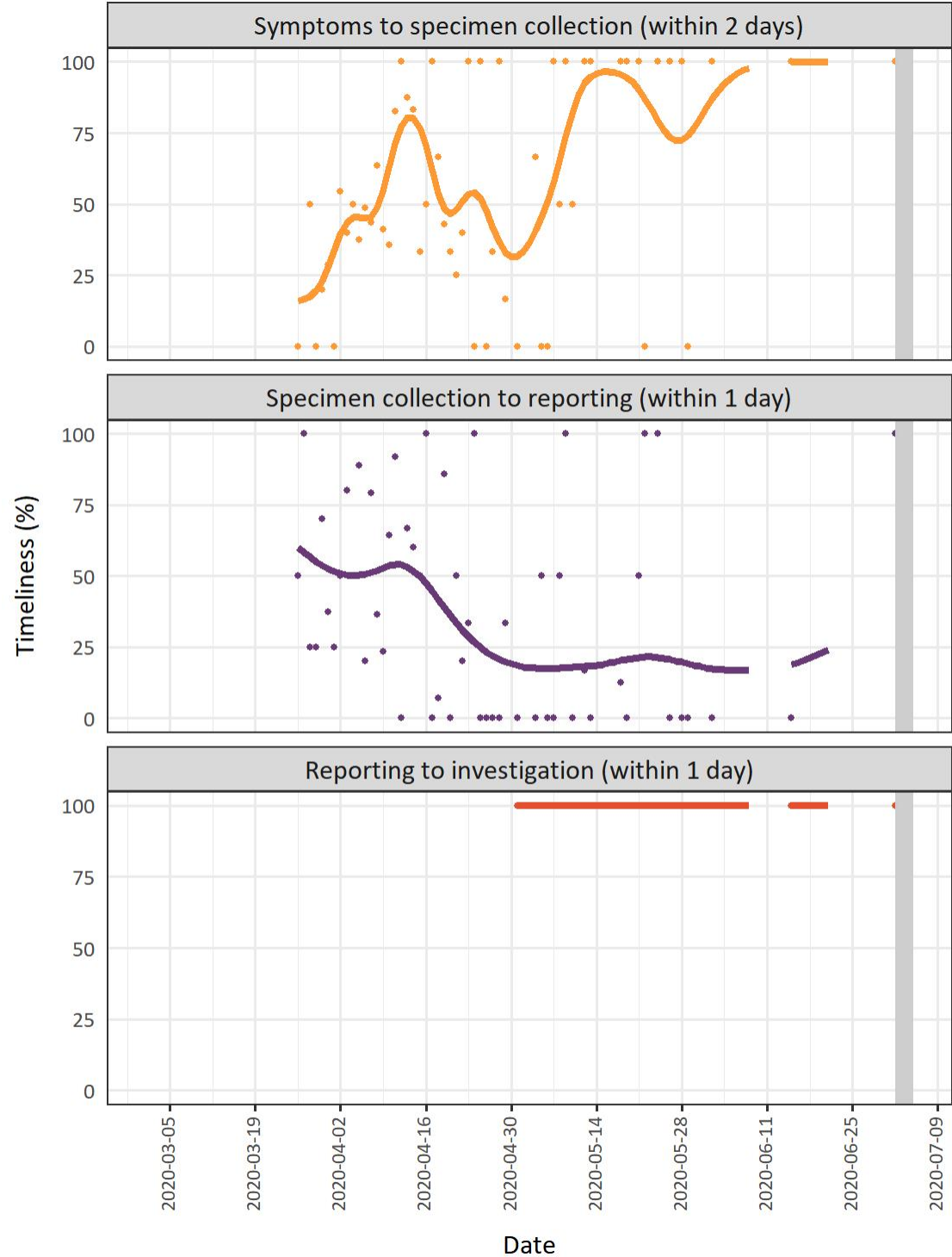
### Likely Acquisition: Leeds, Grenville & Lanark District Health Unit



Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

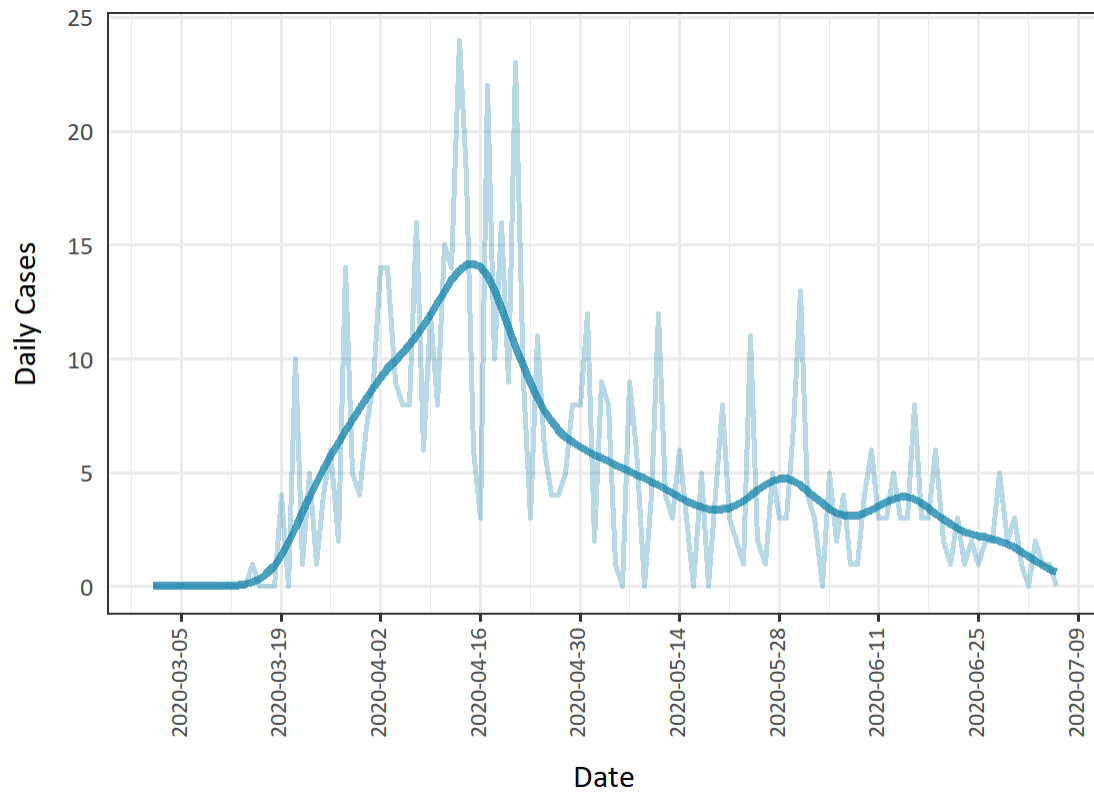
Timeliness: Leeds, Grenville & Lanark District Health Unit



Data Source: iPHIS plus

## Middlesex-London Health Unit

### Epidemic Curve: Middlesex-London Health Unit

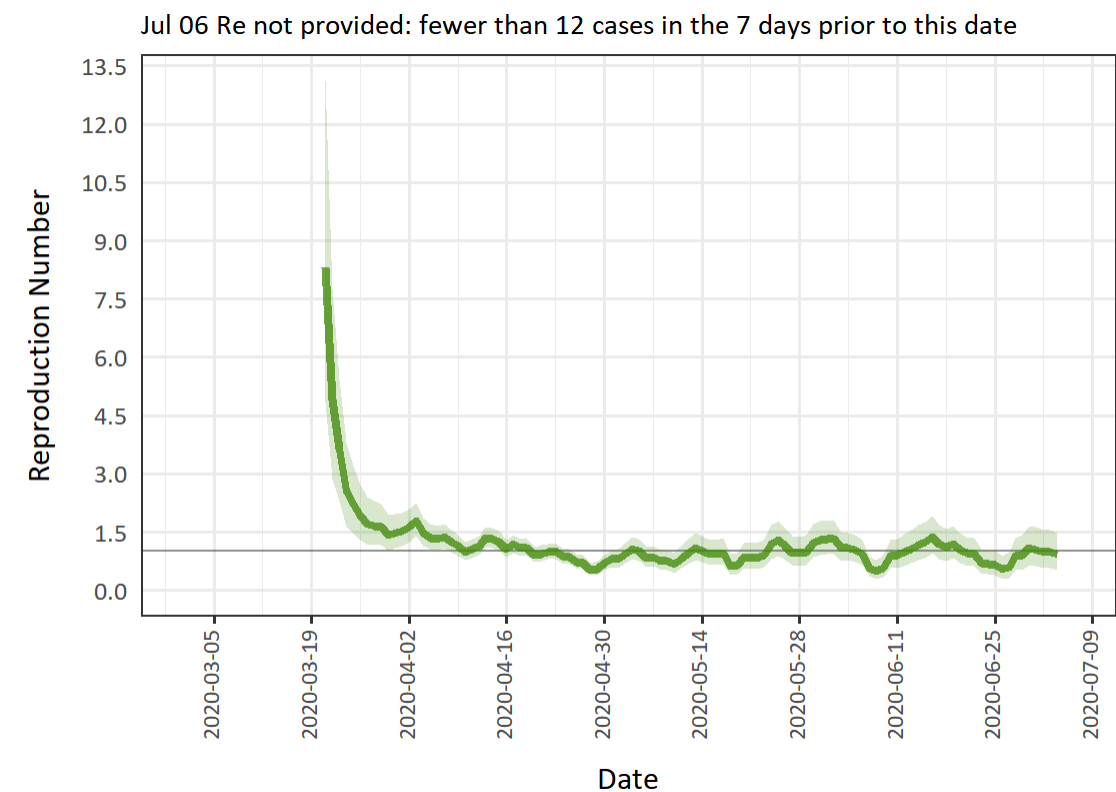


Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus



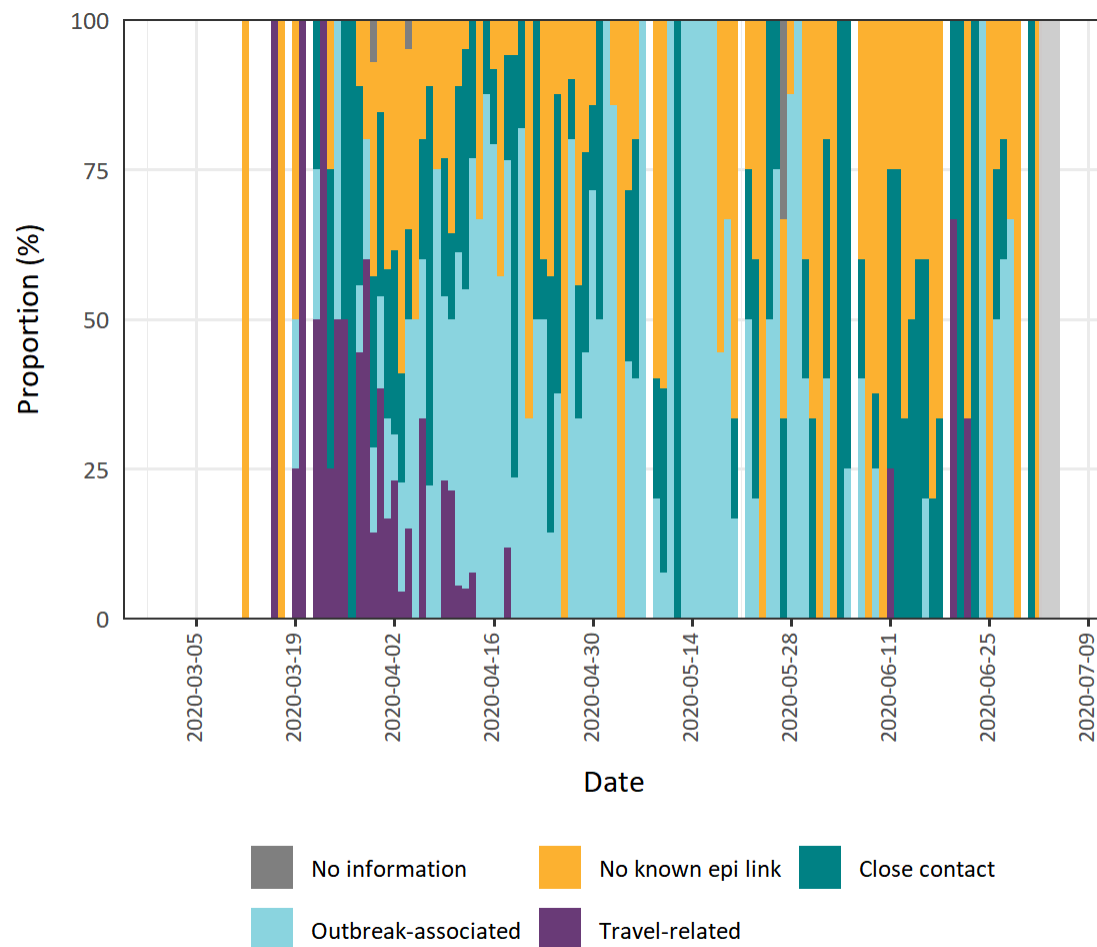
## Reproduction Number: Middlesex-London Health Unit



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

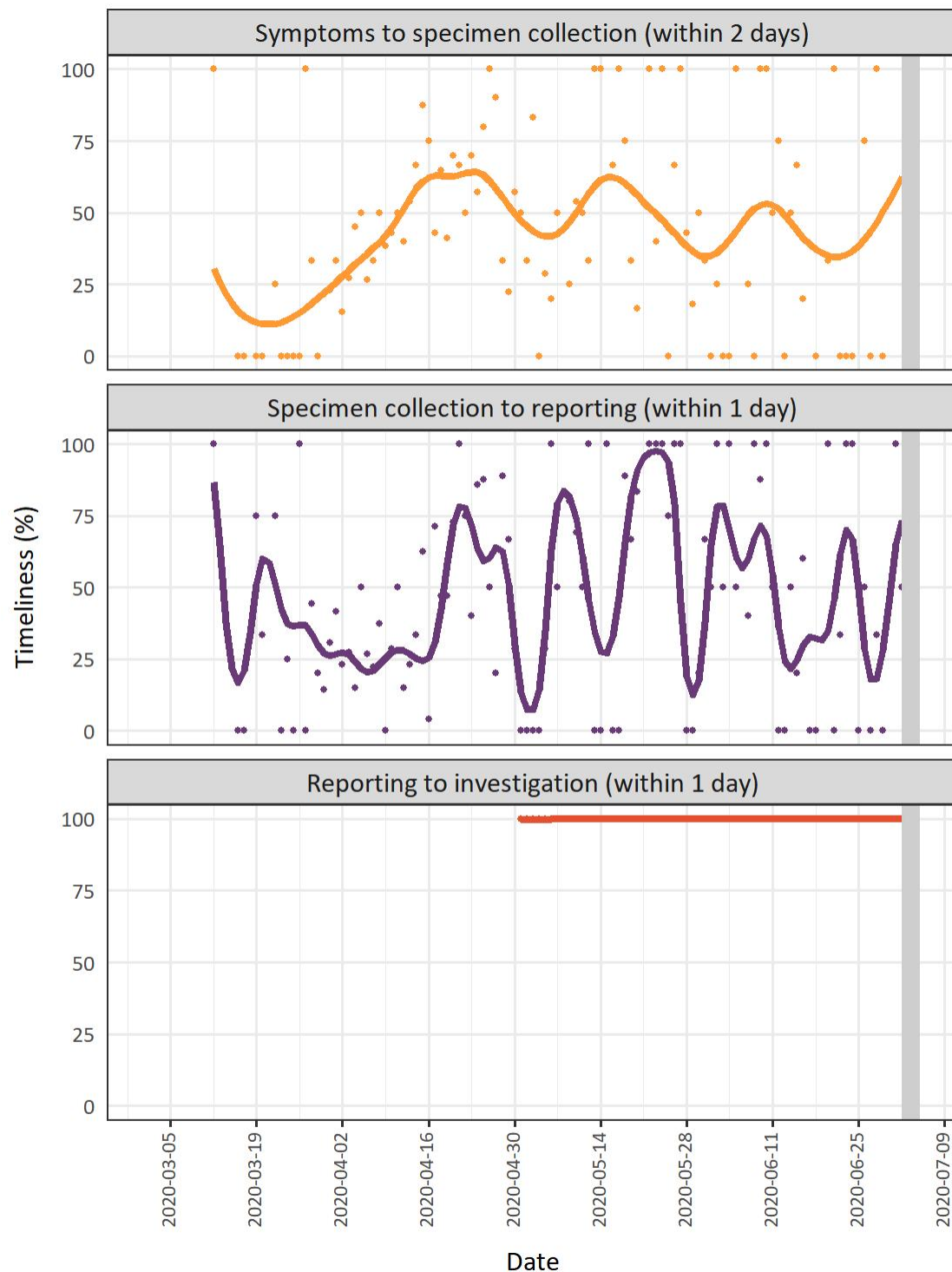
### Likely Acquisition: Middlesex-London Health Unit



Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Timeliness: Middlesex-London Health Unit

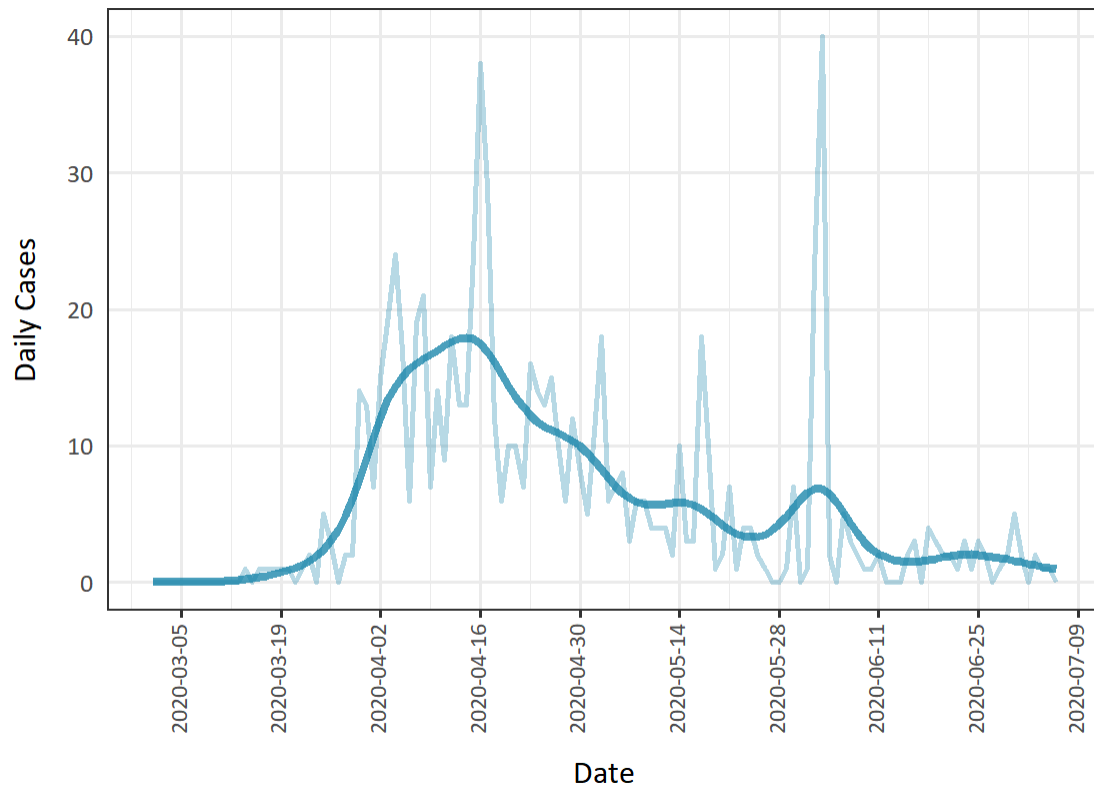


Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Niagara Region Public Health

### Epidemic Curve: Niagara Region Public Health

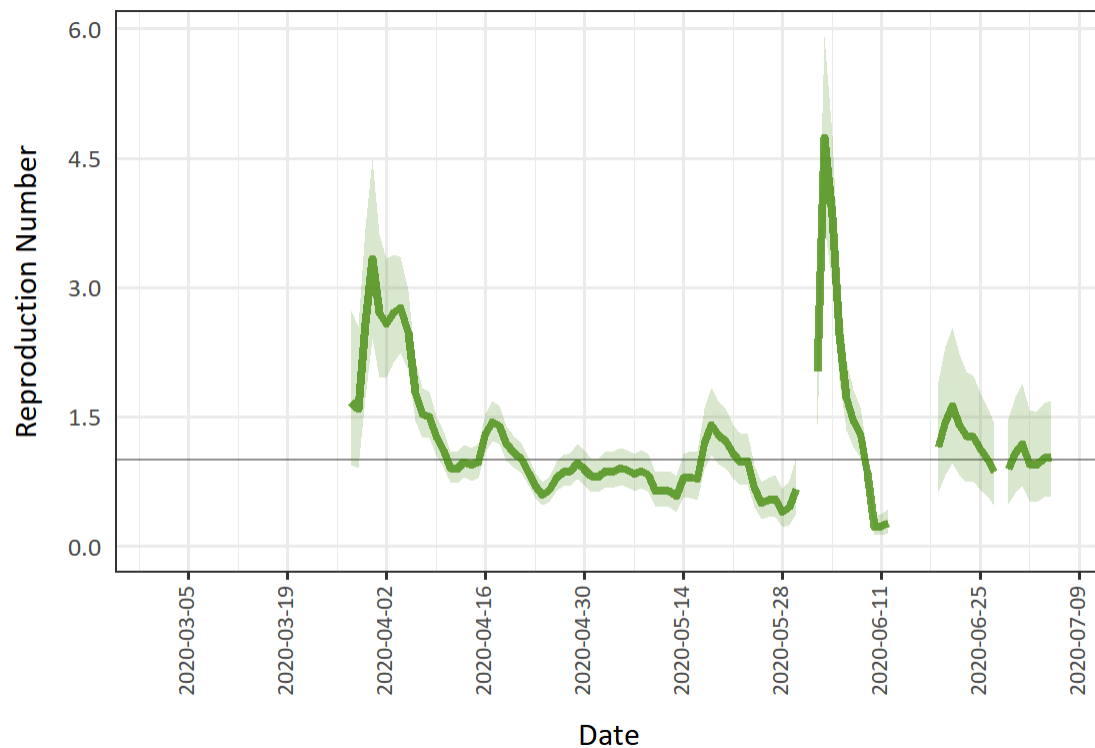


Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

## Reproduction Number: Niagara Region Public Health

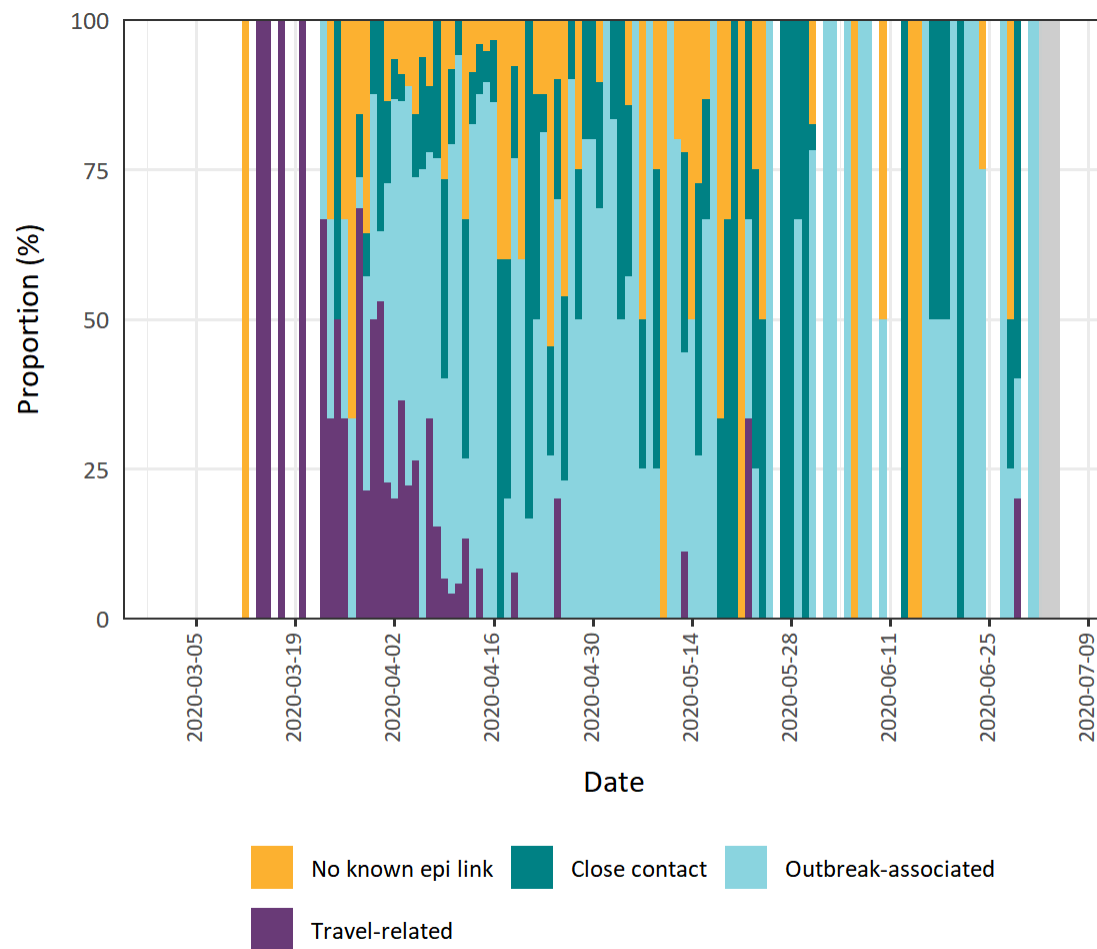
Jul 06 Re not provided: fewer than 12 cases in the 7 days prior to this date



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

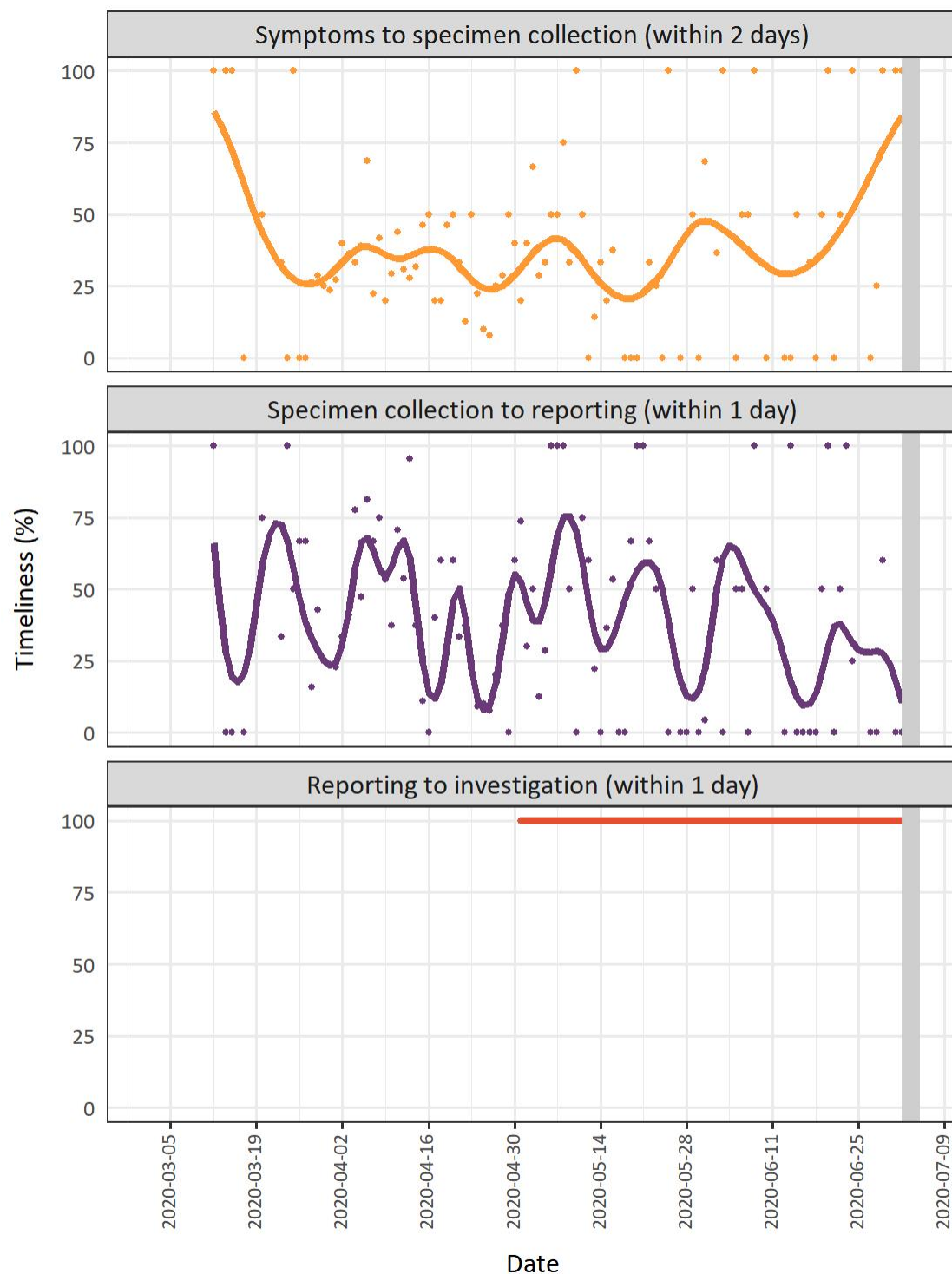
## Likely Acquisition: Niagara Region Public Health



Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Timeliness: Niagara Region Public Health

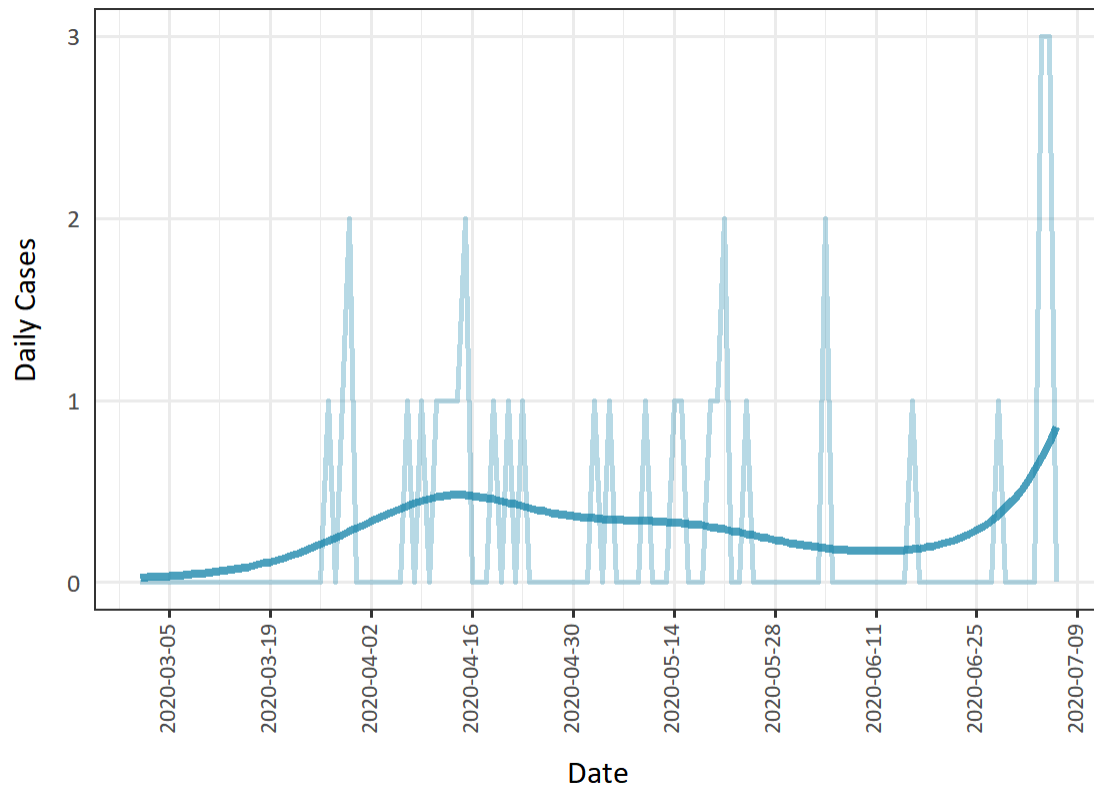


Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## North Bay Parry Sound District Health Unit

