Australian Government
Department of Health and Aged Care

Australian National University

Antenatal care access critical for congenital syphilis prevention, Australia 2016 - 2021

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We declare no conflicts of interest

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We would like to acknowledge the Traditional Owners of the land on which we meet today, the Whadjuk people, and pay our respects to Elders past and present. We extend this respect to all Aboriginal & Torres Strait Islander people here this afternoon.

Overview

- Quiz
- Study “Maternal characteristics associated with the likelihood of adequate syphilis treatment in pregnancy”
- Case studies from the Pilbara
- Questions

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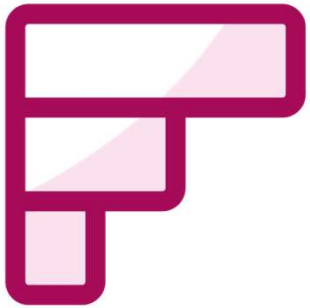

What are the leading infectious causes of preventable stillbirth in order according to the World Health Organization?

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Which organism is responsible for causing congenital syphilis?

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What can congenital syphilis result in?

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In which year did Australia have its highest number of congenital syphilis cases?

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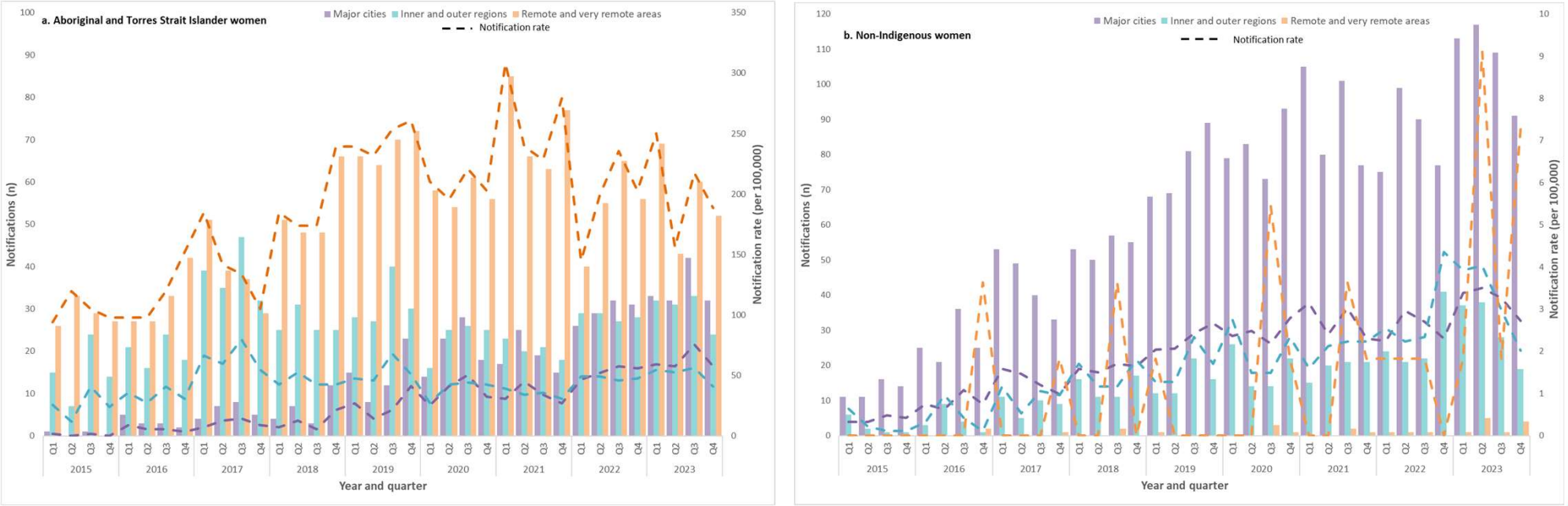
Background

Figure 1: Notifications (n) and notification rate (per 100,000) of infectious syphilis reported in females aged 15-44 years, by Indigenous status, remoteness area, quarter, and year, 2015 – Q4 2023 (a. Aboriginal and Torres Strait Islander and b. non-Indigenous) *



*Excludes cases for whom sex, age, Indigenous status and/or residential postcode were not reported.

Source: Australian Government Department of Health and Aged Care, National Syphilis Surveillance Quarterly Report, Quarter 4: 1 October – 31 December 2023.

