

# Detection and Early Response to Contamination of an Urban Water Supply.

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# Acknowledgements

- ESR Health Intelligence Team and Laboratory staff
- Maree Rohleder and the Health Protection Team HBDHB
- Many Medical Officers of Health
- Many Health Protection Officers and Drinking Water Assessors
- Ministry of Health

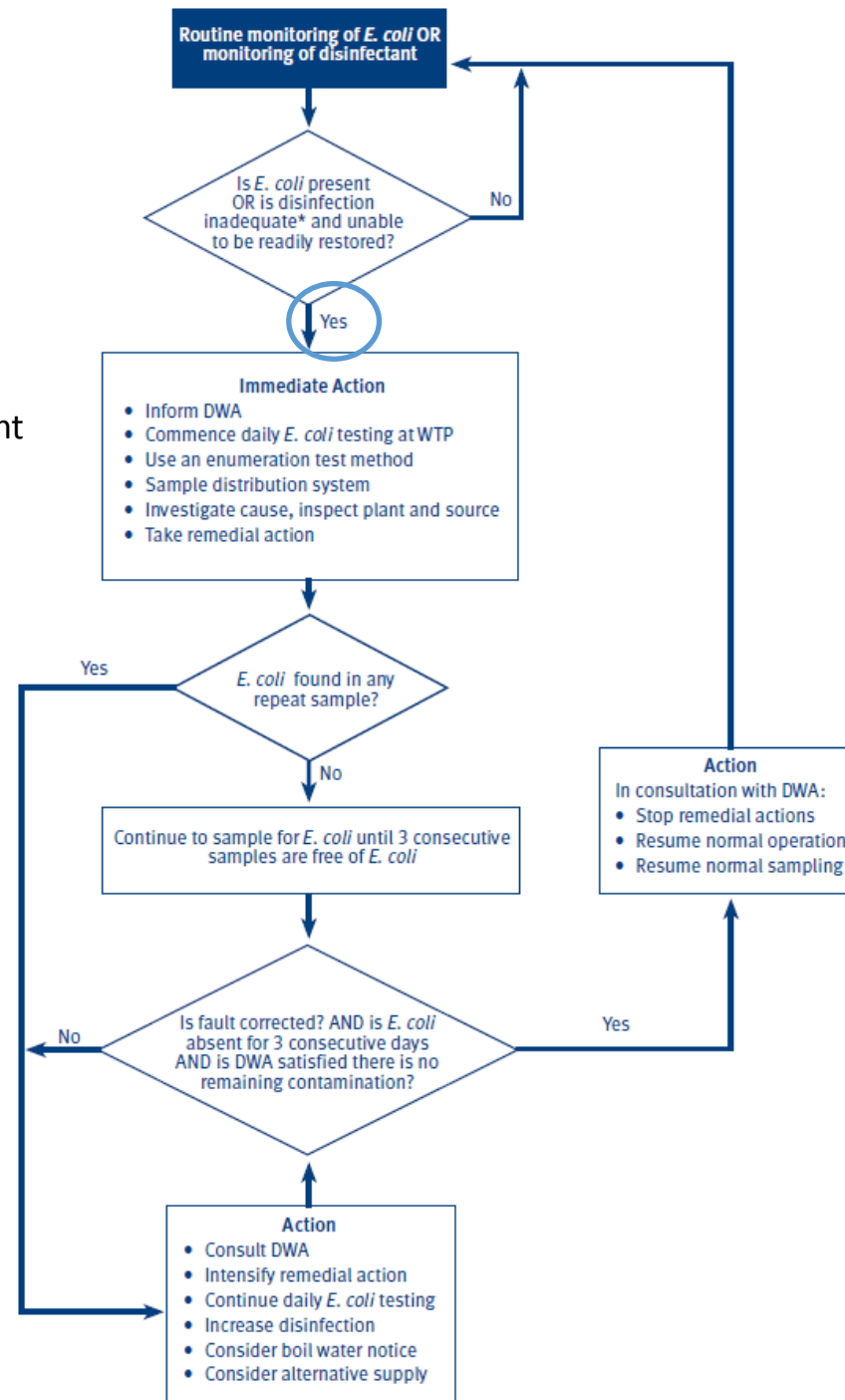
# Detection of Outbreak- Friday 12<sup>th</sup> August

- 9.37am Hastings District Council notified Drinking Water Assessor in Public Health Unit by email of indicative E-coli test from a water sample taken on 11 August
- Pharmacy in Havelock North notices increase in people from a rest home with vomiting and diarrhoea
- Three cases of Campylobacter notified by laboratory
- 11.45 call from team leader health protection
- What do you do?



