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ED and Infectious diseases
Joining the dots

Dr Marisa Gilles

Things to get excited about

- Influenza
- Measles
- Meningitis
- STI's- Syphilis
- TB
- SARS, MERS, COVID-19

When to worry and when to relax

League table of infectivity

- Measles – make sure you are vaccinated (Vx) -2 doses >1966<1992
- Meningitis – household – give prophylaxis – Vx vulnerable
- Pertussis – treatment -household/child care – give prophylaxis
- Mumps - household- Vx
- COVID -19 ? high
- Infectivity of contacts – ZERO
  - TB not very infective – requires long duration of close exposure -minimum 8 hours, hospitalisation not required unless acutely ill

THINKING PUBLIC HEALTH

- **Travel Hx critical**
- Immunisation Hx
- Clinical
- Who to call
- What we do
- What we need you to do

ID EVENTS

- SARS- CoV China - Nov 2002 – Feb 2003 – 8,000 in 26 countries
- Flu Pandemic 2009
- Mers CoV –Saudi Arabia 2012 (Bats/ Camels) 36% mortality
- Ebola – Africa – 2014 – 28,000 – 11,300 died 53% mortality
- Meningococcal 2017
- Measles 2019
- China COVID-19 Dec 2019

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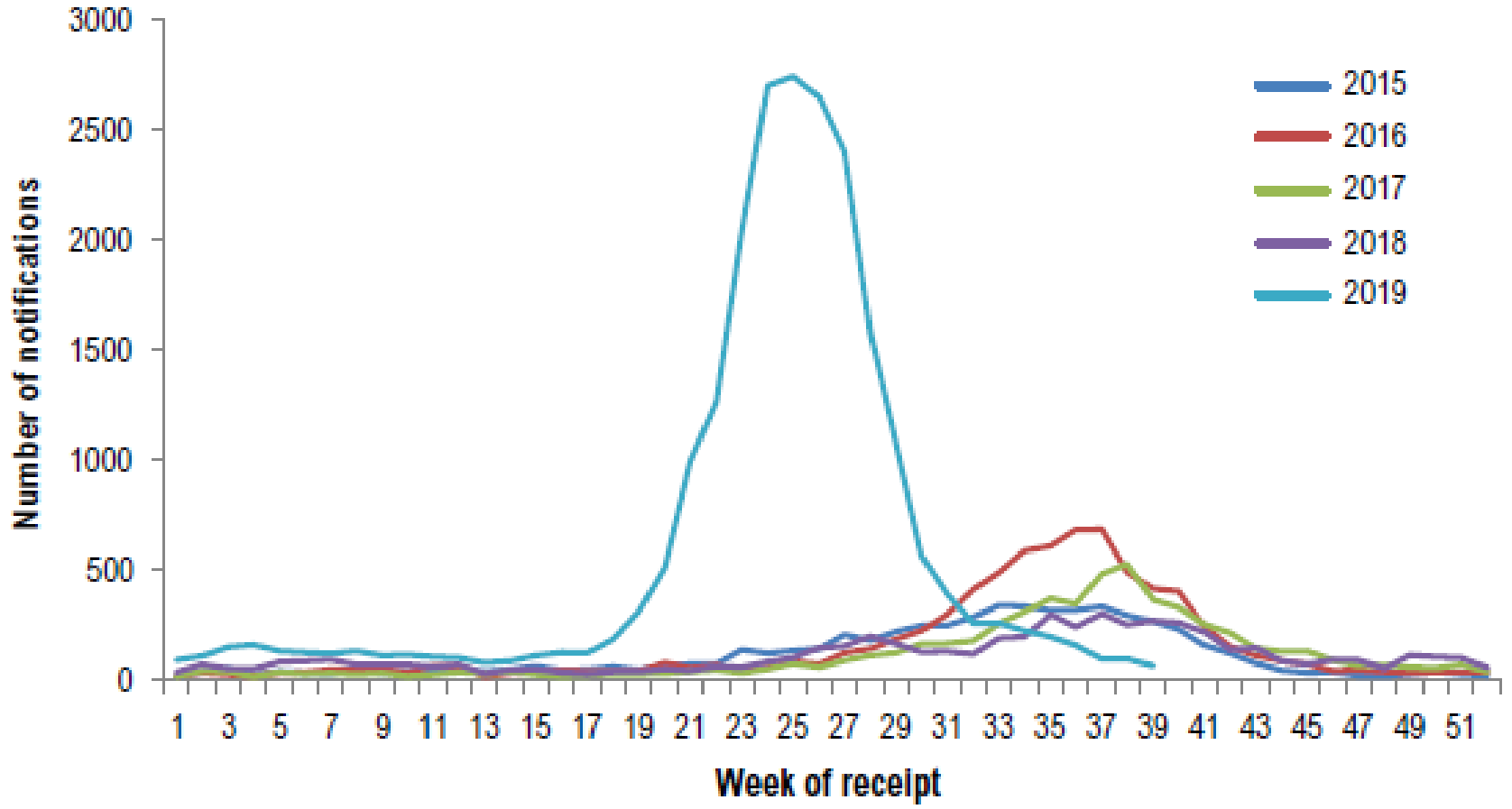
INFLUENZA

Influenza vaccine effectiveness

- Depends on age as well as similarity of the vaccine strains to circulating influenza
- In older people:
  - ~ 30-40% effective in preventing flu symptoms
  - ~ 50-60% effective against hospitalisations
  - ~ 70-80% effective against complications
  - reduced the risk of influenza-related mortality by 31%
  - In healthy children and adults
  - ~ 70-80% effective against illness
  - Vaccine less effective in those with impaired immunity

Influenza notifications in WA by week of receipt, 2015 to 2019



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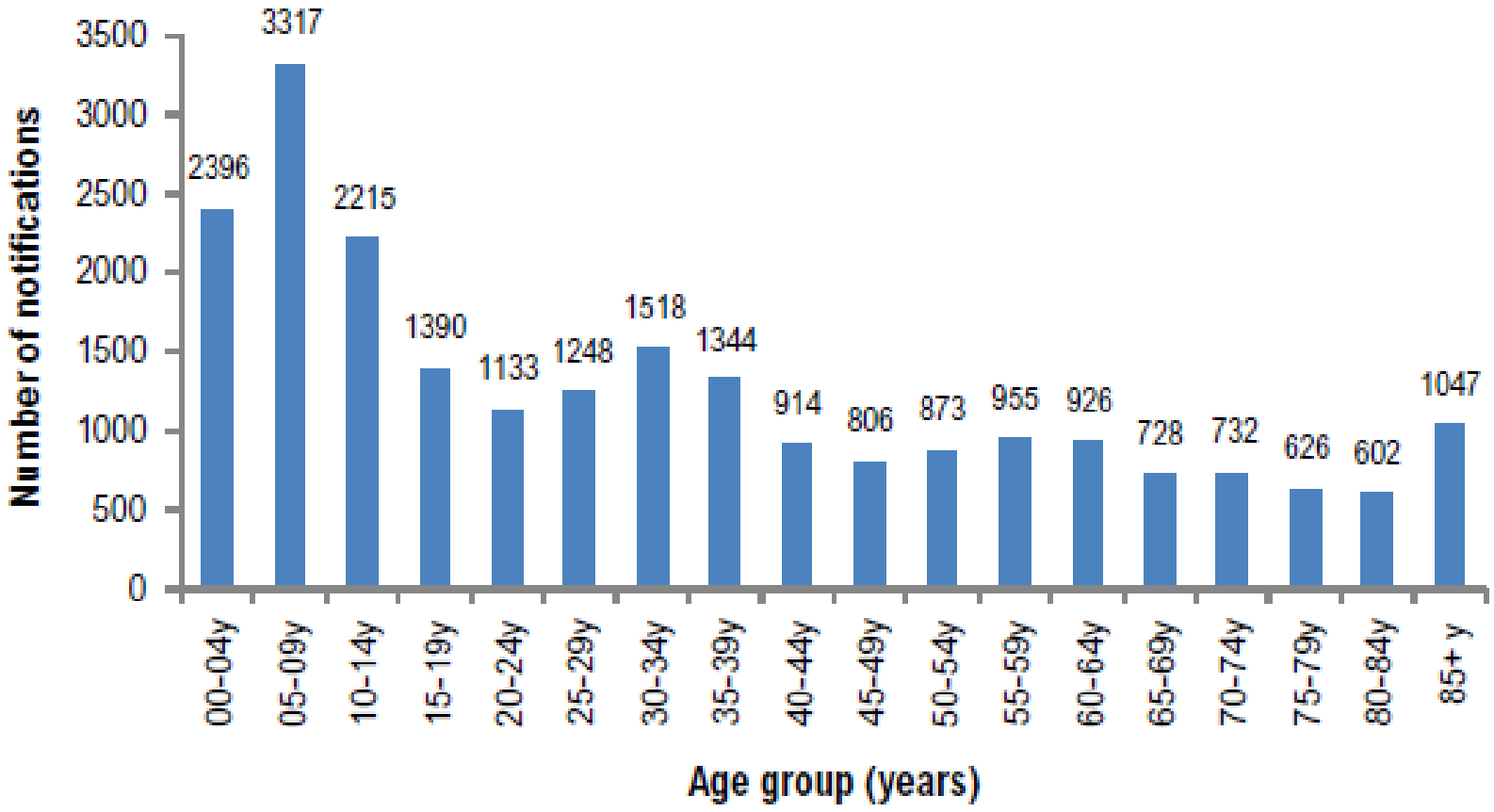
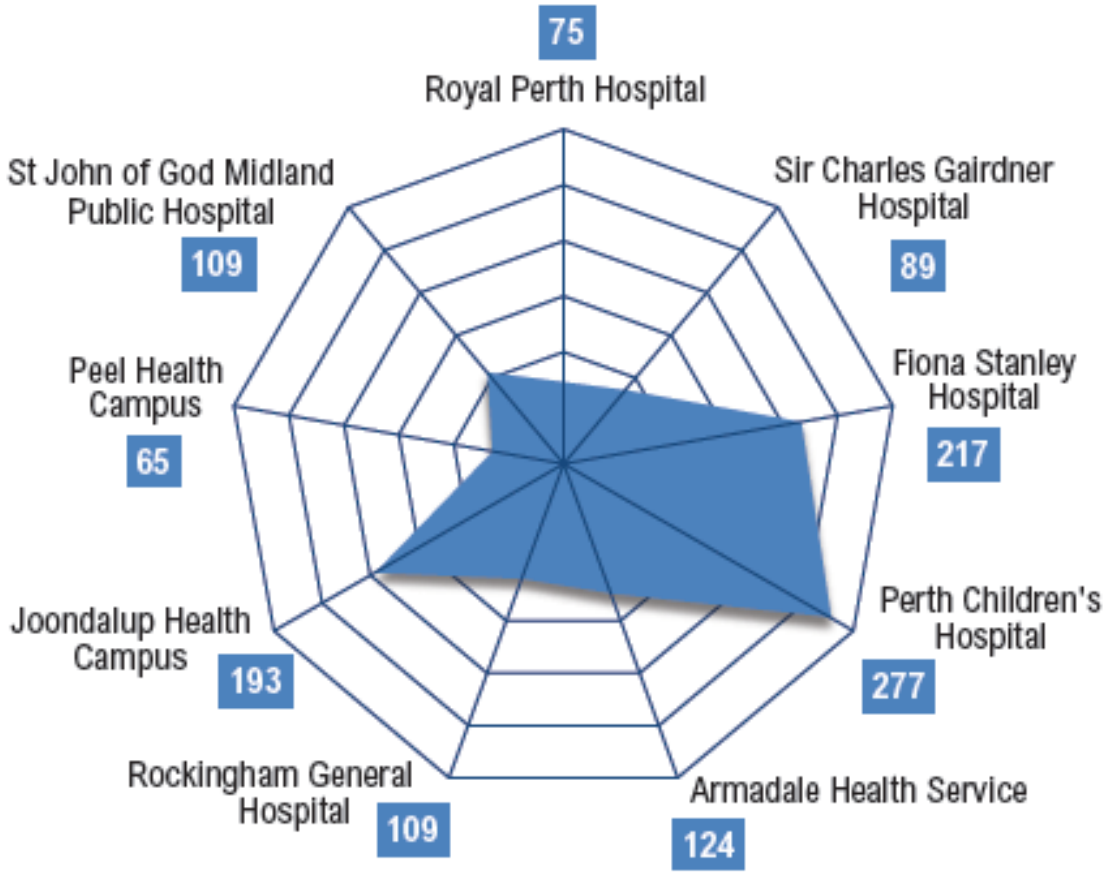
Influenza Fortnightly Update