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How can we prevent congenital syphilis?

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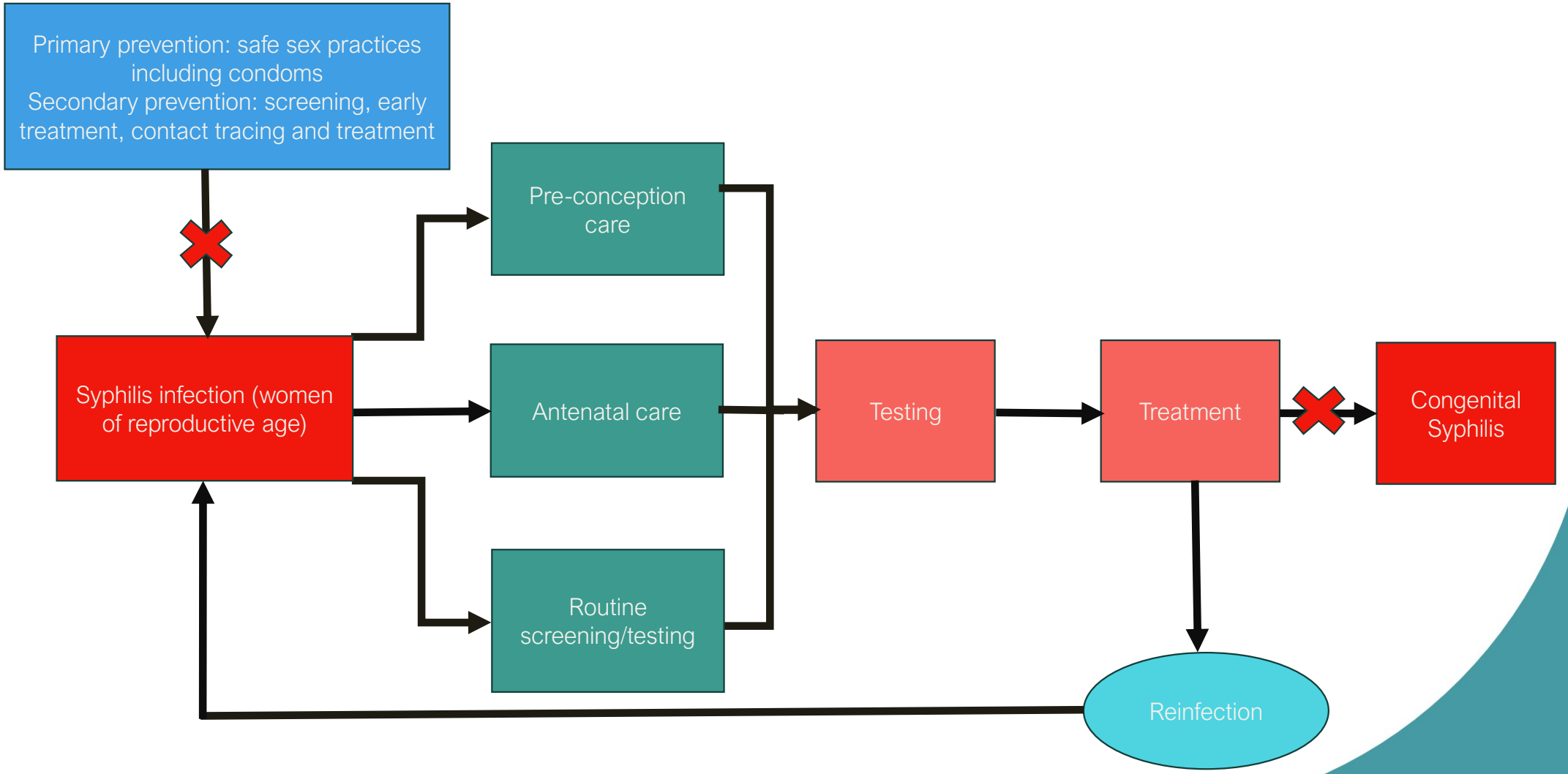
Figure 2. Points of intervention in the prevention of congenital syphilis

