

# Syndromic Surveillance in Public Health

## ACIPC Conference

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Brisbane Queensland, Australia  
18<sup>th</sup> November 2024



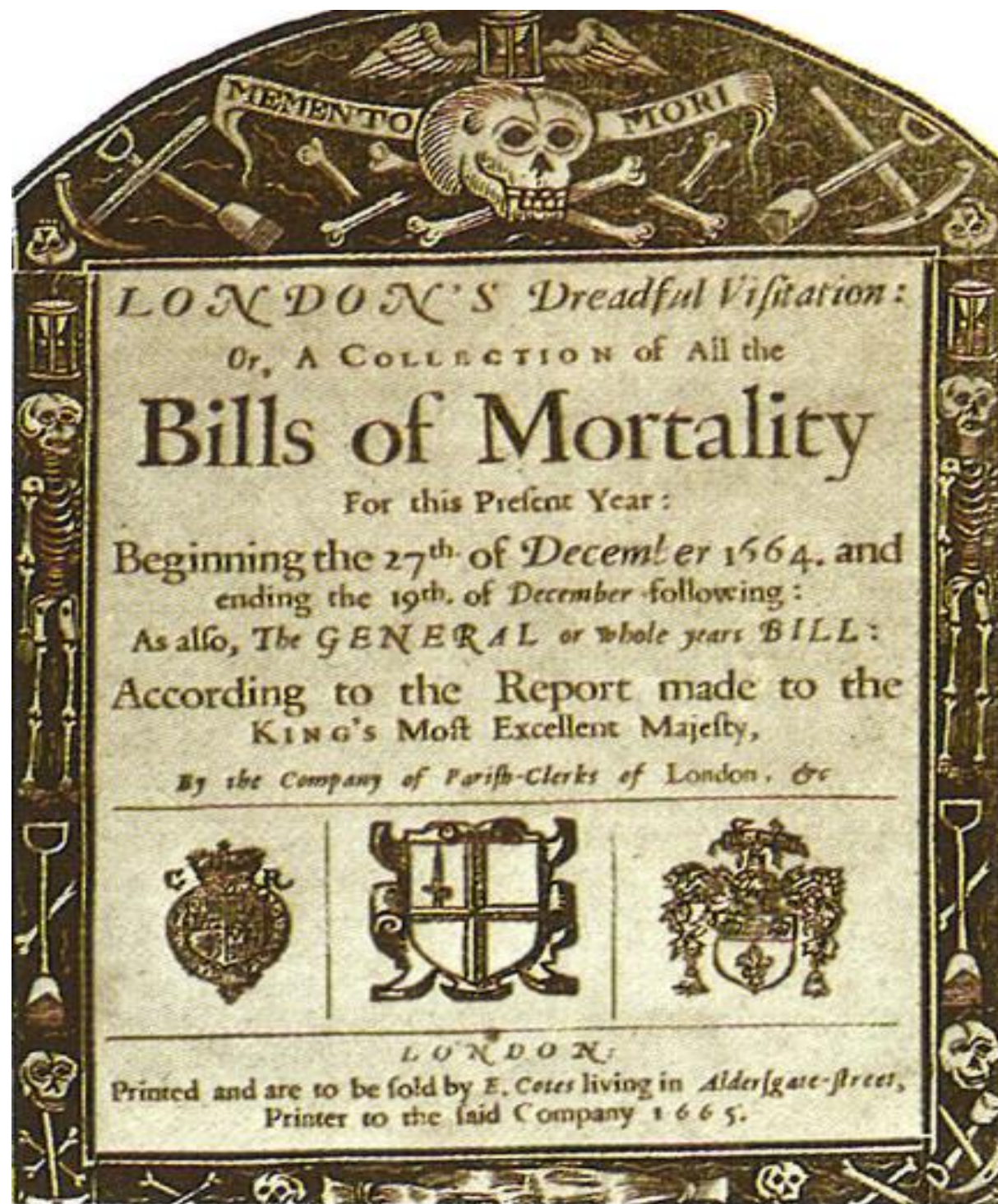
# Acknowledgement of Country

Metro South Health recognises and pays respect to the traditional custodians of the land and waters—the Yugambeh, Quandamooka, Jaggera, Ugarapul, Turrbal and Mununjali peoples—and to Elders, past, present and emerging.