### Epidemic Curve: North Bay Parry Sound District Health Unit



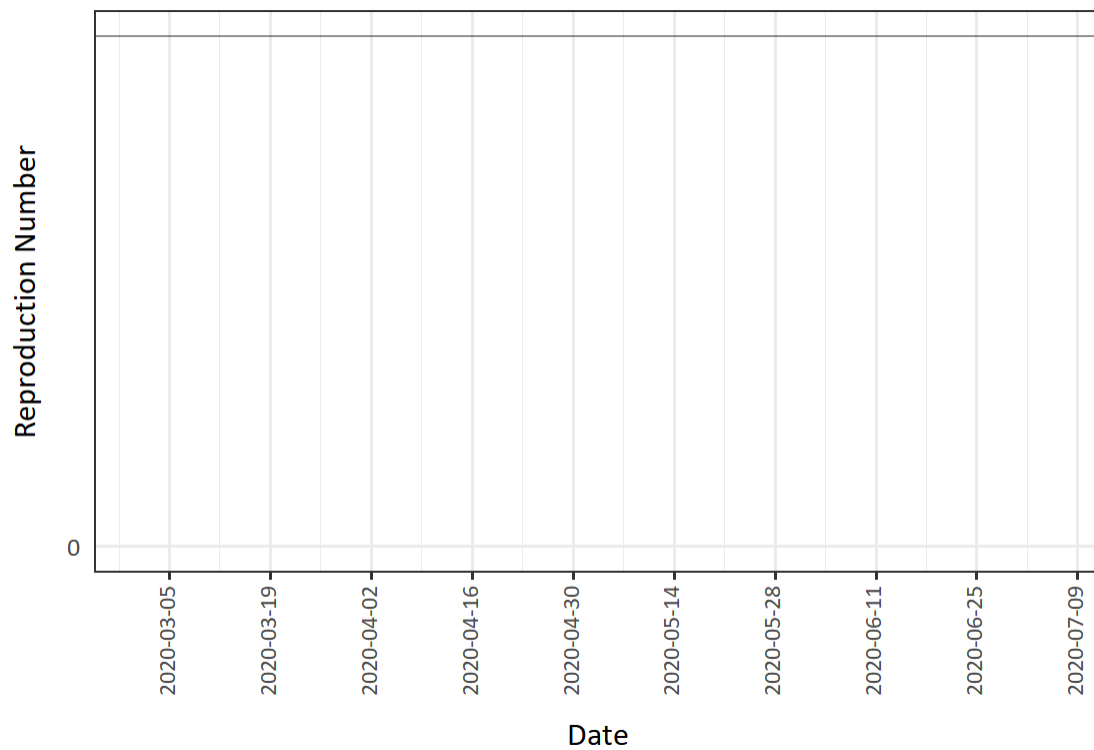
Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus



## Reproduction Number: North Bay Parry Sound District Health Unit

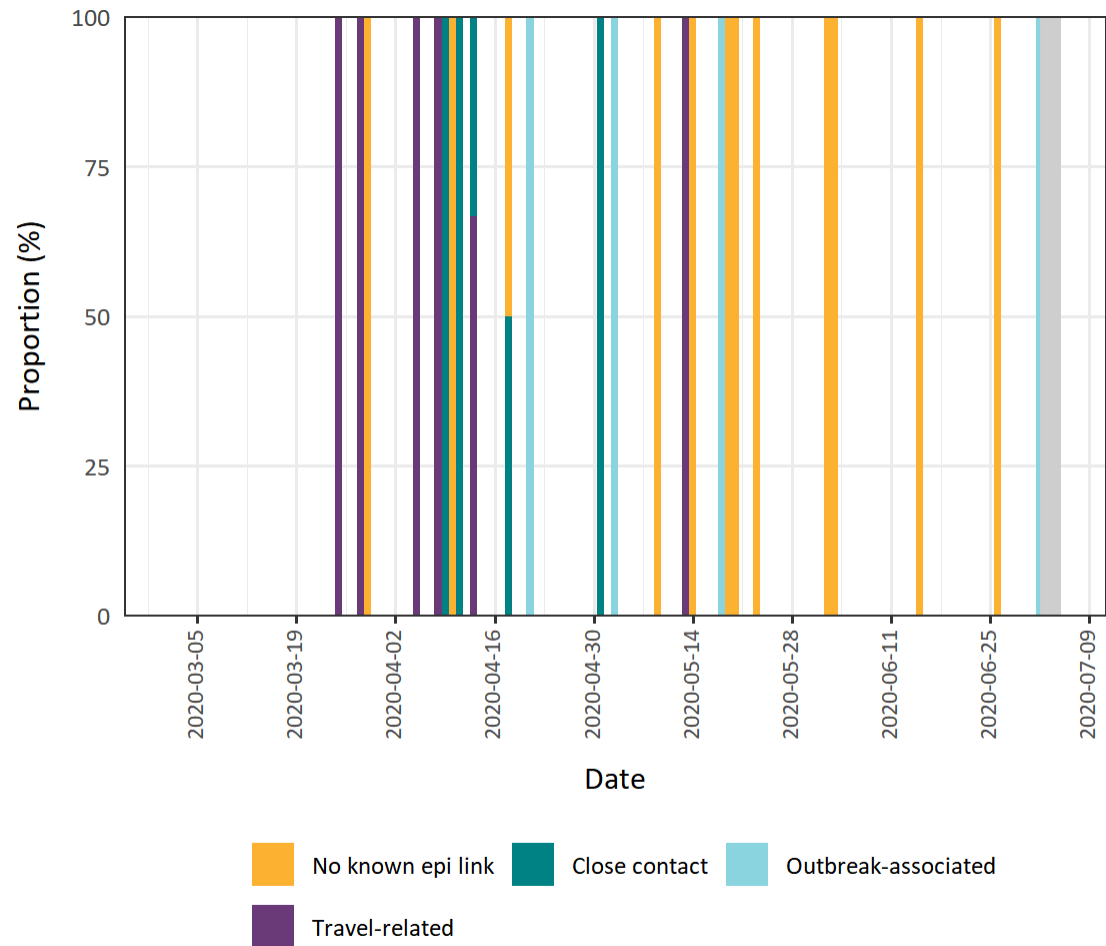
Jul 06 Re not provided: fewer than 12 cases in the 7 days prior to this date



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

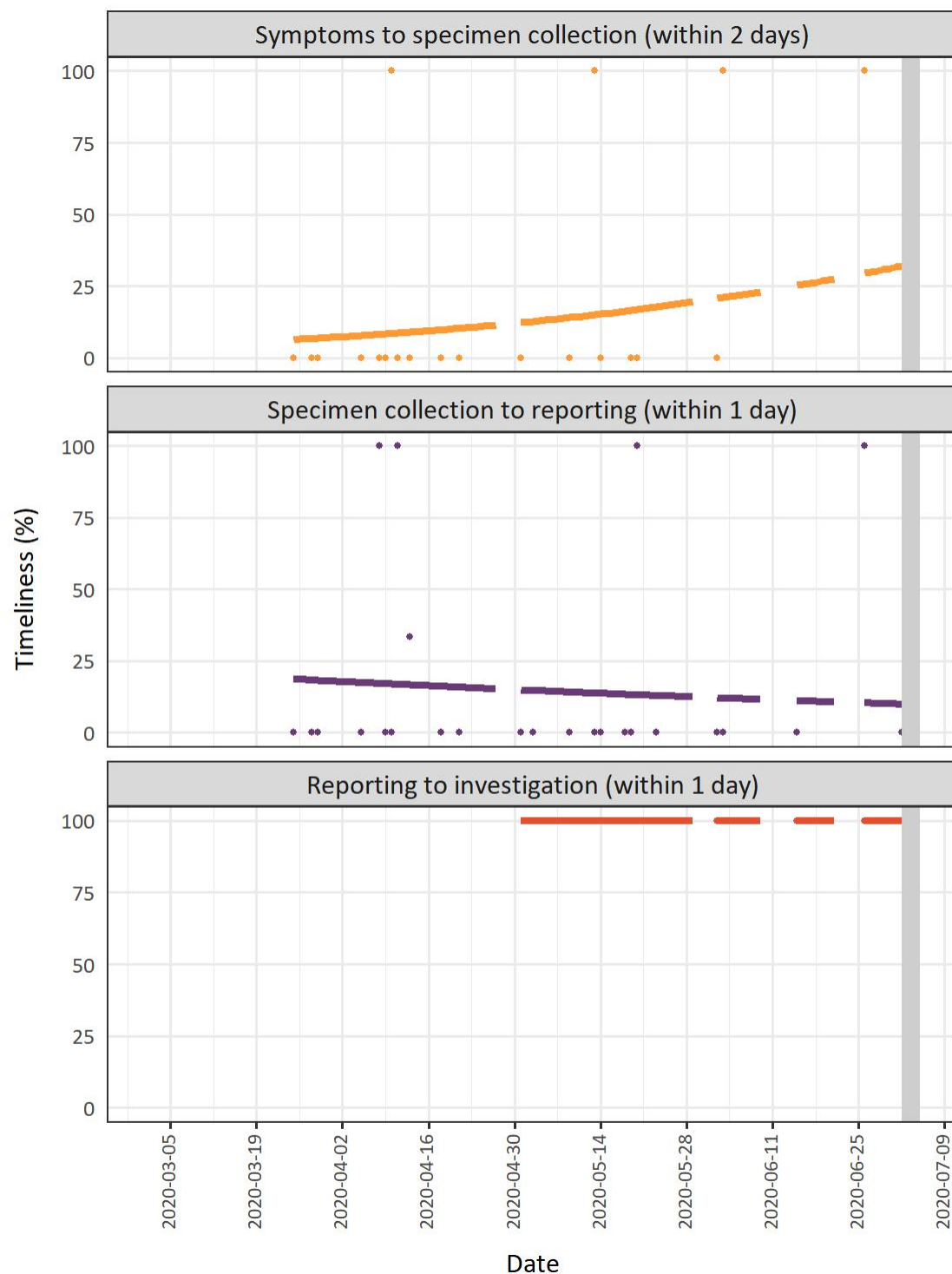
Likely Acquisition: North Bay Parry Sound District Health Unit



Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Timeliness: North Bay Parry Sound District Health Unit

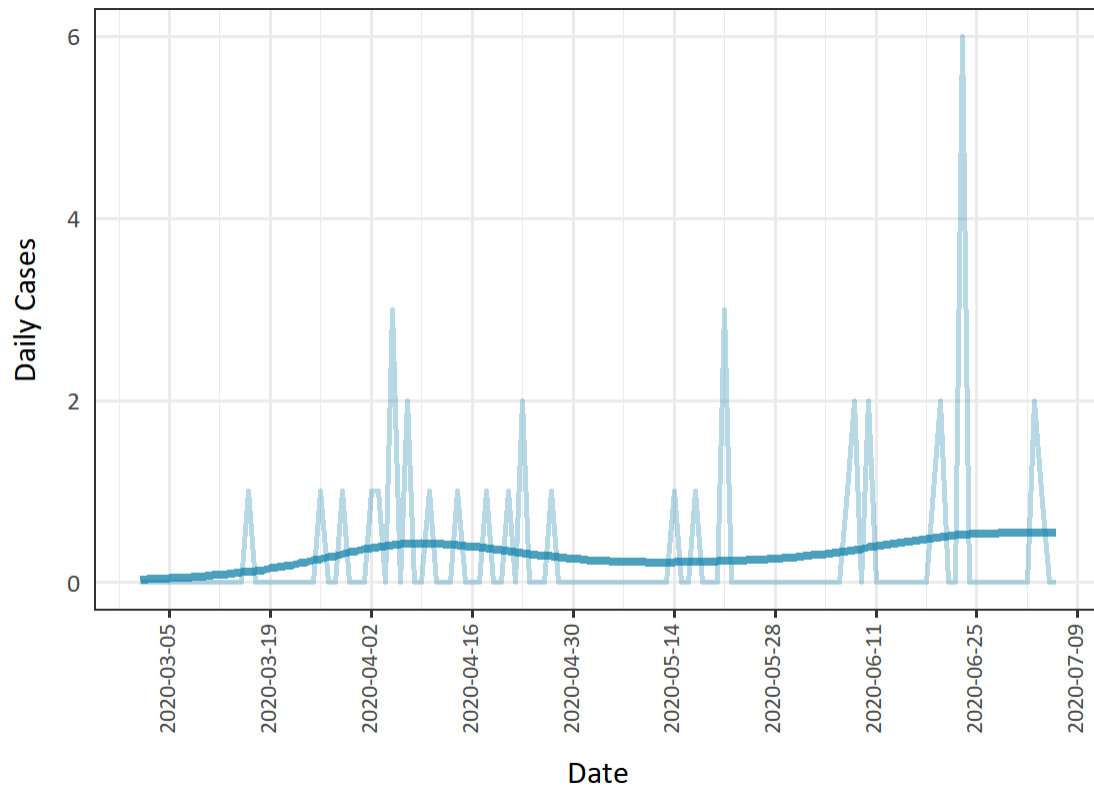


Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Northwestern Health Unit

### Epidemic Curve: Northwestern Health Unit

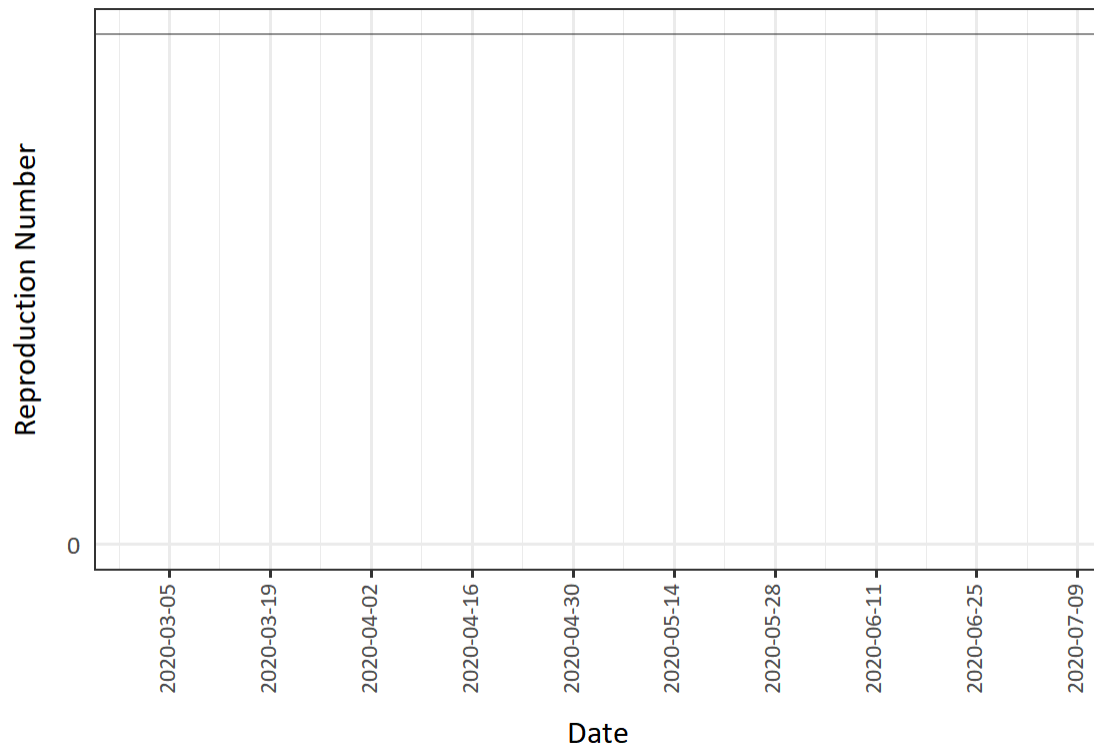


Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

## Reproduction Number: Northwestern Health Unit

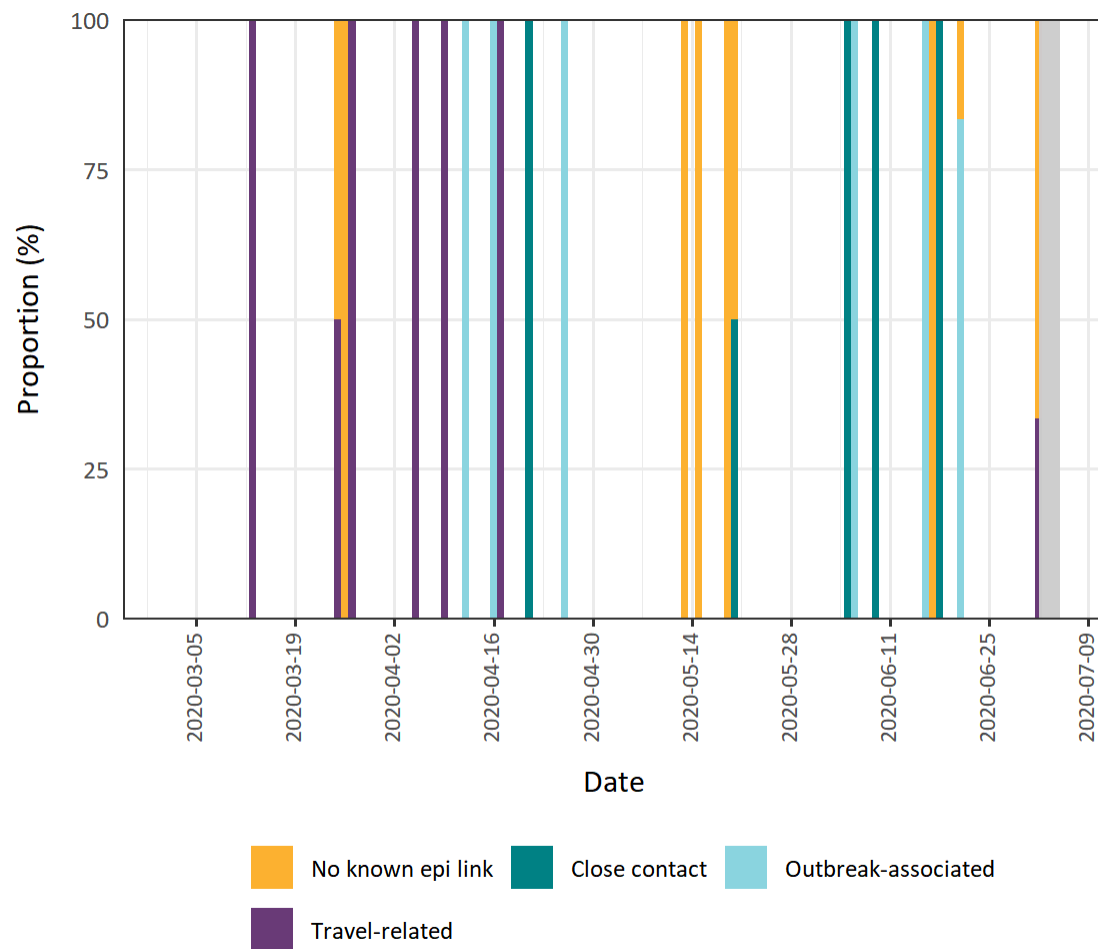
Jul 06 Re not provided: fewer than 12 cases in the 7 days prior to this date



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

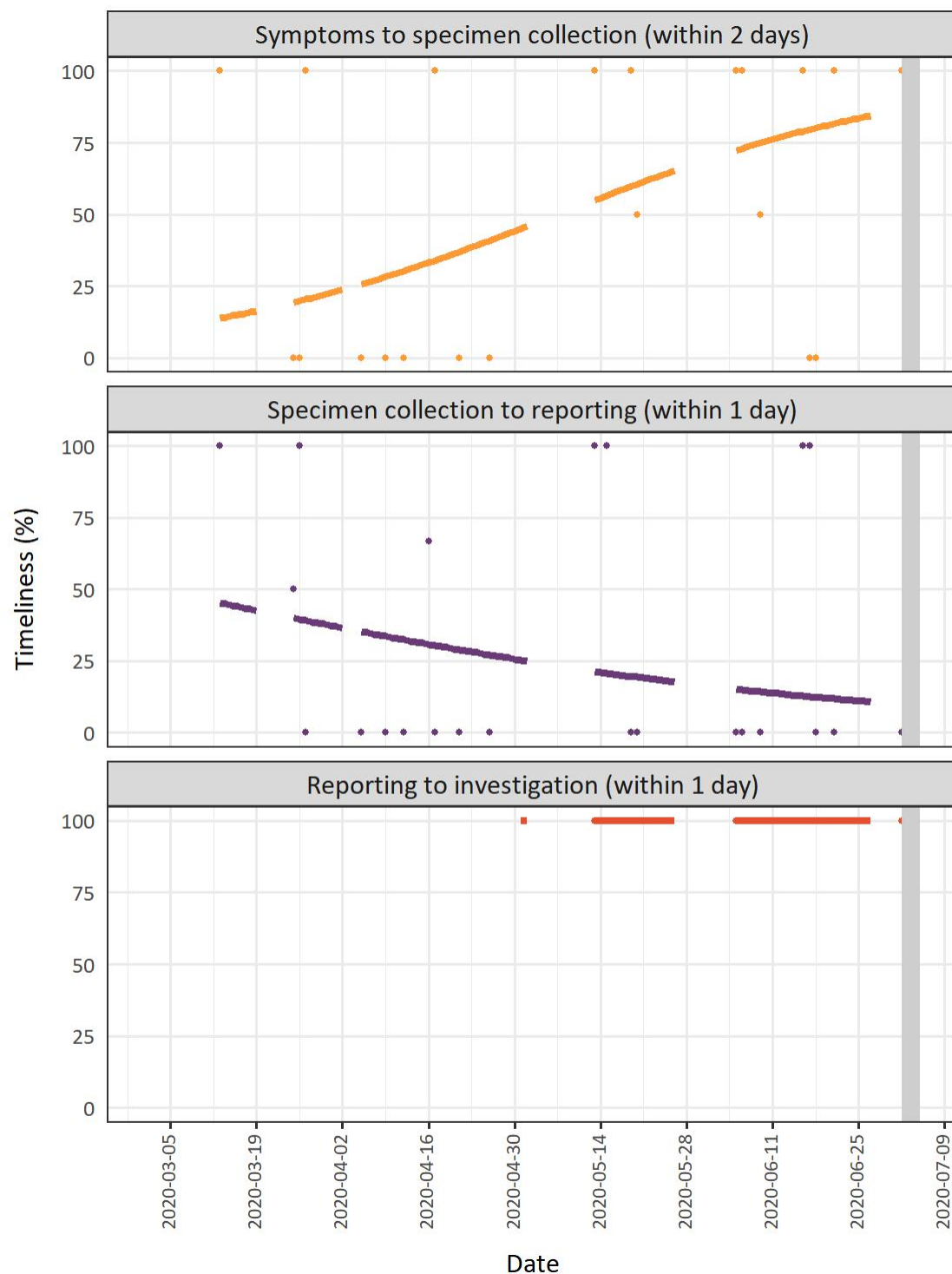
## Likely Acquisition: Northwestern Health Unit



Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Timeliness: Northwestern Health Unit

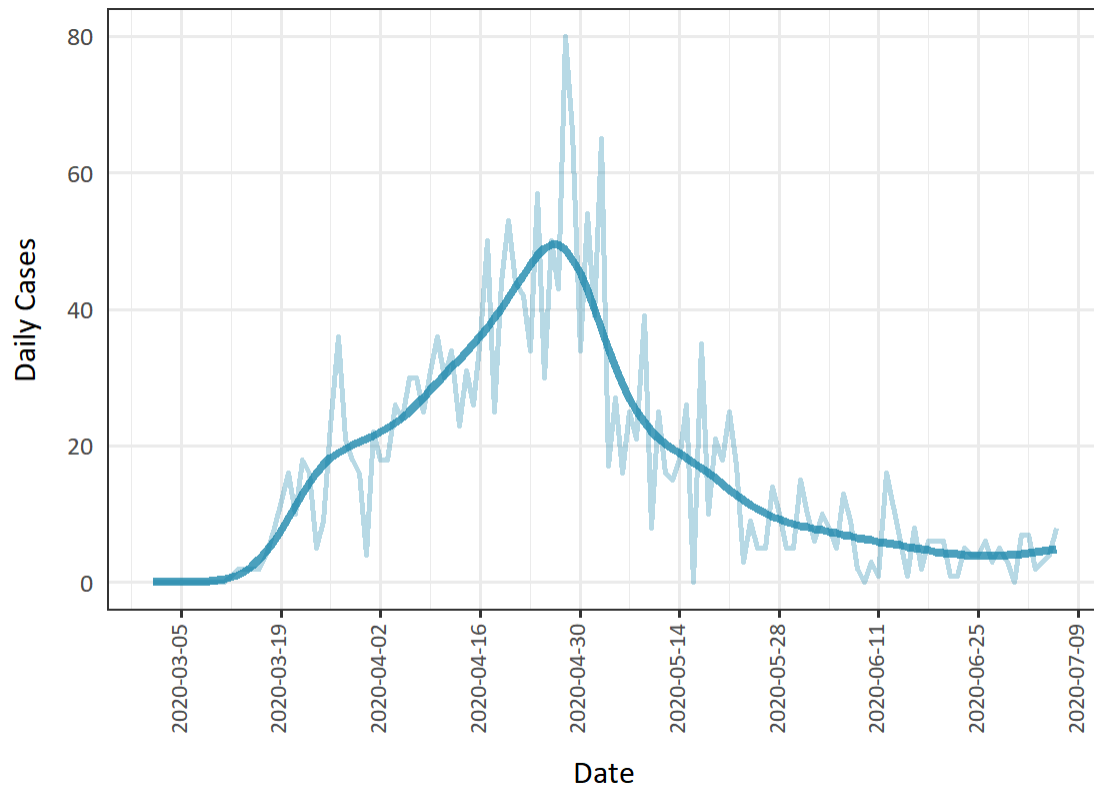


Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Ottawa Public Health

### Epidemic Curve: Ottawa Public Health



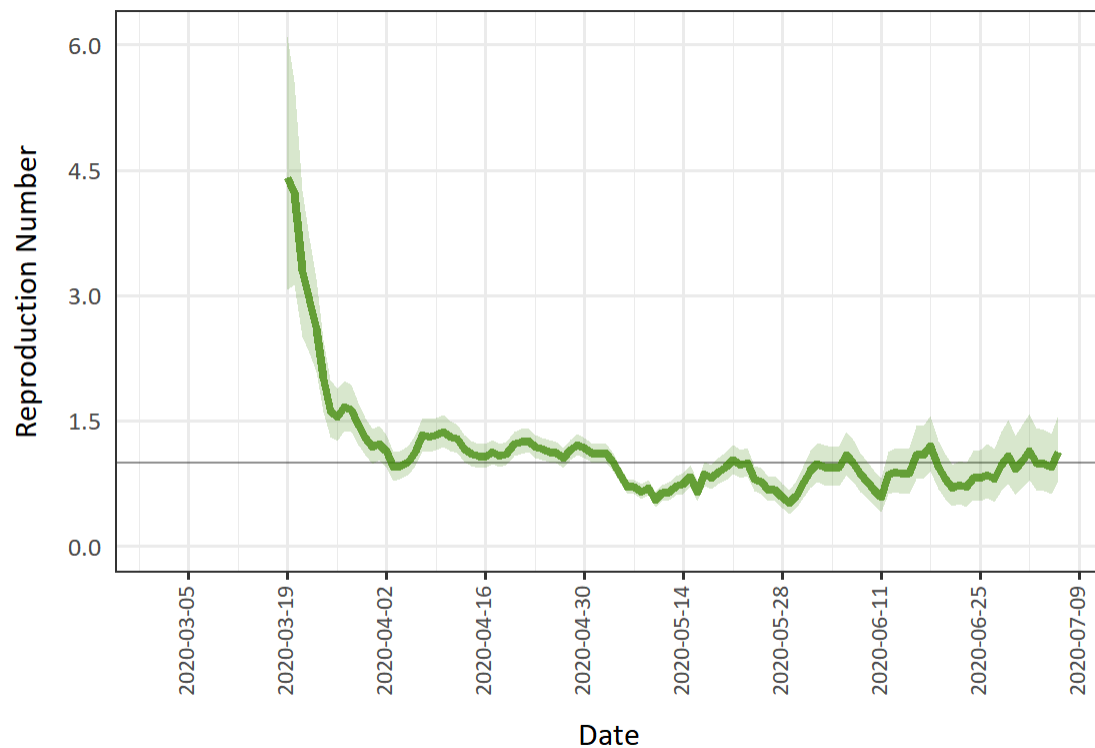
Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus



## Reproduction Number: Ottawa Public Health

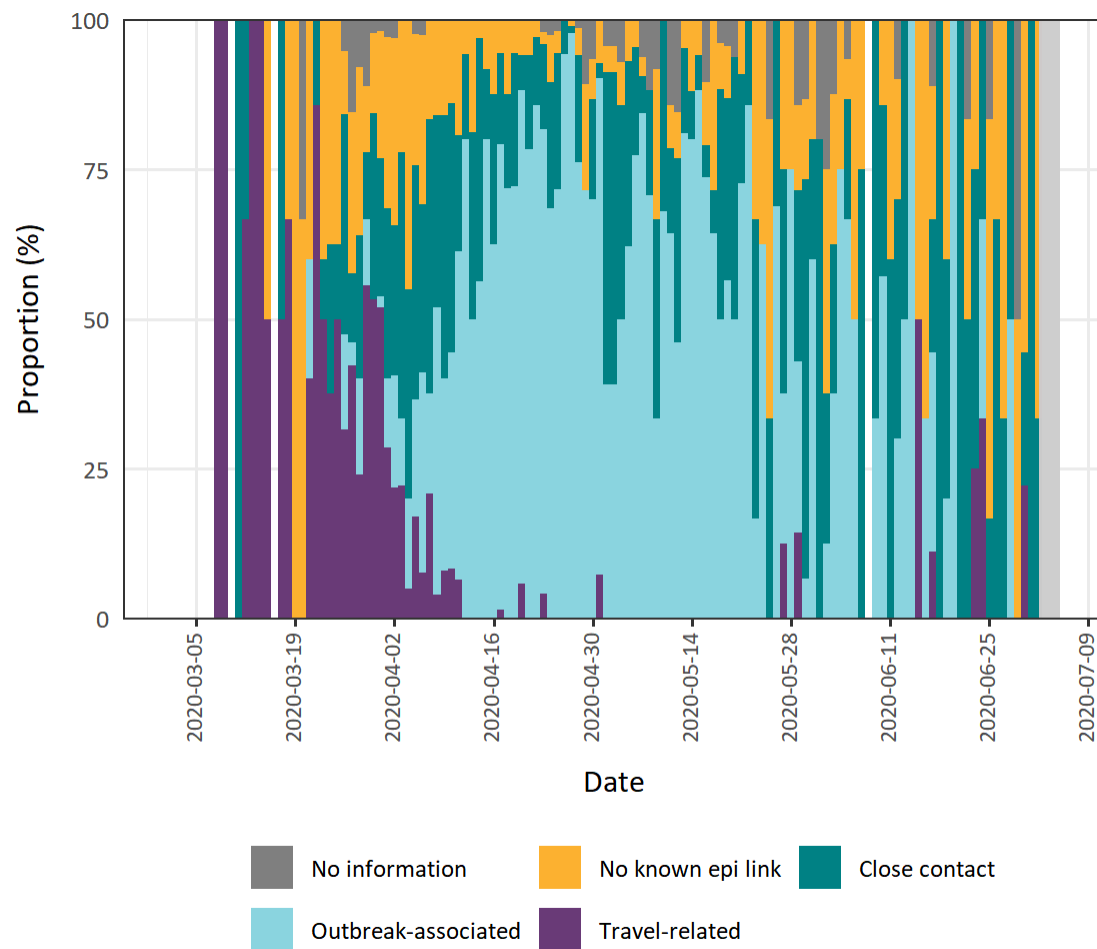
Jul 06 Re = 1.13, 95% CI: 0.78-1.6



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

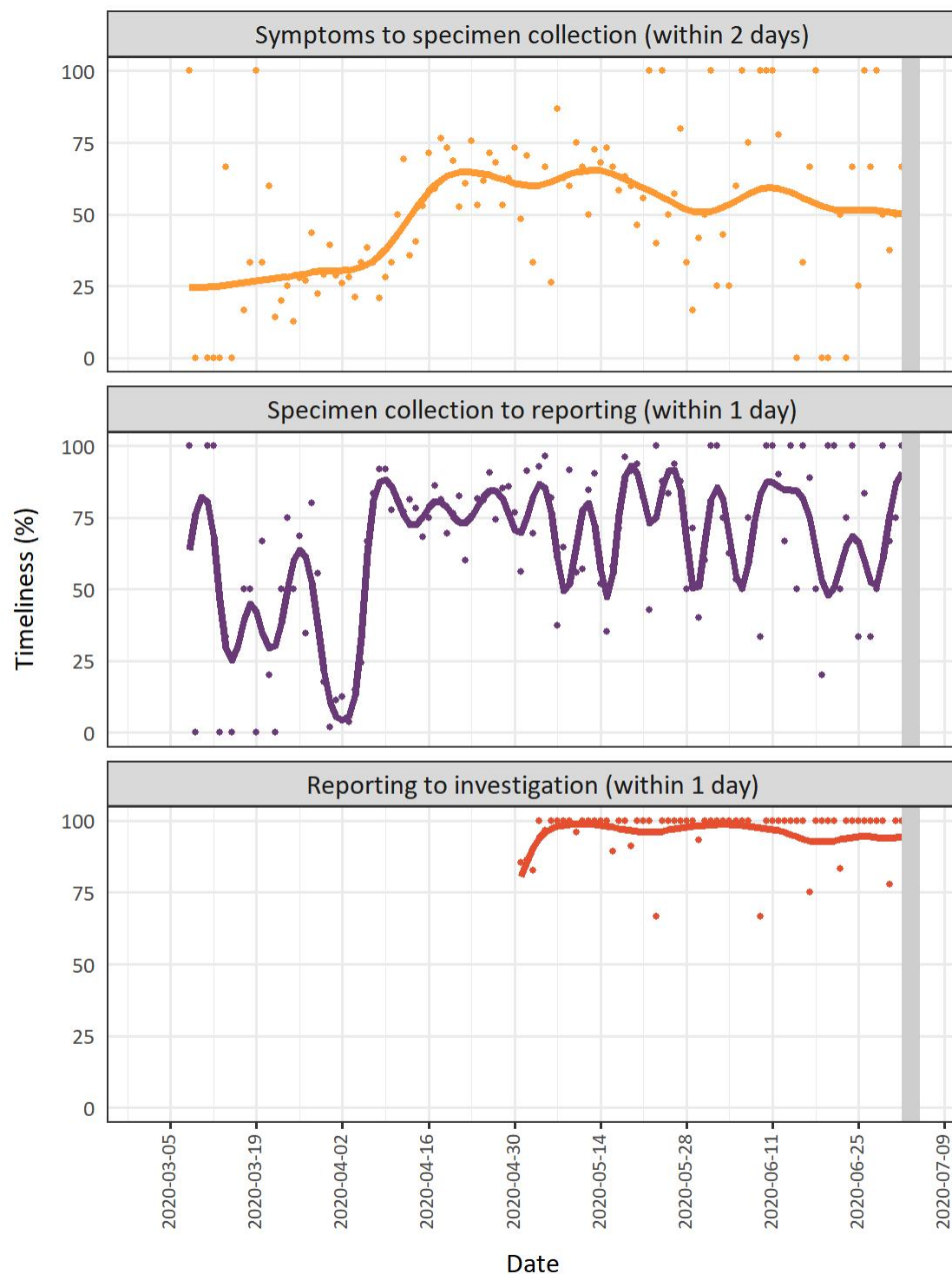
## Likely Acquisition: Ottawa Public Health



Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Timeliness: Ottawa Public Health

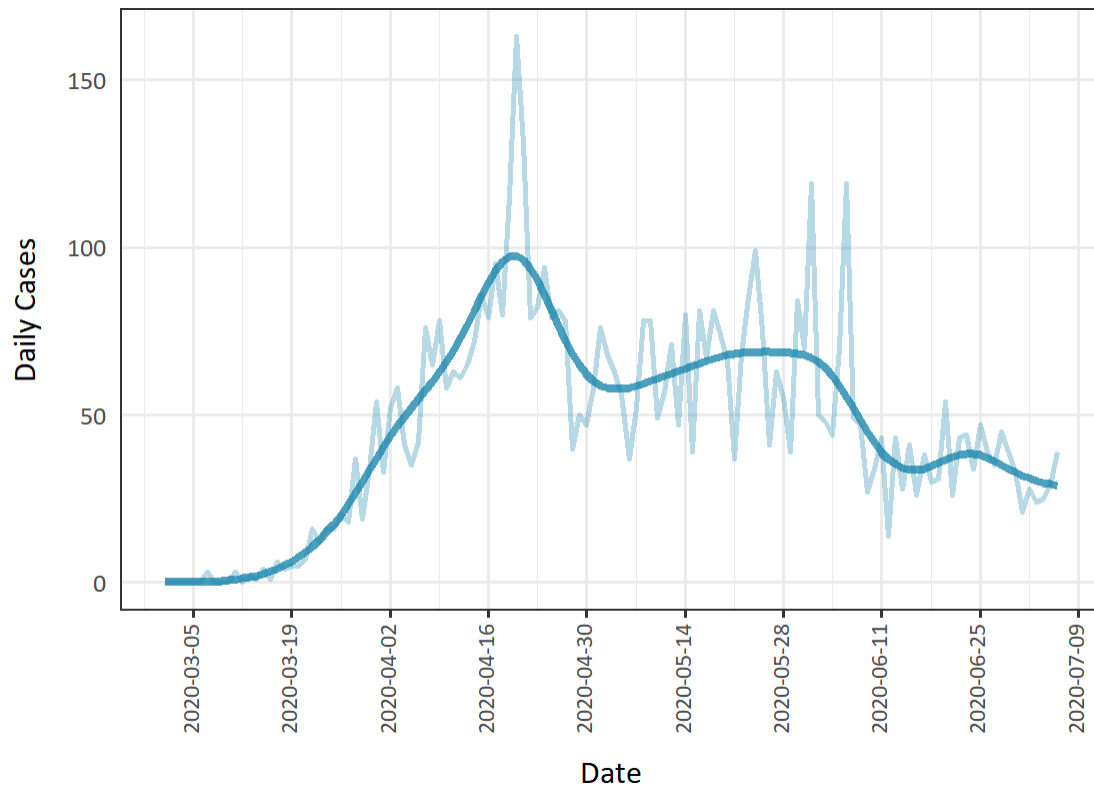


Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Peel Public Health

### Epidemic Curve: Peel Public Health

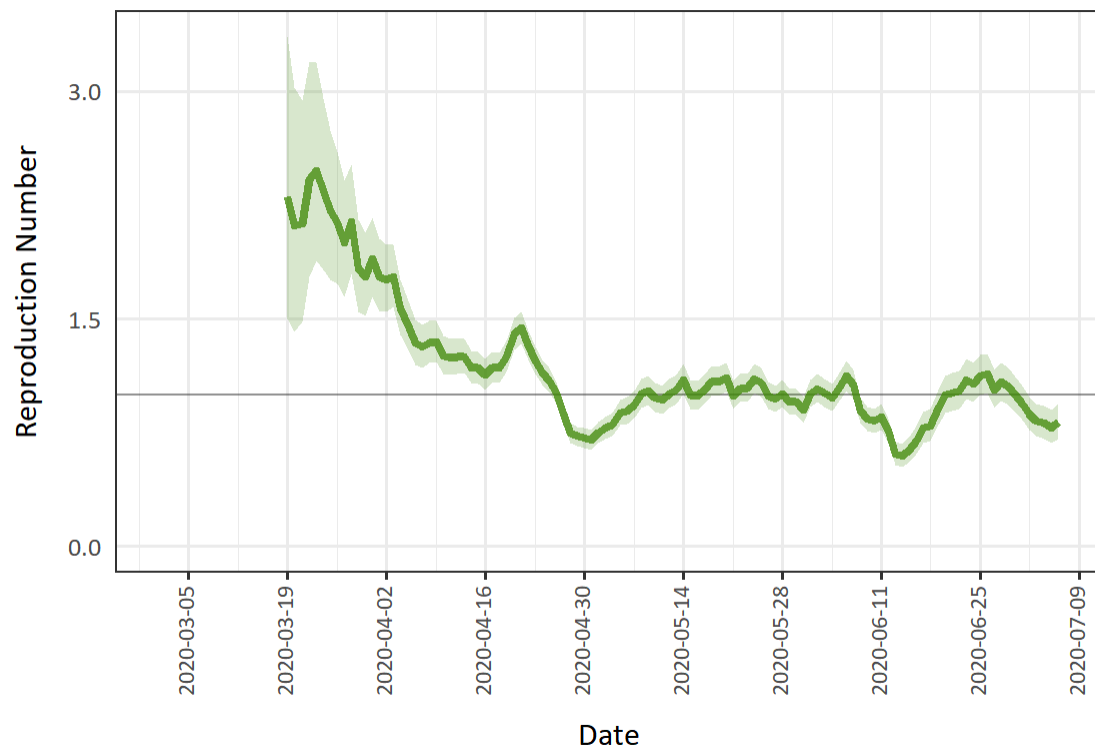


Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

## Reproduction Number: Peel Public Health

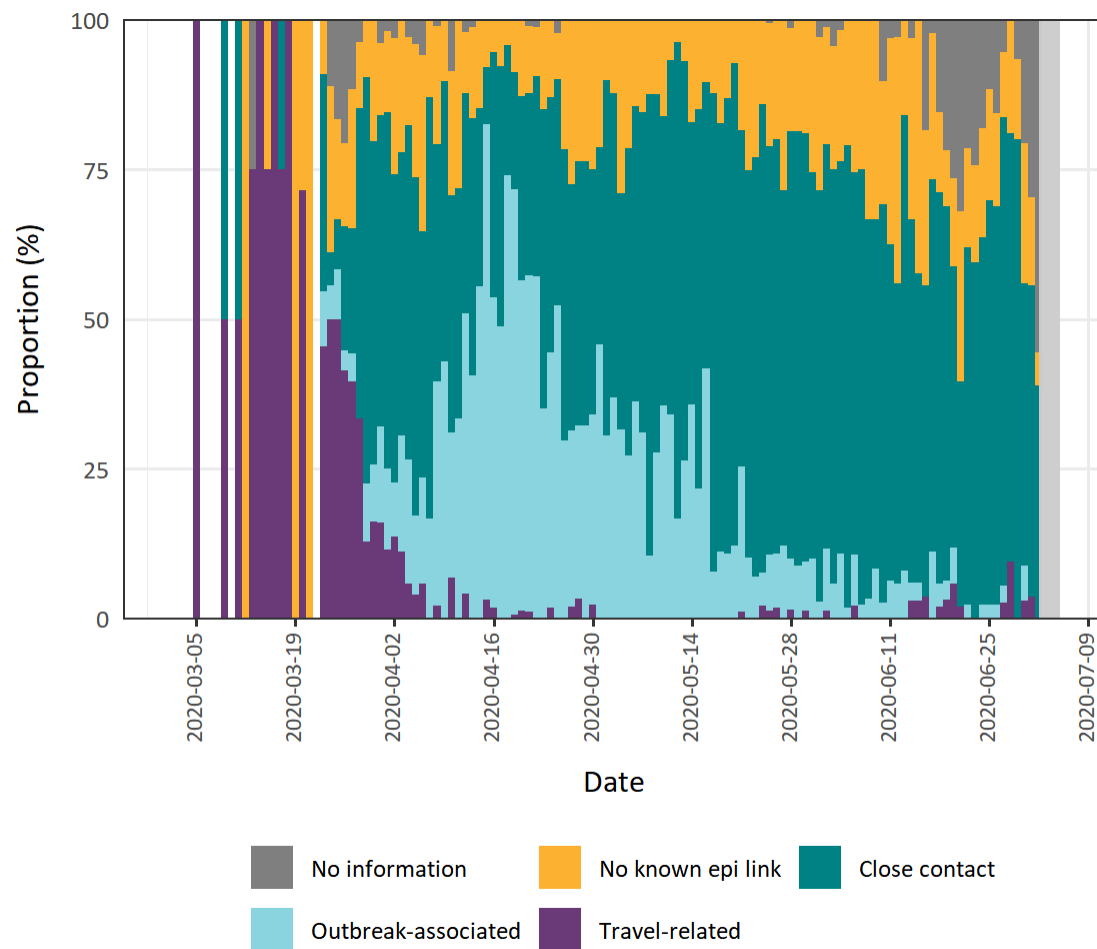
Jul 06 Re = 0.82, 95% CI: 0.71-0.94



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

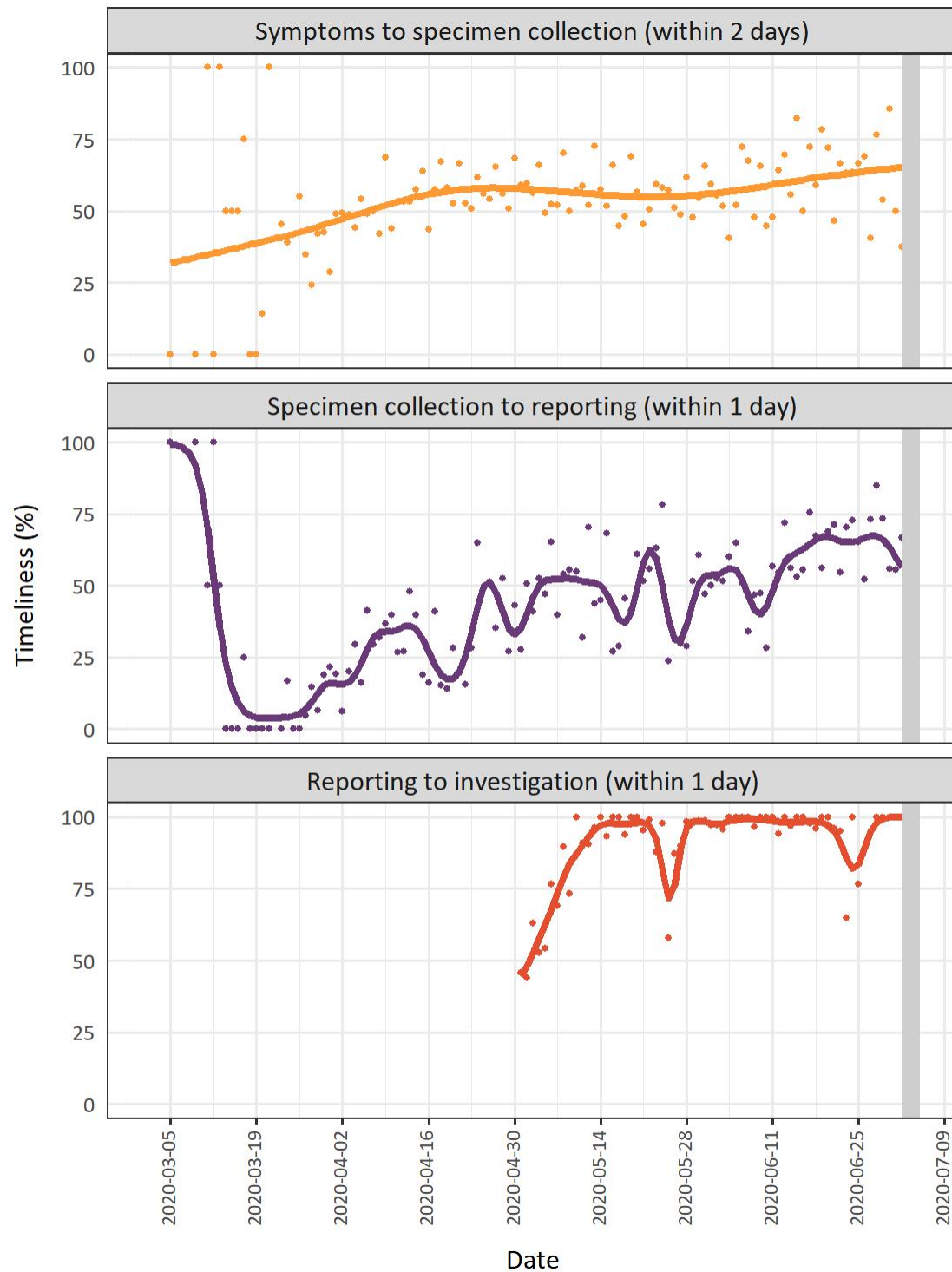
### Likely Acquisition: Peel Public Health



Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Timeliness: Peel Public Health

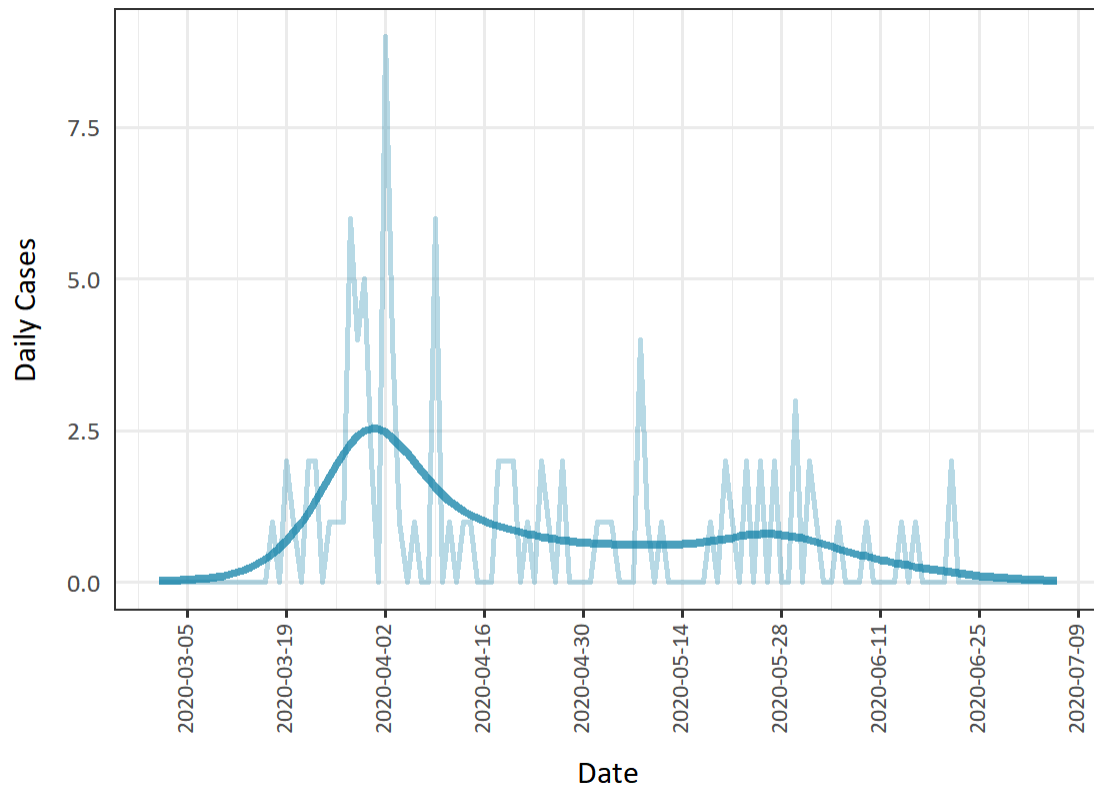


Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Peterborough Public Health

### Epidemic Curve: Peterborough Public Health



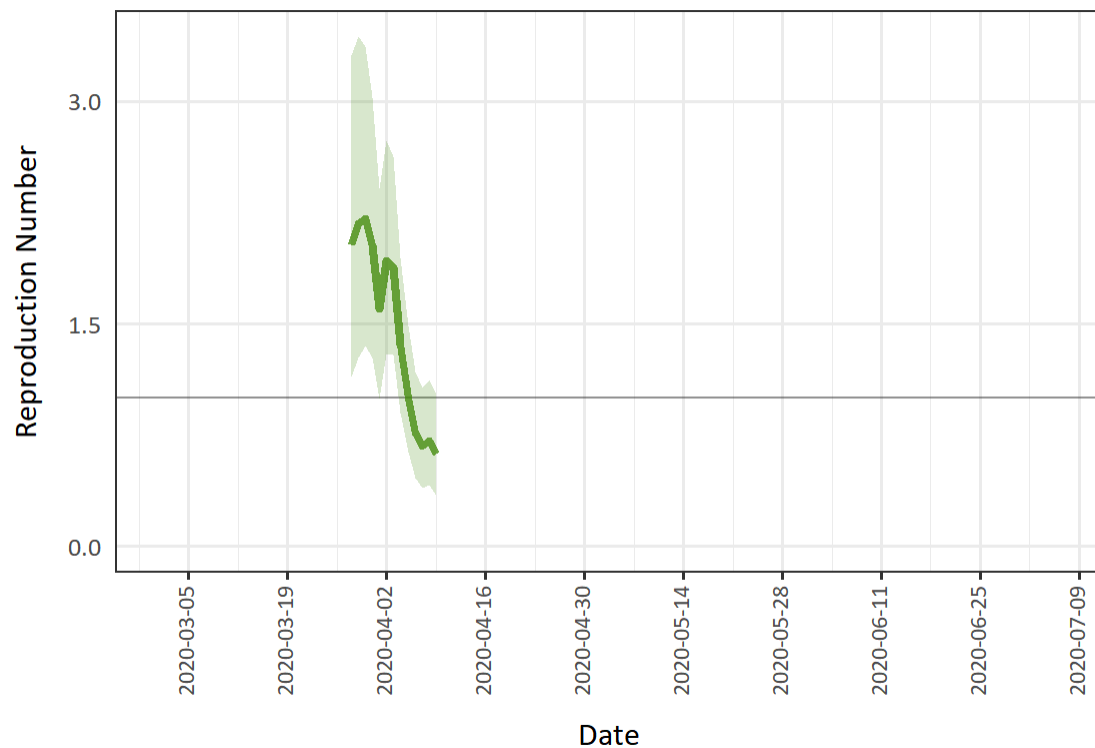
Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus



## Reproduction Number: Peterborough Public Health

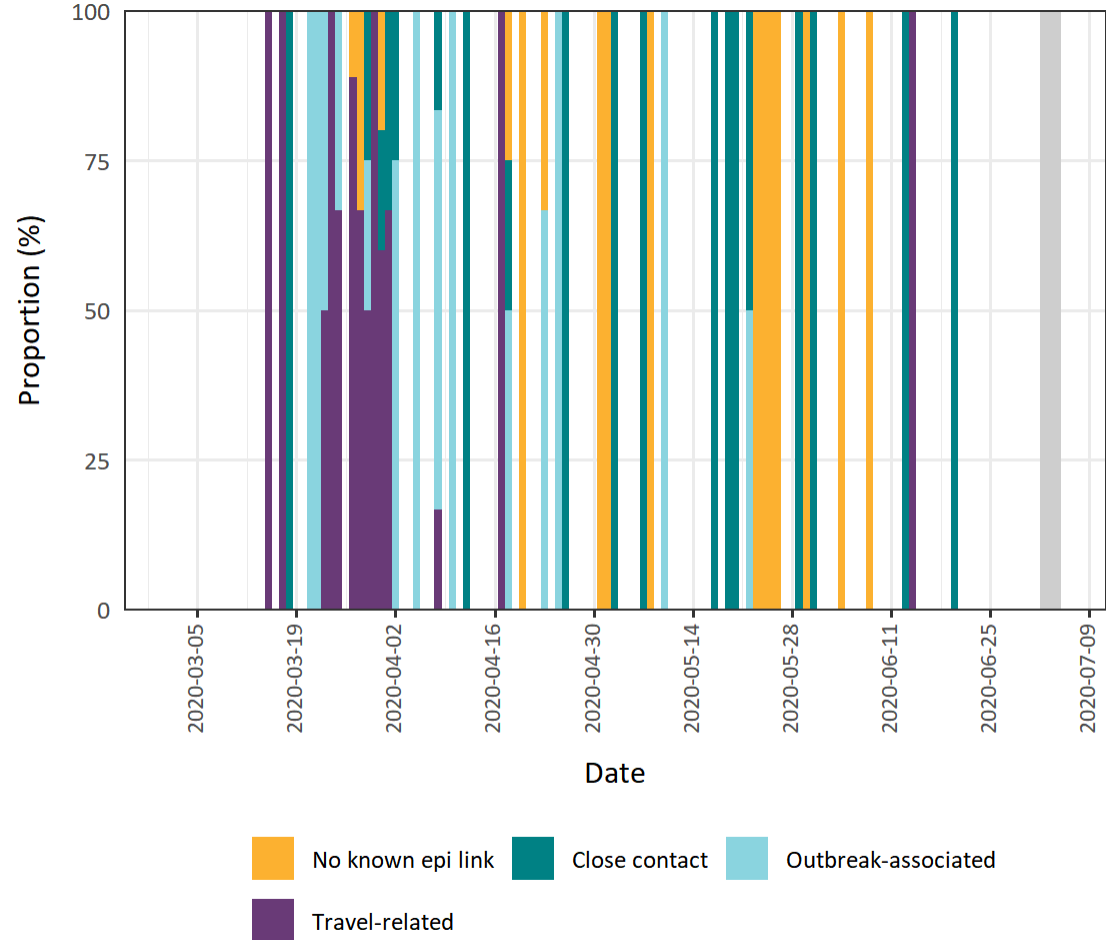
Jul 06 Re not provided: fewer than 12 cases in the 7 days prior to this date



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

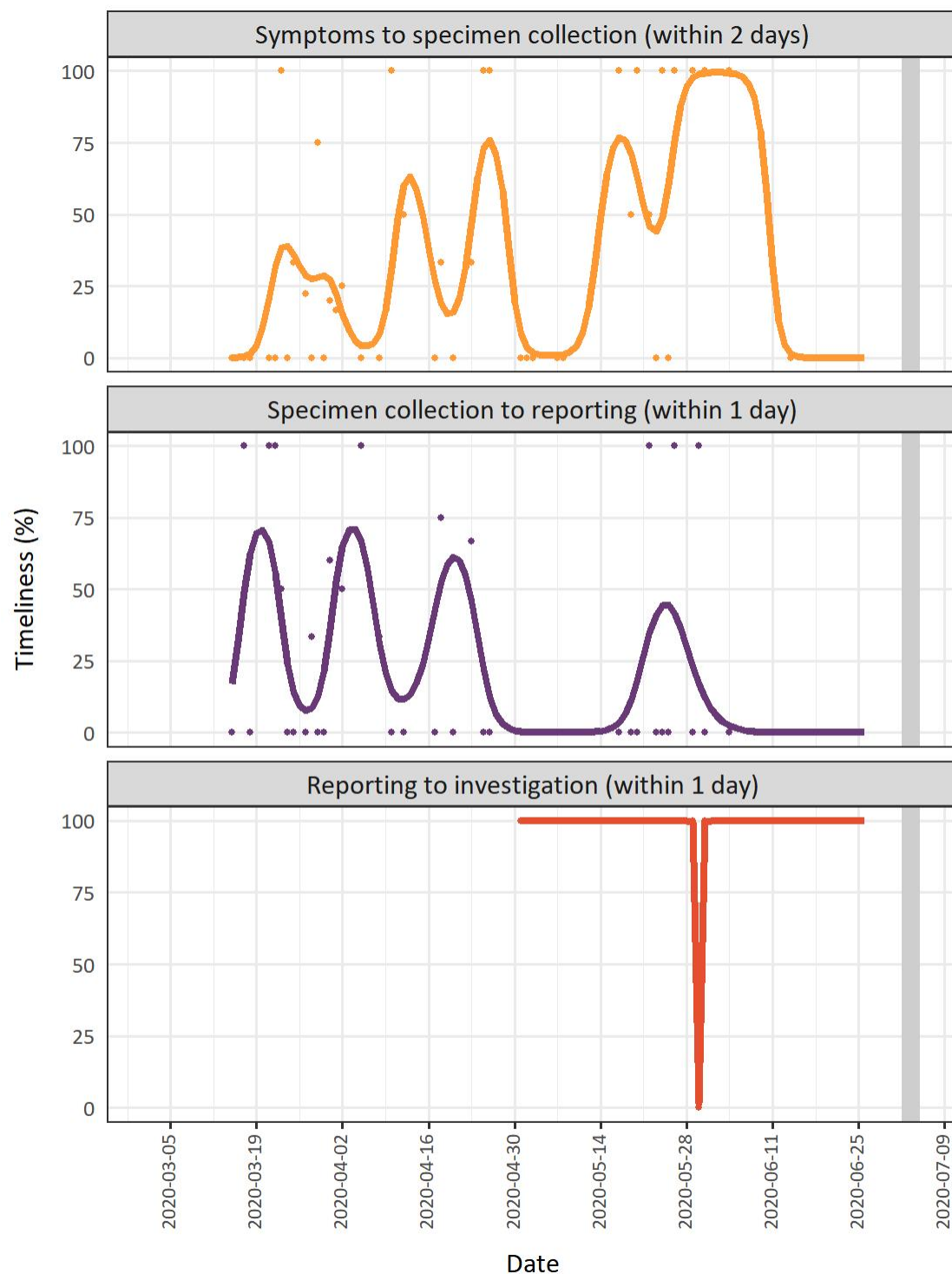
Likely Acquisition: Peterborough Public Health



Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Timeliness: Peterborough Public Health

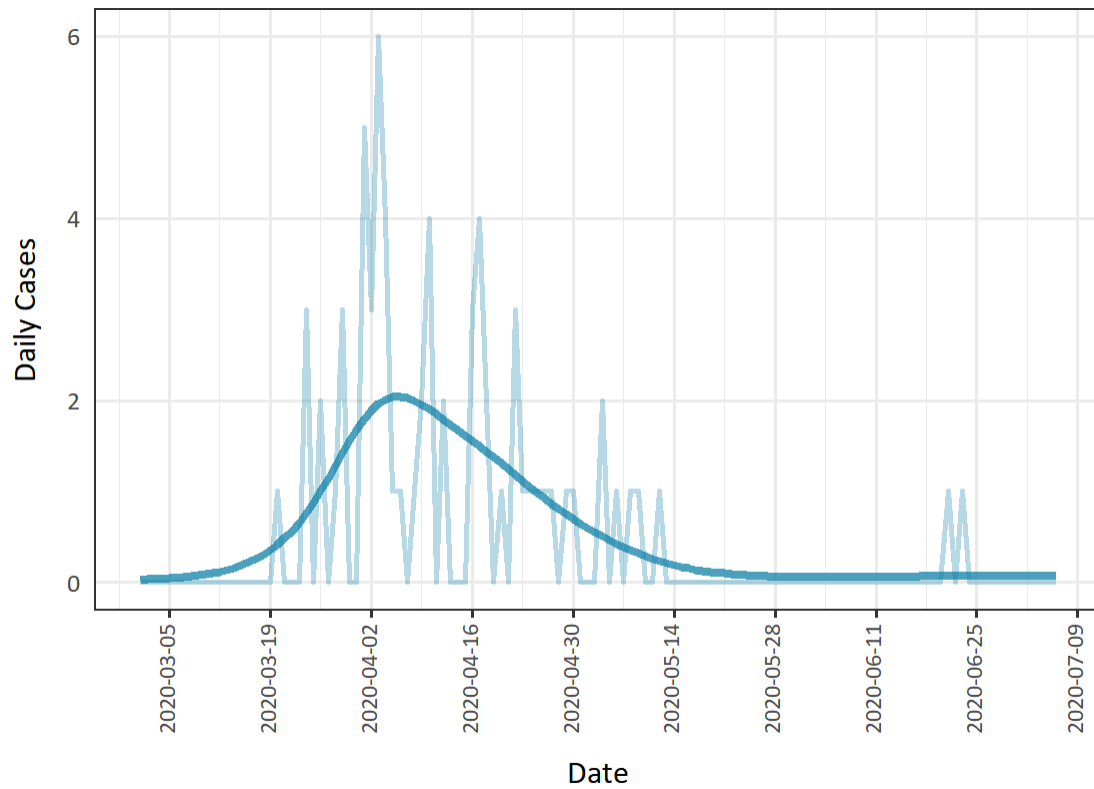


Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Porcupine Health Unit

### Epidemic Curve: Porcupine Health Unit

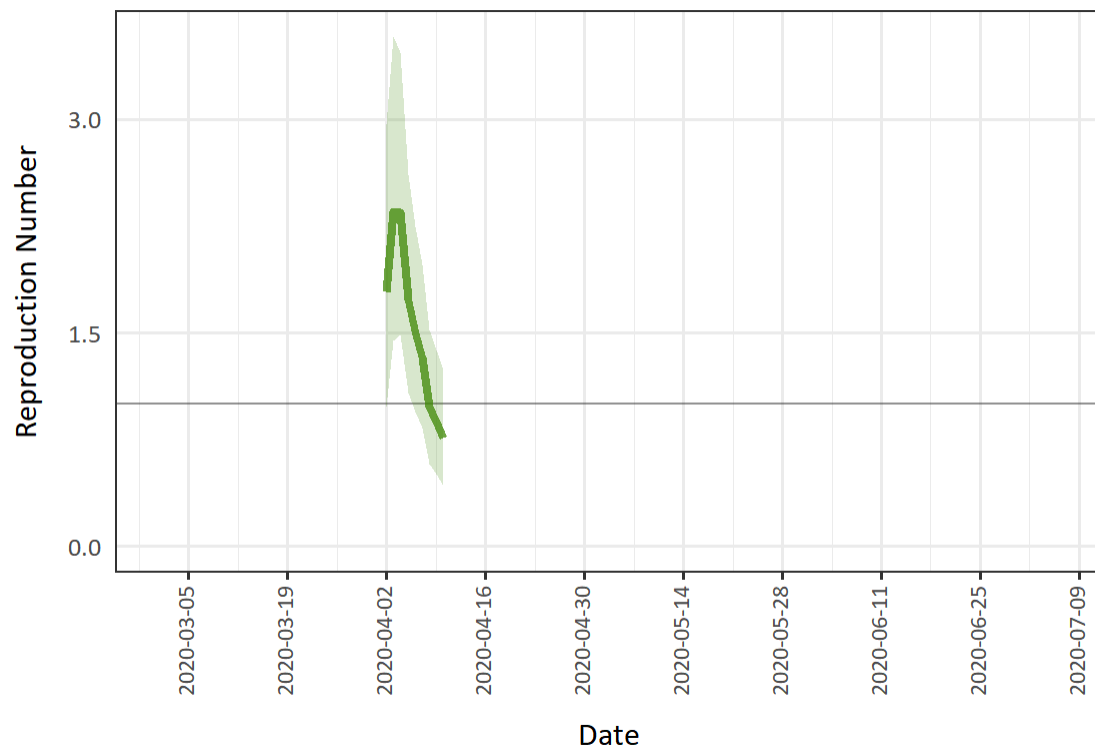


Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

## Reproduction Number: Porcupine Health Unit

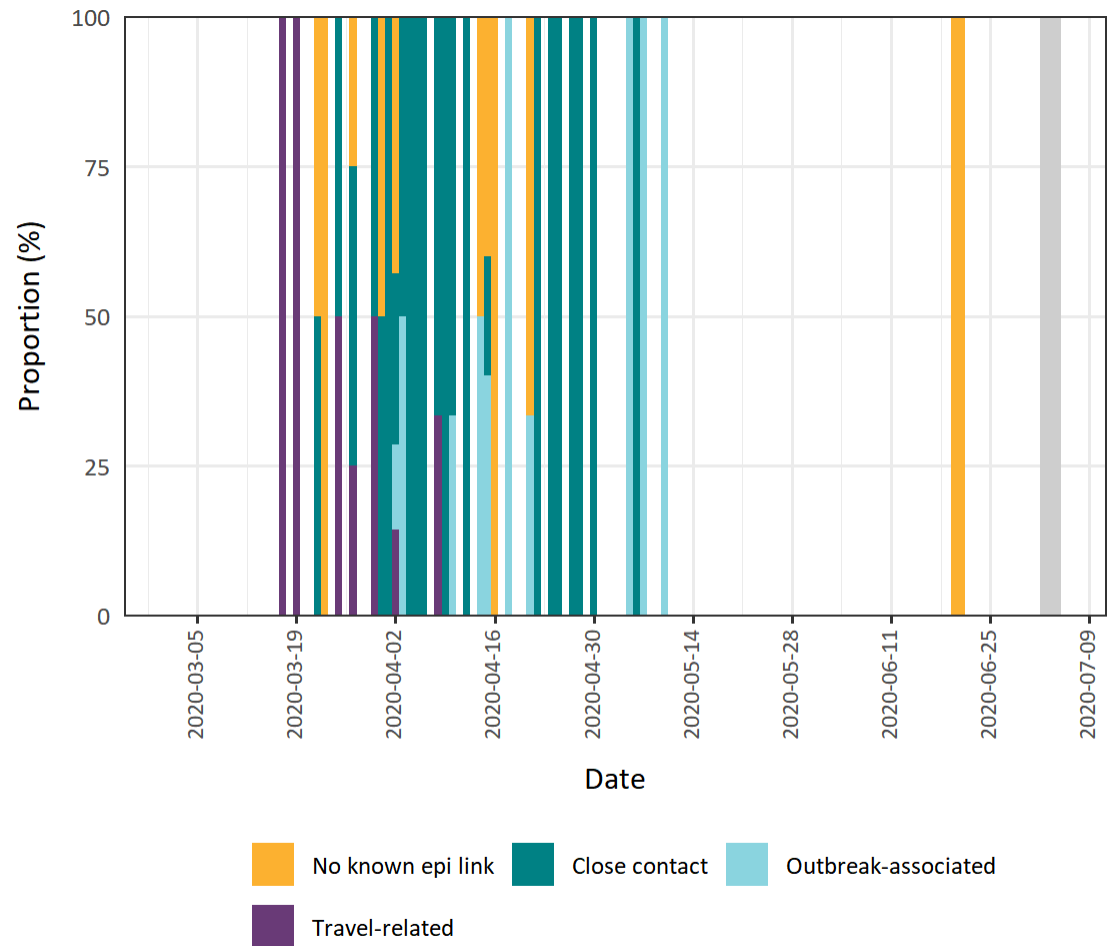
Jul 06 Re not provided: fewer than 12 cases in the 7 days prior to this date



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

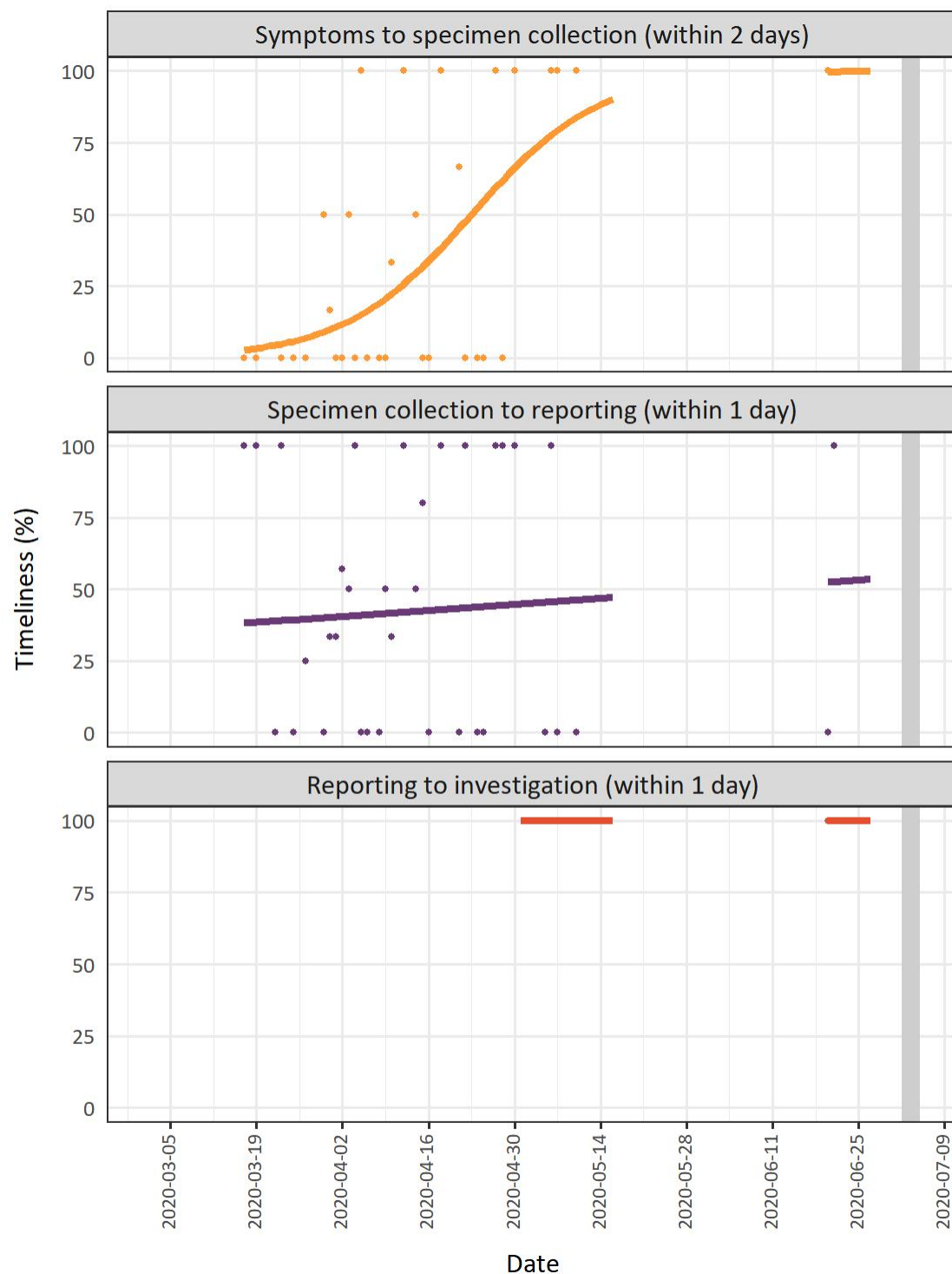
Likely Acquisition: Porcupine Health Unit



Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Timeliness: Porcupine Health Unit

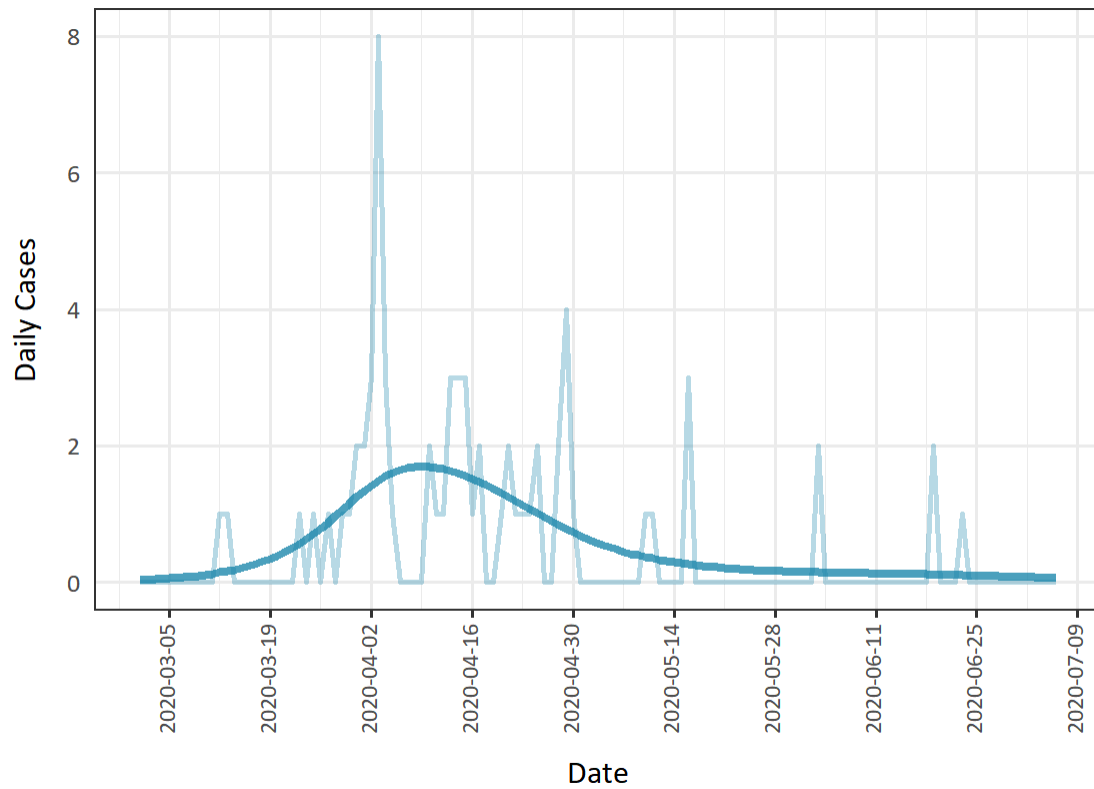


Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Public Health Sudbury & Districts

### Epidemic Curve: Public Health Sudbury & Districts



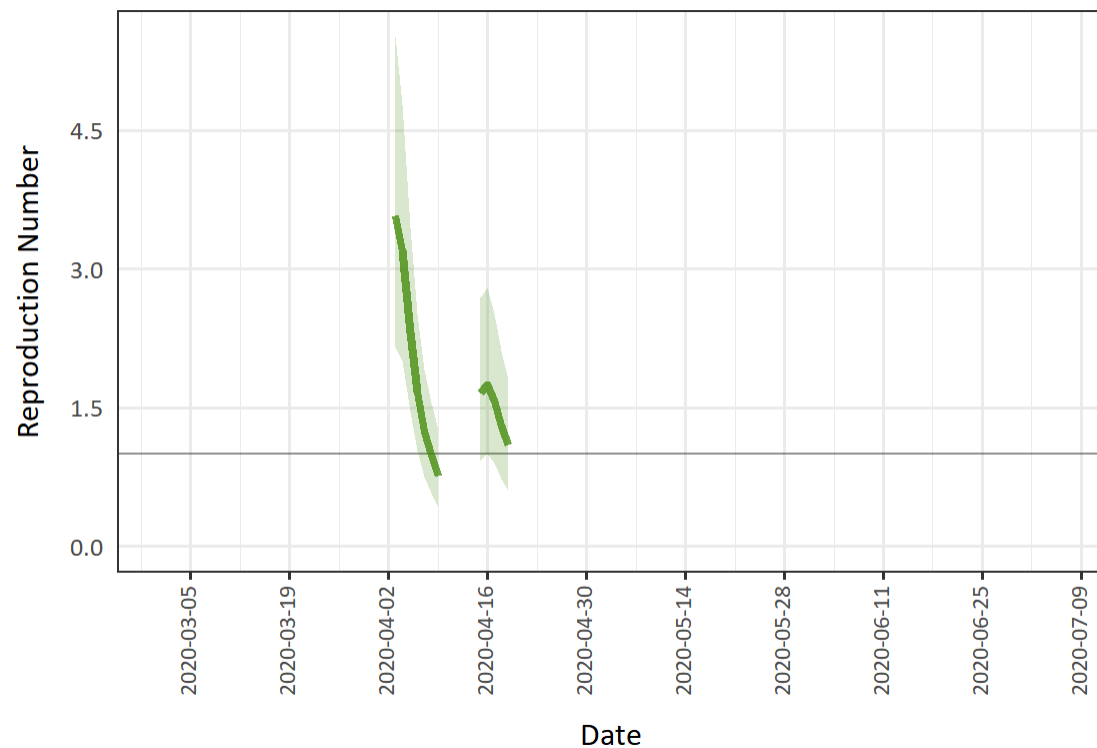
Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus



## Reproduction Number: Public Health Sudbury & Districts

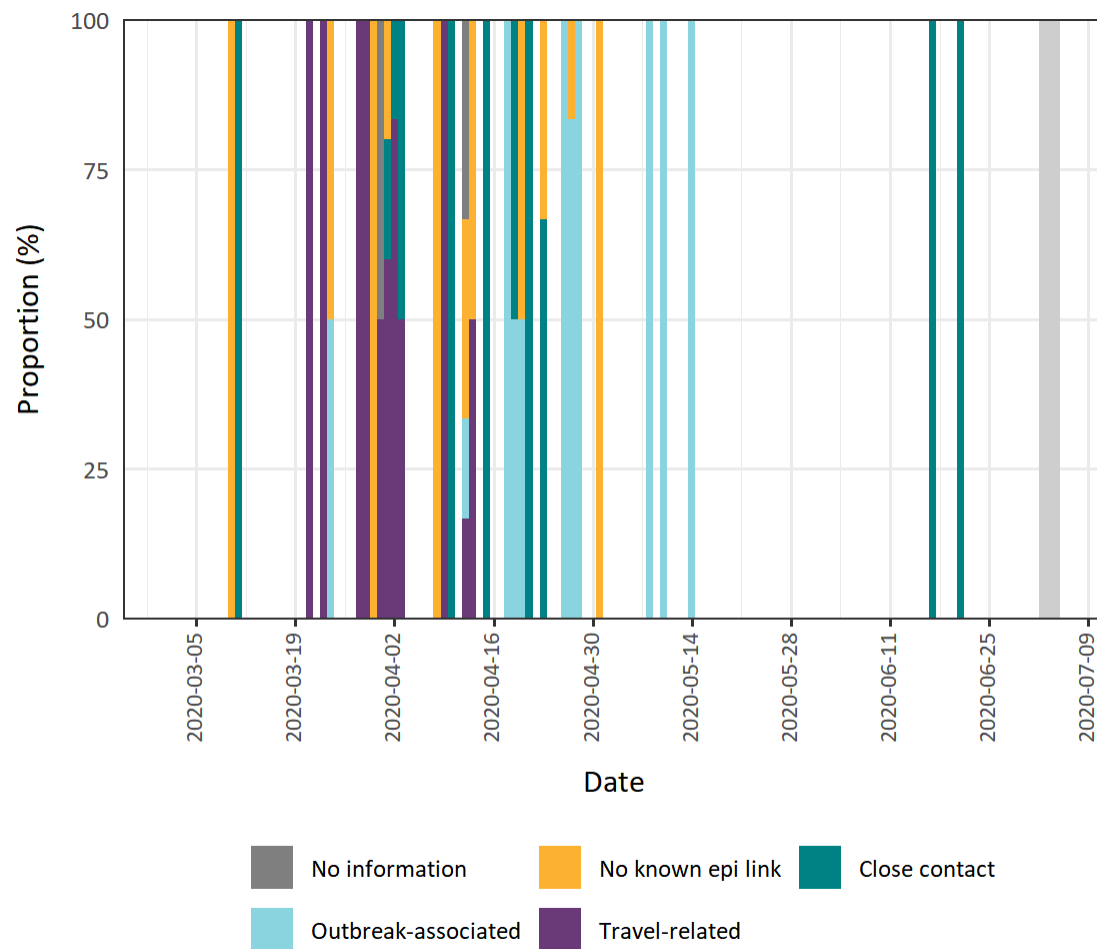
Jul 06 Re not provided: fewer than 12 cases in the 7 days prior to this date



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

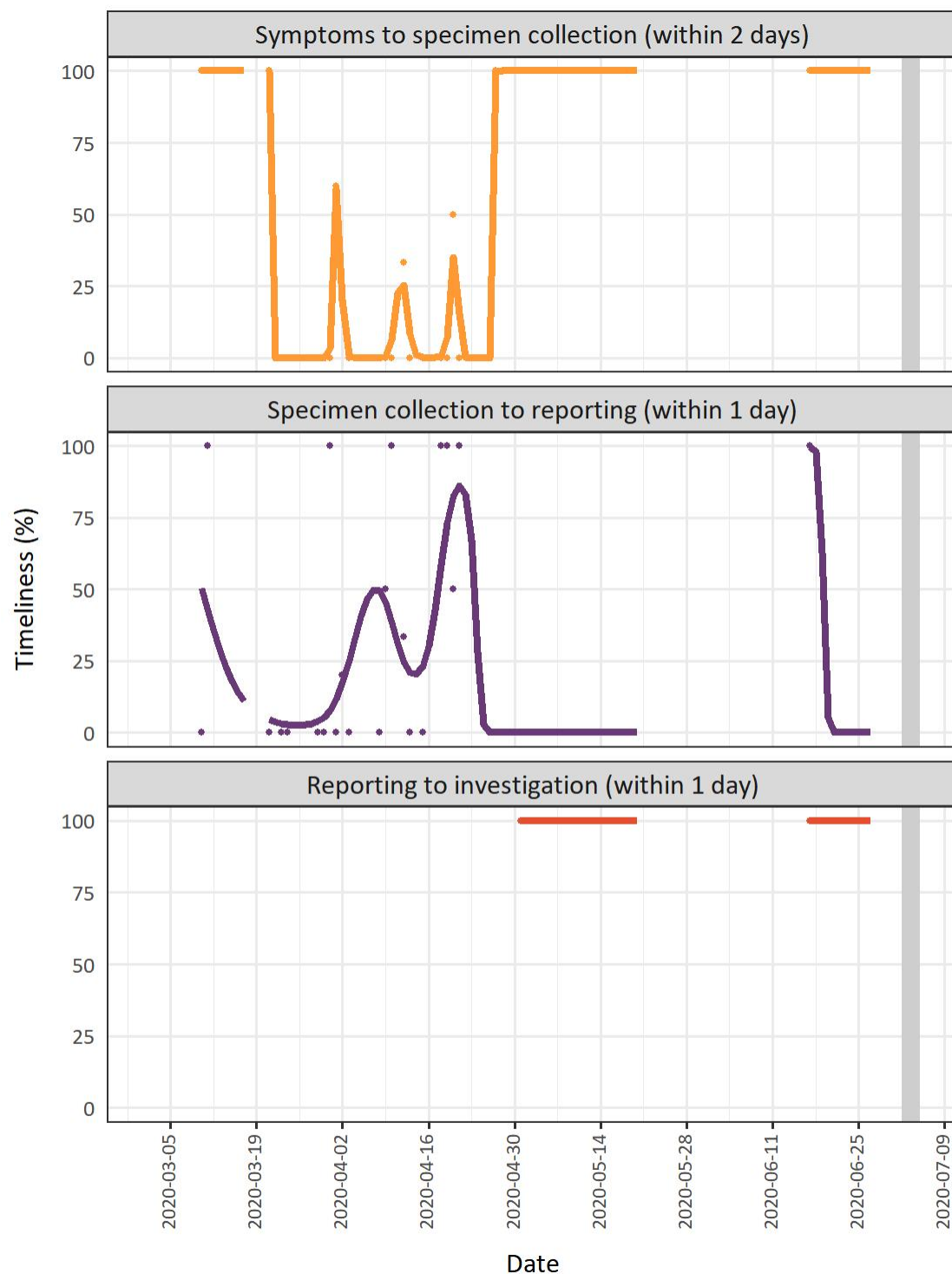
## Likely Acquisition: Public Health Sudbury & Districts



Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Timeliness: Public Health Sudbury & Districts

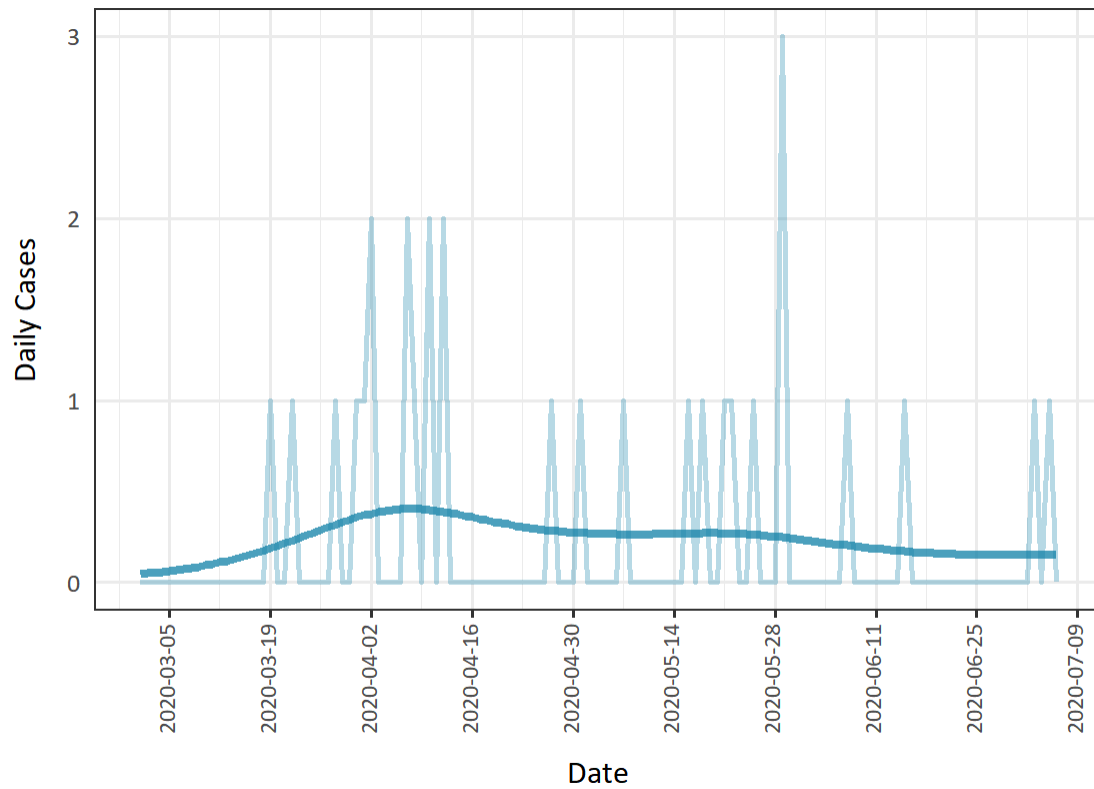


Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Renfrew County and District Health Unit