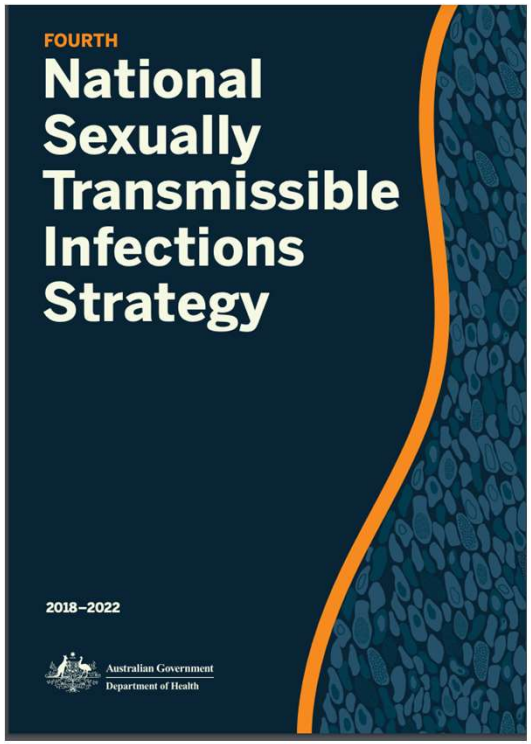


Study aims

1. **Understand** the gaps in the prevention of congenital syphilis in Australia by investigating:

- demographic characteristics
- clinical care characteristics
- risk behaviour characteristics

2. **Inform** policy to eliminate congenital syphilis in Australia



Methods

Descriptive analysis of gestational syphilis cases, 2016 - 2021

Case control study, 2016 – 2021

Qualitative analysis of archival and grey literature using Nvivo 14 software and a thematic approach

Table 1. Case and control definitions, data sources and participant information

	Case	Control
Definition	• Syphilis in pregnancy • Inadequate treatment	• Syphilis in pregnancy • Adequate treatment*
How Identified	National enhanced congenital syphilis dataset	National infectious syphilis dataset
Data source	National enhanced congenital syphilis dataset	Jurisdictional surveillance databases (ACT, QLD, WA) and national data
Matching (age, remoteness area, indigenous status)	1	5
Participants	31/49 cases with sufficient controls	155/235 mothers with adequate data

*Adequate treatment = initiation and completion of treatment with benzathine penicillin at least 30 days prior to delivery

Results

Table 3. Completeness n/N (%) of the pregnancy status variable for infectious syphilis notifications to the NNDSS for females of reproductive age, by state and year, Australia, 2016 – 2021

	Year					
State	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
ACT	n.d*	n.d	n.d	n.d	7/7 (100)	<5 (100)
NSW	73/102 (71)	68/114 (59)	105/167 (61)	174/221 (78)	197/216 (90)	189/210 (91)
NT	n.d	n.d	n.d	n.d	n.d	n.d
QLD	n.d	51/229 (23)	56/226 (24)	49/289 (18)	52/256 (20)	50/266 (19)
SA	n.d	n.d	n.d	n.d	n.d	43/47(91.5)
TAS	n.d	<5 (100)	5/6(80.0)	6/7 (85)	6/6 (100)	<5 (50)
VIC	n.d	n.d	n.d	n.d	n.d	240/282 (84)
WA	19/42 (51)	22/68 (38)	35/97 (36)	160/196 (82)	215/248 (85)	290/321 (90)
Total	94/554 (16)	143/774 (18)	201/892 (21)	387/1133 (32)	483/1090 (42)	773/1184 (66)

Results: descriptive analysis

Figure 3. Syphilis notifications to the NNDSS, 1 January 2016 to 31 December 2021

53 mothers with a baby with congenital syphilis

7.7% of all mothers with syphilis in pregnancy

*There is variation in reporting of pregnancy status from jurisdictions across this time period