# Syndromic Surveillance

**Syndromic surveillance** is the **real-time** collection, analysis, interpretation and dissemination of health-related data to enable the **early identification** of the impact (or absence of impact) of potential public-health threats which require **prompt and effective public health action**

# Early Syndromic Surveillance, 1665



*The Diseases and Casualties this Week.*

<p><b>A</b> Bortive ----- 2</p> <p>Aged ----- 32</p> <p>Bleeding ----- 1</p> <p>Childbed ----- 5</p> <p>Chrisoms ----- 9</p> <p>Collick ----- 1</p> <p>Consumption ----- 65</p> <p>Convulsion ----- 41</p> <p>Cough ----- 5</p> <p>Dropsie ----- 43</p> <p>Drowned at S Kathar. Tower ----- 1</p> <p>Feaver ----- 47</p> <p>Flox and Small-pox ----- 15</p> <p>Flux ----- 3</p> <p>Found dead in the Street at Stepney ----- 1</p> <p>Gripping in the Guts ----- 15</p>	<p>Imposthume ----- 1</p> <p>Infants ----- 7</p> <p>Kingsevell ----- 1</p> <p>Mouldfallen ----- 1</p> <p>Kild accidentally with a Carbine, at St. Michael Woodstreet ----- 1</p> <p>Overlaid ----- 1</p> <p>Rickets ----- 9</p> <p>Rising of the Lights ----- 2</p> <p>Rupture ----- 2</p> <p>Scalded in a Brewers Mash, at St. Giles Cripplegate ----- 1</p> <p>Scurvy ----- 4</p> <p>Spotted Feaver ----- 2</p> <p>Stillborn ----- 13</p> <p>Stopping of the Stomach ----- 11</p> <p>Suddenly ----- 1</p> <p>Surfeit ----- 7</p> <p>Teeth ----- 27</p> <p>Tiflick ----- 12</p> <p>Ulcer ----- 1</p> <p>Vomiting ----- 1</p> <p>Winde ----- 1</p> <p>Wormes ----- 1</p>
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<p>Christned { Males ----- 121</p> <p>{ Females ----- 111</p> <p>{ In all ----- 232</p>	<p>Buried { Males ----- 195</p> <p>{ Females ----- 198</p> <p>{ In all ----- 393</p>	<p>Plague ----- 0</p>
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Decreased in the Burials this Week ----- 69

Parishes clear of the Plague ----- 130      Parishes Infected ----- 0

*The Assize of Bread set forth by Order of the Lord Mayor and Courts of Aldermen,*  
A penny Wheaten Loaf to contain Eleven Ounces, and three half-penny White Loaves the like weight.

John Bell's 1665 publication *London's Remembrancer* states that "the *Bill of Mortality* is of very great use...it giveth a general notice of the Plague, and a particular Accompt of the places which are therewith infected, to the end such places may be shunned and avoided."

# Communicable Disease Surveillance



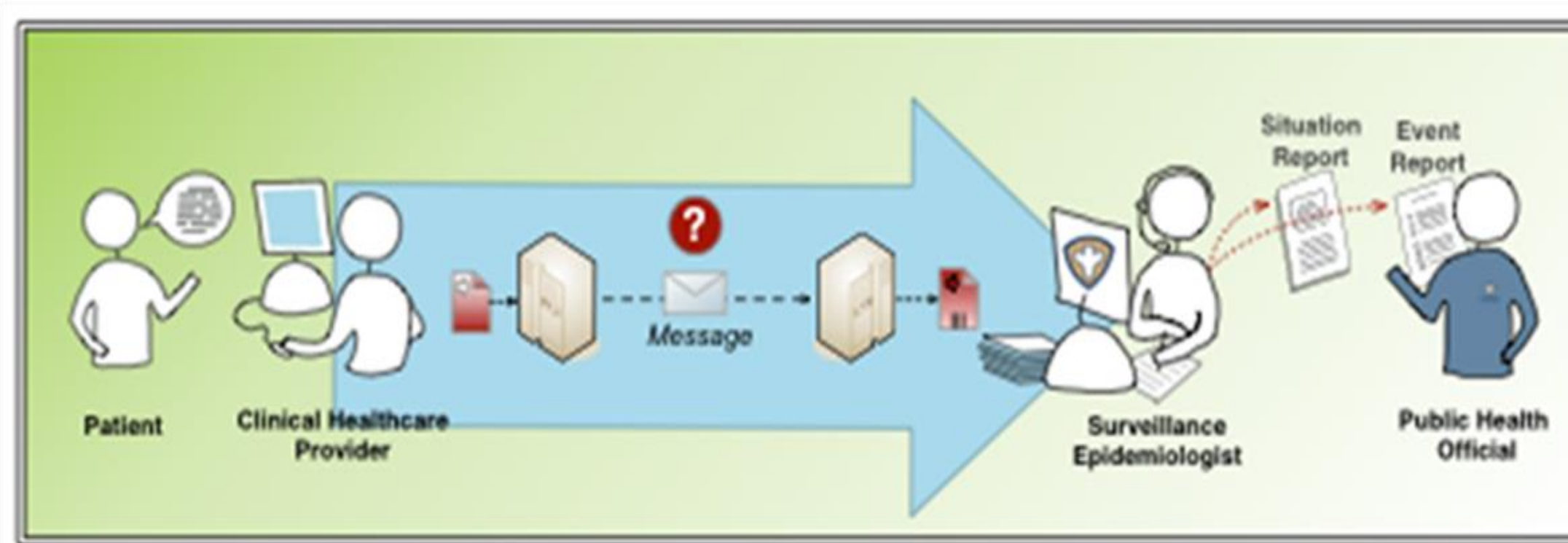
Traditional surveillance usually relies on a sequence of events:

- Patient seeks medical care
- Lab test is ordered for clinical confirmation
- Lab result gets notified to public health

(In Queensland via Notifiable Conditions System or NoCS)

*This sequence of events takes time, with a typical reporting lag-time of  
days to weeks*

# Syndromic Surveillance



## Early Detection: Syndromic Surveillance



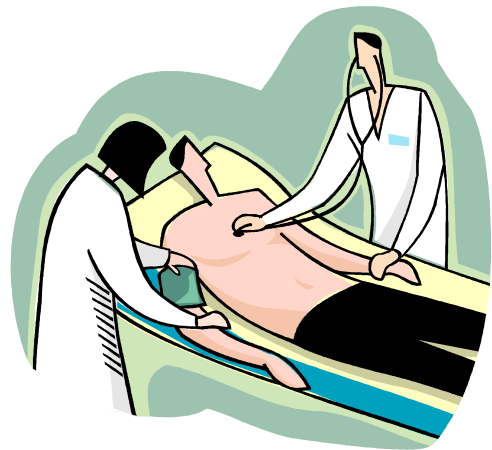
Patient presents to Health Care Provider (ED/ GP)



Symptoms are categorised and aggregated with other patients' symptoms



Hot spots of similar illness types cause alerts to infection control and public health authorities



Emergency  
Departments



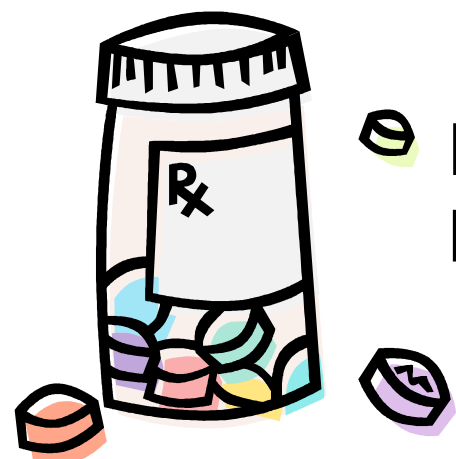
13-HEALTH



GP Surgery



QAS



Prescription  
Drugs

# Syndromic Surveillance Data Sources

Poison  
Control



School/ Work  
Absenteeism



Over-the-counter

Veterinarian Clinics



Big Data



# Features of Data



- Based on signs/ symptoms or other proxy measures
- Not based on lab-confirmed diagnosis
- Usually collected for other purposes
- Tend to be non-specific – sensitive syndrome definitions needed
- Timely (real-time or near real-time)
- Sufficient target population
- 1-3 years historical data available to set algorithms
- Automated data transfer and alert systems

# Missed opportunities



Day 1 - feels fine

Day 2 - headaches (pharmacy – self-medication)

Day 3 - develops cough (rings telephone help-line)

Day 4 - Absent from work (sickness absenteeism)

Day 5 - Worsens (Presents to ED/GP)