Influenza notification data extracted by date of receipt of notification		2019 Year to Date	2018 Same Period
Laboratory-confirmed influenza infections	Notifications	22,770	3,679
	Hospitalisations	3,224	842
	Reported Deaths	80	13
Influenza vaccinations administered as recorded in the Australian Immunisation Register	**Age group**	**2019 Year to Date**	**2018 Same Period**
	6 months < 5 yrs	51.9%	19.8%
	≥ 65 yrs	61.8%	47.8%
		2019 Year to Date	**Total 2018**
Influenza vaccine doses distributed	National Immunisation Program/WA-funded	795,877	557,762

Influenza notifications by age group, 2019, year to date



Metropolitan ED WRI attendances by hospital, for the week ending 29.09.2019



Syphilis: primary

Syphilis in metropolitan perth

- 3 outbreaks ongoing in WA:

Heterosexual people
Metro Perth
68 cases in 2018

MSM
Metro Perth
204 cases in 2018

Aboriginal people
Northern WA
86 cases in 2018

- Syphilis in Perth: highest ever levels in 2018
- At-risk groups need increased screening.

How do we identify who to target?

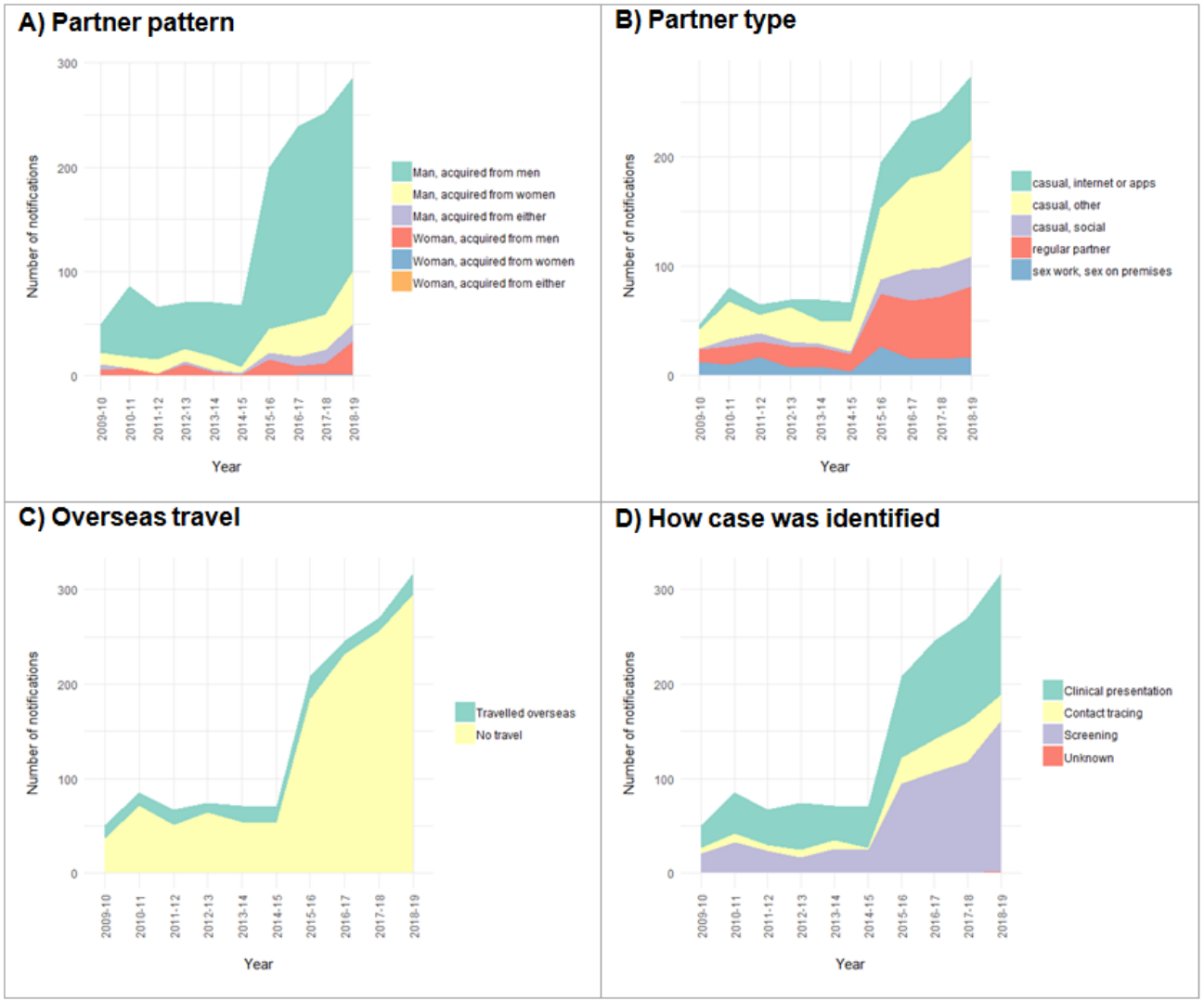


Figure 2: trends in infectious syphilis surveillance reports over a ten year period, for A) partner sexuality patterns, B) partner type, C) overseas travel, and D) how the case was identified.

10 years of infectious syphilis cases (n=1460)

Who is contributing to the upward trend?

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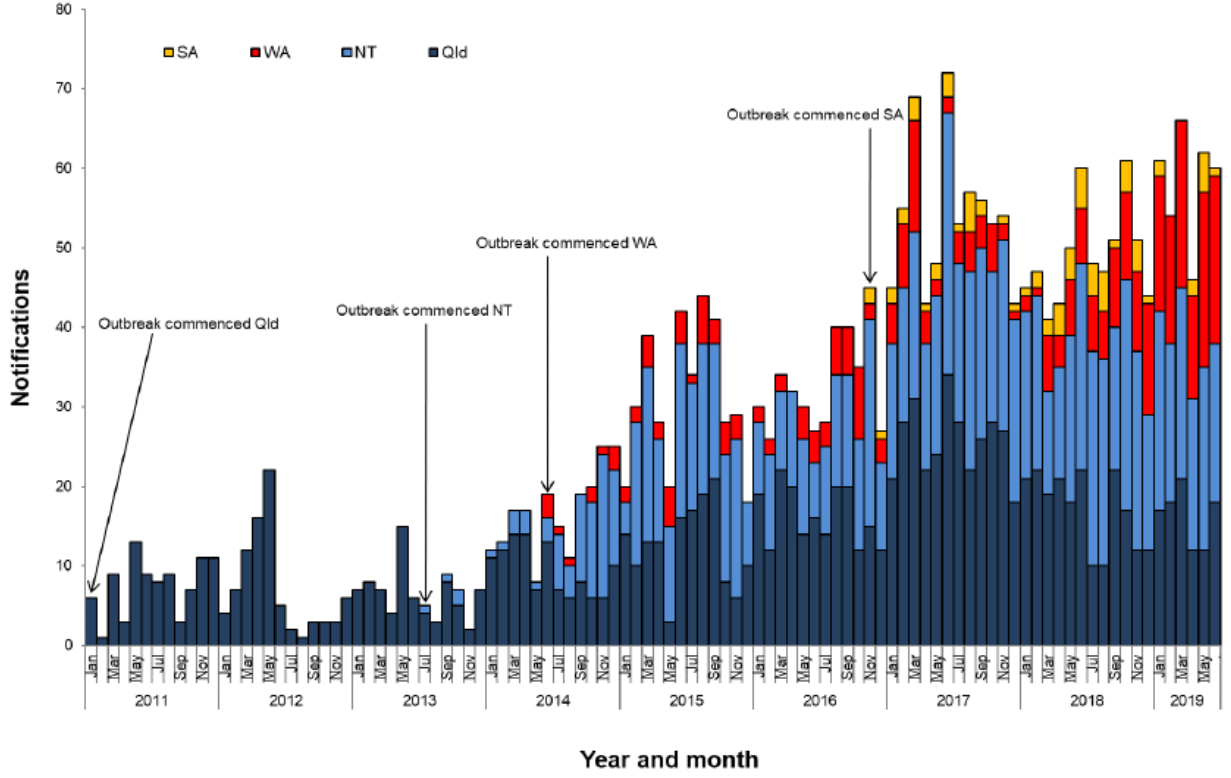
Progress of the multijurisdictional outbreak