Gestational syphilis, Australia, 2016 - 2021

Notifications increased from 31 in 2016 to 195 in 2021*

Rates peaked at **120** cases per 100,000 women who gave birth

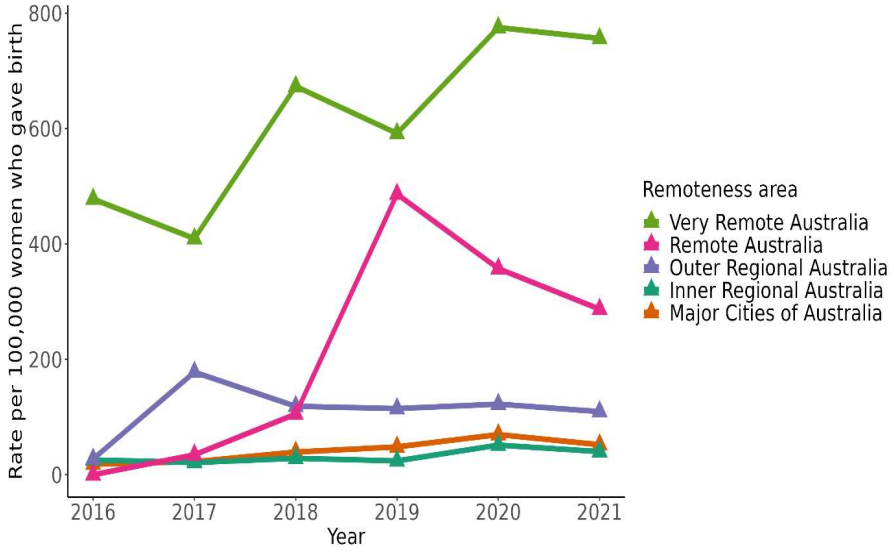
Highest proportion of notifications in the 30 – 34 year-old age group

Highest proportion of notifications from **major cities** (58%)

Highest rates in **remote and very remote** Australia (Figure 5)

*Noting the impact of increasing completeness of data reporting

Figure 4. Rates of gestational syphilis per 100,000 women who gave birth by remoteness area of residence, Australia, 2016 – 2021**



** For rates calculations only states and territories contributing pregnancy status data for each year were included in the population denominator for that year

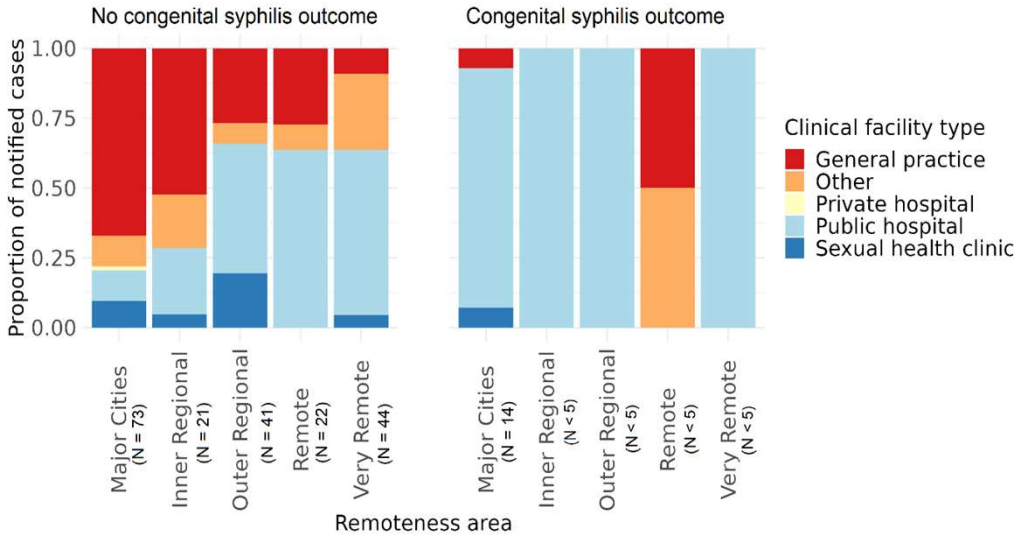
Gestational syphilis, Australia, 2016 - 2021

Overall, most likely to be diagnosed in a public hospital (41%)

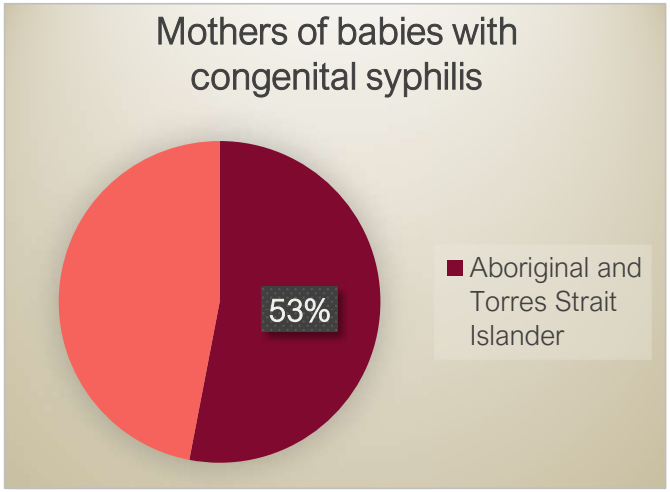
Mothers with no congenital syphilis outcome more likely diagnosed in **primary care** (64% cf 16%)