Day 6 - Lab test

Day 7 - Result awaited

Day 8 - Traditionally notified

# Goals – Public Health



- Early detection/ prevention of an outbreak due to a natural cause or bioterrorism
- Characterize the size, spread, and tempo of outbreaks
- Monitor level of disease in the community and inform public health response
- Planning service delivery and public health messaging
- Help sustain a strong ongoing relationship between public health and clinical medicine
- Assists decision-making on the guidance, implementation, and evaluation of programs and policies for the prevention and control of infectious diseases

# Goals – Mass Gatherings

- Provide early warning of incidents
- Describes the extent and spread of known incidents (“situational awareness”)
- To provide reassurance about the lack of impact of incidents



# Challenges



- Real-time (or near real-time)
- Noisy (wheat from the chaff)
- Data access may be difficult (multiple data streams – different software)
- Duplicate records
- Syndromic coding not standardized
- Data quality may be compromised
- Non-availability of historical data to set up signal detection thresholds
- Complex analytic methodologies

# UK NHS Syndromic Surveillance



UK Health  
Security  
Agency

## Emergency Department Syndromic Surveillance System Bulletin (England) 2024 Week 44

### Syndromic indicators at a glance

**Table 1: The current trend (based on previous weeks, not only the current week) and the level (compared to the expected baseline), of each indicator included in this bulletin.**

Indicator	Trend <sup>1</sup>	Level
Total attendances (Figure 1)	Decreasing	No baseline
COVID-19-like (Figure 2)	Decreasing	No baseline
Acute respiratory infections (Figure 3)	Increasing	Above baseline
Acute bronchiolitis or bronchitis (Figure 4)	Increasing	Similar to baseline
Influenza-like illness (Figure 5)	Increasing	Similar to baseline
Pneumonia (Figure 6)	No trend	Similar to baseline
Asthma (Figure 7)	Decreasing	Similar to baseline
Gastroenteritis (Figure 8)	No trend	Similar to baseline
Cardiac (Figure 9)	Decreasing	Similar to baseline
Myocardial ischaemia (Figure 10)	No trend	Similar to baseline
Acute alcohol intoxication (Figure 11)	Increasing	Above baseline
Mental health (Figure 12)	Decreasing	No baseline
Scarlet fever (Figure 13)	No trend	Similar to baseline
Impact of cold (Figure 14)	Decreasing	Similar to baseline

<sup>1</sup> trend reports on the trend seen over most recent and earlier weeks

# Public Health Rapid, Emergency, Disease and Syndromic Surveillance (PHREDSS)

- Legacy from Sydney Olympics in 2000
- Daily monitoring of presentations to NSW public hospital emergency departments and Triple Zero (000) calls
- Number of presentations and calls in each acute illness/injury categories is monitored in real-time to quickly identify unusual patterns of illness
- Monitoring the impact of seasonal and known disease outbreaks, such as seasonal influenza or gastroenteritis

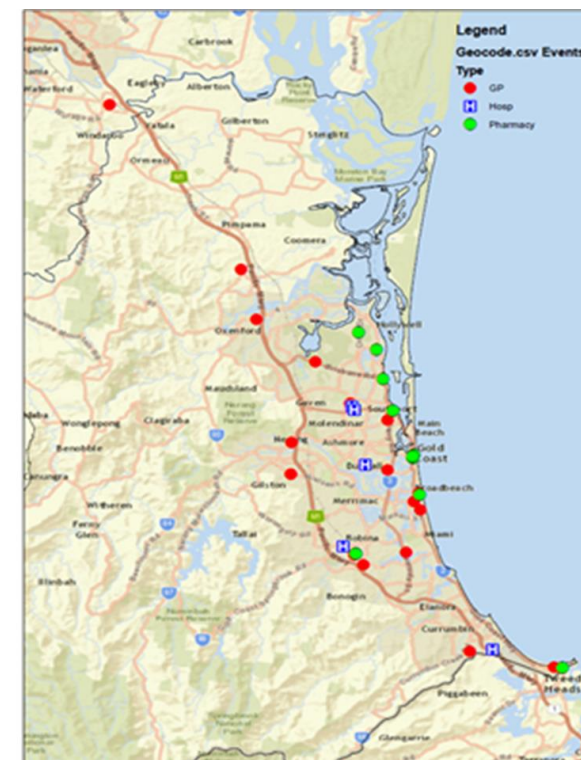
# Syndromic Surveillance Systems in Australia