Do more tests if e.coli present

Chlorination if repeat  
E.coli elevated



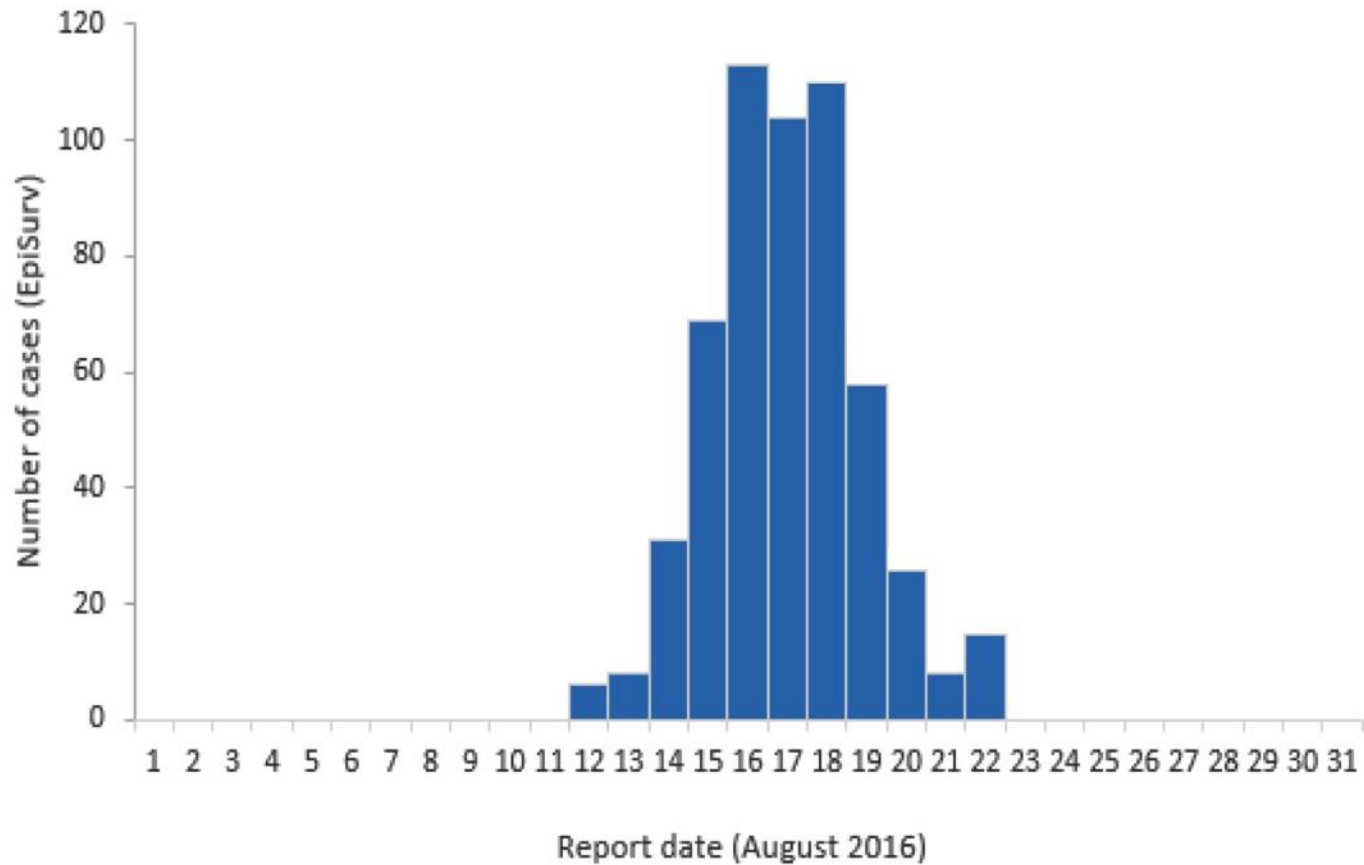
# Immediate control and response actions -Friday 12<sup>th</sup> August

- 12.53 pm meeting called by HBDHB with HDC water operators, PHU, ESR, MoH
- Public Health Nurses call Havelock North Schools and others in Hawke' s Bay
- Decision made at meeting to chlorinate Havelock North water supply without waiting for confirmation of E. coli
- 4.30-6.15pm Coordinated Incident Management System meeting called decides to issue Boil Water Notice
- 6.40pm Boil Water Notice issued

# Confirmation of Campylobacter in HN Water

- 9am Saturday – E.coli confirmed in reticulation and bore
- *Campylobacter* isolated from the reticulated water supply on 12<sup>th</sup> August
- *Campylobacter* isolated from a bore on 19<sup>th</sup> and 24<sup>th</sup> August