Figure 1. Epidemic curve showing category 1 infectious syphilis [α] outbreak cases notified in Aboriginal and Torres Strait Islander people residing in affected regions[β] of Queensland, the Northern Territory, Western Australia and South Australia from commencement of the outbreak in each jurisdiction to 30 June 2019[ɛ,ᵞ]



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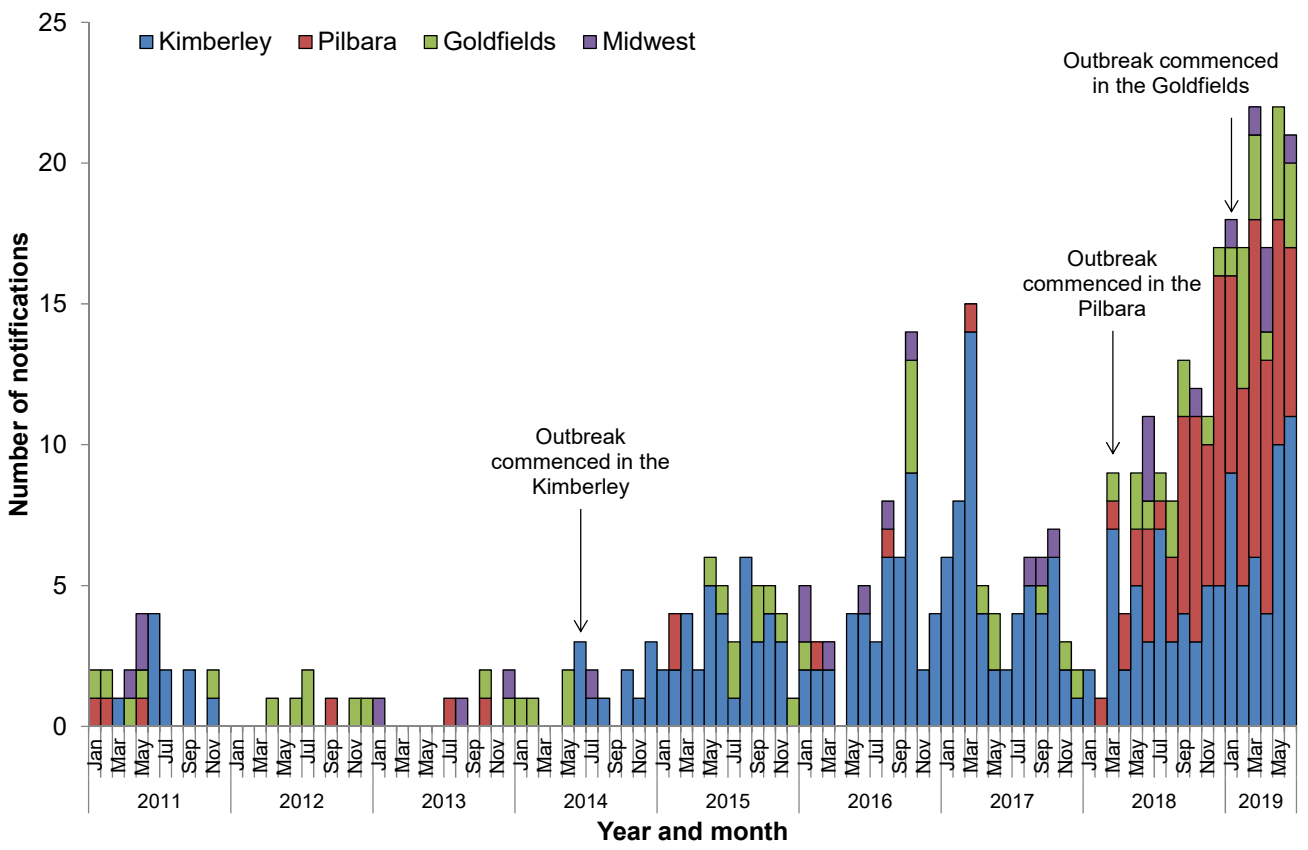
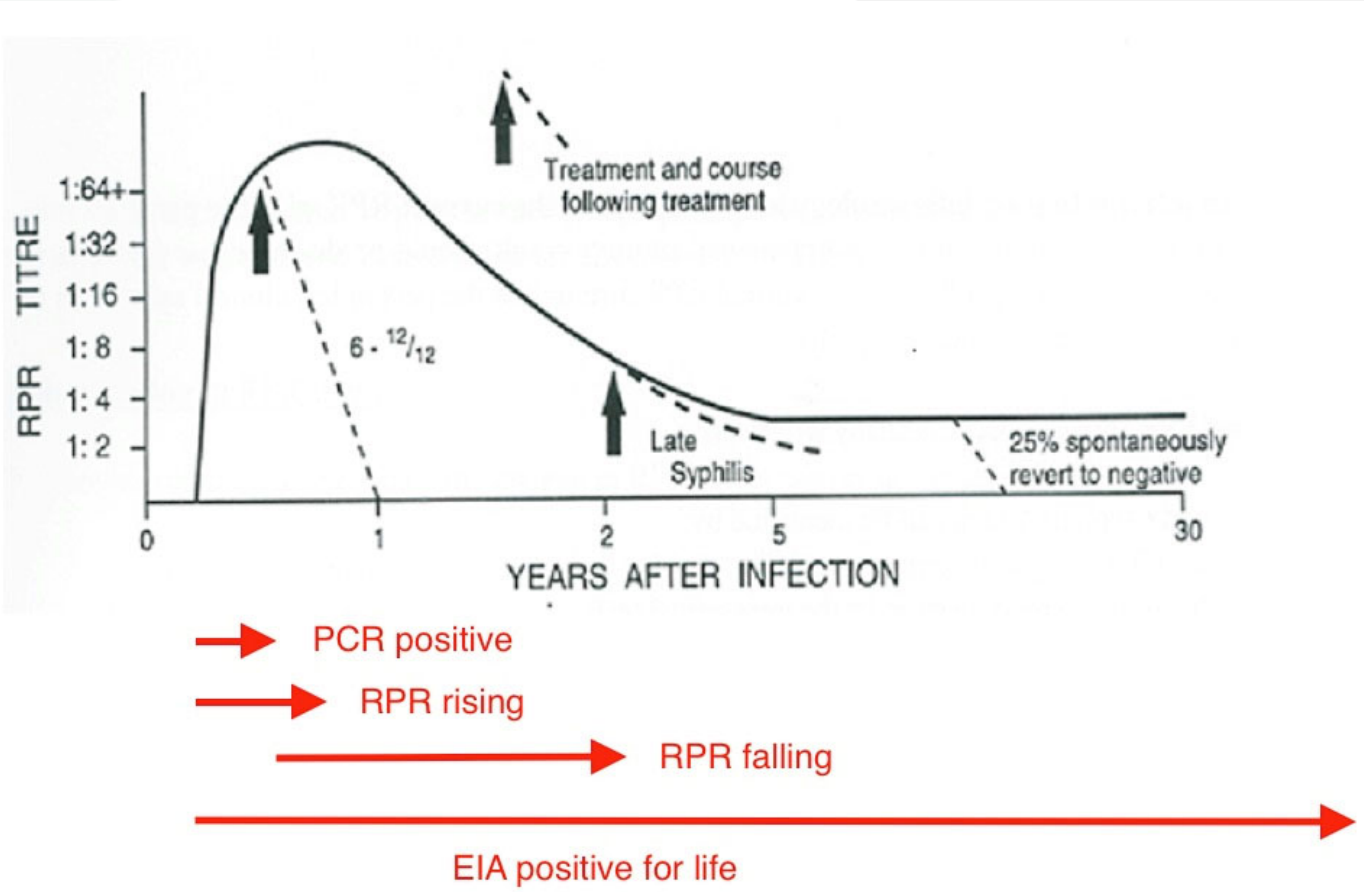
Epidemic curve of infectious syphilis notifications among Aboriginal people in remote areas of WA Jan 2011 - Jun 2019



Three investigations for syphilis



PCR

- organism is present in lesions of primary and secondary (early) syphilis
- helps to distinguish syphilis lesions from other lesions (e.g. herpes, psoriasis, lichen sclerosis)
- Positive result means:
  - This patients has primary or secondary syphilis
- **Sensitivity ~70%**

RPR

- not a specific anti-T.pallidum antibody
- expressed as a doubling, dilution titre 1:1,2,4,8,16,32,64,128 etc
- **marker of disease activity**
- useful to diagnose reinfection (RPR rising) and to track treatment response (RPR falling)
- Results mean: positive antibody test plus
  - High and/or rising: this patient has untreated syphilis
  - Rapidly falling: this patient has recently has treatment success
  - Low and stable: this patient has latent or successfully treated syphilis
  - Rising: patient may be reinfected

Syphilis treatment

- Benzathine penicillin 1.8G IMI
- 2 x 0.9G prefilled syringes
- x weekly for 3 doses
- except early latent, secondary or primary
  - proven duration less than 2 years (negative serology)
  - proven primary or secondary: positive serology plus PCR positive lesions
  - **1 stat dose only**
- except any neurosyphilils
  - headaches, deafness, vertigo, visual changes
  - Lumbar puncture plus IV benzyl penicillin
  - Refer to hospital
- except in penicillin allergic
  - doxycycline alternative (100mg bd, 28 days, 14 days if early)
- Pregnant woman: urgent referral

Syphilis: treatment

- LA Benzathine penicillin:
- Limited availability and sold as packs of 10
- Sold in Australia only as 900mg prefilled syringes
- One dose = 2 large gluteal injections (each side)
    - Can be decanted to one large injection
- Always repeat RPR on day of treatment

- Jarisch-Herxheimer (J-H) reaction
- Warn patients to avoid unnecessary representations