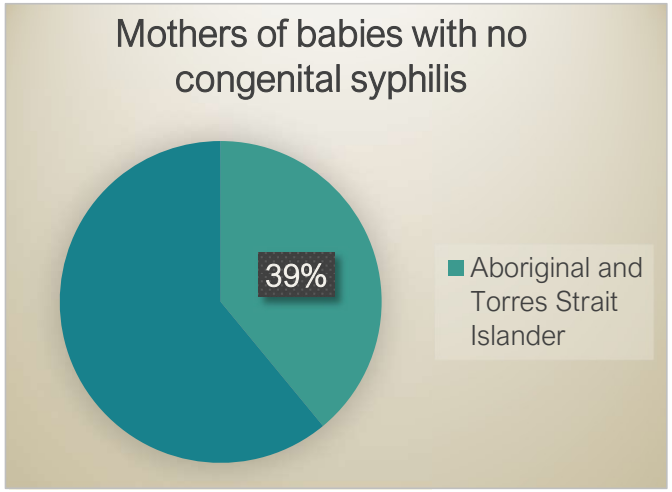
Mothers in outer regional to very remote areas are less likely to be diagnosed in primary care

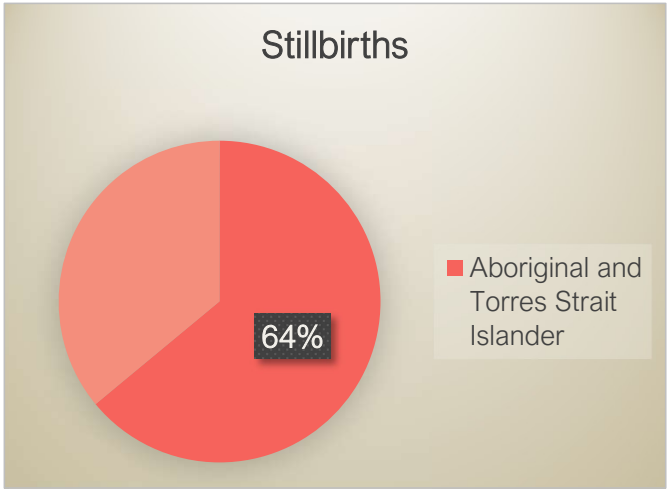
Figure 5. Proportion of gestational syphilis notifications by clinical facility of diagnosis, remoteness area and congenital syphilis outcome, Australia, 2016 – 2021

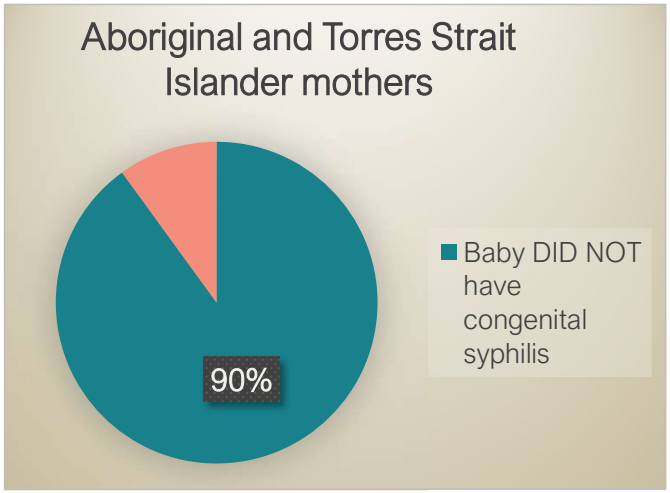


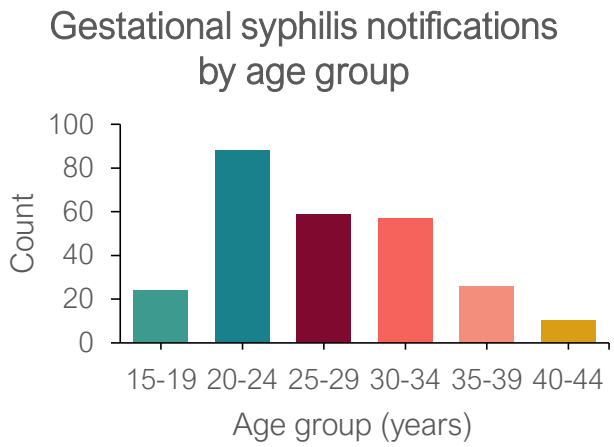
Aboriginal and Torres Strait Islander mothers with gestational syphilis