- ASPREN - Australian Sentinel Practices Research Network – a sentinel general practice surveillance system that collects the number of influenza-like illness presentations seen in participating practices each week
- FluTracking - an online syndromic surveillance system collecting community-level information on influenza-like illness, now expanded to include COVID-19-like illness

# Syndromic Surveillance Systems in Australia

- FluCAN - a real-time sentinel hospital surveillance system for acute respiratory disease requiring hospitalisation
- SPRINT-SARI Australia - for Severe Acute Respiratory Infection (in ICU)
- Paediatric Active Enhanced Disease Surveillance (PAEDS) - hospital-based surveillance system for selected serious childhood diseases of public health importance and adverse events following immunisation

# Gold Coast Model of **Gastro** Syndromic Surveillance for the 2018 Commonwealth Games GC2018



# Gastro Syndromic Surveillance

Real-time (or near real-time) data over a 4-week period of number of gastro presentations before, during and after the Games was obtained from:

- Public Emergency Departments
- Private Emergency Departments
- Sentinel GP practices
- After-hours Doctor service (13-SICK)
- Tele-helpline (13HEALTH)
- Polyclinic in Games Village
- First-aid clinics in Venues
- Calls/Complaints from Games Workforce/ Community



# Gastro Syndromic Surveillance

A brief common exposure questionnaire was filled out for every gastro presentation through a survey link provided

Questions were on:

- Demographics
- Food exposure: venues where food was consumed 3-days prior to illness
- Water exposure: places where they swam 3-days prior to illness

# Gastro survey

- A text message was sent with the survey link where mobile numbers of patients were available

OR

- A pamphlet with survey link/ QR code was given to patient to complete survey

## Do you have vomiting or diarrhoea?

You may be part of a community **outbreak** of gastroenteritis

By completing a short survey, your information could help us detect and prevent further spread of gastroenteritis (gastro) illness in the community.

Visit the website below or scan the QR code to complete the survey.

[www.goldcoast.health.qld.gov.au/GastroSurvey](http://www.goldcoast.health.qld.gov.au/GastroSurvey)



# Gastro survey

**Gastro Illness Questionnaire**

Organization: Gold Coast Public Health Unit

To detect potential food borne illness outbreaks early and prevent the spread of gastro illness in our community, we would like your assistance in answering some questions regarding your illness and foods eaten before becoming ill.

The information from this questionnaire is confidential and is being collected in accordance with the Public Health Act 2005. Only authorised officers from QLD Health will be involved in examining the information

This questionnaire should only take five minutes to complete, and may be completed by a person other than the patient, i.e. completion on behalf of the patient. If you have completed this questionnaire in the previous seven (7) days, please do not complete this again. This questionnaire should be completed once only while you are unwell with gastro illness.

Please click 'Begin Survey' to access the gastro illness questionnaire. For more information about this questionnaire, please contact the Gold Coast Public Health Unit by email at GCPHU@health.qld.gov.au

**e1cc** Please save this pass code in reference to your survey response.

**Begin Survey**

Survey Starting Date: Friday, 9 March 2018 12:00 AM

Survey Closing Date: Monday, 31 December 2018 11:59 PM

**Gastro Illness Questionnaire**

1 2 > Exit Survey

**Patient details**

First name  Surname   
 Age (years)  Gender   
 Phone number

**Where did you seek treatment or advice for this gastro illness?**  
 (tick all that apply)

Health  
 General practice/family doctor  
 Pharmacy  
 Public Emergency Department  
 Private Emergency Department  
 Other (please specify)

**Did you experience any of the following symptoms?**  
 (tick all that apply)

Nausea/Vomiting  Diarrhoea  Stomach cramps  Blood in stools

**What was your first symptom?**

First symptom \*required field

Date of first symptom (dd/mm/yyyy) \*required field

Are you still ill?  
 Yes  No  Don't know

**Finish later** **Continue**

**Gastro Illness Questionnaire**

1 2 > Exit Survey

**Your gastro illness may not be from the last meal you ate. It is important to remember all food eaten three days prior to your illness (including the day of your illness) as they are all possible sources of your gastro illness.**  
 Consider bakeries, cafes or restaurants, hotels or clubs, private functions (wedding, birthday), public events (sporting, music, gala), service stations, temporary food stalls (market, van, truck) and theme parks.