# Outbreak by report date.



# Campylobacter notifications from Hawke's Bay DHB over previous 12 months

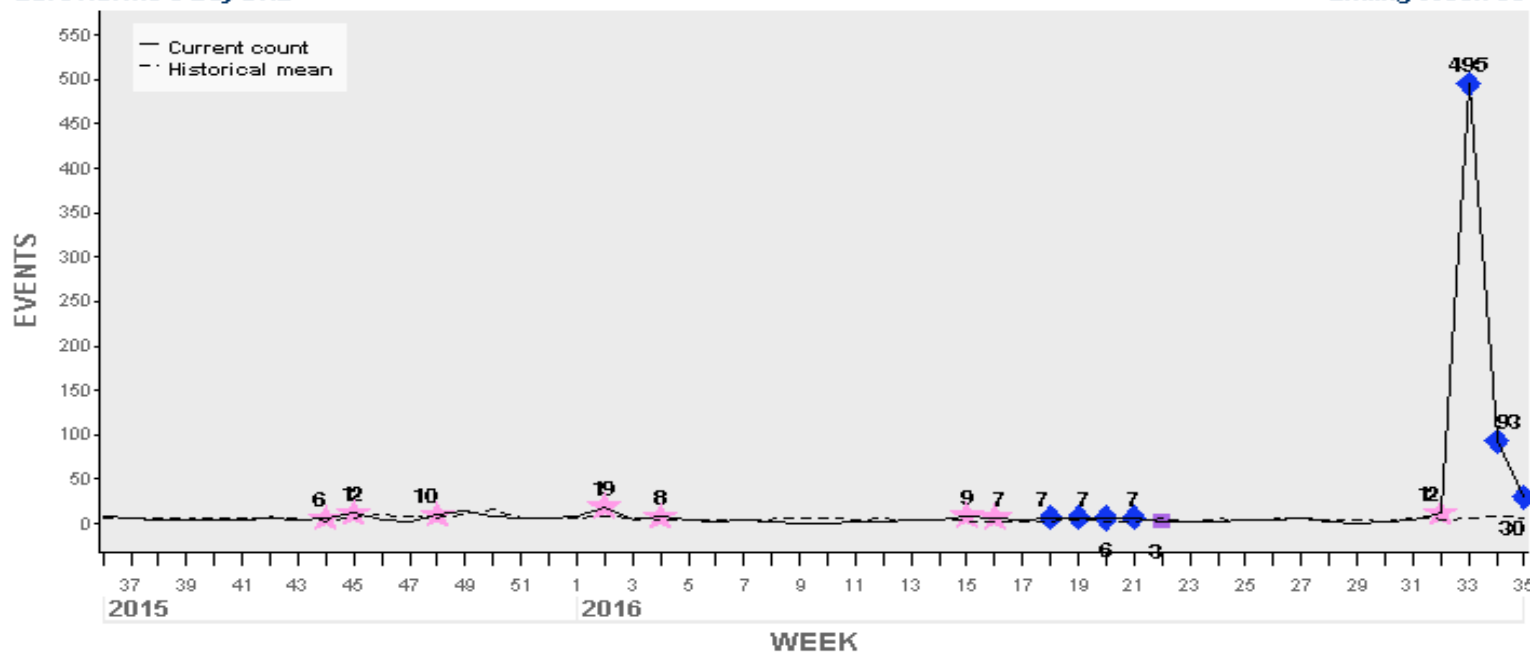


Early Aberration Reporting System

## Campylobacteriosis

ESR: Hawke's Bay DHB

Ending Week 35



### ABERRATION DETECTION FLAGS

- ★ CUSUM
- ◆ CUSUM + HL
- Historical Limits
- Manual Flag



# Could we have detected the outbreak earlier ?

## Pre-diagnostic / Syndromic signals?

- Emergency Department
- School absenteeism
- Pharmacy sales
- Healthline
- Search stream and other social media