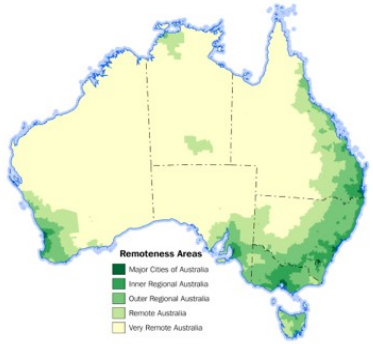








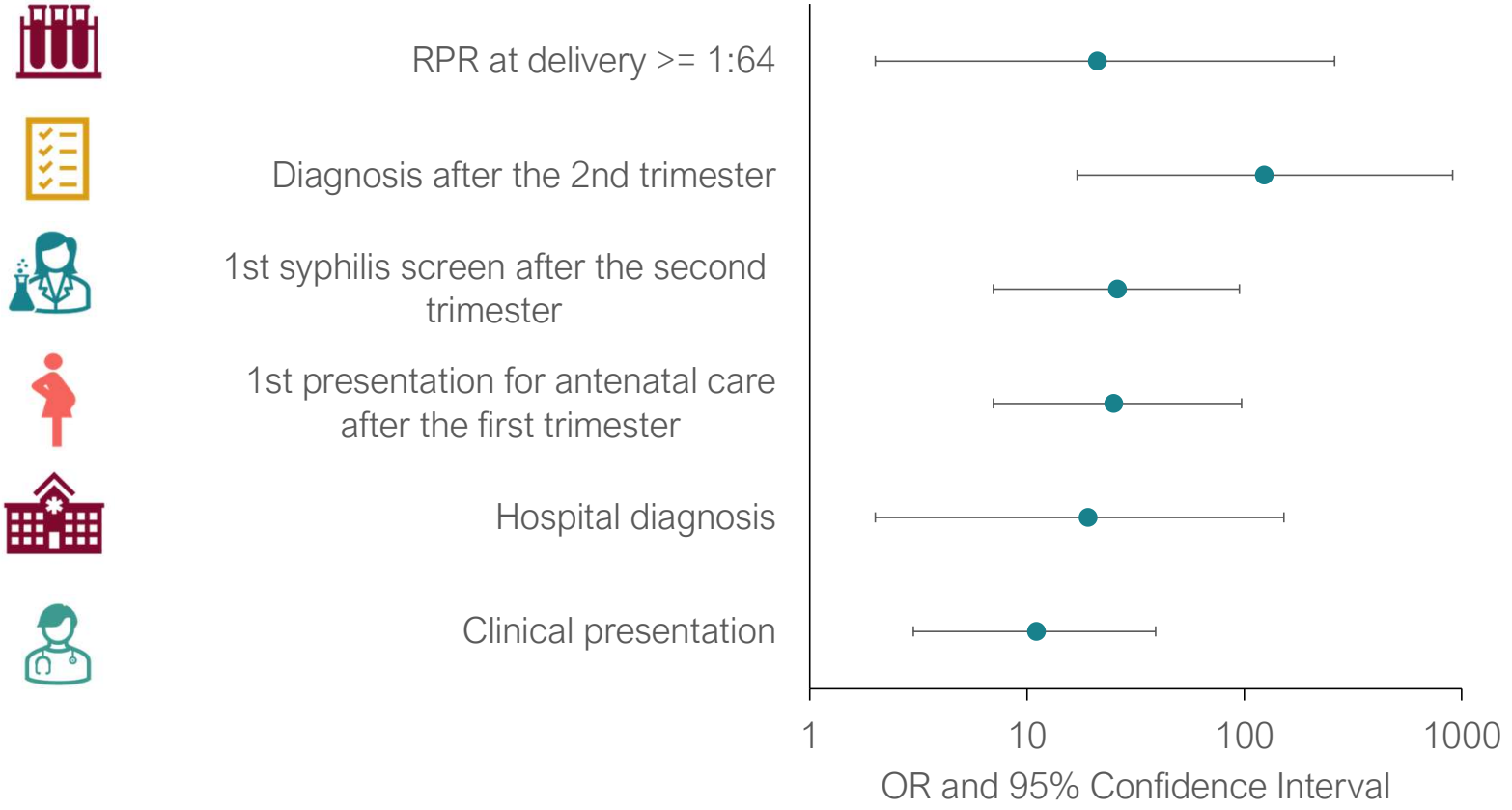
All mothers with babies with congenital syphilis in remote and very remote Australia