Syphilis: follow-up

- **No sex for 7 days.**
- **Partner notification.**
  - Public health
  - Prevent re-infection
- **Repeat RPR 3, 6 and 12 months**

Should see 4 fold (2 titre) reduction in 6-12 months

  - Reinfection is common and treatment failure is rare.
  - EIA test will remain positive for life
  - Rising RPR indicates reinfection
  - Persistent low RPR + serofast state
- **Full STI screening.**
- **Health department notification form.**

Syphilis take home messages

- Increase syphilis testing.
- Beware the patient with a rash
- Request:
  - Syphilis serology (antibody + RPR)
    - Use RPR to monitor treatment, detect re-infection

  + PCR if there is anything to swab

  Seek advice for interpretation
- If in doubt, treat

Measles

THE MEASLES STORY

- Responsible for the death of hundreds of thousands of children worldwide
- A travel Bug – New Zealand, Siri Lanka, Bali, Philippines, Europe, USA, Ukraine, Israel, Congo, Tonga, Samoa…
- Measles cases were at their highest for 20 years in Europe in 2018, as the antivaccine movement grows.
- Cases in Europe exceeded 60 000 in 2018; with over 72 deaths reported.
- **Most non-vaccinated; many with no previous medical Hx**
- A tight correlation between vaccination rates and outbreaks.
- France - A slump in 2010 followed by a spike in measles cases 2011.
- In Italy, rates fell in 2014, cases surged from a few dozen a month to hundreds.
- In Romania, below 90% in 2014. 2017, > 1000 cases a month, up from just 1 or 2.
- Congo 2019 - 310,000 – 6,000 deaths –low Vx coverage, malnutrition, weak Public health systems

New Zealand measles outbreak

- From 1 January 2019 to 8 January 2020 – 2,190 notified across New Zealand
- 1,733 of these confirmed cases are in the Auckland region
- > 15% were hospitalised.
- 2 deaths of unborn foetus in 2nd trimester
- Pneumonia accounts for nearly two thirds of **measles deaths**
- Approximately 1 in 1000 cases develop encephalitis (inflammation of the brain), of these 15% die and approximately one third are left with permanent brain damage

NZ measles story

- Measles outbreak predicted 2yrs ago
- An "immunization campaign" aimed vaccinate 90–95% only < 80% vaccinated, resulting in the epidemic. One case resulted in 2400 contaacts
- Australia (74 cases) linked to the NZ epidemic. An ongoing outbreak in Perth began in October 2019 after a New Zealander visited while infectious.
- Epidemic spread to Samoa (5697 cases) 83 deaths & Tonga (612 cases 0 deaths).
- NZ Government criticised for its response to the epidemic
  - shortages supply of vaccines
  - for not acting on recommendations to conduct national MMR 'catch-up' campaigns prior to the outbreak.
  - been an increase of .5% of people who have declined the vaccine since 2017

Samoa measles outbreak September 2019

- Vx rate 31% in Samoa- linked to 2 deaths after MMR Vx
- As of 6 January 2020, 5,697 confirmed cases > 2% population, 83 deaths
- A state of emergency declared 17 November, closure of all schools, keeping children under 17 away from public events, and making vaccination mandatory..[7]
- Samoan anti-vaccination activist Edwin Tamasese arrested and charged with "incitement against a government order".
- 2 December, imposed a curfew, cancelled all Christmas celebrations and public gatherings.
- All unvaccinated families ordered to display a red flag in front of their homes to warn others and to aid mass vaccination efforts. Some added messages like "Help!" or "I want to live!".[8]
- On 5 and 6 December, government shut down everything other than public utilities to move all civil servants over to the vaccination campaign. Curfew lifted 7/12- 90% of the population Vx. 22 December, an estimated 94% population vaccinated.

MEASLES IN WA

- Eliminated from WA - 20 years
- "Was rare" but had 36 cases in 2018 – all linked to travel abroad- secondary and tertiary cases occurred
- 55 cases 2019 majority in Perth - **over 6000 contacts**
- The History is essential
  - Age if born before 1966 – not likely/almost impossible
  - Travel Hx
  - Vaccination Hx
  - Epidemiological link to a confirm case
- If suspected – isolate, do EDTA blood, urine an T/S PCR and culture and blood for serology. Ring Public Health Nurse

What is necessary to be a case

- Travel Hx
- Epidemiological link- Hx of Exposure
- Immunisation Hx
- Age born after 1996 before 1992 highest risk
- Clinical picture
  - fever
  - cough
  - runny nose
  - sore and watery ‘pink eyes’
  - rash.

What to do if you suspect a case

- Measles is very infectious
- Isolate immediately
- Contact PHU
- Test – PCR T/S and urine, serology – state Hx and urgent

July Perth outbreak -background

- From July to August 2018 MCDC responded to 15 cases of Measles. All index cases have been acquired overseas.
- This included 5 primary cases, 9 secondary cases and 1 tertiary case.
- Eight of the secondary cases were infected from a single primary case.
- Many of the secondaries were at a single workplace.
- Six of these cases reported having had two MMRs, 5 with good documentation.

Summary of cases- primary cases -5

- **Disease Onset**:
  - Mid to late July
- **Travel history**:
  - Four had recent history of travel to Bali
  - One to the Philippines.
  - One was a resident of South West but came through the metropolitan area while infectious.
- **Vaccination history**:
  - Three had documentation of two MMRs
- **Contacts**:
  - cases attended a number of GPs, pathology services, ED and other public places.

Summary of cases- secondary cases - 9

- **Place of contact**:
  - One case was a household contact
  - One in an emergency department
  - Seven cases where in a single workplace.
  - Eight of the nine secondaries came from a single primary.
- **Vaccination history:**
  - Three had documentation of two MMRs.

Summary of cases- tertiary case - 1

- **Place of contact:**
  - Household contact of a secondary case and fully isolated prior to disease onset.

The workplace outbreak

- The primary case was a super spreader
- The workplace specialises in property - conducted numerous open homes across Perth.
- There were about 80 staff, in an open plan layout, with the majority aged in their 30s.
- The culture of the workplace was to work while sick and many cases attended while unwell despite clear and repeated advice to the contrary.
- Management was slow to take the issue seriously.
- A vaccination clinic was not held at the workplace until there was secondaries cases
- Active surveillance for further cases was conducted, and unwell people from the workplace were rung daily and tested.

Fully vaccinated cases

- It is possible that our widespread use of PCR picked up additional cases that would not often be detected.
- The vaccinated cases tended towards an attenuated course of disease.
- There were also no further cases from a case that reported two MMRs suggesting that their infectivity may be limited.
- In March to May 2006 in NSW there was a measles outbreak of 59 cases. A report regarding child case outcomes included that
  - None of the cases who had received 1 or more MMRs were hospitalised, while 15% (n=4) of the unvaccinated children where.
  - Those with 1 or more MMRs were also less likely to report fever, cough, coryza, or a typical rash.

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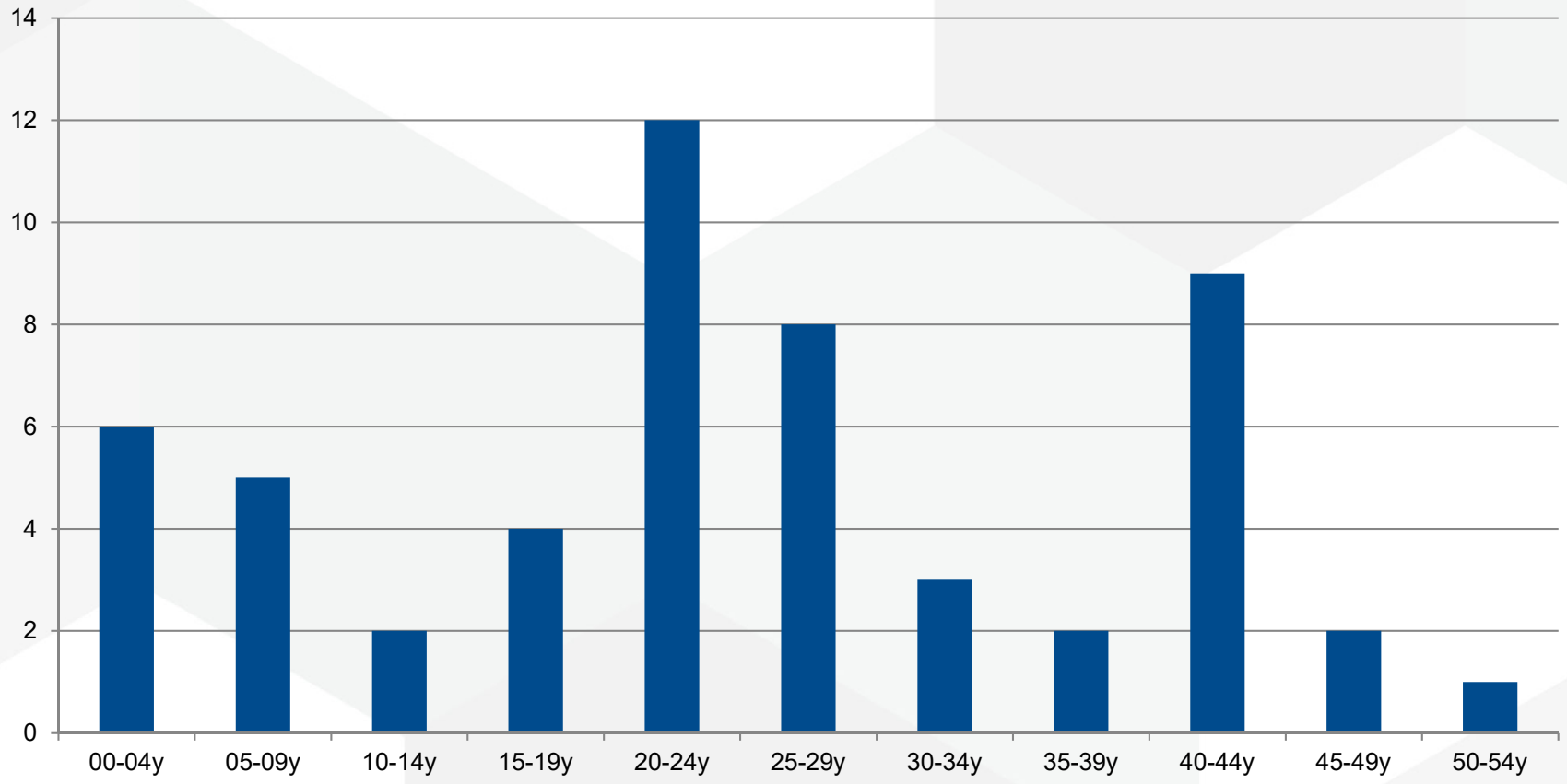
Measles notifications by age group 2019