## Spatial resolution of syndrome data

- Water distribution zone linked data

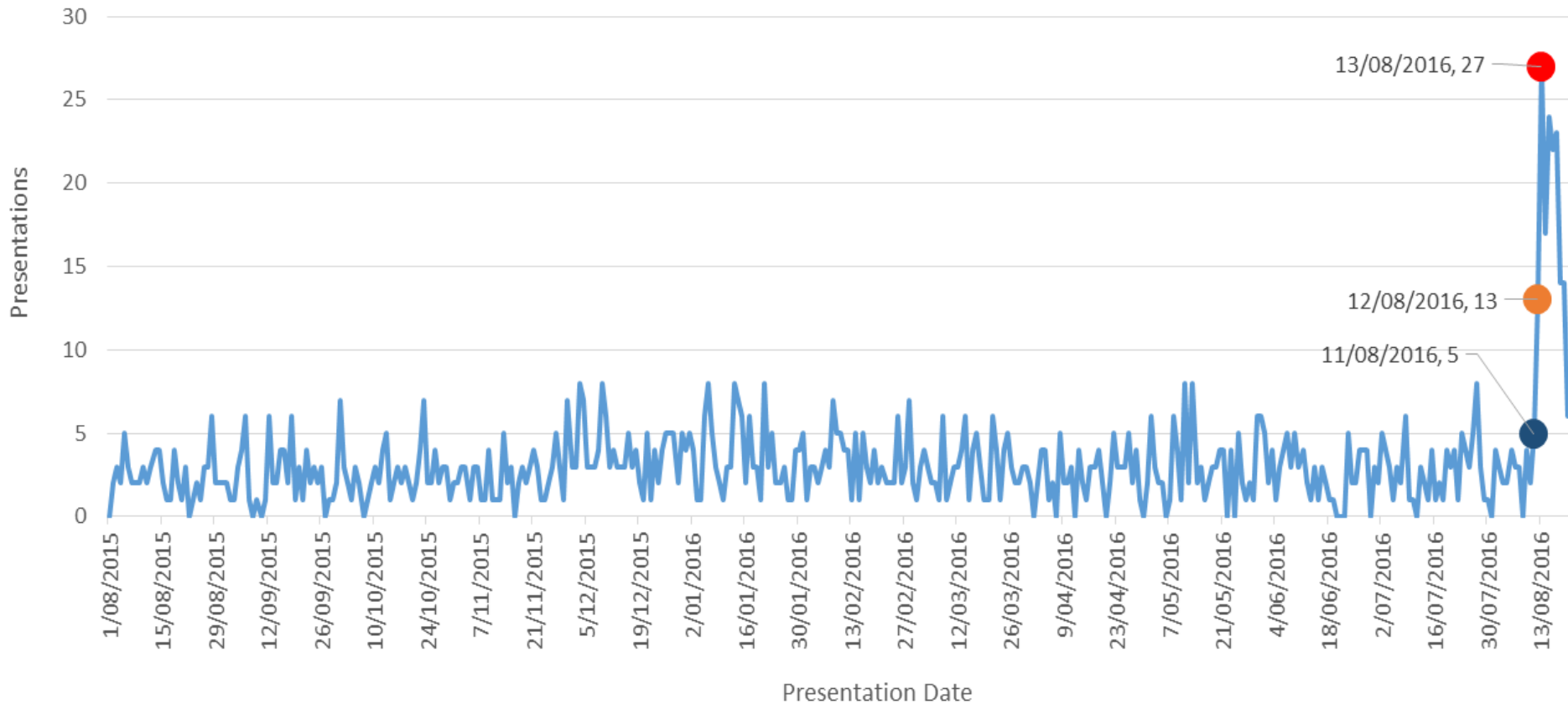
## Real time pathogen detection in water?

- Bore chamber alarm