**During the 3 days prior to your illness, did you consume any food that was not prepared at home?**  
 Consider all food consumed for breakfast, lunch, dinner, and all snacks.

No - continue to next question  Yes - please provide food venue details below

**Food venue name & suburb (up to 10)**

**Were there others who attended any of the above places with you who also become ill with similar symptoms?**

Don't know  No  Yes - how many

**In the past week (7 days), did you swim in a swimming pool, theme park or natural waterway, e.g. river, dam, lake, creek?**

No  Yes - please provide swimming venue details

**Swimming venue (up to 3)**

**Please provide further information or feedback related to your illness in the space below**

You may be contacted by the Gold Coast Public Health Unit if further information is required. Please tick the box if you do not wish to be contacted.

do not wish to be contacted

**Previous** **Finish later** **Print** **Submit Survey**

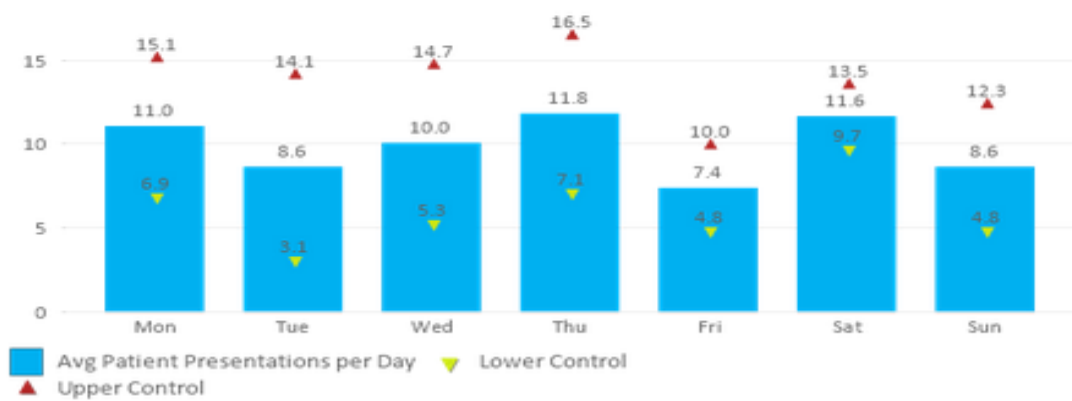