### Epidemic Curve: Renfrew County and District Health Unit

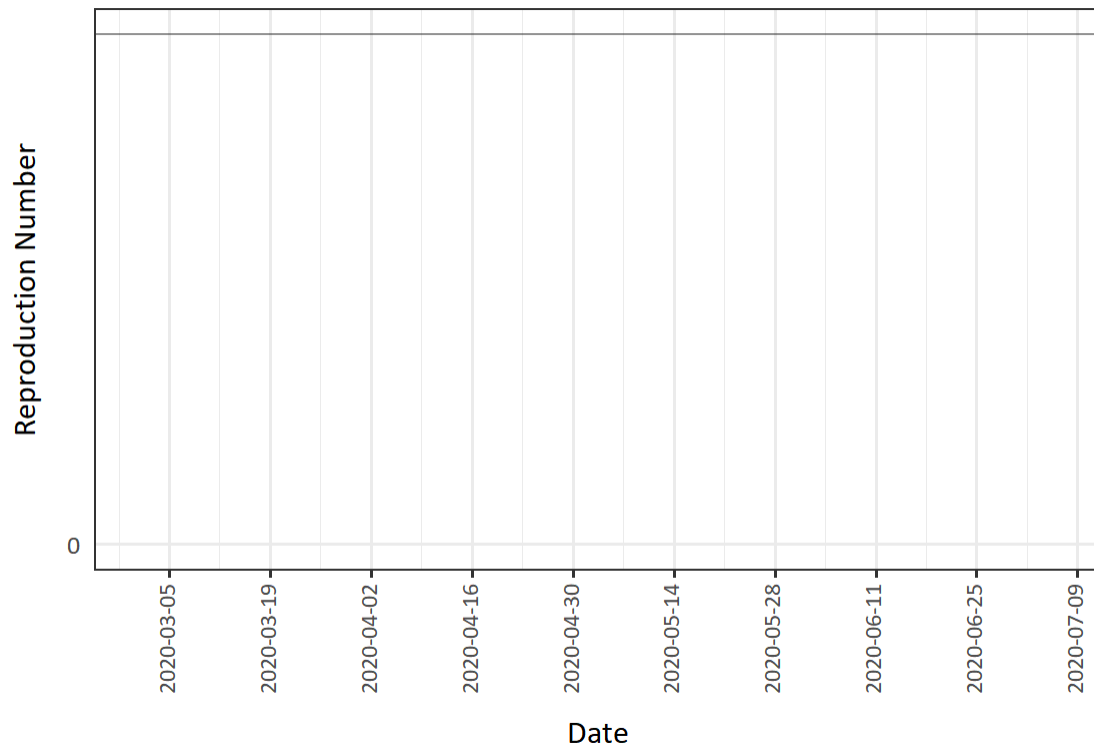


Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

## Reproduction Number: Renfrew County and District Health Unit

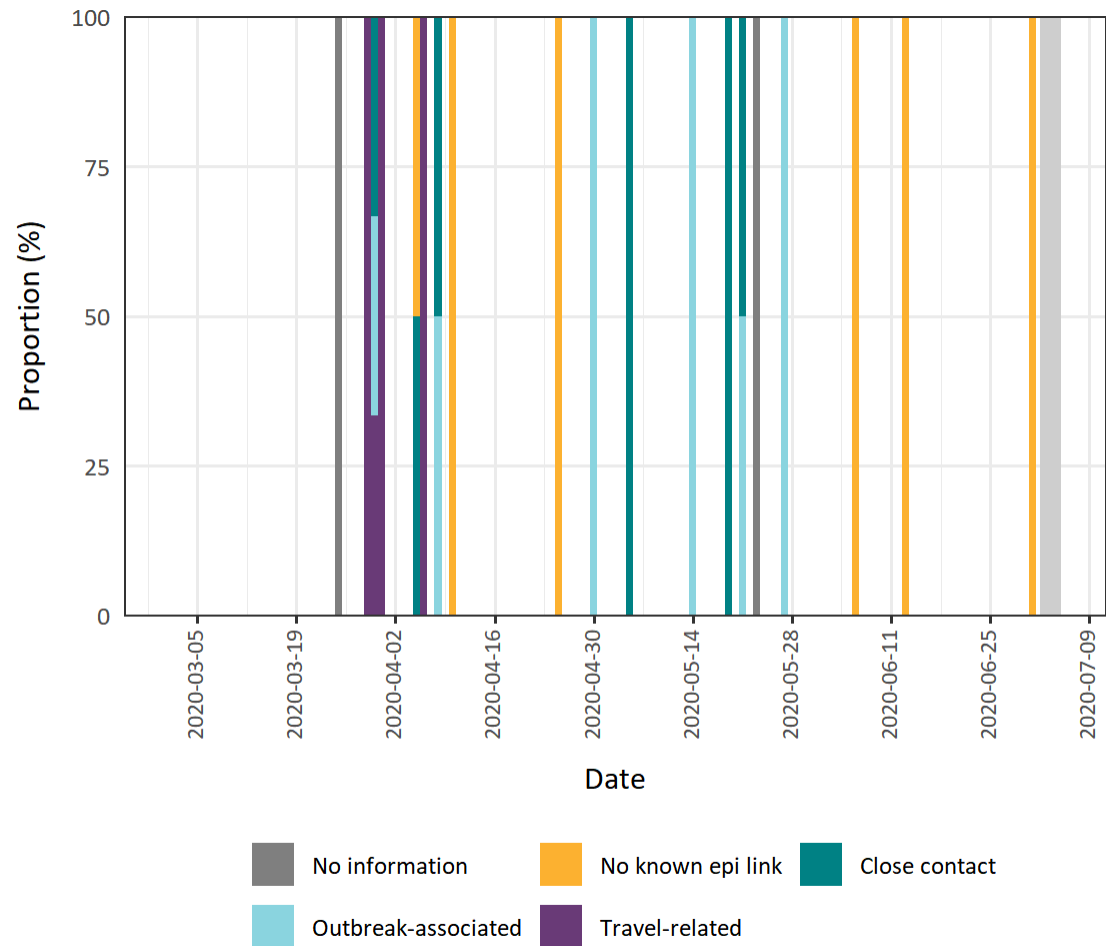
Jul 06 Re not provided: fewer than 12 cases in the 7 days prior to this date



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

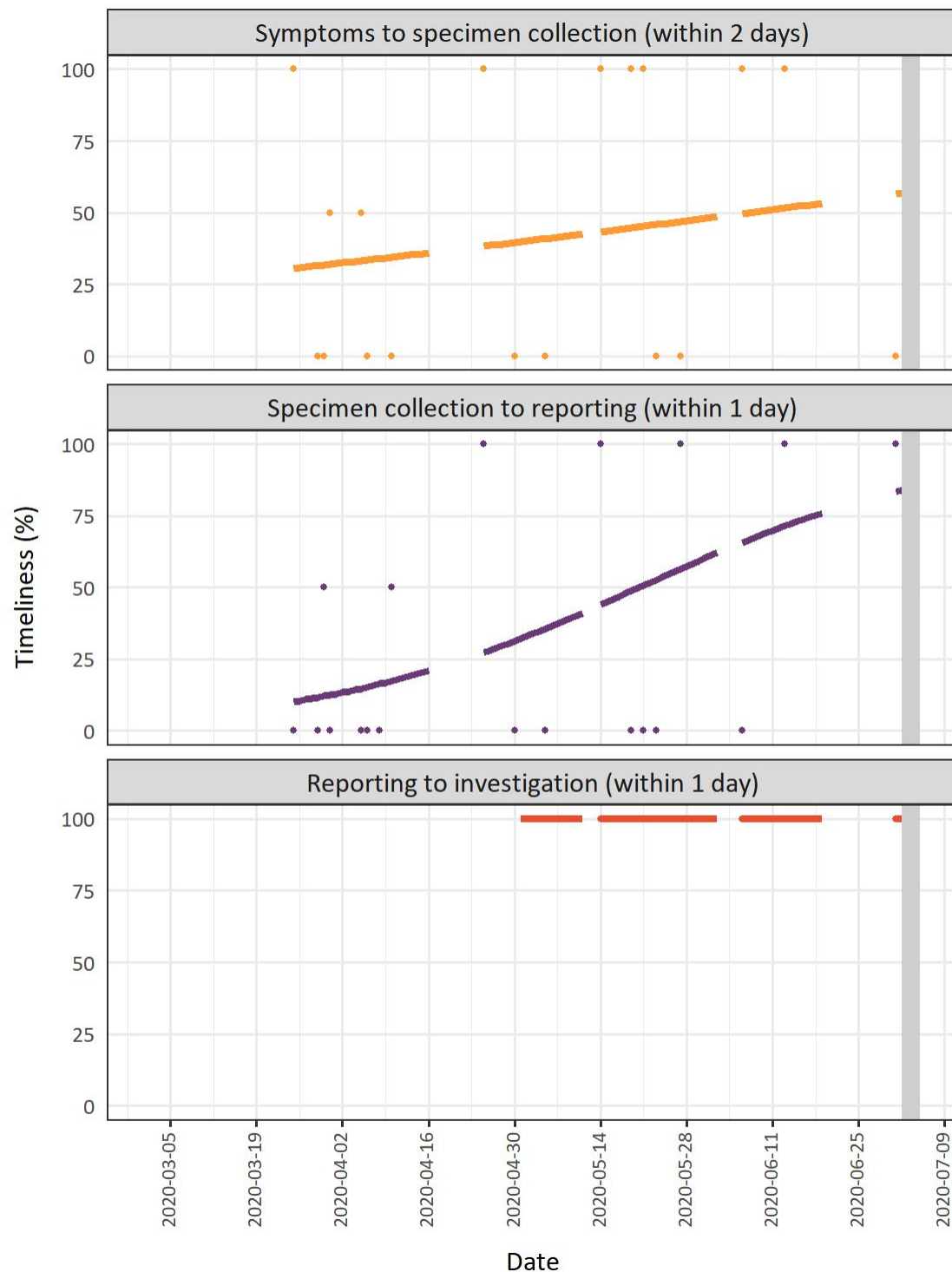
Likely Acquisition: Renfrew County and District Health Unit



Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Timeliness: Renfrew County and District Health Unit

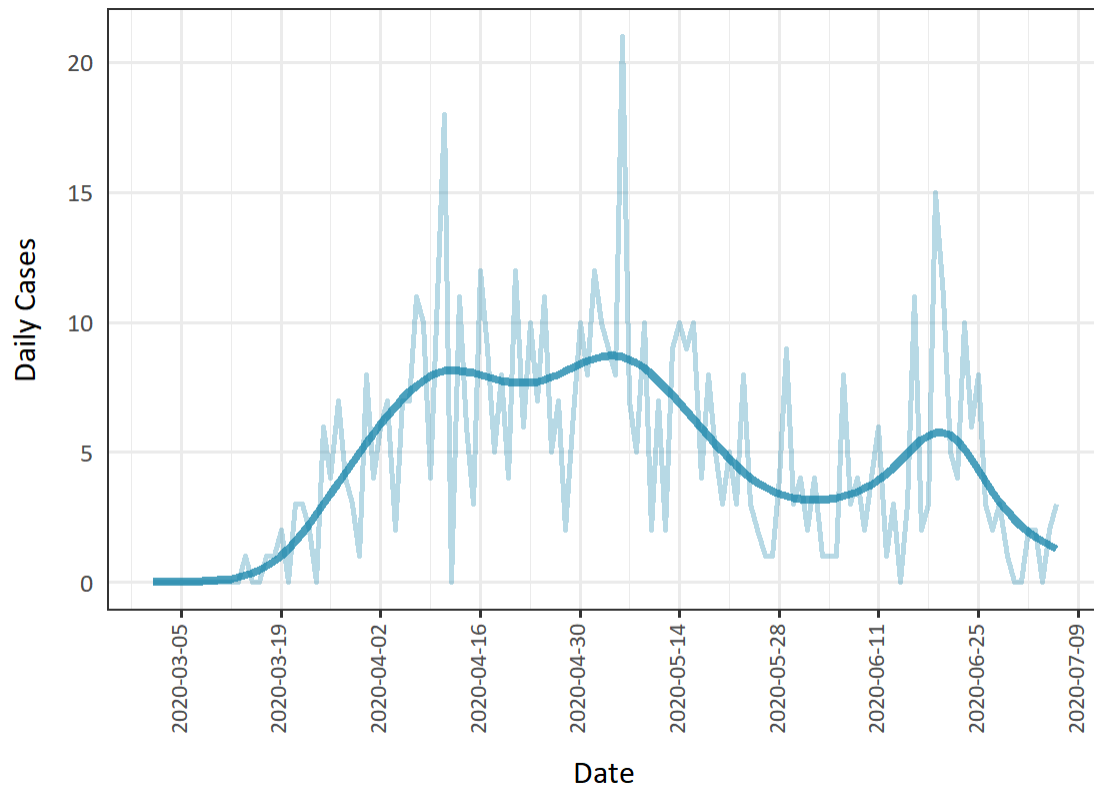


Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Simcoe Muskoka District Health Unit

### Epidemic Curve: Simcoe Muskoka District Health Unit



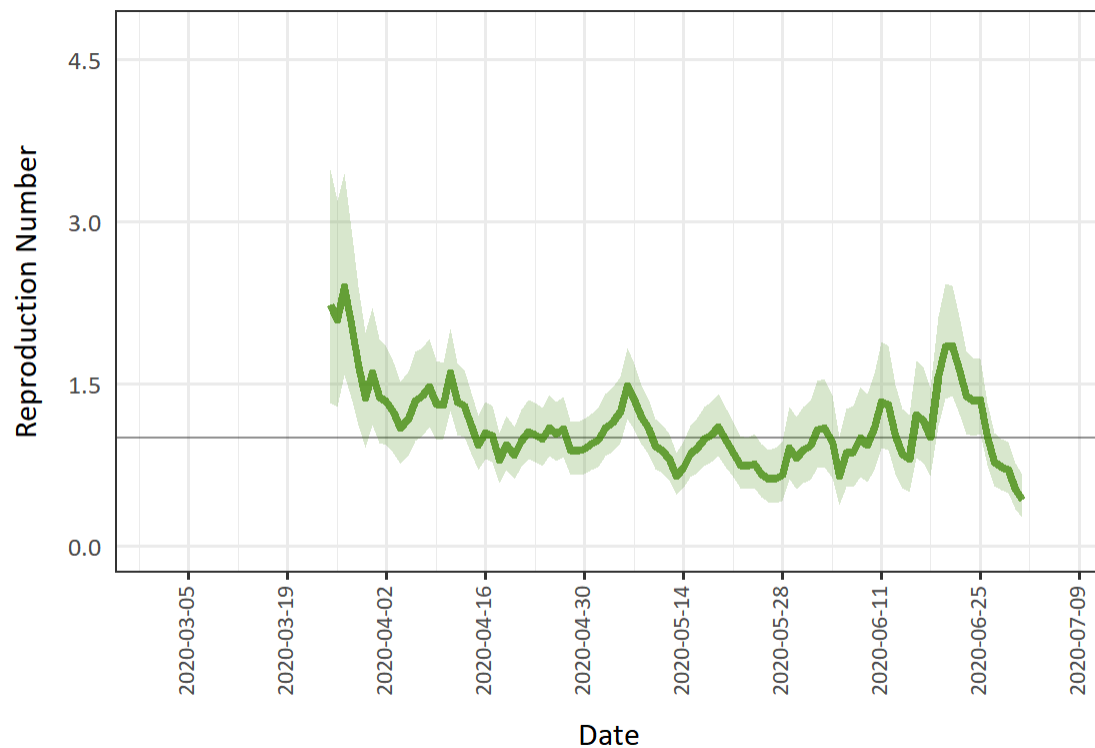
Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus



## Reproduction Number: Simcoe Muskoka District Health Unit

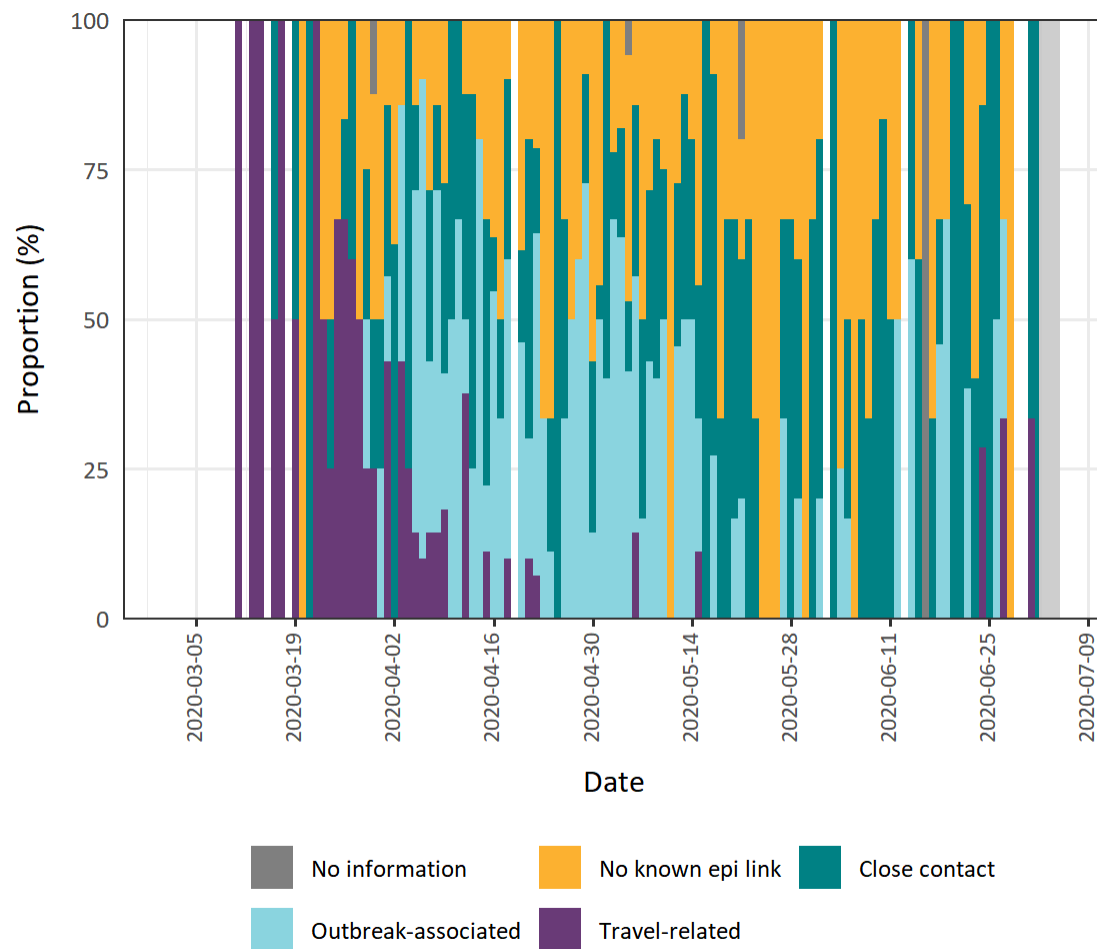
Jul 06 Re not provided: fewer than 12 cases in the 7 days prior to this date



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

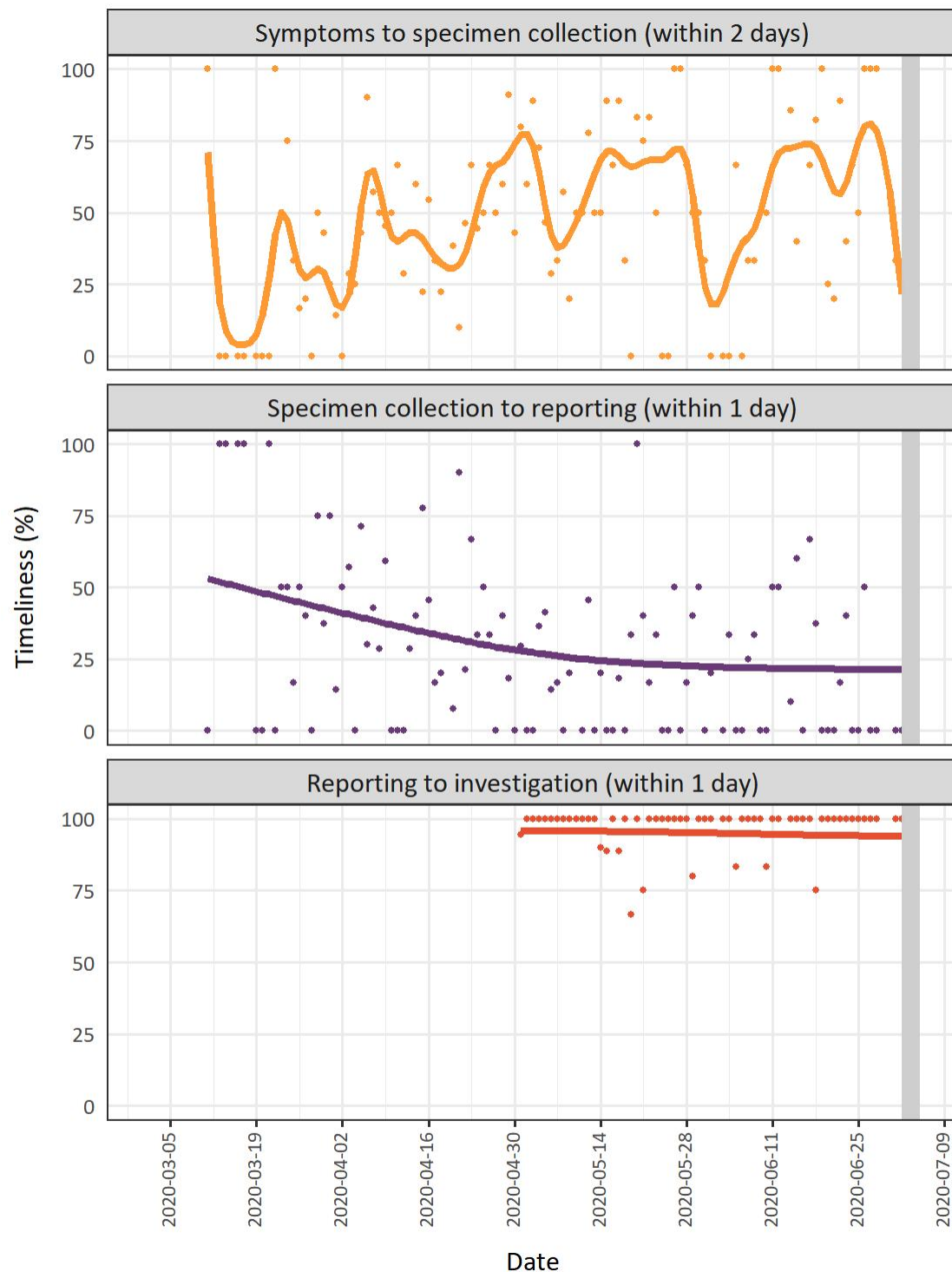
### Likely Acquisition: Simcoe Muskoka District Health Unit



Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Timeliness: Simcoe Muskoka District Health Unit

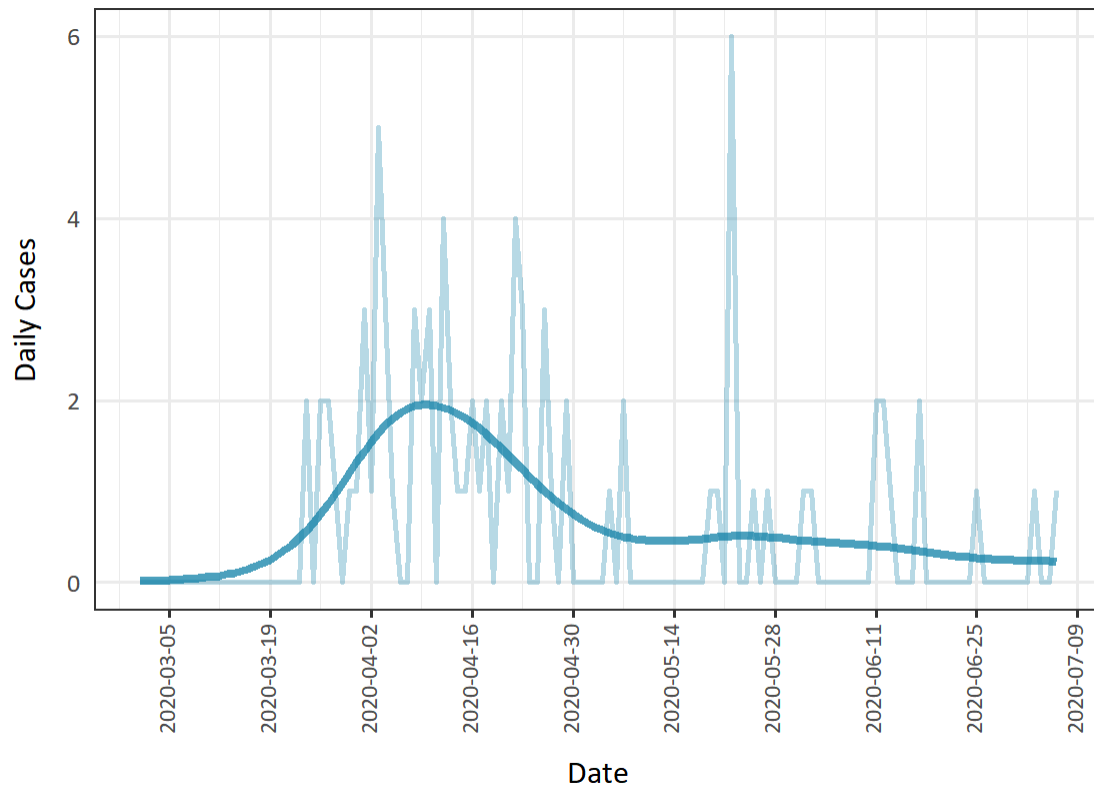


Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Southwestern Public Health

### Epidemic Curve: Southwestern Public Health

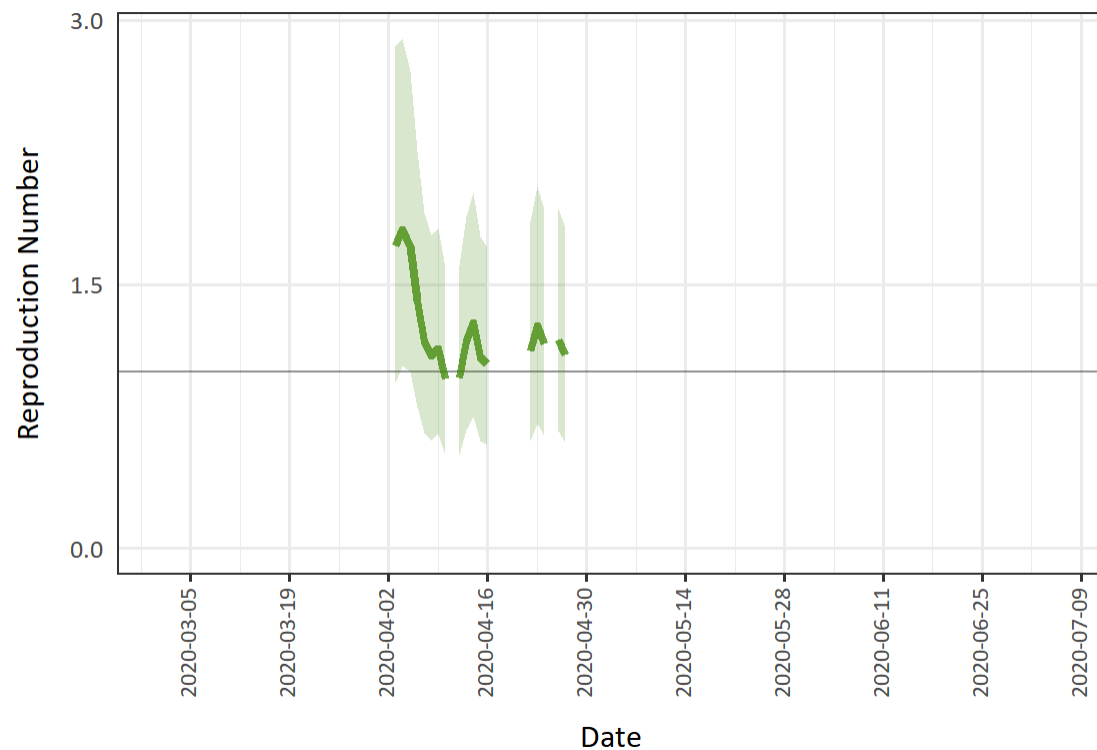


Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

## Reproduction Number: Southwestern Public Health

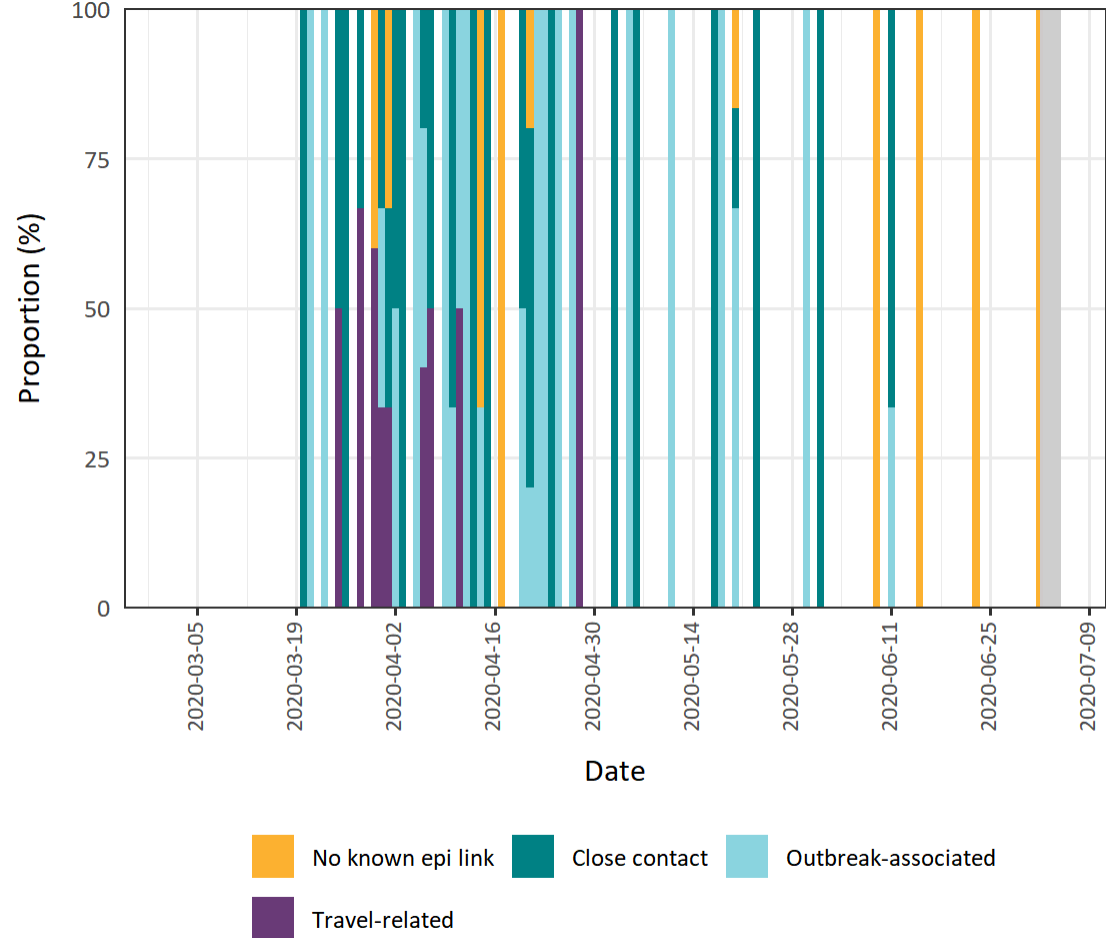
Jul 06 Re not provided: fewer than 12 cases in the 7 days prior to this date