Source: Australian Bureau of Statistics

Case Control Study

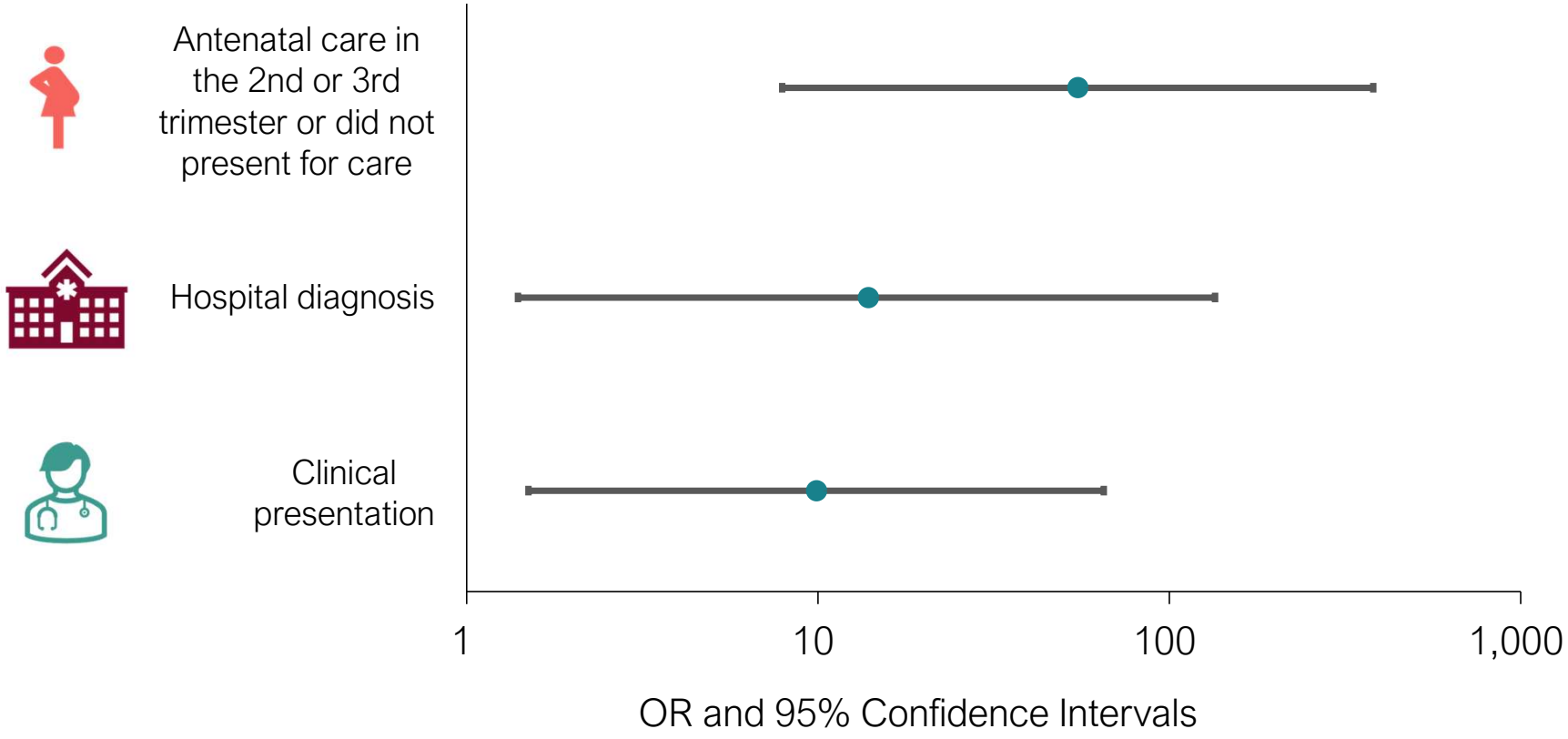
Figure 5. Factors associated with inadequate treatment of syphilis in pregnancy on univariate analysis, Australia* 2016-2021