# GC2018 Public ED Gastro Dashboard



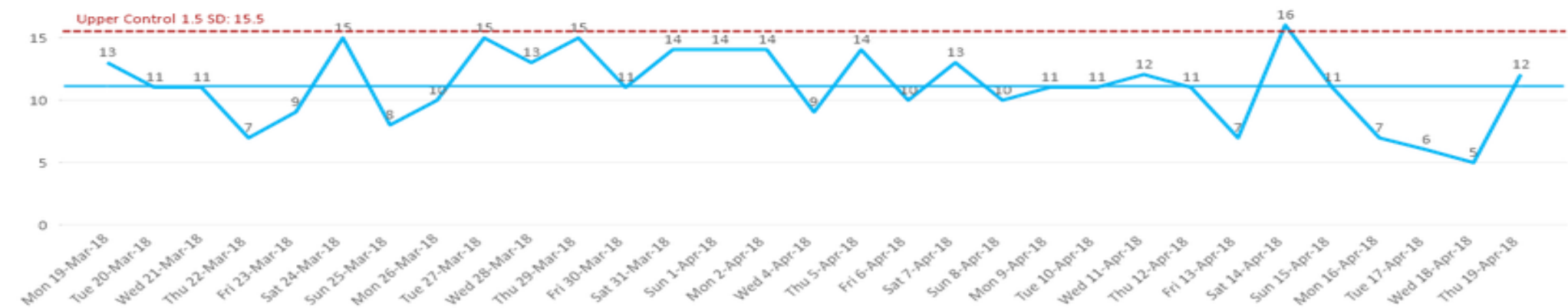
## GASTROENTERITIS PATIENT TRENDS

Patient Presentation Trends - All Locations: 19-Mar-18 to 19-Apr-18

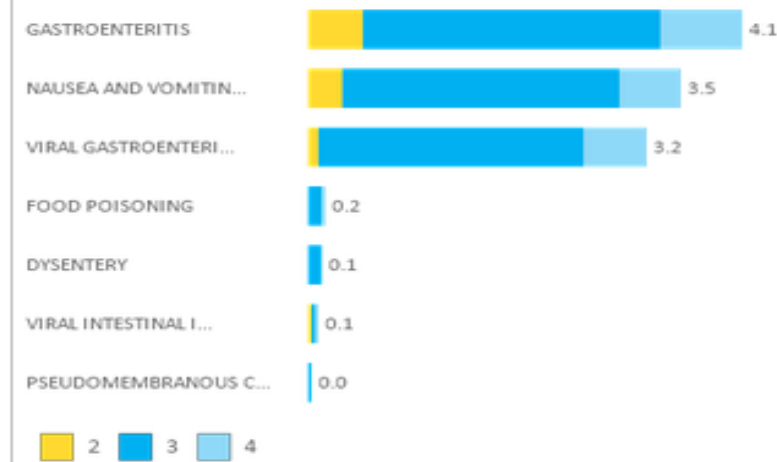
Gastroenteritis Patient Presentations per Day



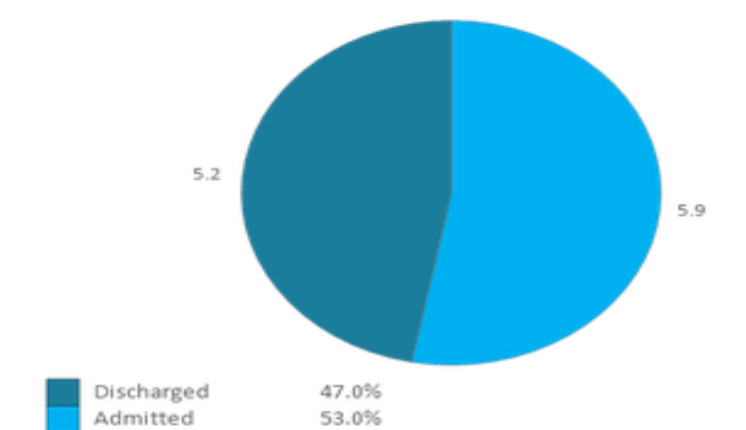
Gastroenteritis Patient Presentations per Day



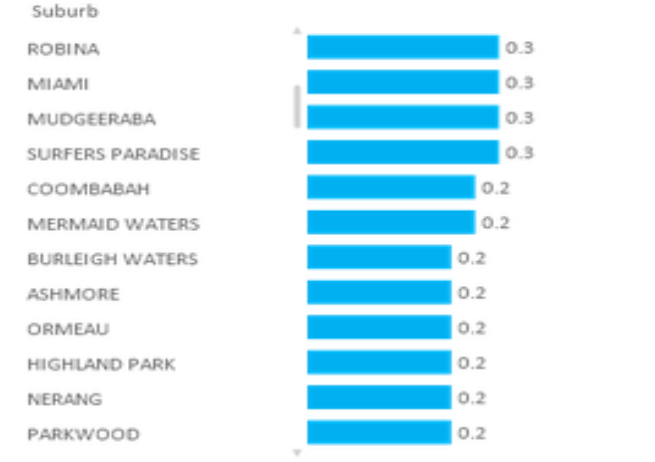
Gastroenteritis Patient Presentations by Diagnosis & Triage per Day



Gastroenteritis Patient Presentations by Discharge Status per Day



Gastroenteritis Patient Presentations by Suburb per Day



Details of Patients Presenting with Gastroenteritis | All Locations: 19-Mar-18 to 19-Apr-18

Facility	Arrival Date	Patient Name	URN	Age	Gender	Triage Category	Presenting Complaint	Diagnosis	Time in ED	Departure Time	Departure Destination	Mobile Number	Suburb	Postcode	Treating Clinician
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# Gastro case numbers