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ACTION BY WA GOVERNMENT 26 MARCH

Free Measles (MMR) vaccinations to ensure 2 doses for everyone born after 1966 for immediate effect

- People born before 1966 will be immune as they have been exposed to the wild virus.
- People born before 1992 would have only had one dose of MMR unless they had a second dose catch up programs
  - In 1998 - school program delivered to 5-12 years.
  - In 2000 - offered to adults born after 1970.
  - In 2001 – offered to 18-30 years

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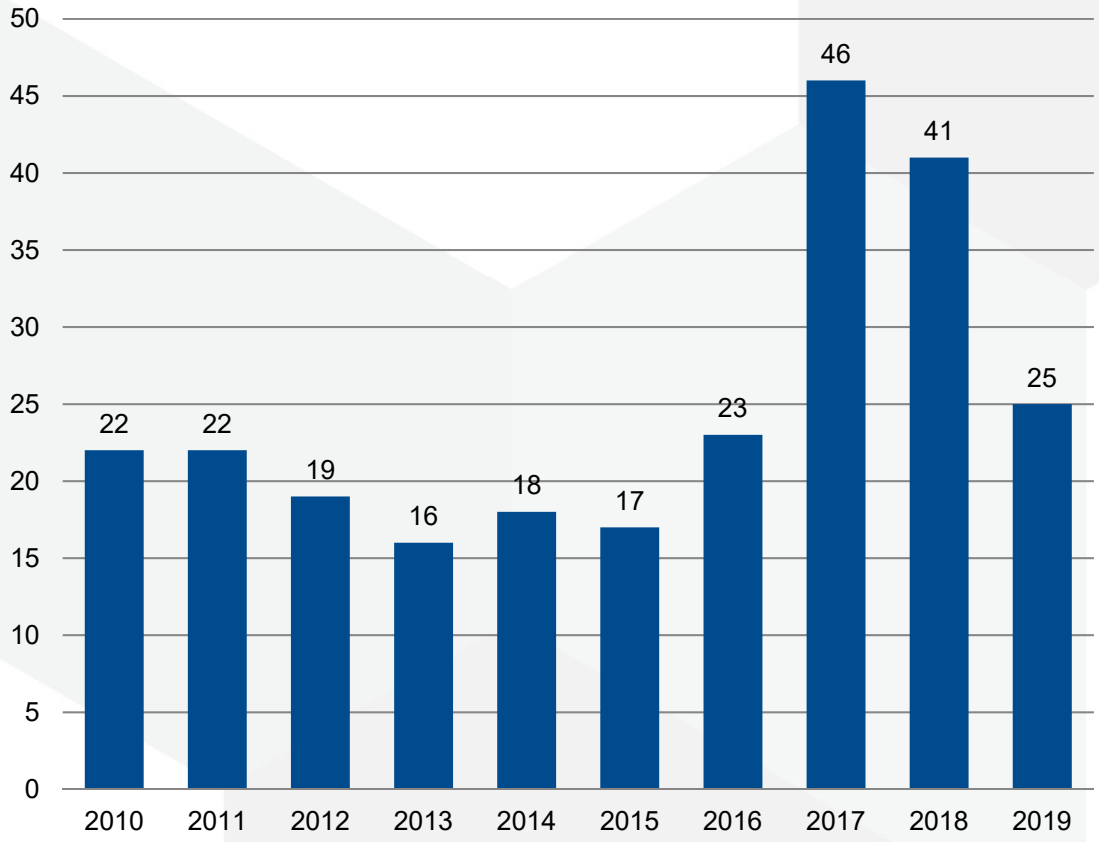
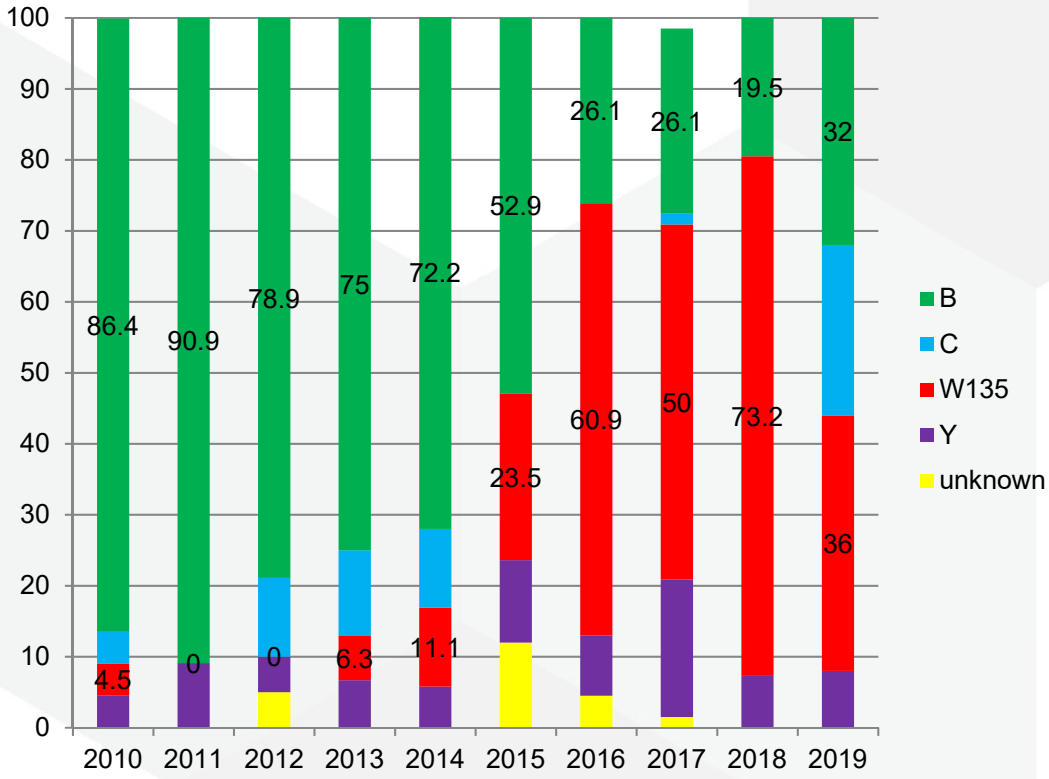
NUMBER OF MENINGOCOCCAL NOTIFICATIONS BY YEAR IN WA