- On line turbidity monitoring
- In line PCR?
- Rainfall

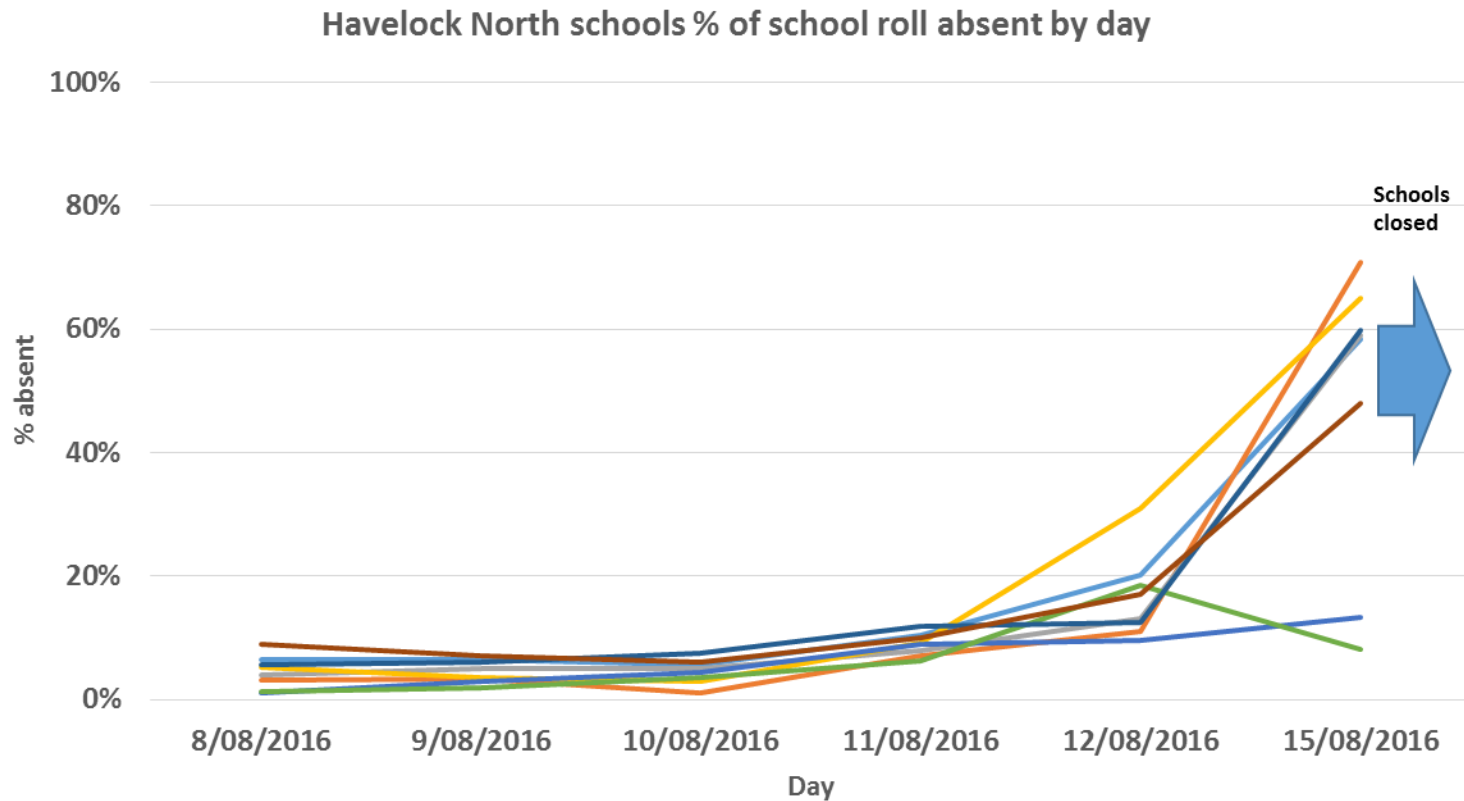
# Daily ED Presentations to Hawke's Bay Fallen Soldiers' Memorial Hospital