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

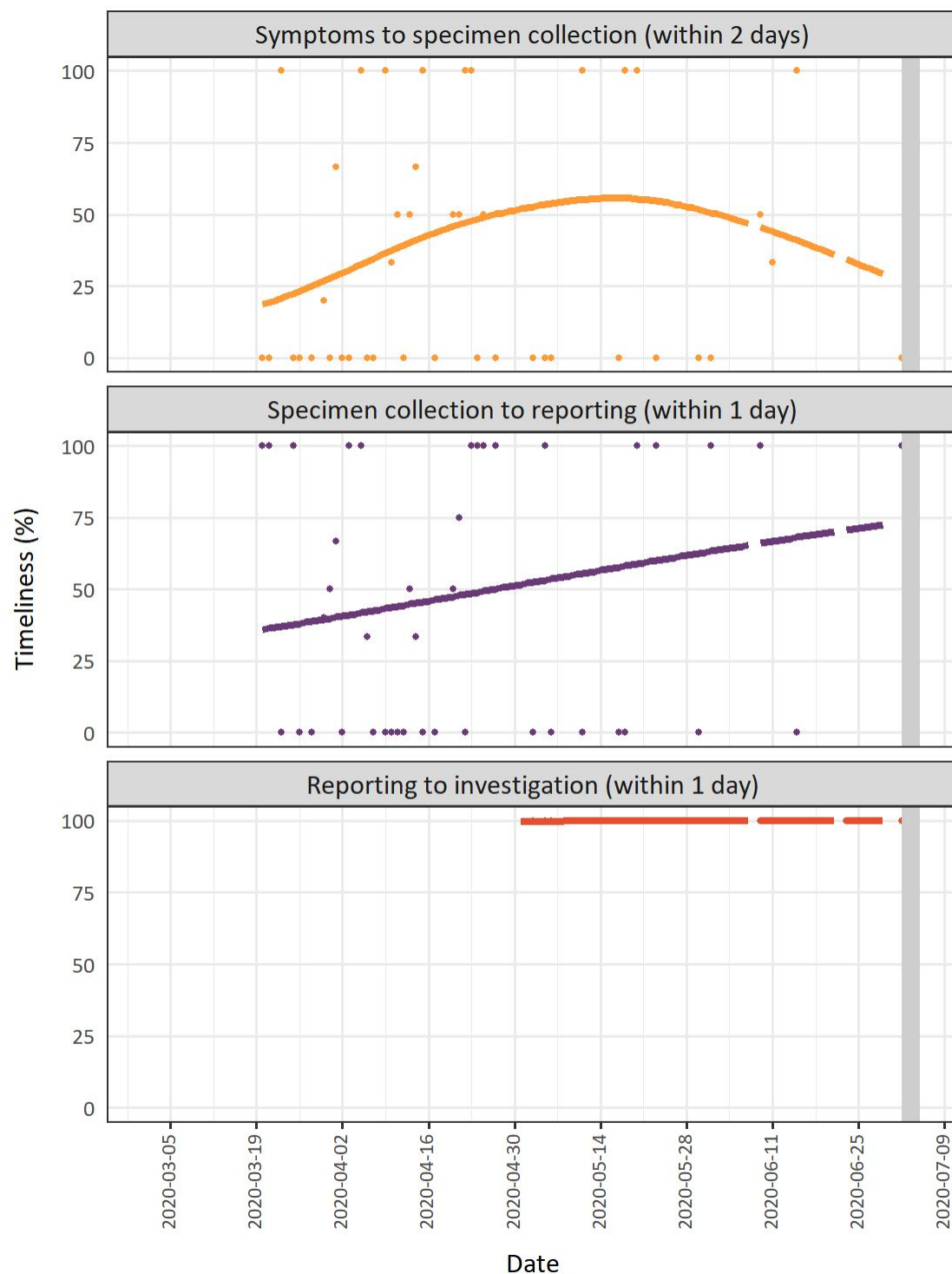
Likely Acquisition: Southwestern Public Health



Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Timeliness: Southwestern Public Health

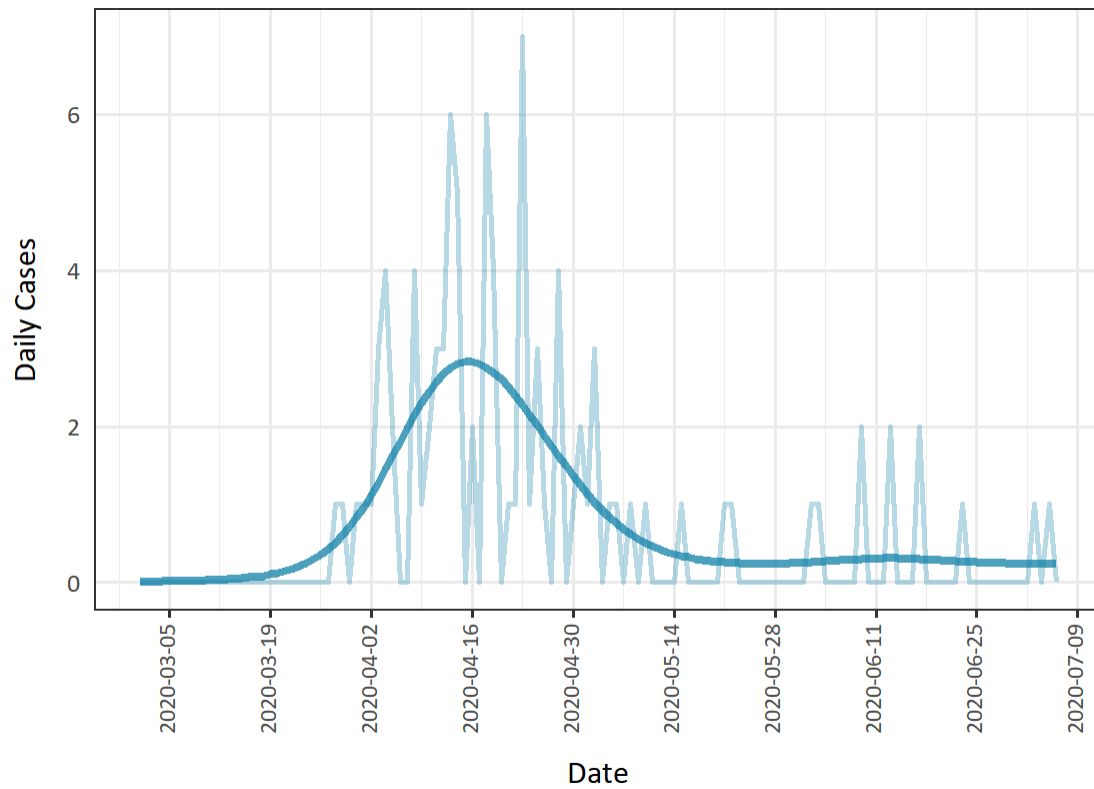


Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Thunder Bay District Health Unit

### Epidemic Curve: Thunder Bay District Health Unit



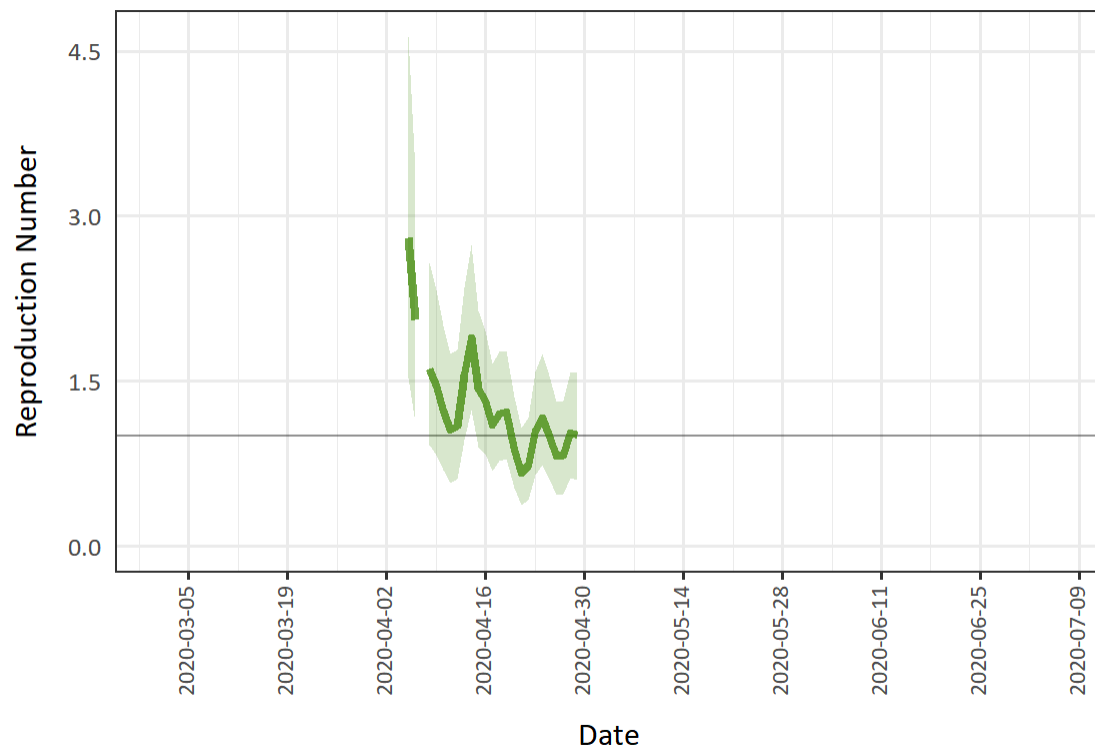
Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus



## Reproduction Number: Thunder Bay District Health Unit

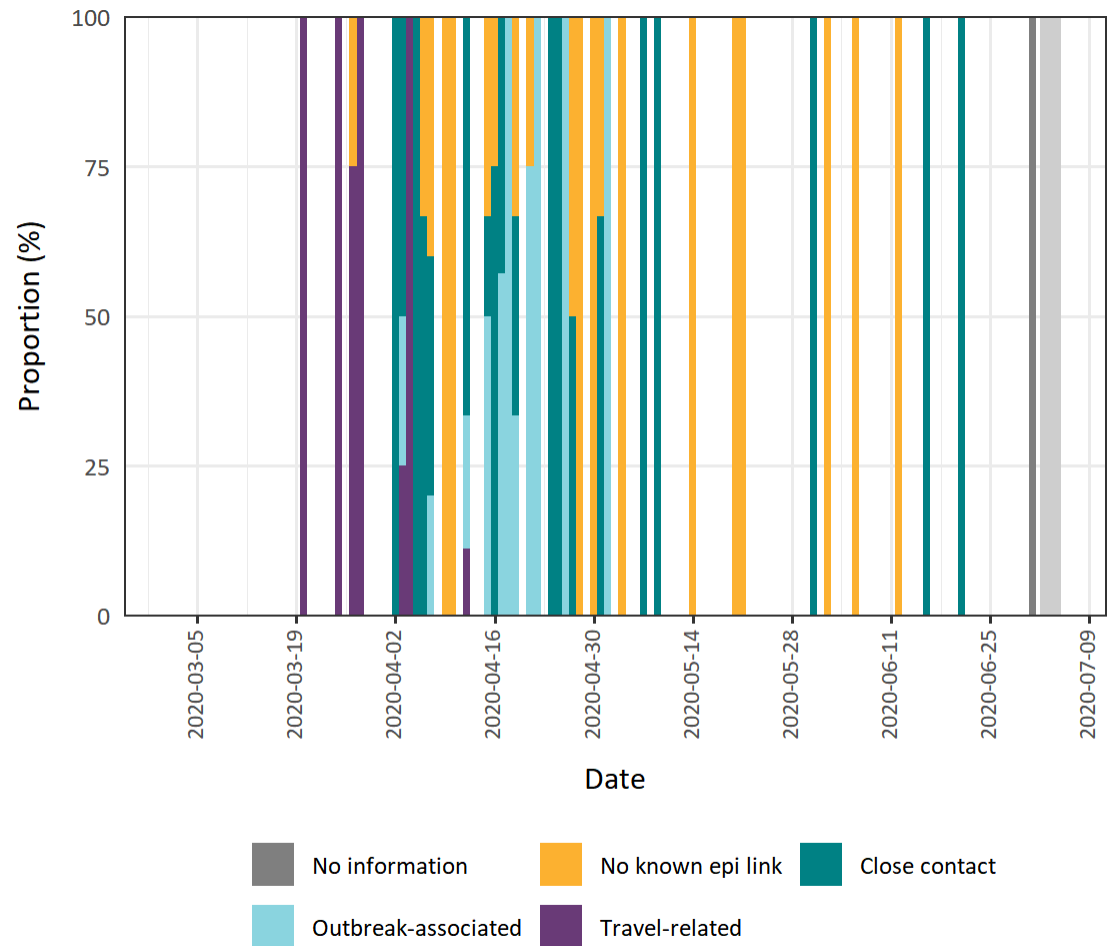
Jul 06 Re not provided: fewer than 12 cases in the 7 days prior to this date



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

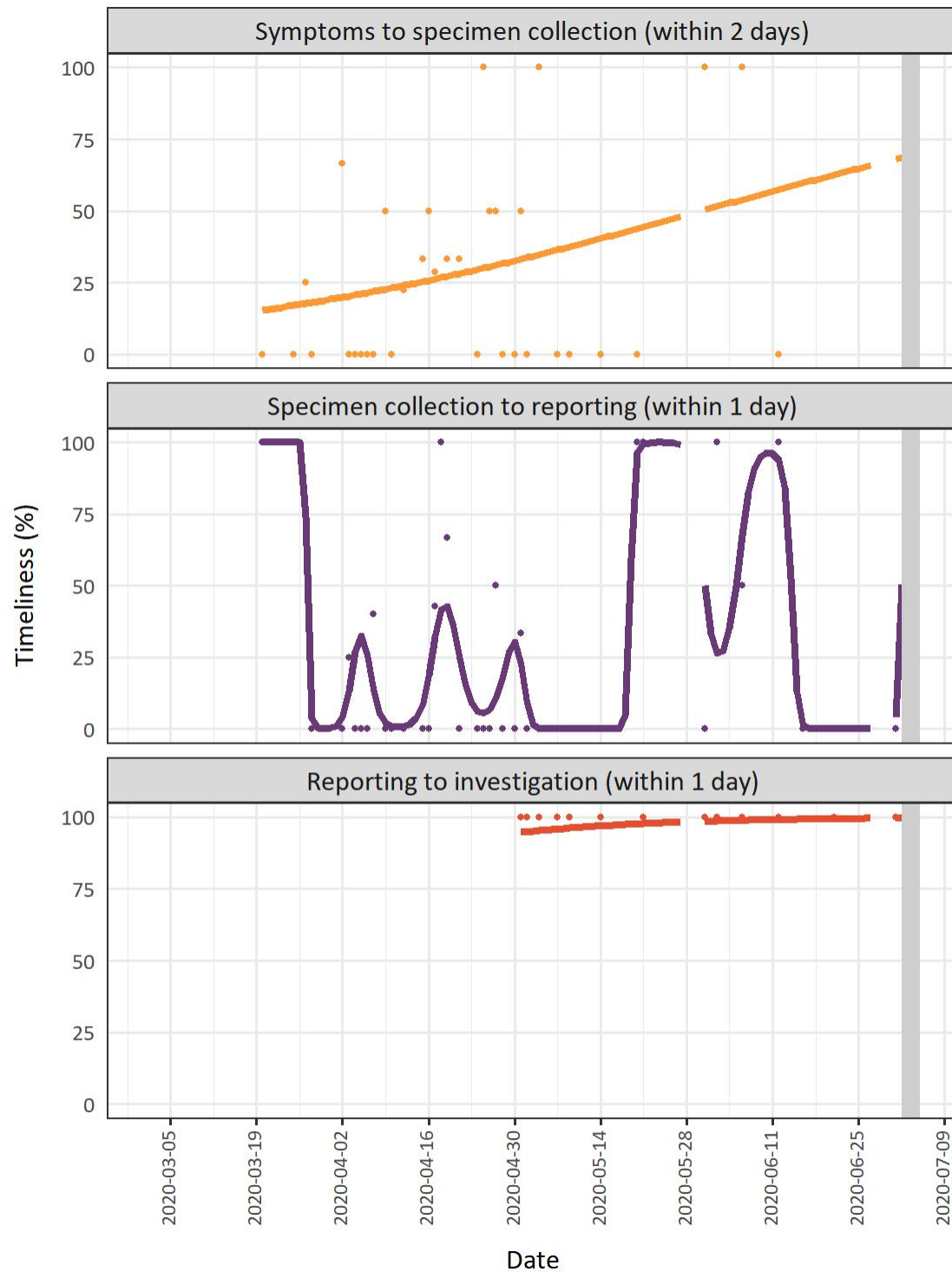
Likely Acquisition: Thunder Bay District Health Unit



Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Timeliness: Thunder Bay District Health Unit

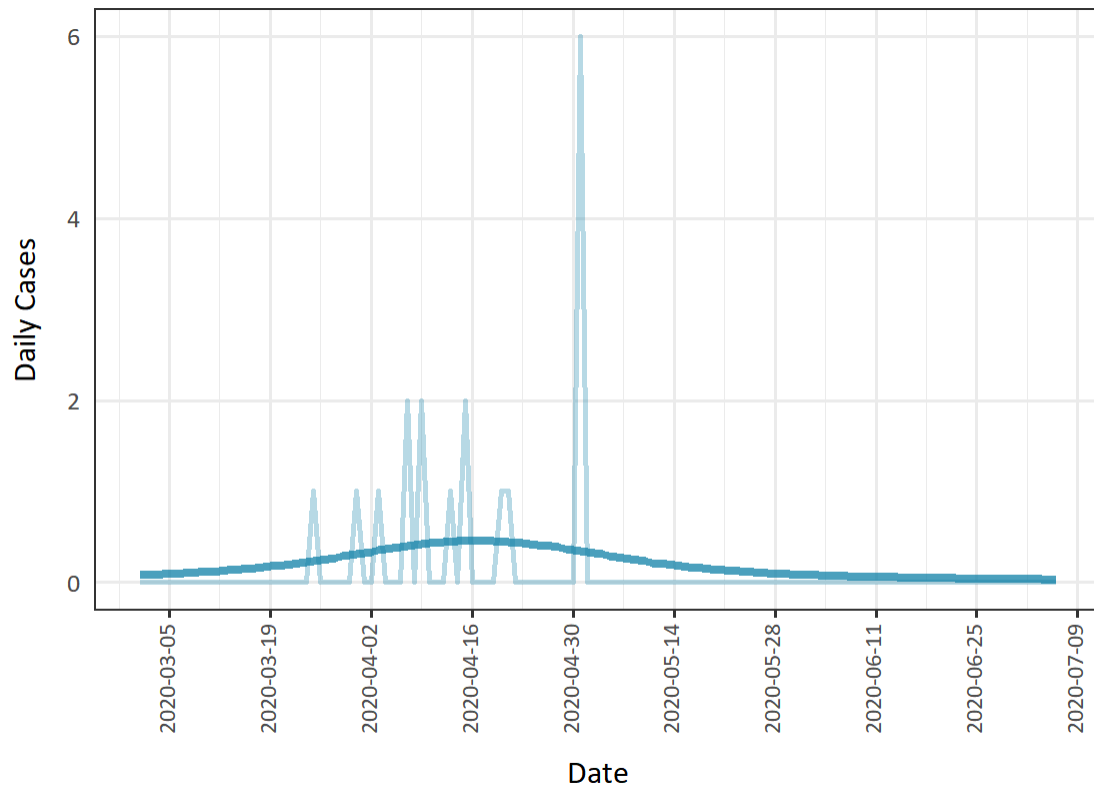


Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Timiskaming Health Unit

### Epidemic Curve: Timiskaming Health Unit

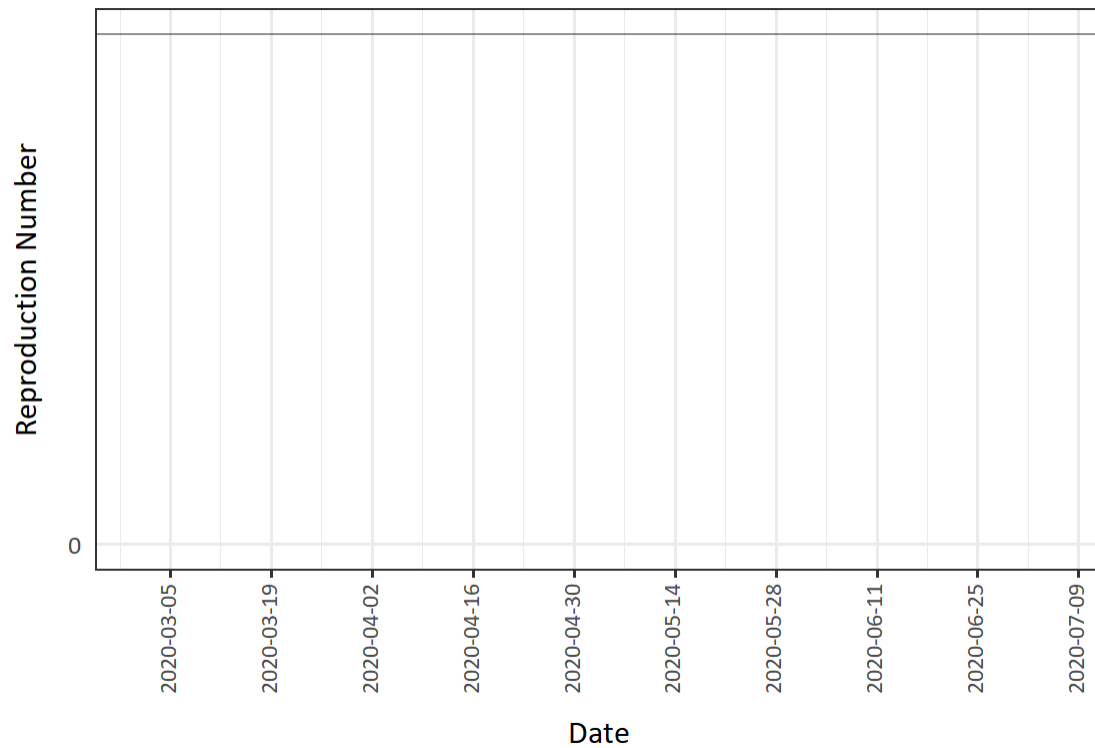


Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

## Reproduction Number: Timiskaming Health Unit

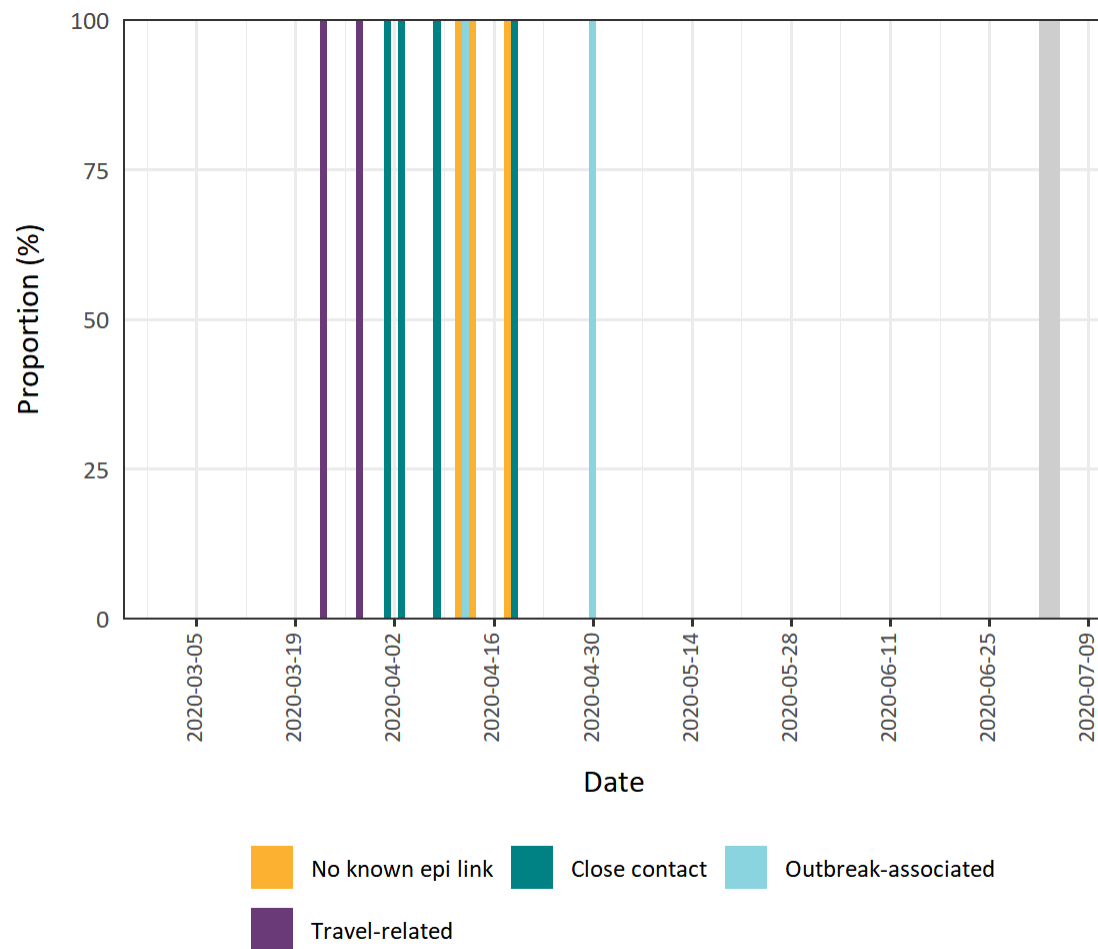
Jul 06 Re not provided: fewer than 12 cases in the 7 days prior to this date



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

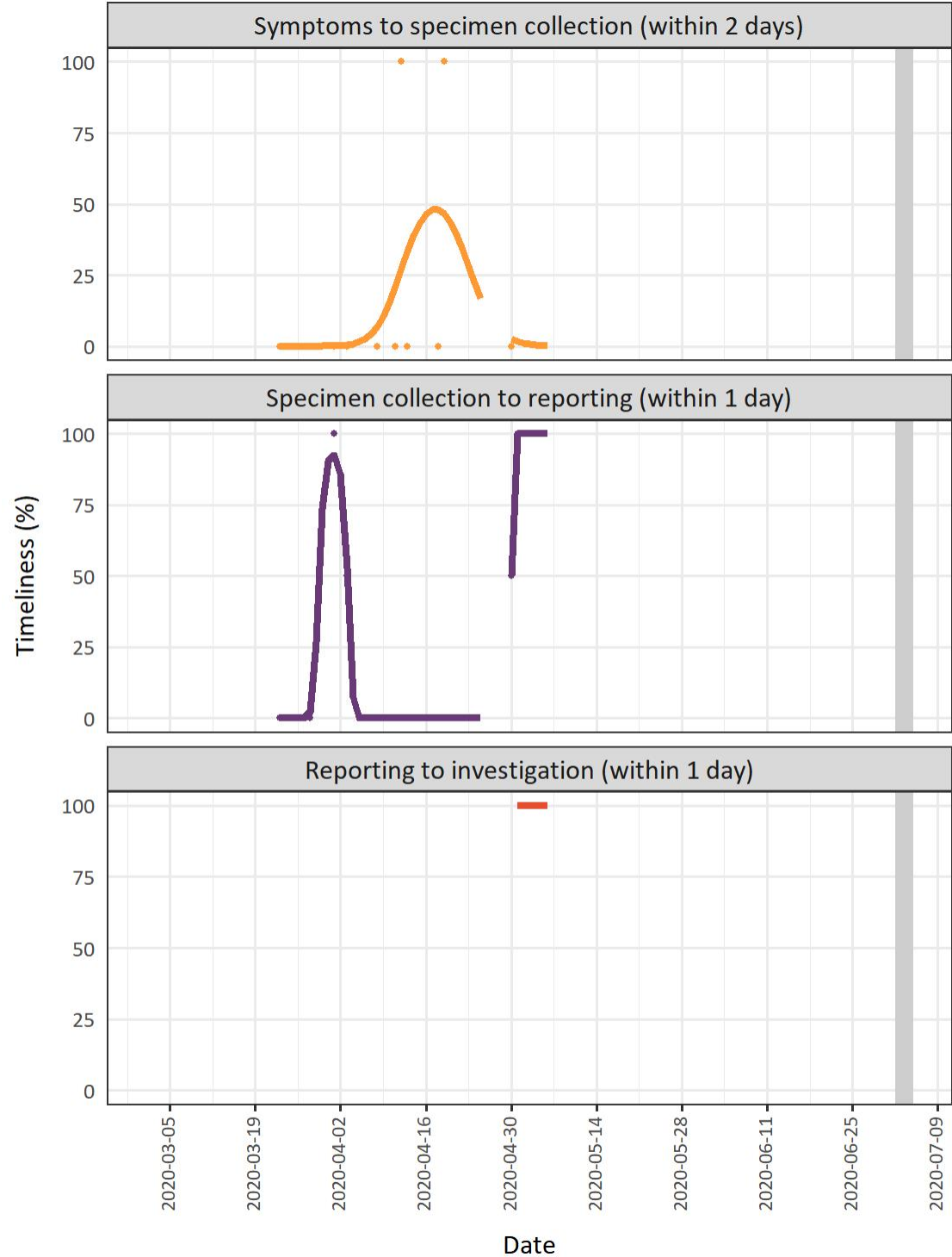
### Likely Acquisition: Timiskaming Health Unit



Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

Timeliness: Timiskaming Health Unit

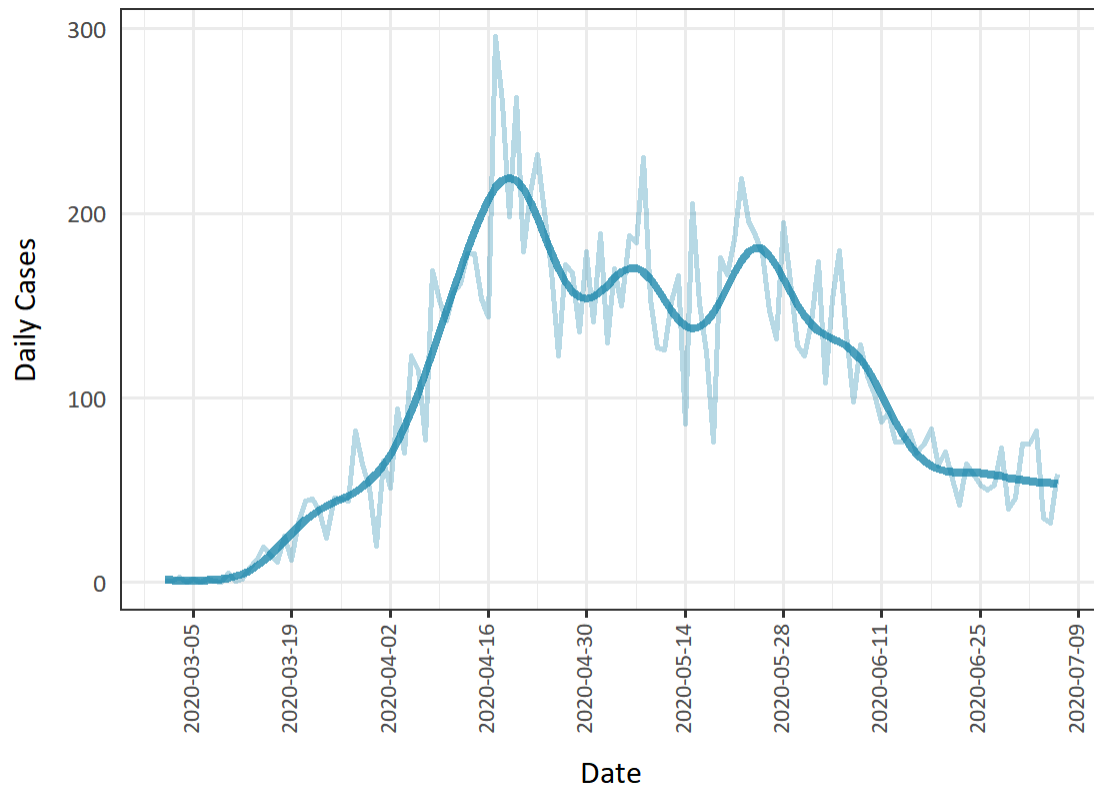


Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Toronto Public Health

### Epidemic Curve: Toronto Public Health



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus



## Reproduction Number: Toronto Public Health

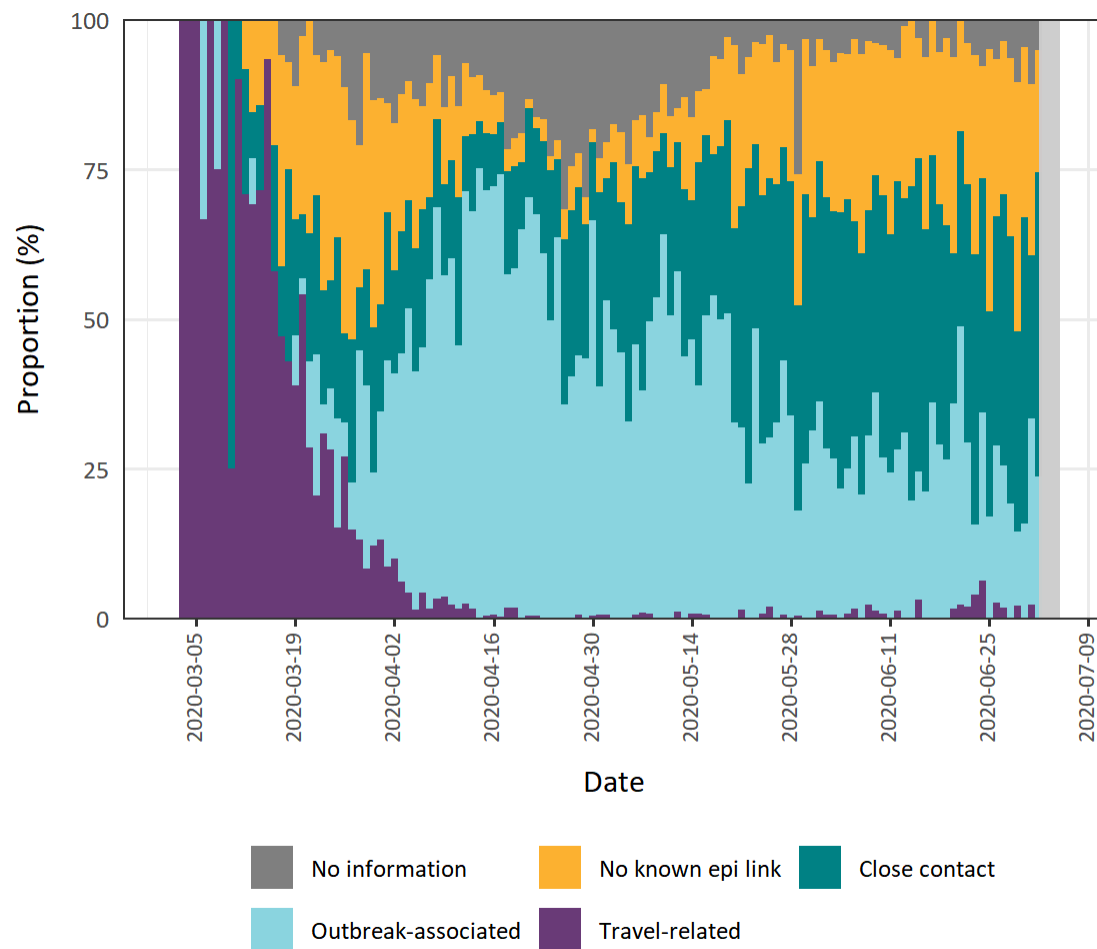
Jul 06 Re = 0.98, 95% CI: 0.89-1.1



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

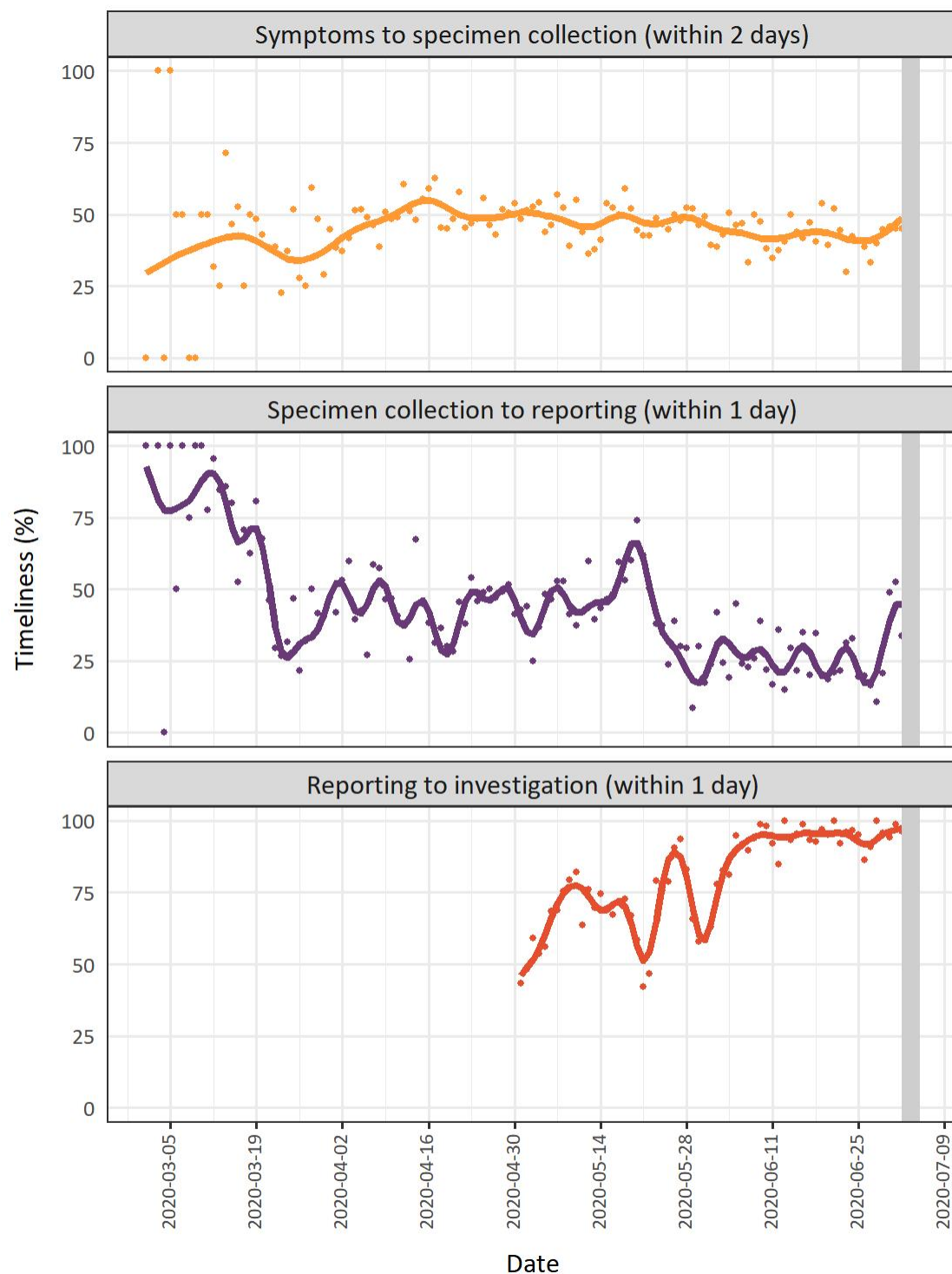
### Likely Acquisition: Toronto Public Health



Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Timeliness: Toronto Public Health

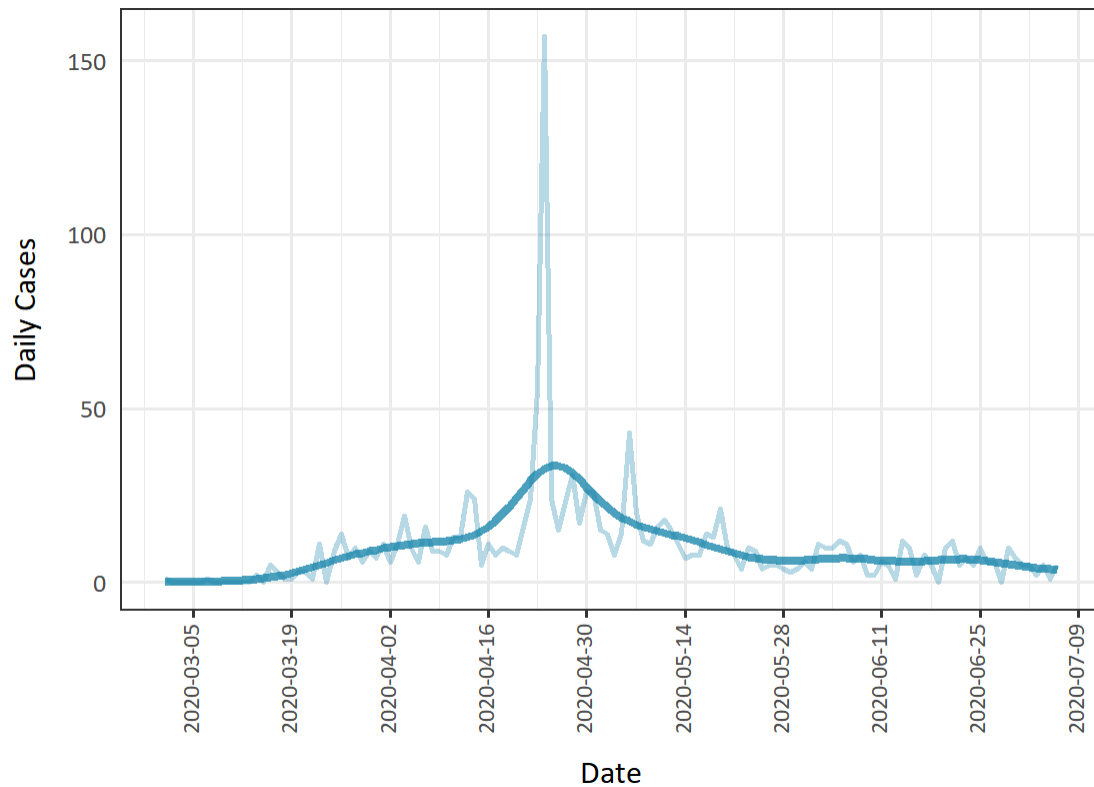


Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Waterloo Public Health and Emergency Services

### Epidemic Curve: Waterloo Public Health and Emergency Services

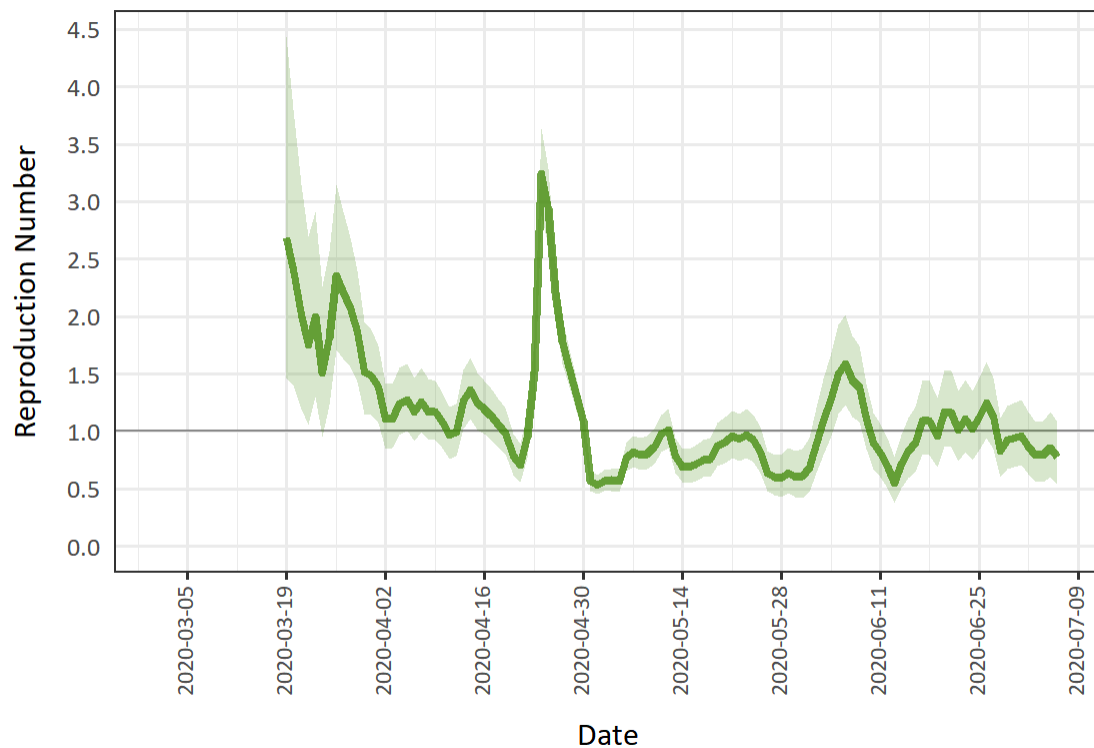


Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

## Reproduction Number: Waterloo Public Health and Emergency Services

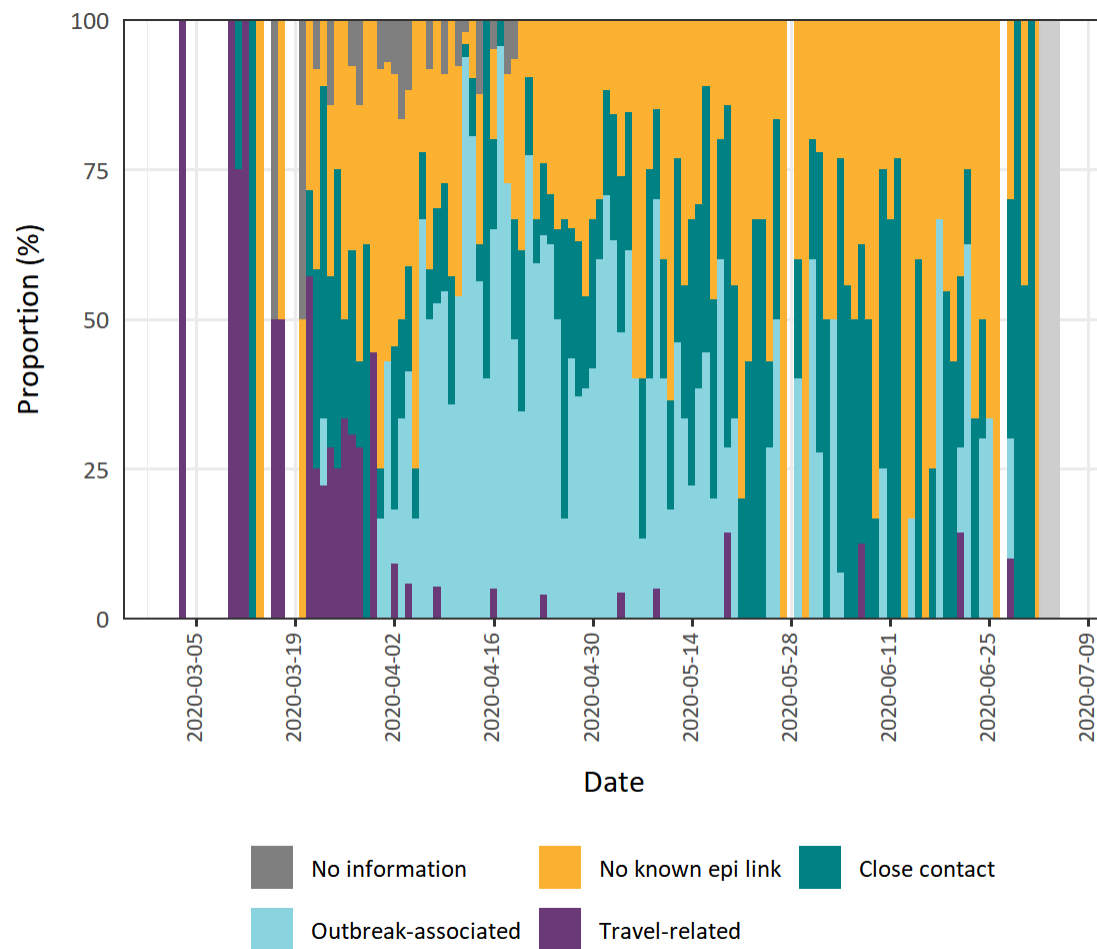
Jul 06 Re = 0.77, 95% CI: 0.53-1.1



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

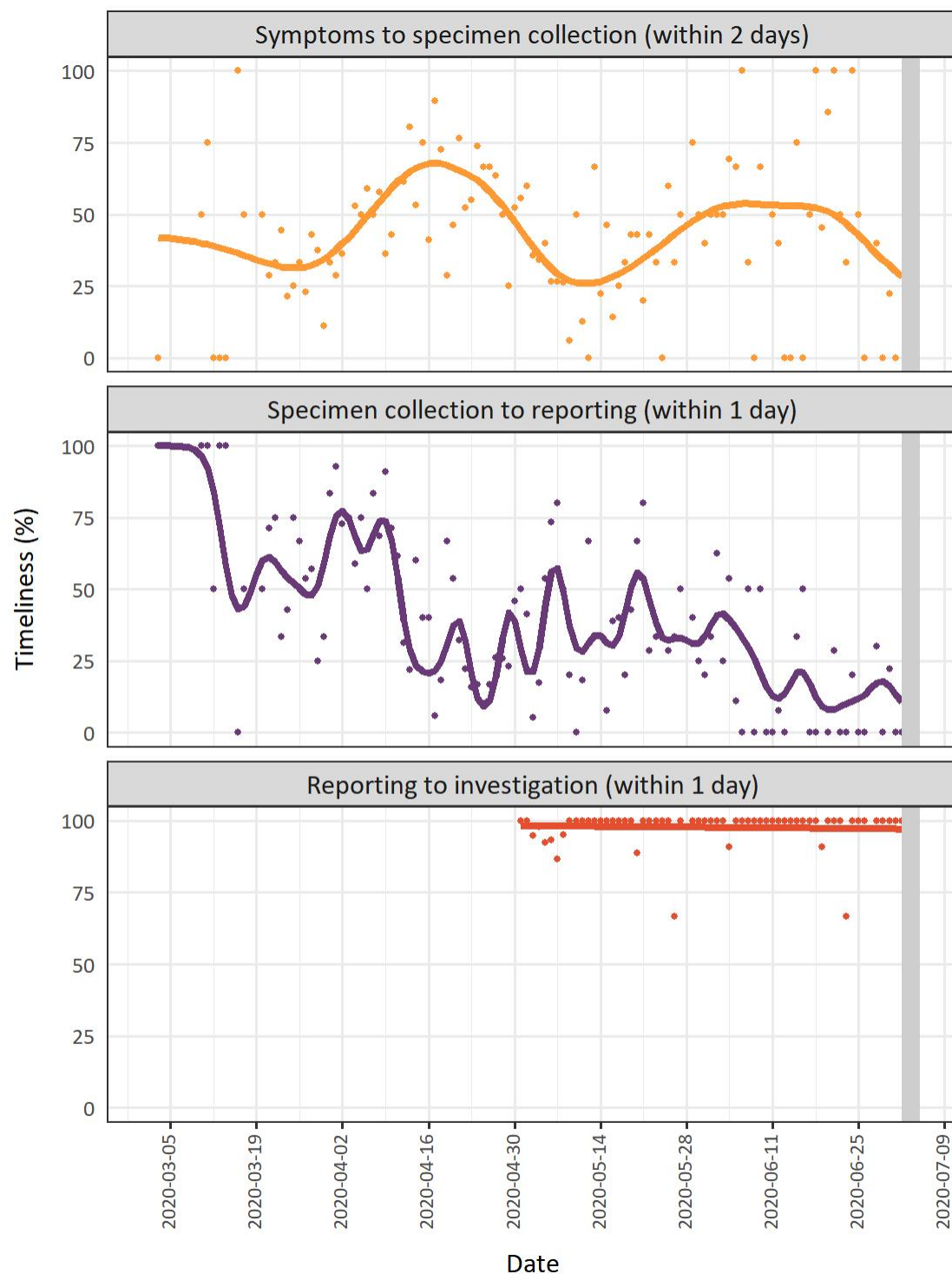
## Likely Acquisition: Waterloo Public Health and Emergency Services



Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Timeliness: Waterloo Public Health and Emergency Services

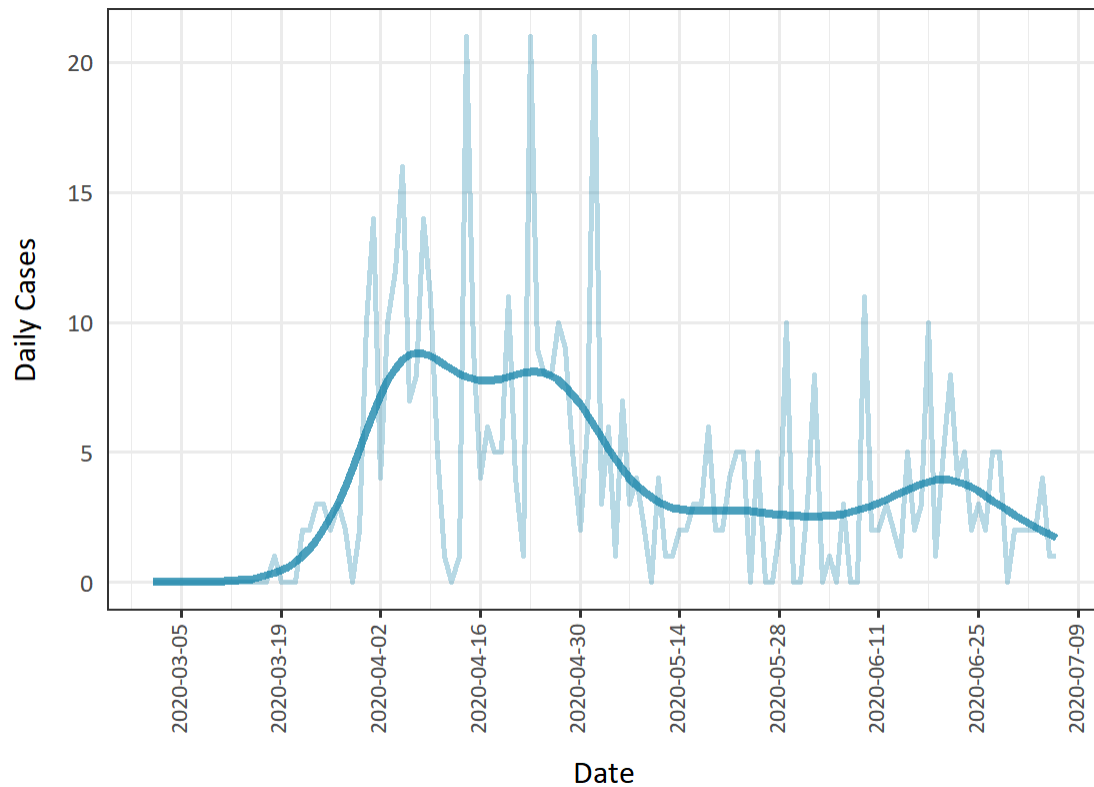


Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Wellington-Dufferin-Guelph Public Health

### Epidemic Curve: Wellington-Dufferin-Guelph Public Health



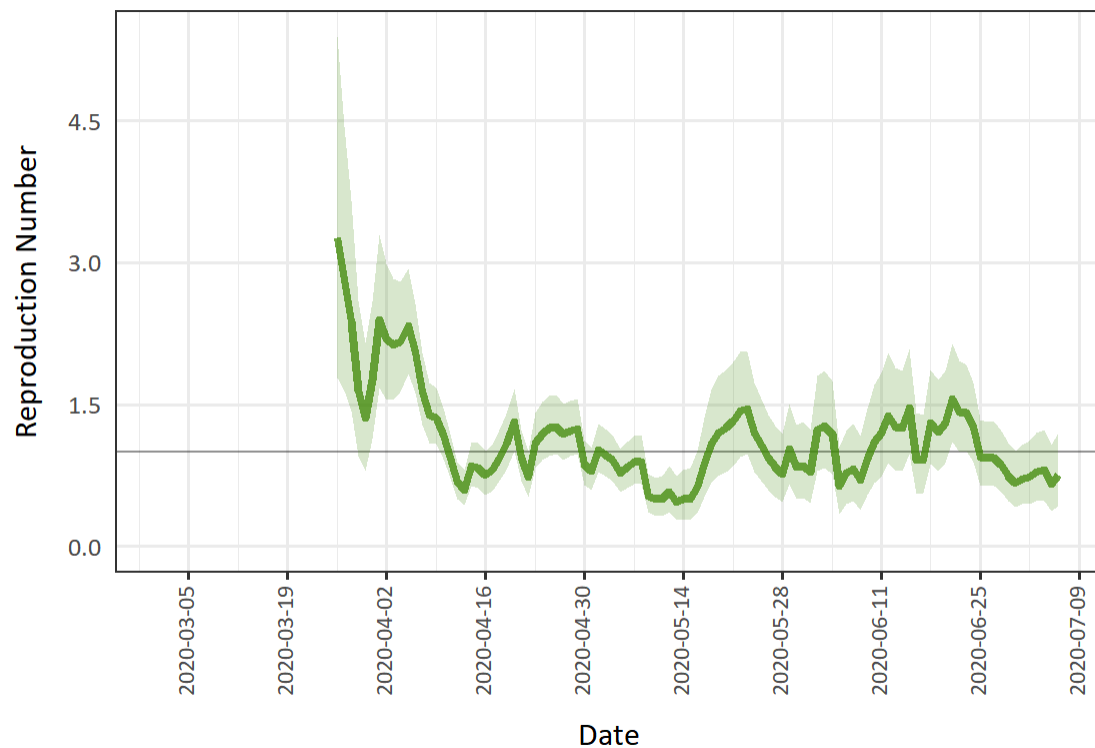
Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus



## Reproduction Number: Wellington-Dufferin-Guelph Public Health

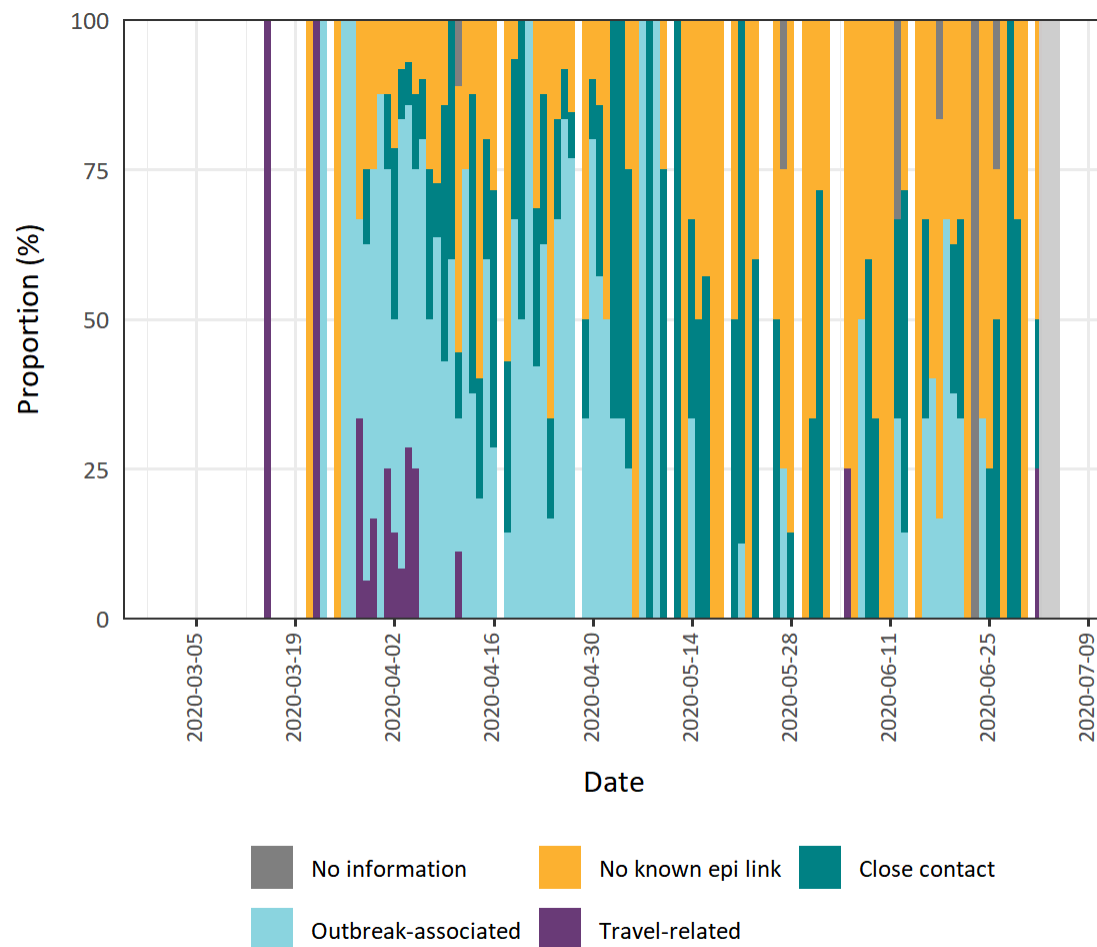
Jul 06 Re = 0.75, 95% CI: 0.43-1.2



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

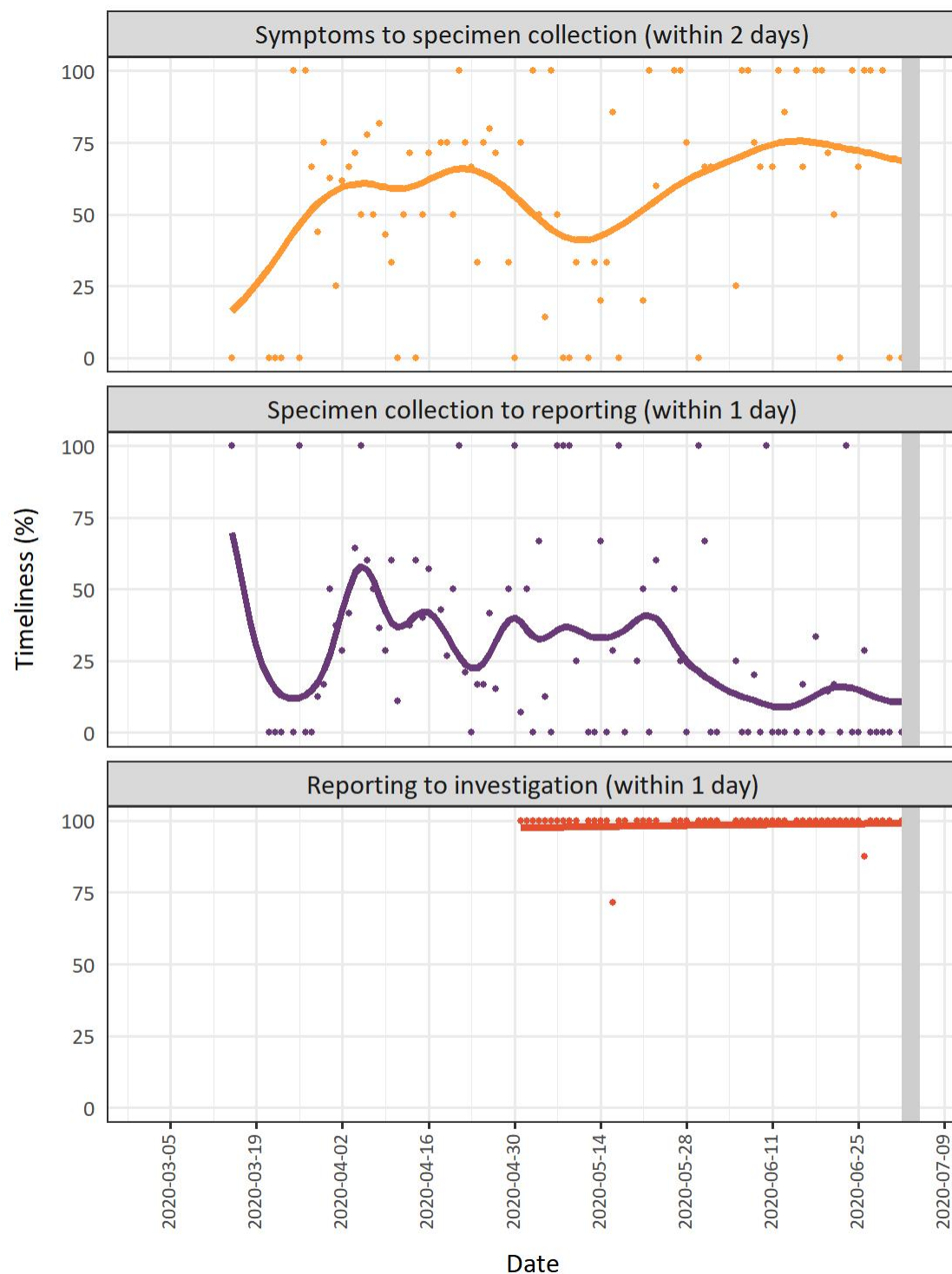
## Likely Acquisition: Wellington-Dufferin-Guelph Public Health



Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Timeliness: Wellington-Dufferin-Guelph Public Health

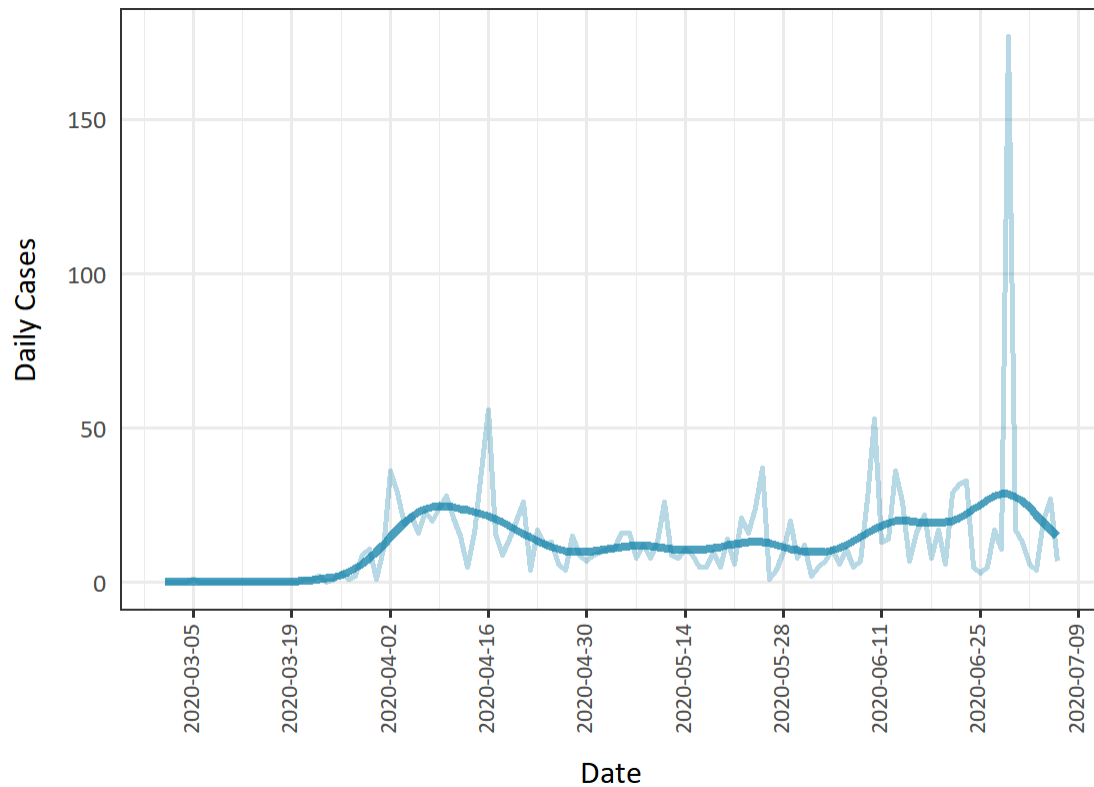


Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Windsor-Essex County Health Unit

### Epidemic Curve: Windsor-Essex County Health Unit

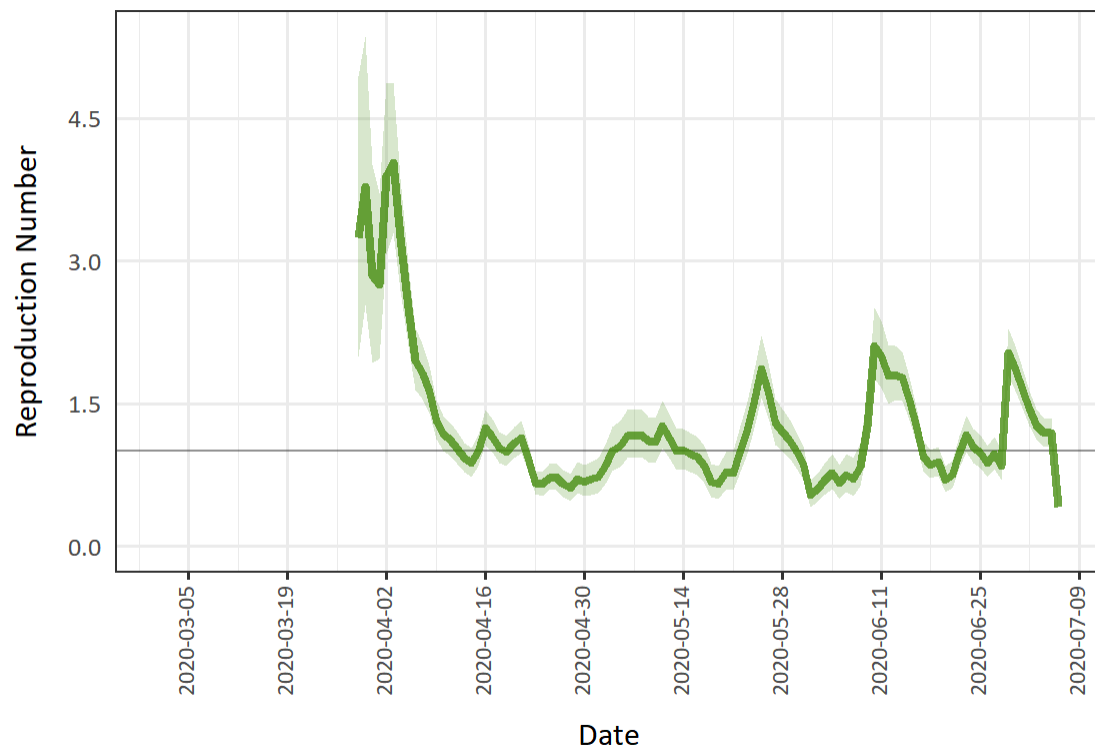


Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

## Reproduction Number: Windsor-Essex County Health Unit

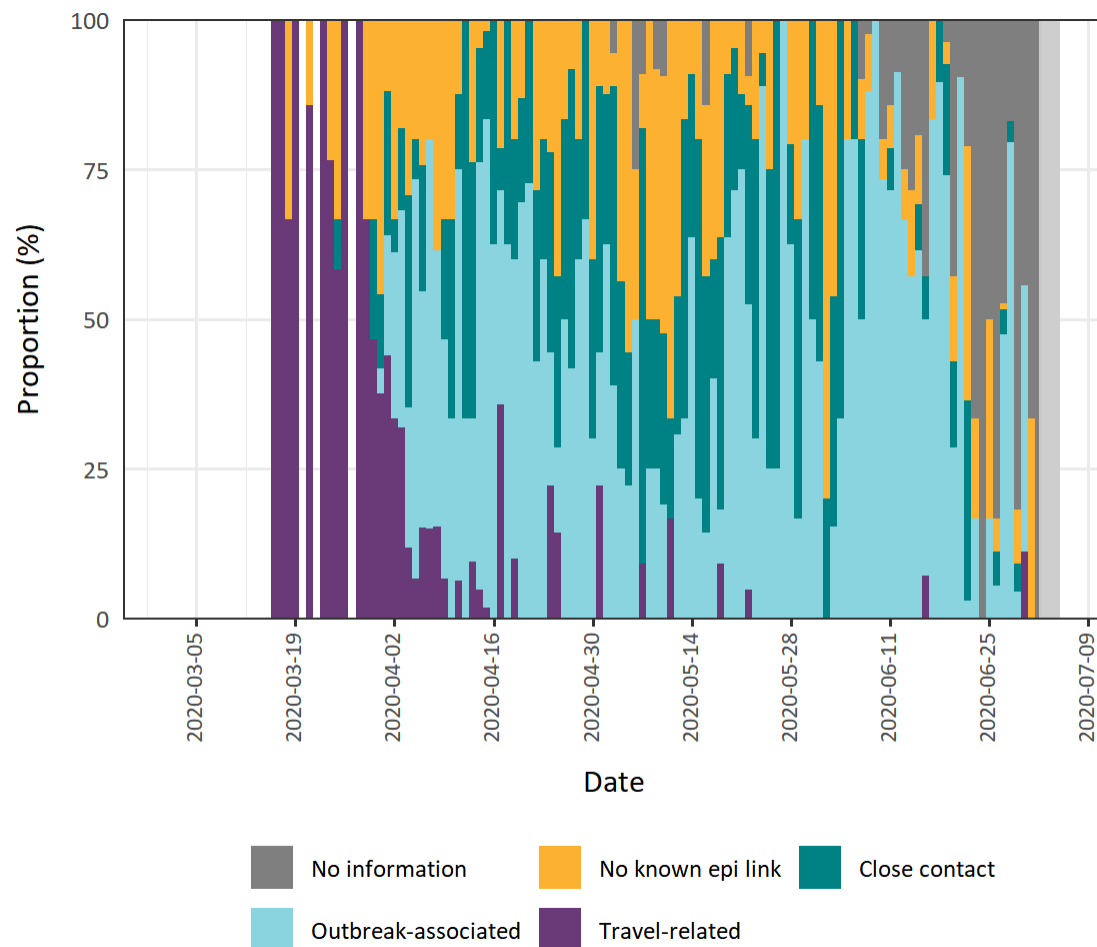
Jul 06 Re = 0.41, 95% CI: 0.33-0.50



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

### Likely Acquisition: Windsor-Essex County Health Unit



Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Timeliness: Windsor-Essex County Health Unit

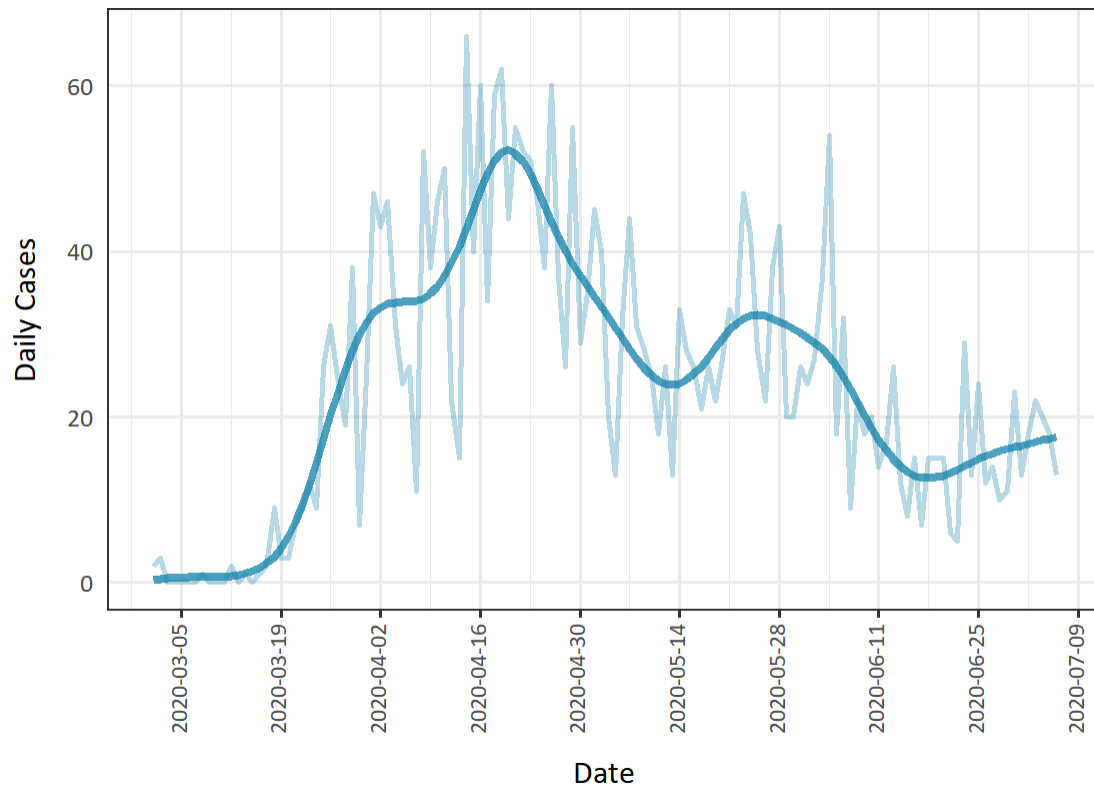


Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## York Region Public Health

### Epidemic Curve: York Region Public Health



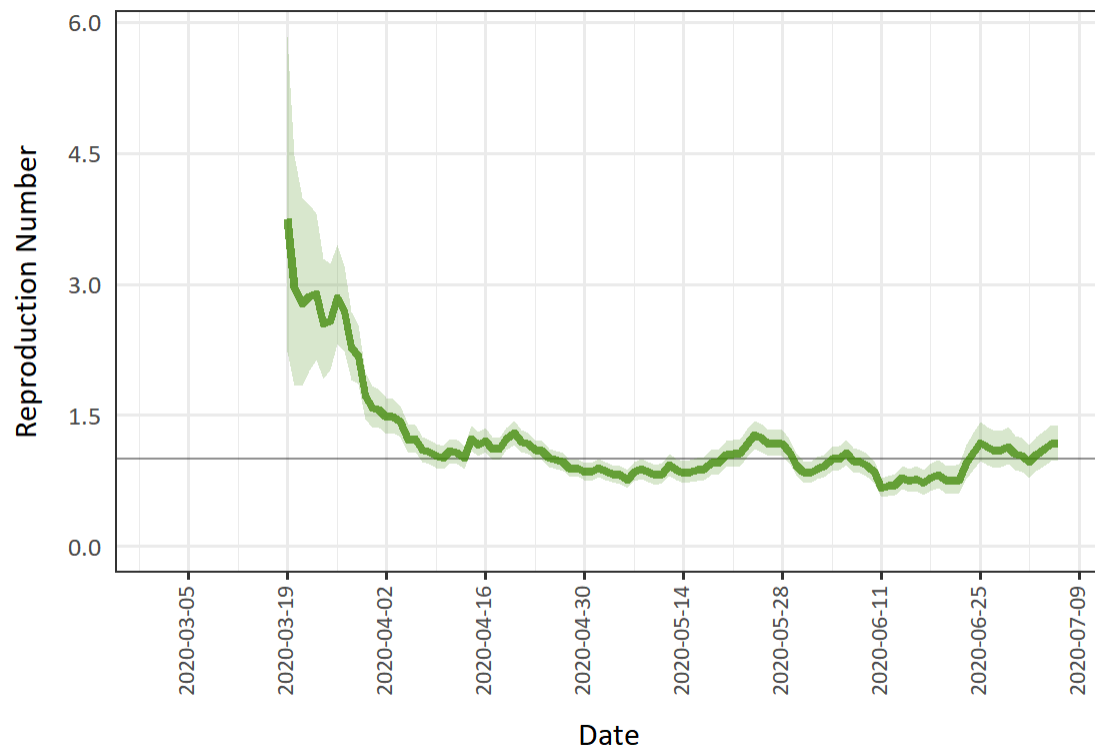
Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus



## Reproduction Number: York Region Public Health

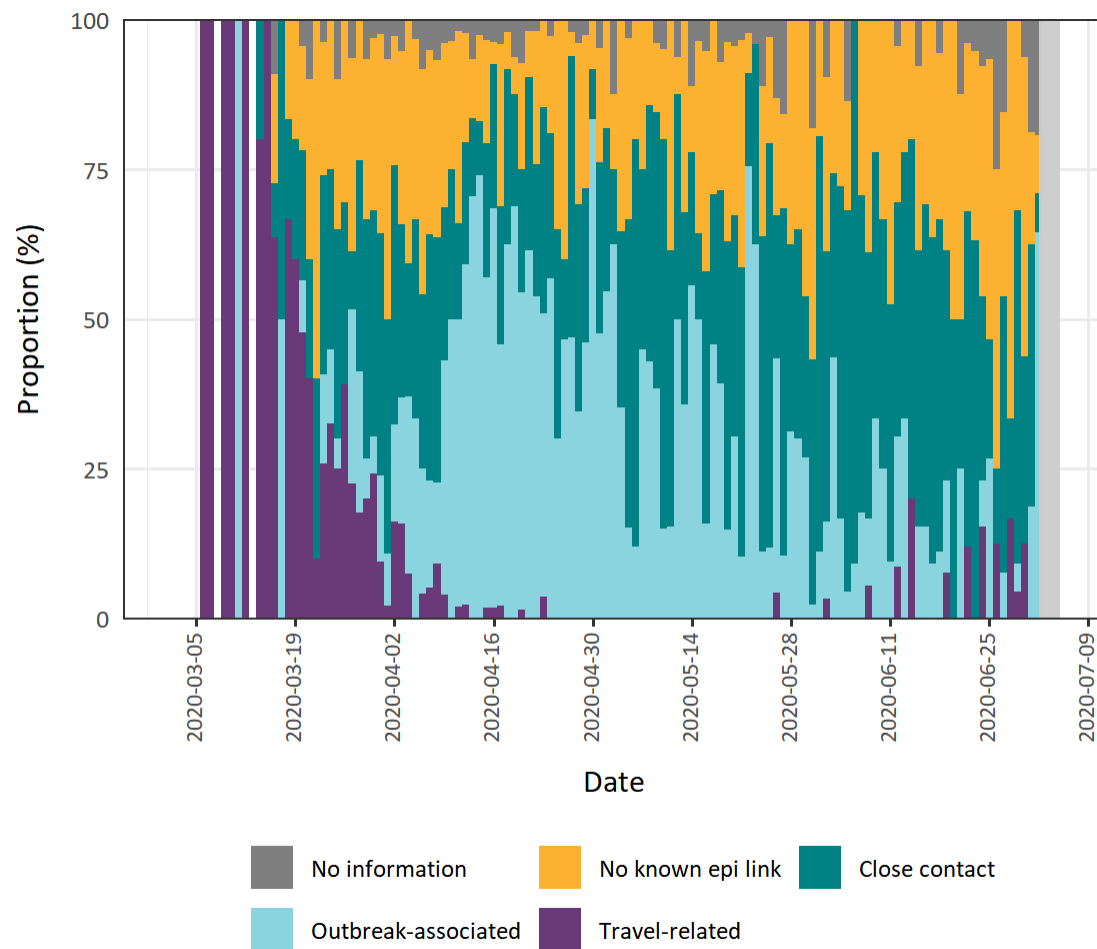
Jul 06 Re = 1.17, 95% CI: 0.98-1.4



Note: the date used in this graph is the public reporting date

Data Source: iPHIS plus

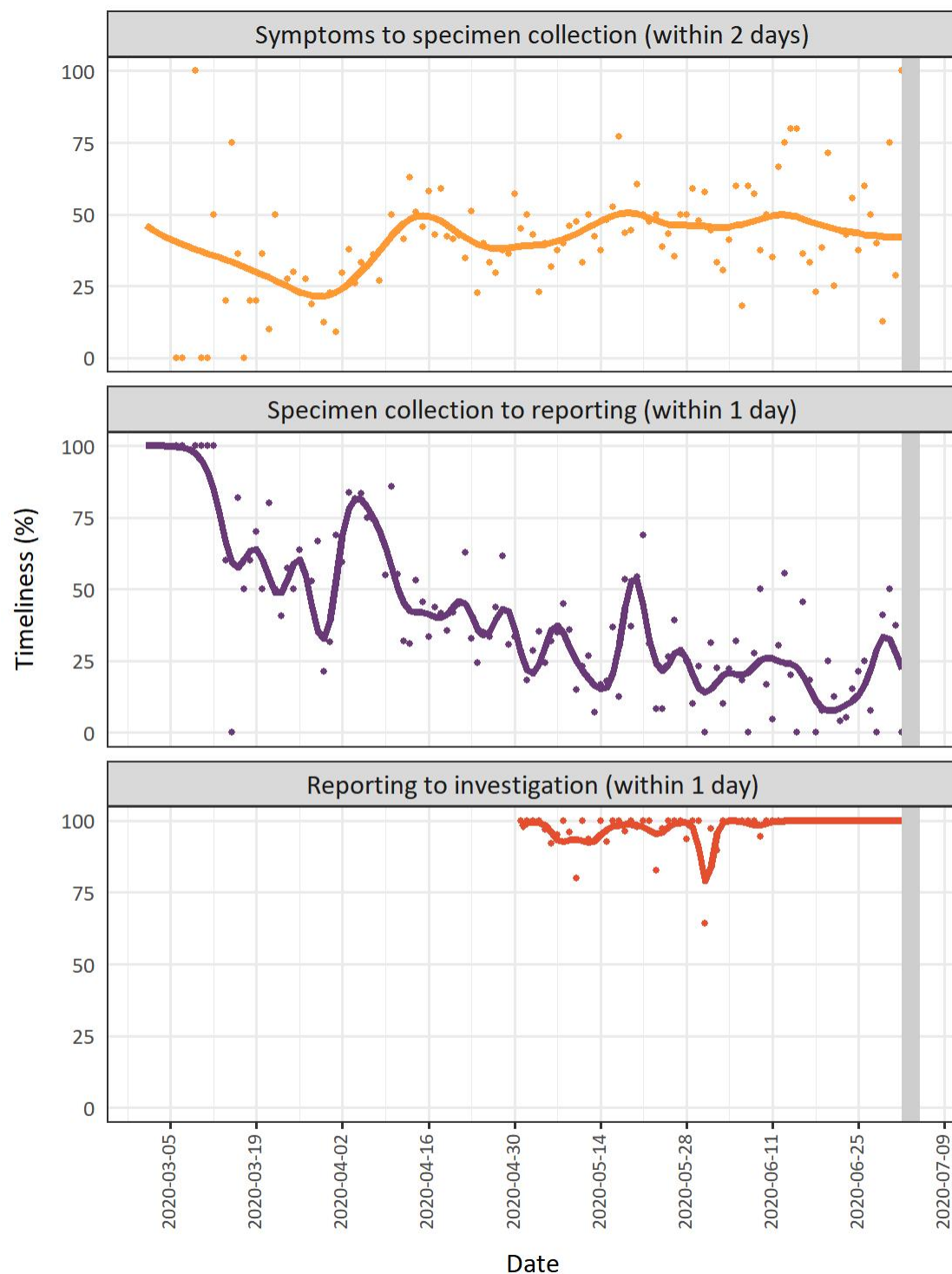
### Likely Acquisition: York Region Public Health



Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Timeliness: York Region Public Health



Note: the date used in this graph is the case reported date

Data Source: iPHIS plus

## Methods

- The data for this report were based on:
  - Information extracted from the Ontario Ministry of Health (Ministry) integrated Public Health Information System (iPHIS) database as of 4 p.m. on the day prior to this report.
  - Information successfully uploaded to the Ministry from Local Systems: Toronto Public Health (Coronavirus Rapid Entry System) CORES, The Ottawa Public Health COVID-19 Ottawa Database (The COD) and Middlesex-London COVID-19 Case and Contact Management Tool (CCMtool) as of 2 p.m. on the day prior to this report.
- The date variable used in the figures for the epidemic curve and the reproduction number throughout this report refers to the date that a case first appeared in the compiled data set + 1 additional day. This corresponds to the “public reporting date” of each case at the provincial level.
  - In order to account for certain instances when there were long lags between when a case’s specimen was collected and when their data was entered into iPHIS, CORES, The COD, or CCMtool, we replaced the public reporting date with the specimen collection date + 3 days (the mode of the distribution from specimen collection to public reporting date). This replacement was made for cases whose delay between specimen collection and case creation was between 7 and 90 days.
  - In rare circumstances when this delay was more than 90 days, we did not make the date replacement.
- The date variable used in the figures for the likely acquisition and the timeliness metrics refers to the case reported date, which is the date the case was reported to the public health unit.
- Due to smaller case counts, we have combined the North West and North East regions into a single region in this report.
- The PHUs were categorized into regions as follows:
  - Toronto: Toronto Public Health
  - Central East: Durham Region Health Department, Haliburton, Kawartha, Pine Ridge District Health Unit, Peel Public Health, Simcoe Muskoka District Health Unit, and York Region Public Health
  - Central West: Brand County Health Unit, City of Hamilton Public Health Services, Haldimand-Norfolk Health Unit, Halton Region Public Health, Niagara Region Public Health, Region of Waterloo Public Health and Emergency Services, and Wellington-Dufferin-Guelph Public Health
  - Eastern: Ottawa Public Health, Eastern Ontario Health Unit, Hastings Prince Edward Public Health, Kingston, Frontenac and Lennox & Addington Public Health, Leeds, Grenville & Lanark District Health Unit, and Renfrew County and District Health Unit

- Northern: Northwestern Health Unit, Thunder Bay District Health Unit, Algoma Public Health, North Bay Parry Sound District Health Unit, Porcupine Health Unit, Public Health Sudbary & Districts, and Timiskaming Health Unit
- South West: Chatham-Kent Public Health, Grey Bruce Health Unit, Huron Perth Public Health, Lambton Public Health, Middlesex-London Health Unit, Southwestern Public Health, and Windsor-Essex County Health Unit
- GTA health units include: Durham Region Health Department, Peel Public Health, Toronto Public Health, and York Region Public Health.
- With the exception of the time from case reported date to investigation start date, orientation of case counts by geography is based on the diagnosing health unit (DHU). DHU refers to the case's public health unit of residence at the time of illness onset and not necessarily the location of exposure. For the time from case reported date to investigation start date, responsible public health unit was used in order to align with the process for case management. Cases for which the responsible health unit was reported as the Ministry of Health (MOH) (to signify that the PHU is not responsible for case management, such as cases that are not residents of Ontario) have been excluded from the analyses.
- Epidemic curve: smoothed epidemic curves were estimated using generalized additive models of the daily number of cases.
- Reproduction number: the reproduction number was measured using the EpiEstim package in R.<sup>1</sup> The procedure uses daily reported case counts and a 7-day rolling window for estimation. The mean serial interval was set at 4.5 days with a standard deviation of 2.5 days, as adapted from published estimates.<sup>2,3</sup> EpiEstim uses a Markov Chain Monte Carlo sampling procedure, and the median represents the middle of the distribution of most probable values of the reproduction number. The reproduction number of a region was only calculated when there were at least 12 cases in that region in the last 7 days.
- Likely source of acquisition is determined by examining the exposure and risk factor fields from iPHIS and local systems to determine whether a case travelled, was associated with an outbreak, was a contact of a case, had no known epidemiological link (sporadic community transmission) or where information was pending or missing. Cases with multiple exposures or risk factors were assigned to a single likely acquisition source group which was determined hierarchically in the following order:
  - For cases with an episode date on or after April 1, 2020: Outbreak-associated > close contact of a confirmed case > travel > no known epidemiological link > information missing or unknown
  - For cases with an episode date before April 1, 2020: Travel > outbreak-associated > close contact of a confirmed case > no known epidemiological link > information missing or unknown.
  - Data for the three days prior to the extract date are not shown for this graph due to lags in data entry.

- Timeliness of reporting: smoothed curves were estimated using generalized additive models of the proportion of cases that were reported within the stated time frame. The dots in the graph represent the individual proportions for a given reported date. The duration elapsed from reporting to investigation was only measured from May 1st onwards, as this is the date that the directive to enter investigation start date was issued. Cases with missing or pending dates have been excluded from the denominator in this analysis.
  - For the time from case reported date to investigation start date, cases with a disposition status of referred to the First Nations and Inuit Health Branch (FNIHB), lost to follow up, or untraceable were excluded from the analyses.
  - If there were no cases within 7 days of the case reported date, the smoothed curve for the proportion meeting the target is not shown.
  - Data for the three days prior to the extract date are not shown for this graph due to lags in data entry.

## Limitations

- This report includes confirmed cases of COVID-19 as per the Ontario Ministry of Health [case definition](#), which may change over time. Case detection is strongly influenced by the provincial testing strategy, which may also influence the time elapsed between various steps in the testing and notification process.
- iPHIS and iPHIS plus (which includes iPHIS, CORES, The COD, and COVID-19 CCMtool) are dynamic disease reporting systems, which allow ongoing updates to data previously entered. As a result, data extracted represent a snapshot at the time of extraction and may differ from previous or subsequent reports.
- The data only represent cases reported to public health units and recorded in iPHIS plus. As a result, all counts will be subject to varying degrees of underreporting due to a variety of factors, such as disease awareness and medical care seeking behaviours, which may depend on severity of illness, clinical practice, changes in laboratory testing, and reporting behaviours.
- The public reporting date lags the infection date; as such, public reporting dates likely represent infections that occurred approximately 10 days earlier.
- For reproduction number analyses, all cases since initial importation were presumed to be locally transmitted. Further, the estimates of the reproduction number are influenced by the choice of serial interval. As such, the reported estimates in the analysis are subject to change as additional data on the estimated serial interval are published.
- The epidemic curves in this report will not align with the curves provided in other reports due to the date chosen. In monitoring trends over time, the public reporting date was specifically chosen in order to identify early signals of increasing cases, which is challenging when using episode date or reported date due to lags in data entry and therefore the need for caution when reviewing case data for more recent days. As such, numbers from the epidemic curve should not be compared between this regional report and the daily/weekly epidemiologic summary.

## References

1. Cori A, Ferguson NM, Fraser C, Cauchemez S. A new framework and software to estimate time-varying reproduction numbers during epidemics. *American Journal of Epidemiology* 2013; 178(9):1505–1512. Available from: <https://doi.org/10.1093/aje/kwt133>
2. Nishiura H, Linton NM, Akhmetzhanov AR. Serial interval of novel coronavirus (COVID-19) infections. *Int J Infect Dis* 2020; 93:284–286. Available from: <https://doi.org/10.1016/j.ijid.2020.02.060>
3. Du Z, Xu X, Wu Y, Wang L, Cowling BJ, Ancel Meyers L. Serial interval of COVID-19 among publicly reported confirmed cases. *Emerg Infect Dis.* 2020; 26(6):1341-1343. Available from: <https://doi.org/10.3201/eid2606.200357>

## Disclaimer

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## For Further Information

For more information, email [epir@oahpp.ca](mailto:epir@oahpp.ca).

## Public Health Ontario

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