% SEROTYPE OF MENINGOCOCCAL DISEASE IN WA 2010-2019



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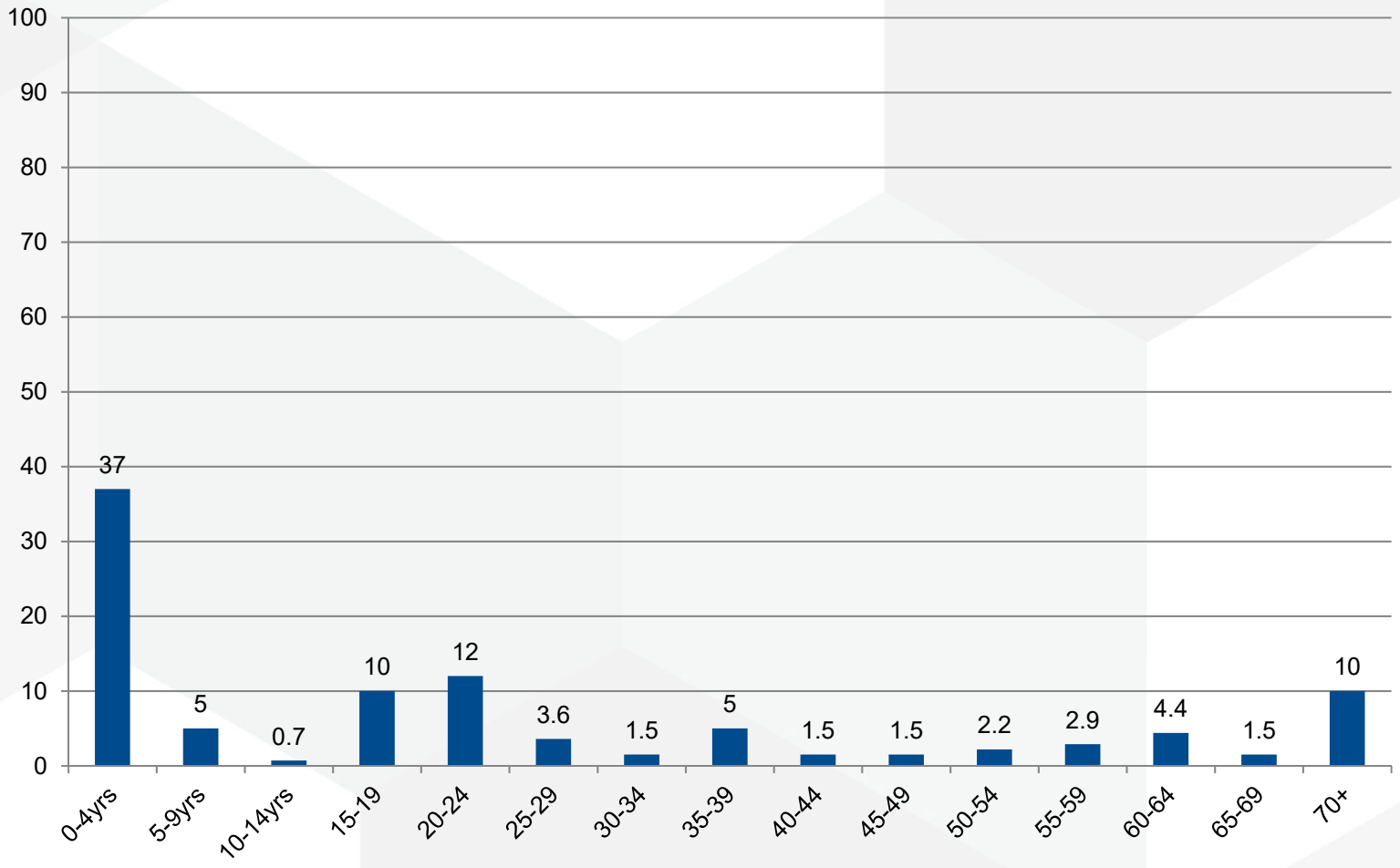
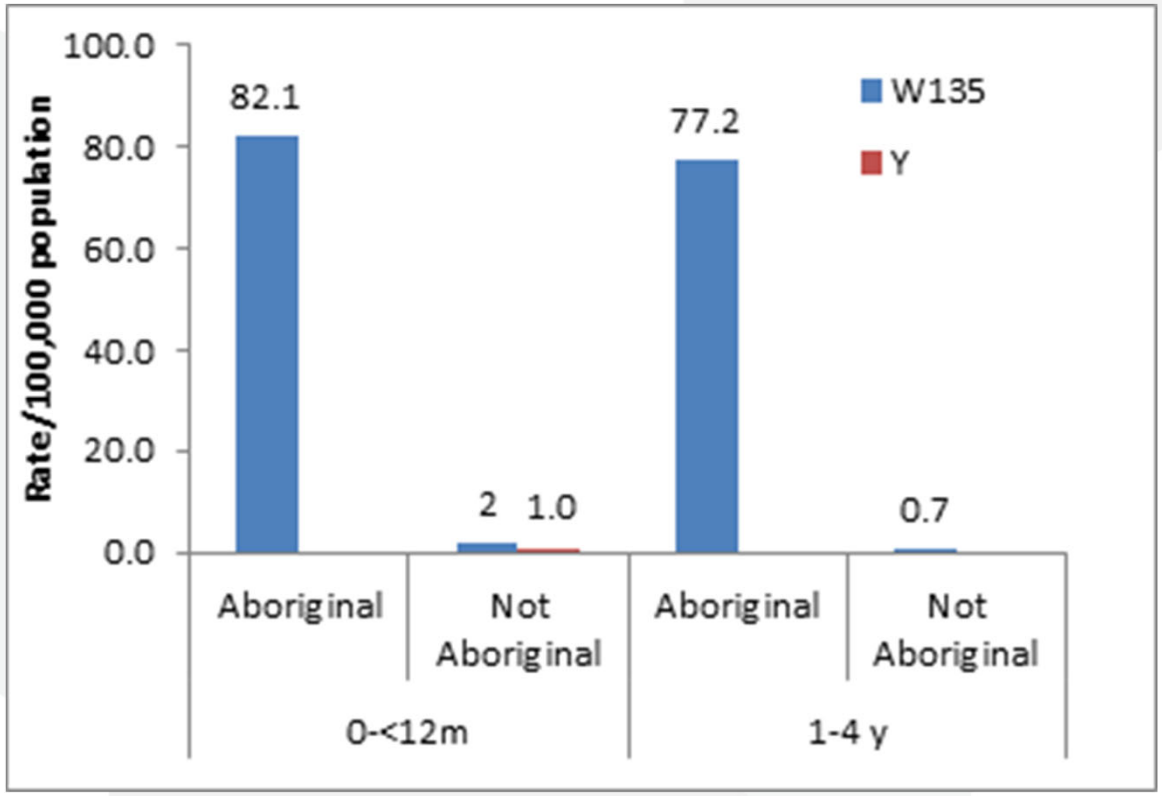
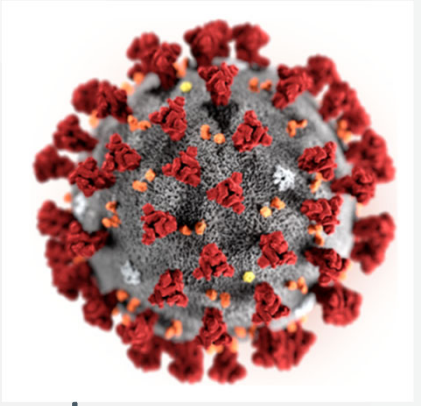
MENINGOCOCCAL DISEASE BY AGE GROUP WA



AVERAGE ANNUALISED AGE-SPECIFIC MENINGOCOCCAL NOTIFICATION RATES





China - COVID -19

- A Coronavirus – common cold UTRI– 4 serotypes
- Linked to bats
- Some – Mers, SARS, COVID-19 – LRTI- higher fatality rate
- Dynamic situation –
  - Incubation – 5 – 24 days…
  - Infectivity- starts? 24 hours before? and finishes – 4 criteria
  - Fatality rate – no denominator -0.4-2.0….

CASE DEFINITION

Confirmed case

- test positive to specific SARS-CoV-2 PCR or has virus identified by electron microscopy or viral culture

Suspect case

- Satisfies Epi and clinical criteria
- Epi – Travel to (including transit thru) mainland China in the 14 days before the onset of illness
- Or close of casual contact in the 14 days before the illness onset with a confirmed case of COVID-19

CLINICAL CRITERIA

Clinical criteria

- Fever

Or

- Acute respiratory infection (SOB or cough)

WA 160 tested – 0 negative

PERSON UNDER INVESTIGATION

Clinically compatible illness and travel to

- Hong Kong
- Singapore
- Indonesia
- Japan
- Thailand

In 14 days before onset of symptoms

Based volume of traffic and epi of COVID-19

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Figure 1. Newly confirmed cases per day (75 748 cases in total to date)

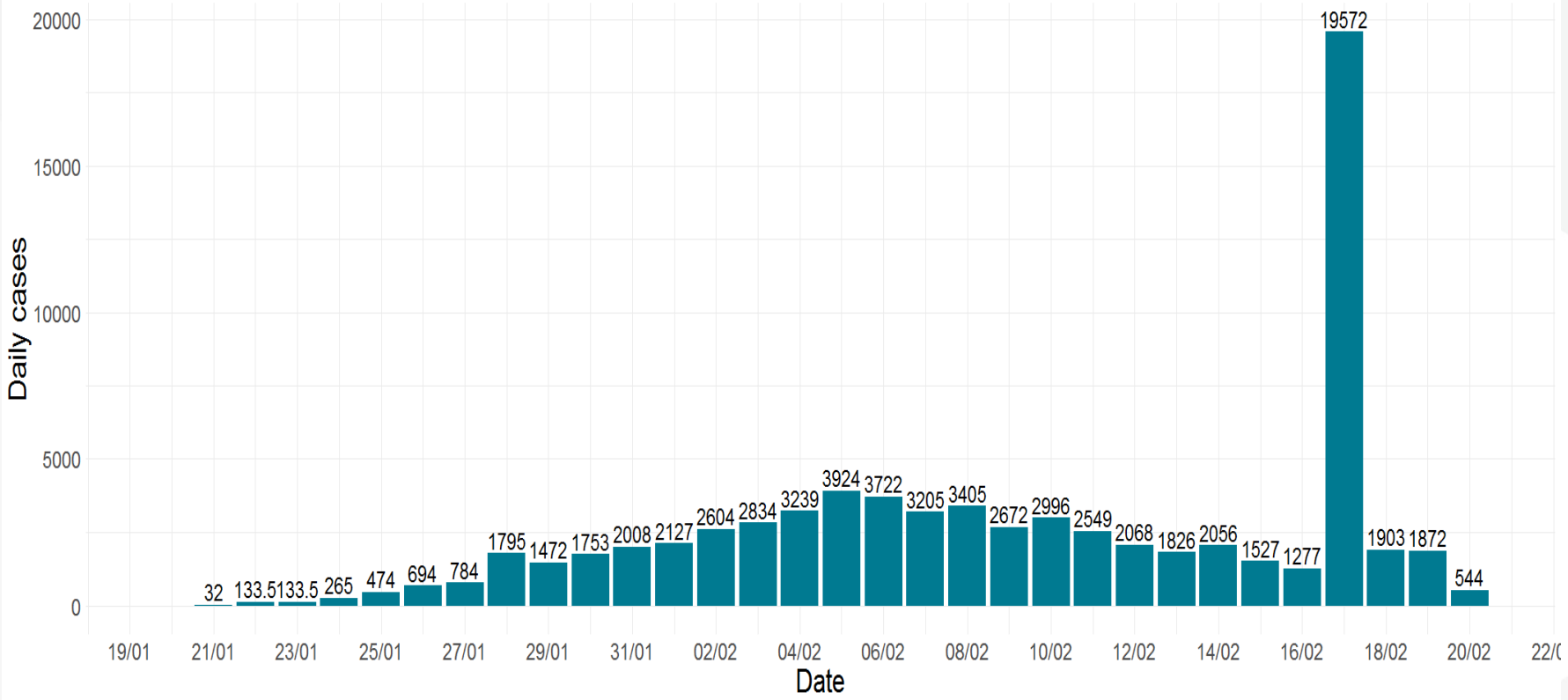
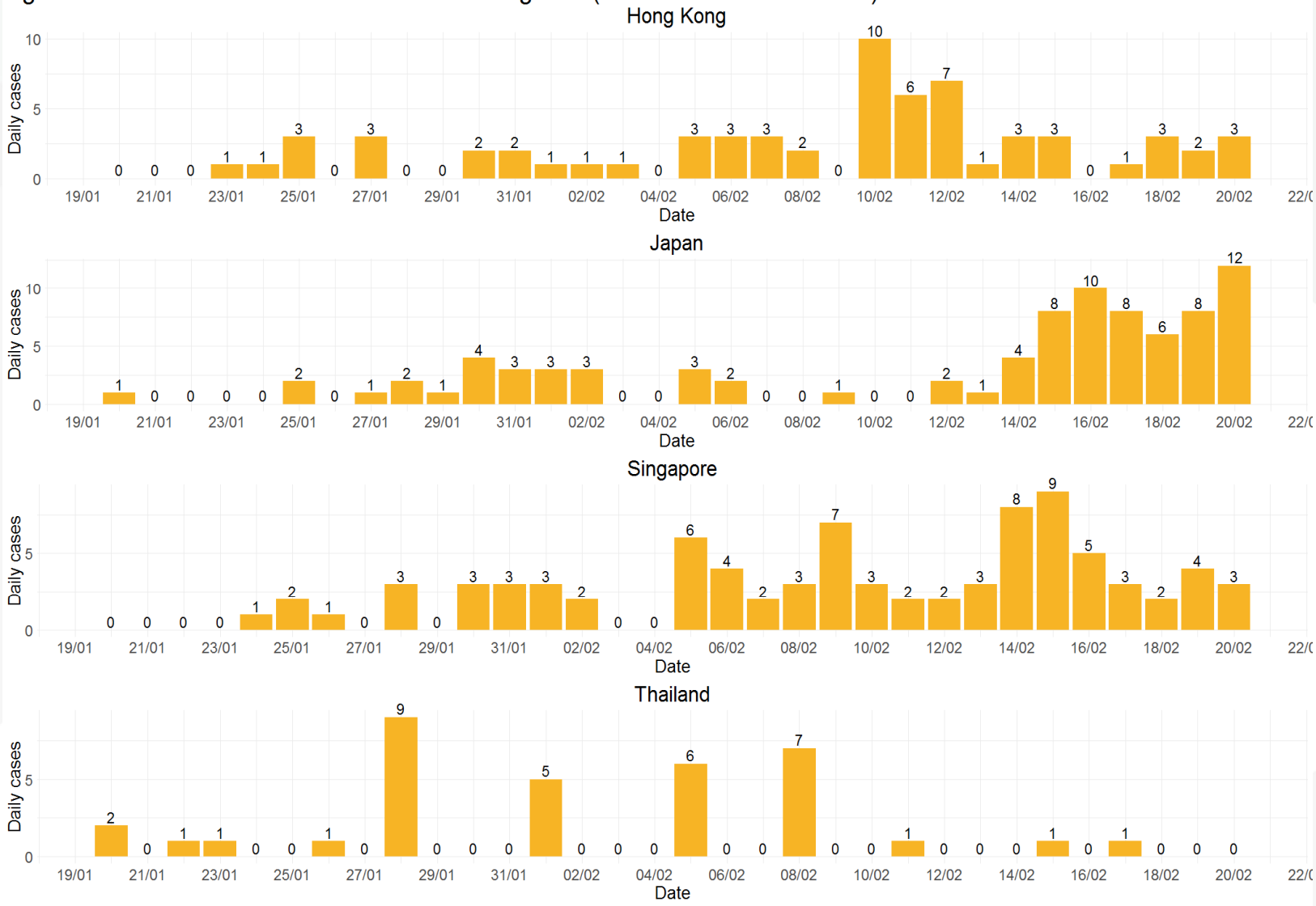