Event Reason – Nausea/Vomiting/Diarrhoea

1 August 2015 to 18 August 2016 – Midnight to Midnight



# Havelock North Schools % of School Roll Absent by School Day



Te Mata School

Hereworth

Havelock North High

Lucknow School

Woodford House

Havelock North Intermediate

Havelock North Primary School

Iona College

# Google Trends

● **gastro**  
Search term

+ Compare

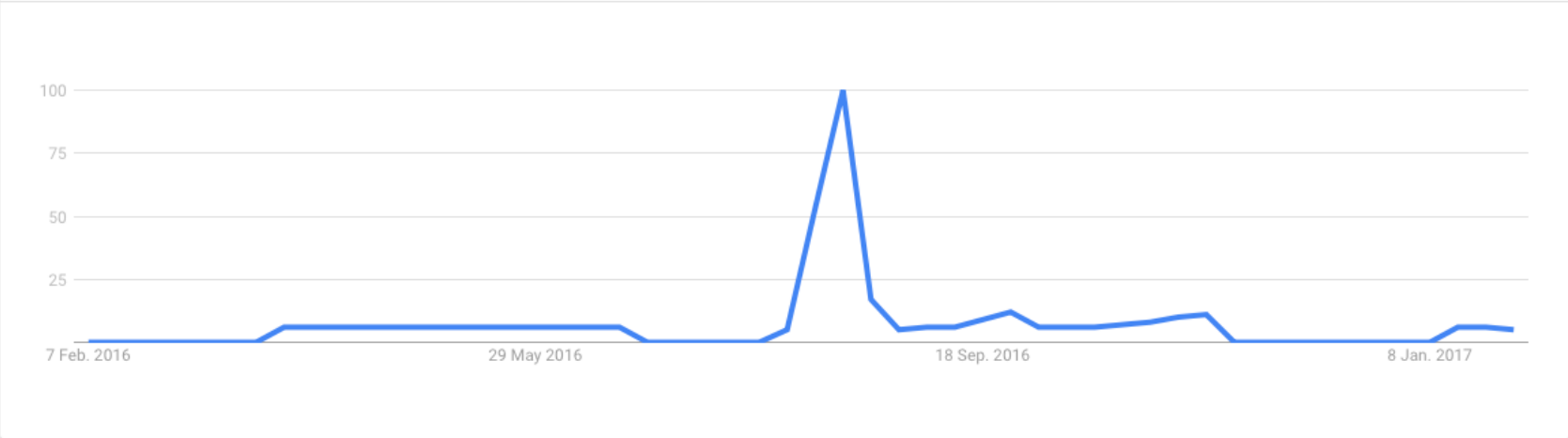
Hawke's Bay ▼

Past 12 months ▼

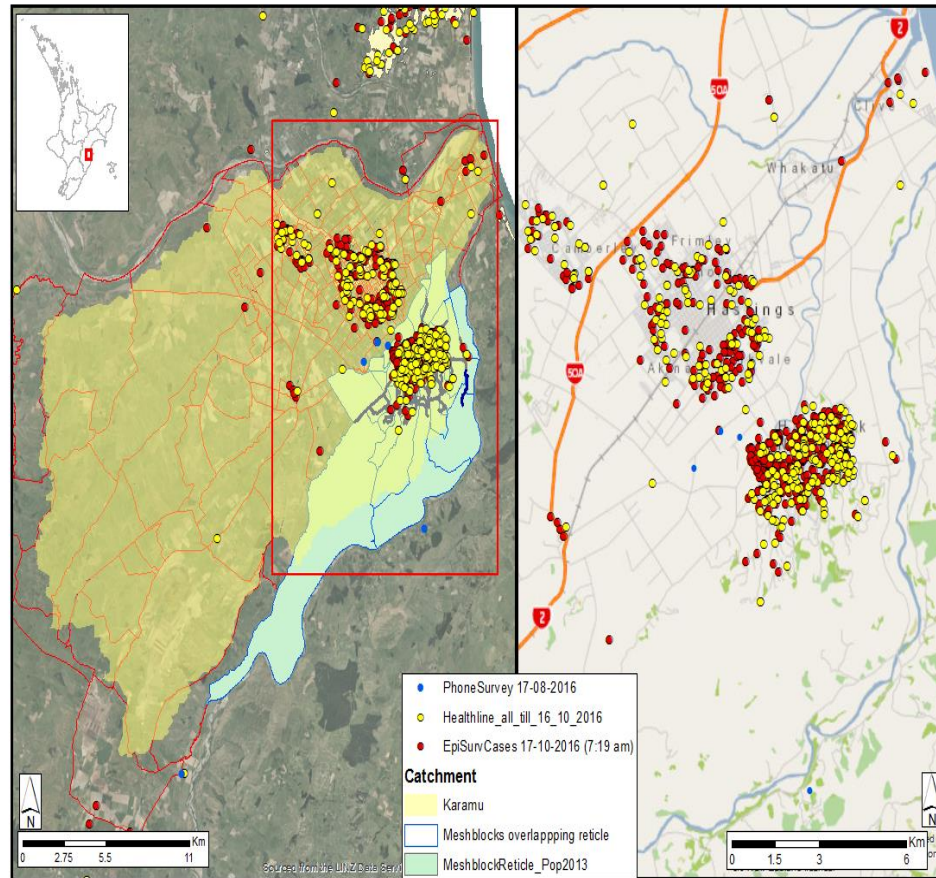
All categories ▼


Web Search ▼

Interest over time ?