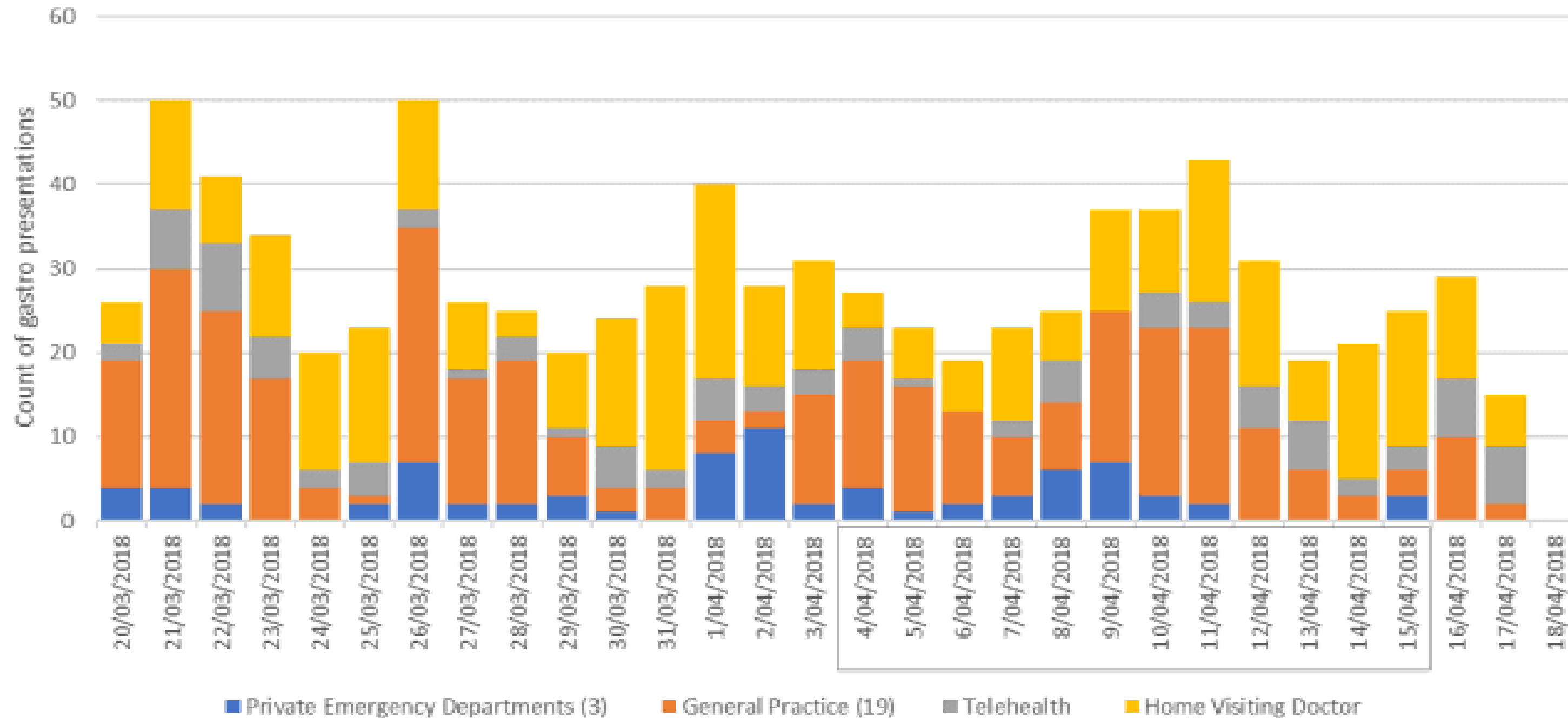


Figure 11: Daily count of gastroenteritis illness presentations to sentinel sites reported to the Gold Coast Public Health Unit, 20 March to 18 April 2018

# Response – Monitoring and Action

- Data from the surveys was available through Epi Info™ - a software tool designed for outbreak investigations
- Maps and graphs were generated to identify hotspots
- The environmental health team took appropriate action to minimise or avert a disease outbreak
- Some actions include:
  - Inspect/ test swimming pools
  - Inspect/ test food premises



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**Minister for Health and Minister for Ambulance Services**

**The Honourable Steven Miles**

**Wednesday, April 18, 2018**

### Health workers in gold medal performance during Games

The dedicated staff working on the frontline at Gold Coast Health are celebrating a gold medal performance during the Commonwealth Games today.

“A range of potential issues were well managed by Public Health resulting in no disruptions or outbreaks during Games period” – The Honourable Steven Miles



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'You're right; there's a frozen pea on the floor.  
I'll cordon off the area, sound the store alarm  
and call in the disposal experts.'

**Do not underestimate the  
Power of Reassurance that  
Public Health can provide in  
a Mass Gathering Event !!**

THANK  
YOU