Figure 2. Confirmed cases in countries of investigation (890 cases in total to date)



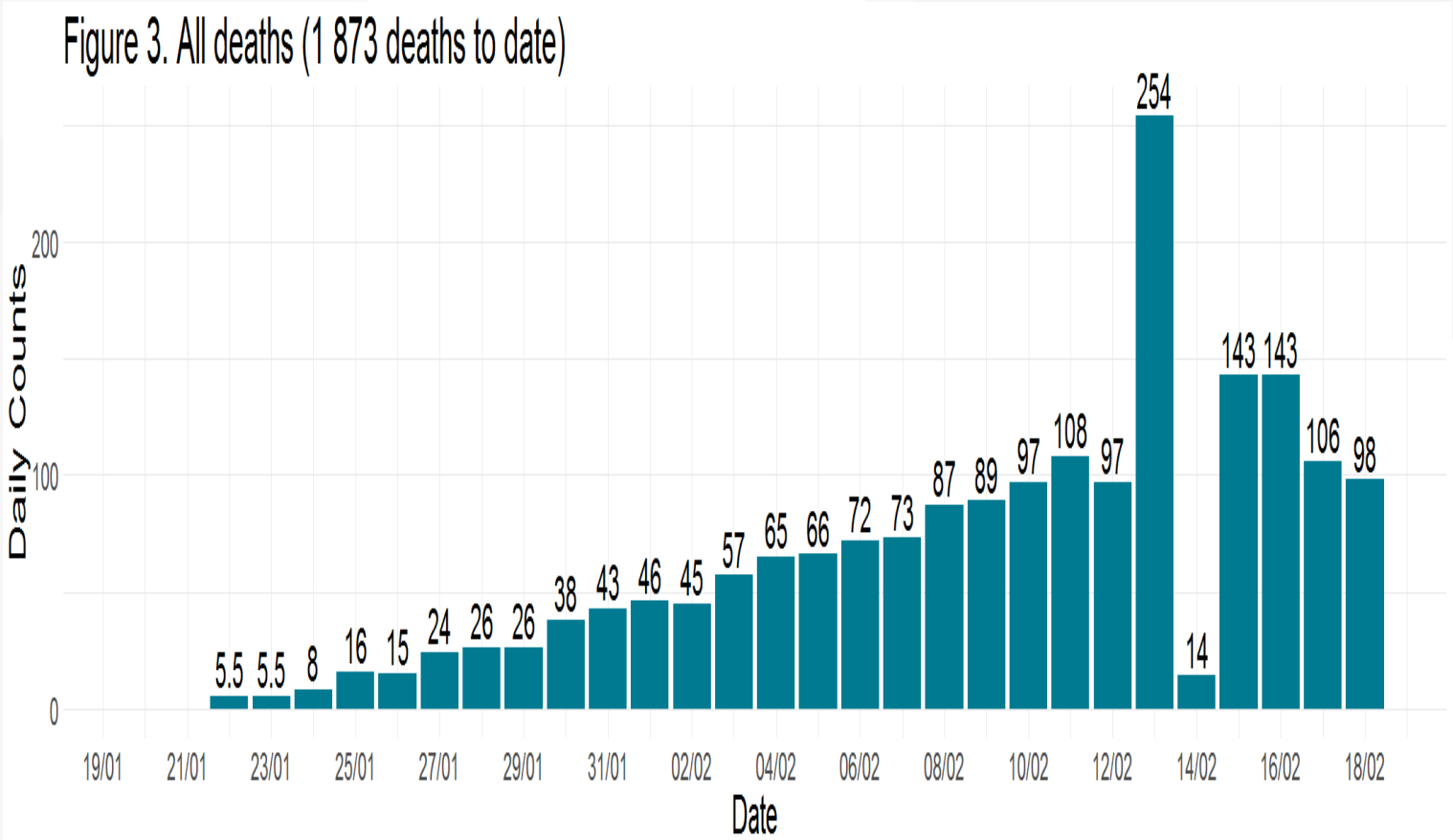


Figure 3. All deaths (1 873 deaths to date)
Daily Counts
0
100
200
5.5
5.5
8
16
15
24
26
26
38
43
46
45
57
65
66
72
73
87
89
97
108
97
254
14
143
143
106
98
19/01
21/01
23/01
25/01
27/01
29/01
31/01
02/02
04/02
06/02
08/02
10/02
12/02
14/02
16/02
18/02
Date

Figure 3. Newly confirmed cases per day in international conveyance (e.g. cruise ships) (621 cases to date)

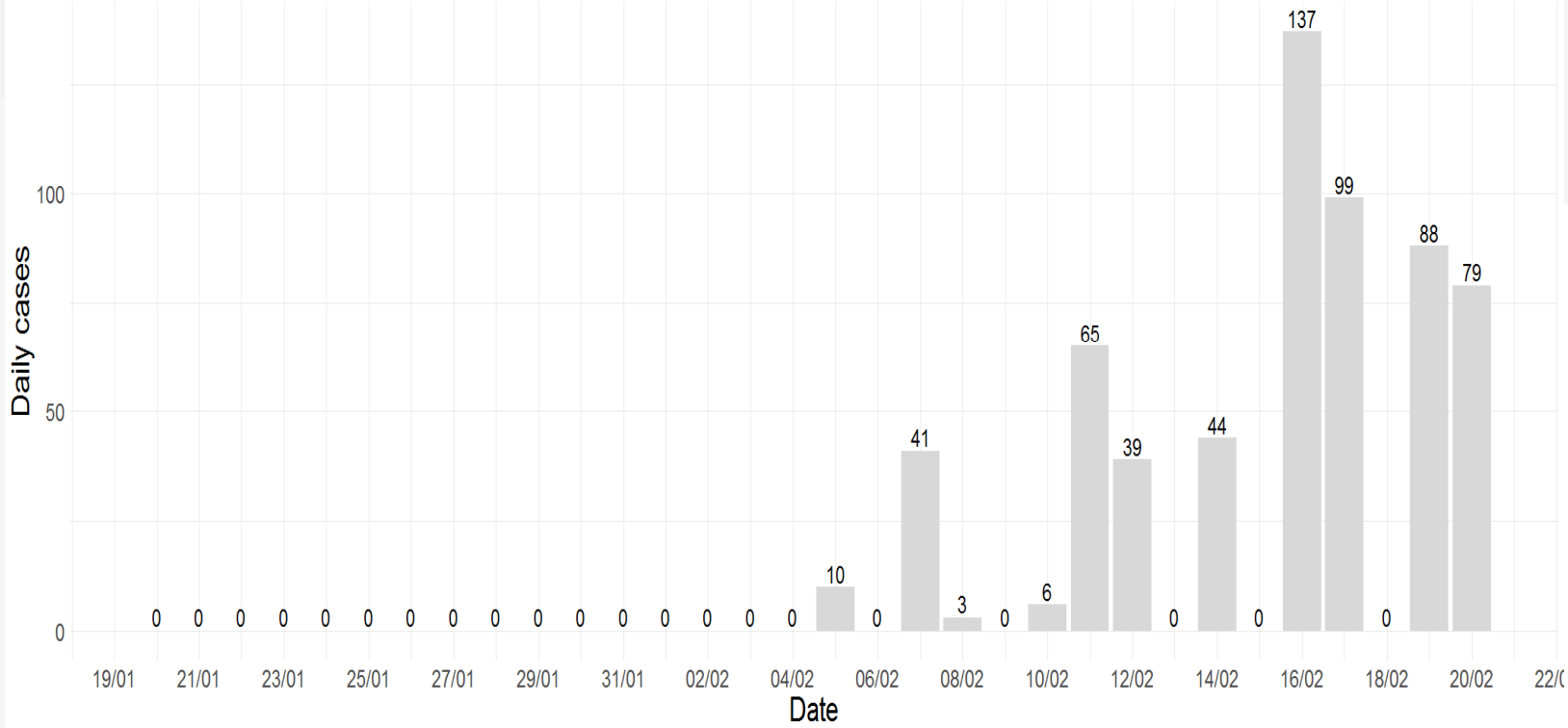


Figure 4. All deaths (2 129 deaths to date)