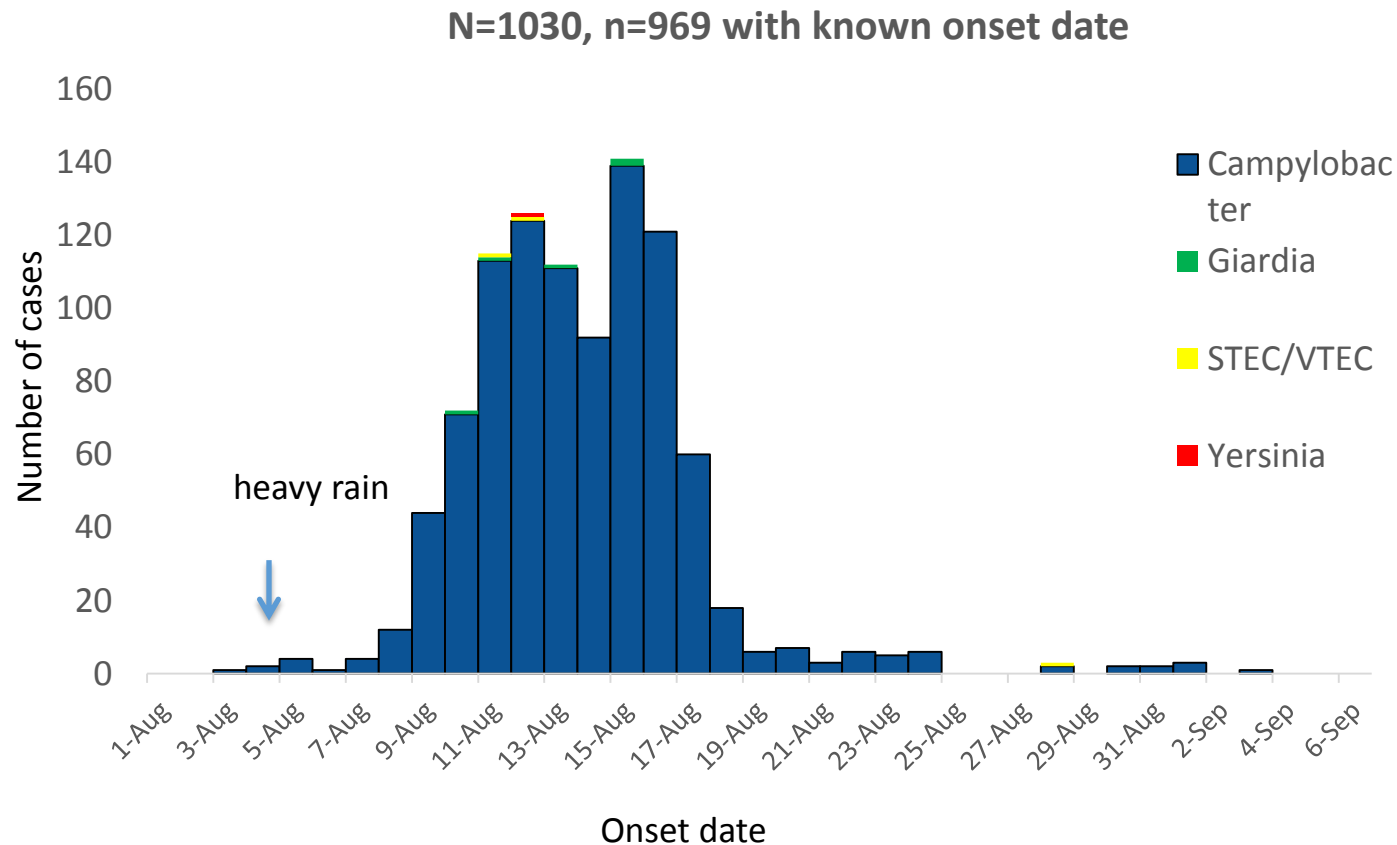


# Geospatial Distribution of Gastroenteritis Reports



GIS analysis courtesy  ESR

# Notified Gastroenteritis Cases by Onset Date



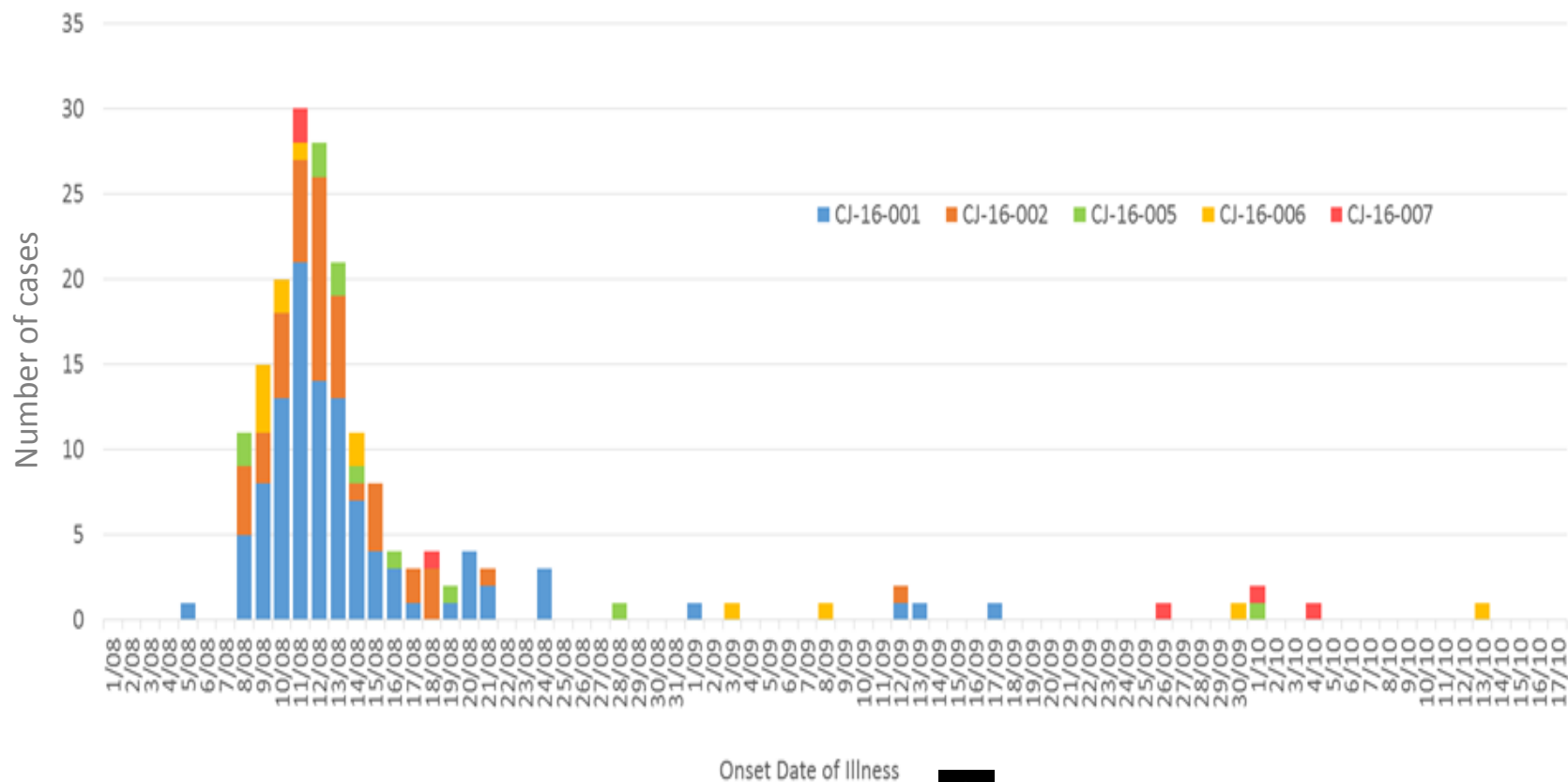


# Extreme weather



# Outbreak-related Campylobacter Genotypes

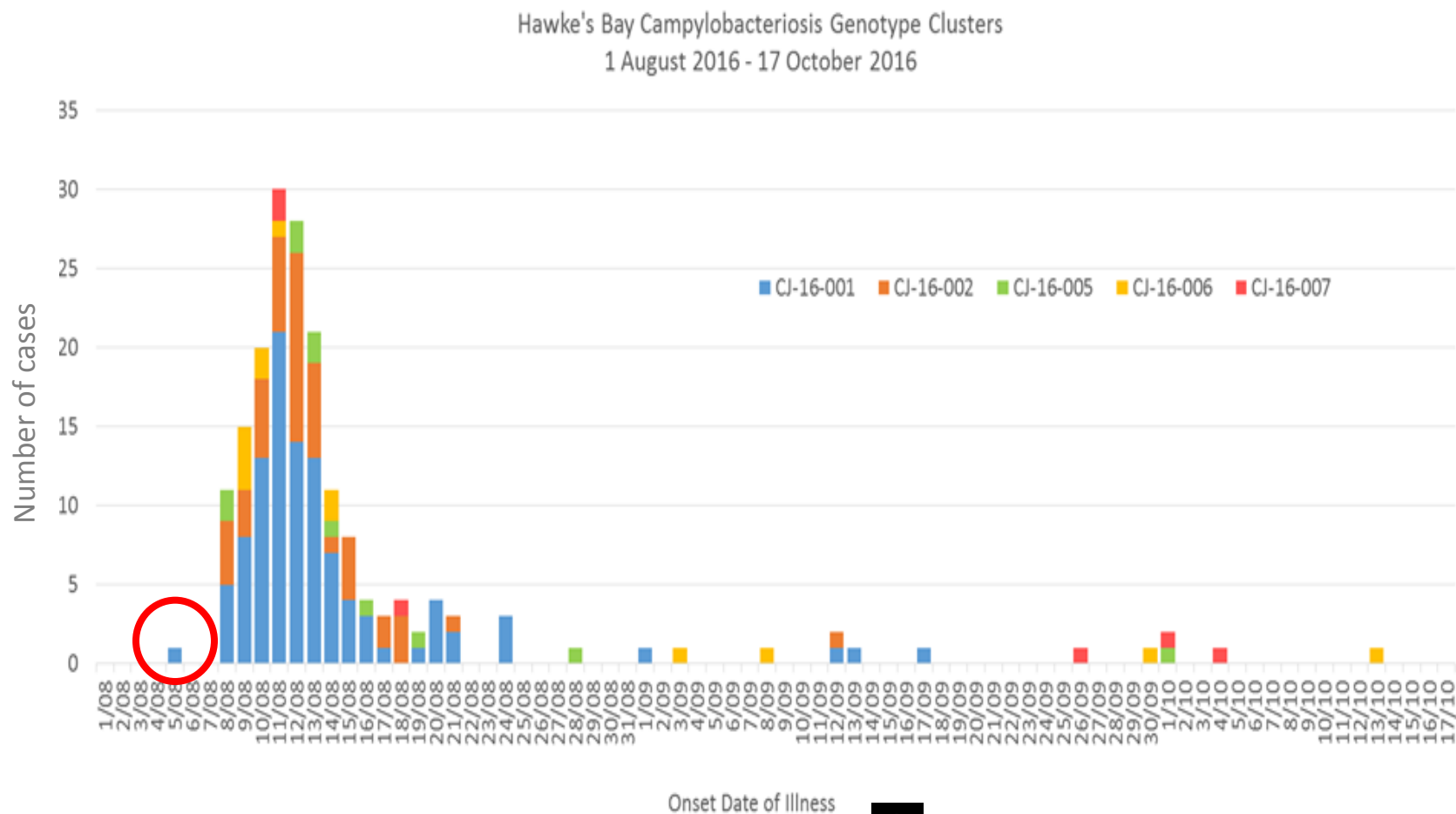
Hawke's Bay Campylobacteriosis Genotype Clusters  
1 August 2016 - 17 October 2016



Genetic analysis courtesy of  E/S/R



# Outbreak-related Campylobacter Genotypes



Genetic analysis courtesy of ESR

All findings are preliminary and subject to change upon further analysis





# Bore 1 chamber