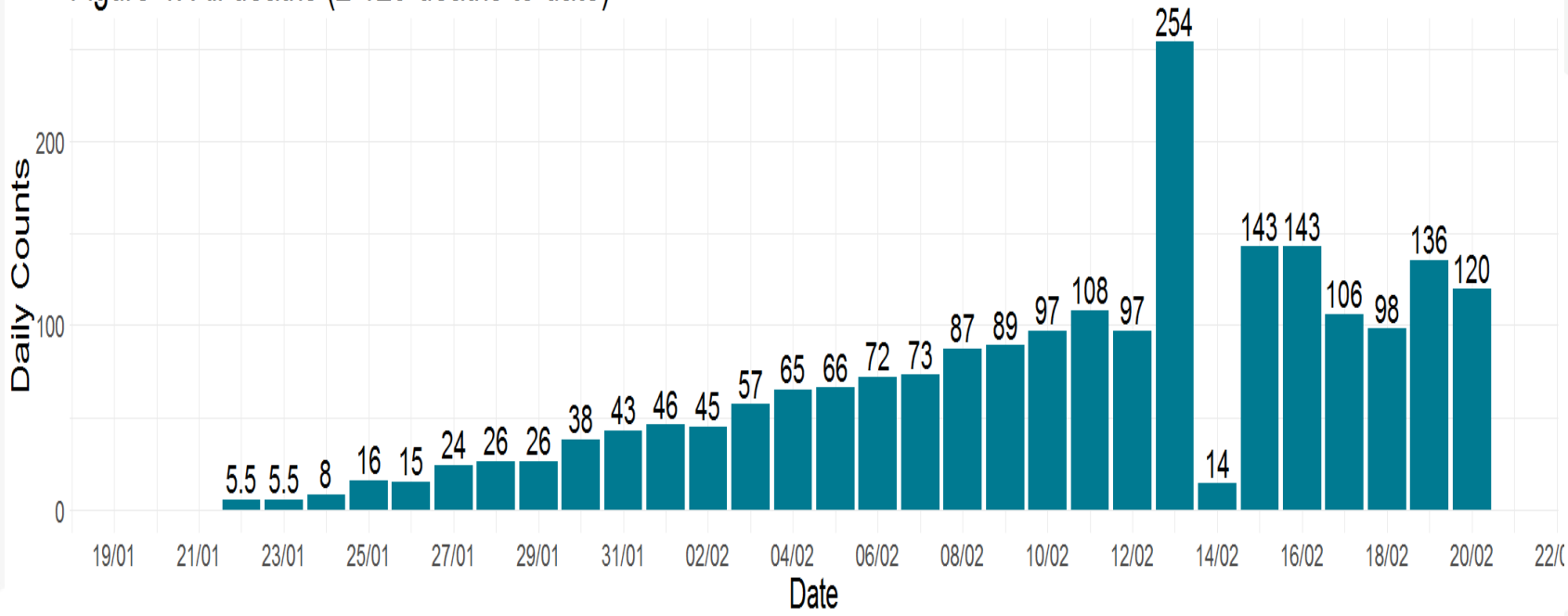


Figure 5. Confirmed cases in Australia (15 cases in total to date)

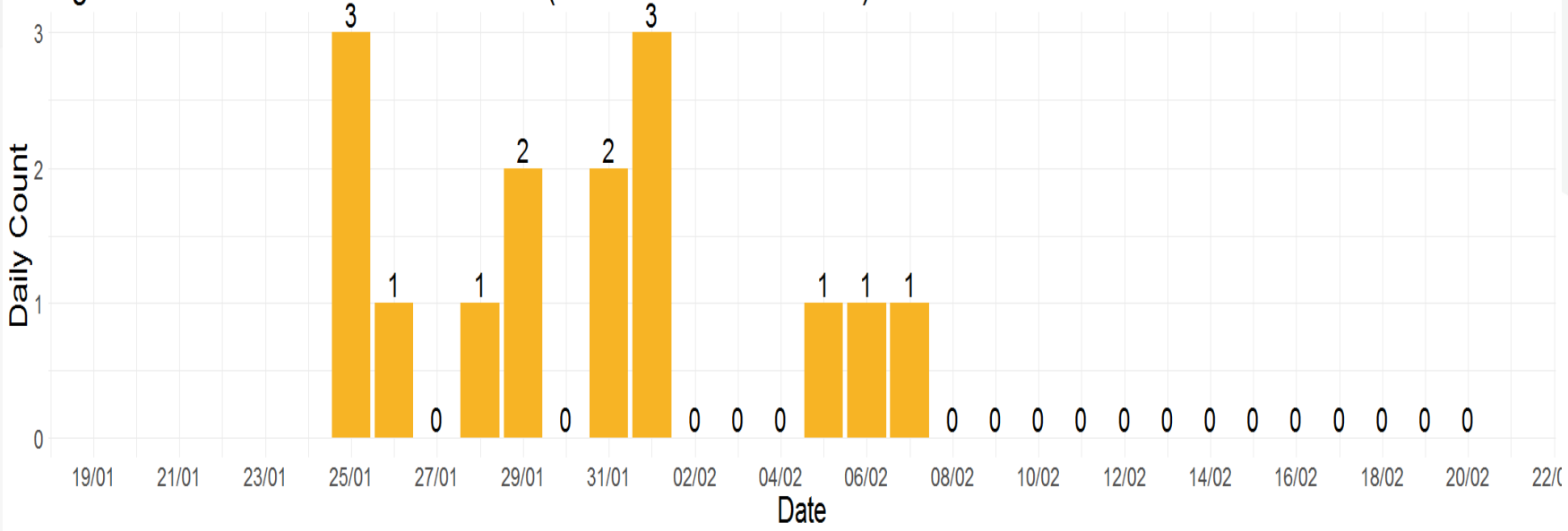


Figure 6. Daily number of tests (222 tests recorded to date)

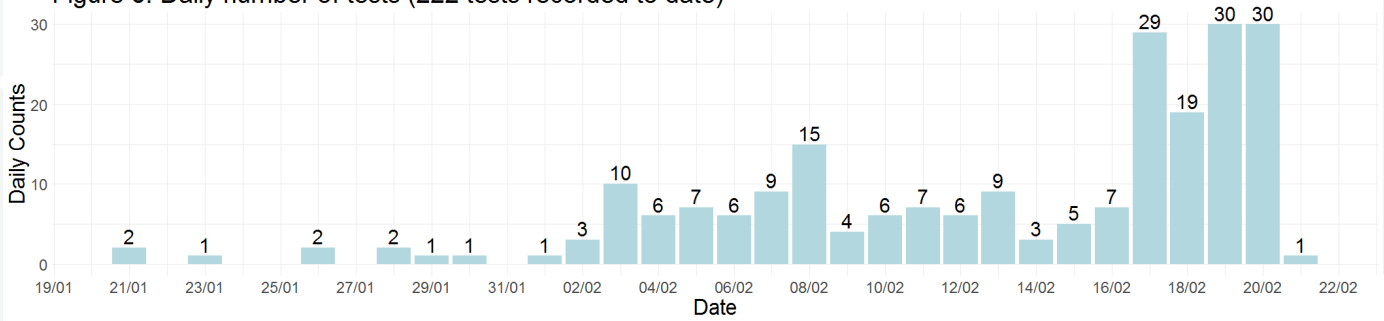
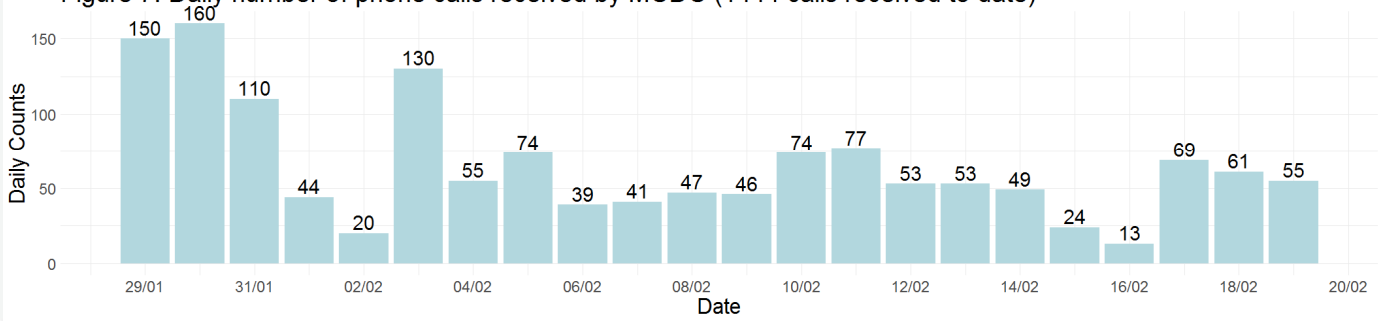


Figure 7. Daily number of phone calls received by MCDC (1444 calls received to date)



TESTING

Mild symptoms – surgical mask and full PPR

- Dry swab – nasal or nasopharyngeal and T/S
- Serology

Significantly unwell – or aerosol procedures- P95 mask and full PPE

CDNA SoNG (SERIES OF NATIONAL GUIDELINES) VERSION 8
RELEASE FROM ISOLATION

- Afebrile 24 hours
- Resolution of acute illness for 24hours
- At least 7 days after onset f acute symptoms
- PCR negative of two consecutive specimens collected 24 apart

INTERESTING DEVELOPMENTS

Diamond Princess

3700 passenger and crew when quarantined – everyone tested

- 542 confirmed cases – 65 with no symptoms….
- 88 new cases recently

Passengers not linked to these cases that are -ve allowed to leave the ship

Australian passenger's flew out 19th Feb quarantined Darwin another 14 days

HEP C – NEW WORLD - DAA

- Treatment quick
- Effective
- Well tolerated – minimal if any S/E
- Challenge- detecting Hep C – need more targeted testing
  - Risk factors…Incarceration, PWID, other BBV, Abn LFT
- Engaging in treatment
- Maintaining in treatment
- Treatment as prevention