*Cases from NSW, NT, QLD, SA, Vic, WA, controls from ACT, QLD, WA
Cases and controls matched on age group, remoteness area and Indigenous status

Case Control Study

Figure 6. Independent risk factors for inadequate treatment of syphilis in pregnancy on multivariable analysis, Australia* 2016-2021



*Cases from NSW, NT, QLD, SA, Vic, WA, controls from ACT, QLD, WA
Cases and controls matched on age group, remoteness area and Indigenous status

Qualitative analysis of congenital syphilis cases, Australia 2016 - 2021

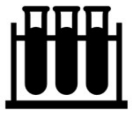
Complex social factors

No or minimal antenatal care

Difficulty accessing antenatal care

Poor communication and coordination between health care providers

Inaccurate assessment of risk of having STIs including syphilis



Inadequate testing or follow up after testing

Inadequate contact tracing

Limitations

- Data completeness
  - pregnancy data not available from all jurisdictions
  - incomplete pregnancy data
  - little clinical data available for mothers in major cities

- Selection bias possible

- Small sample size

- Qualitative analysis was mainly from government reports and reviews so the ‘voice’ is that of the health system, not women with syphilis in pregnancy

Conclusions

Data quality for women with gestational syphilis needs to be improved

There is a need to **re-imagine antenatal care** for women at high risk of congenital syphilis

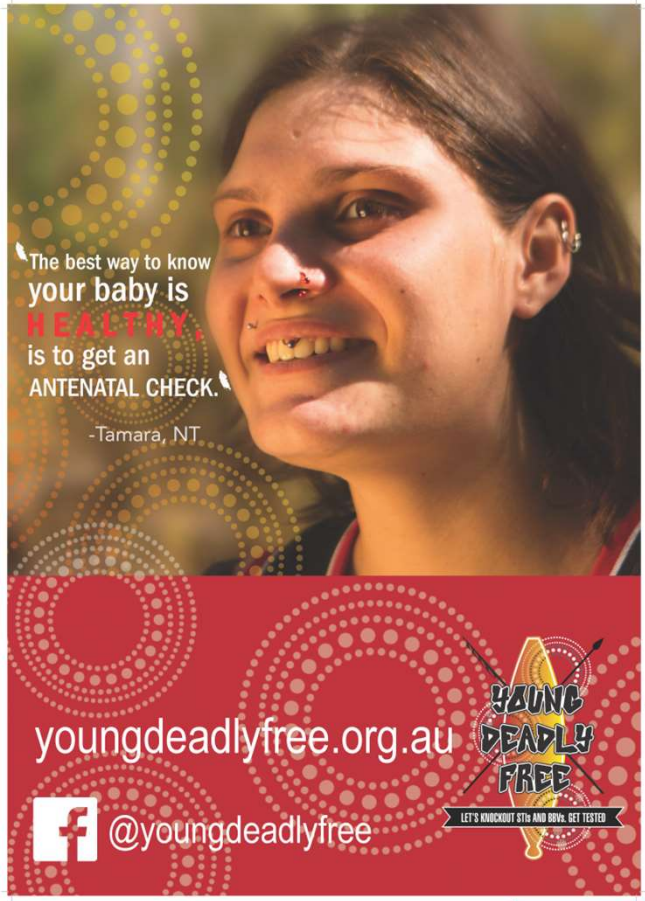
- provide antenatal care and testing in non-traditional settings
- outreach services
- models underpinned by the concept of “Birthing on Country”

Replace recommendations for risk assessment with **three universal syphilis screens** in pregnancy

Point of care syphilis testing should be more widely available to ensure timely follow-up (including in emergency departments)

There needs to be **practical cultural safety training** linked to key performance indicators for all health services

There is a need to **identify, challenge and put to an end to institutional racism** as well as judgemental attitudes and victim blaming



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How do you think access to antenatal care could be improved for the women you interact with ???

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Case studies from the Pilbara

https://startsat60.com/media/travel/touring/pilbara-western-australia

Current syphilis outbreak in the Pilbara

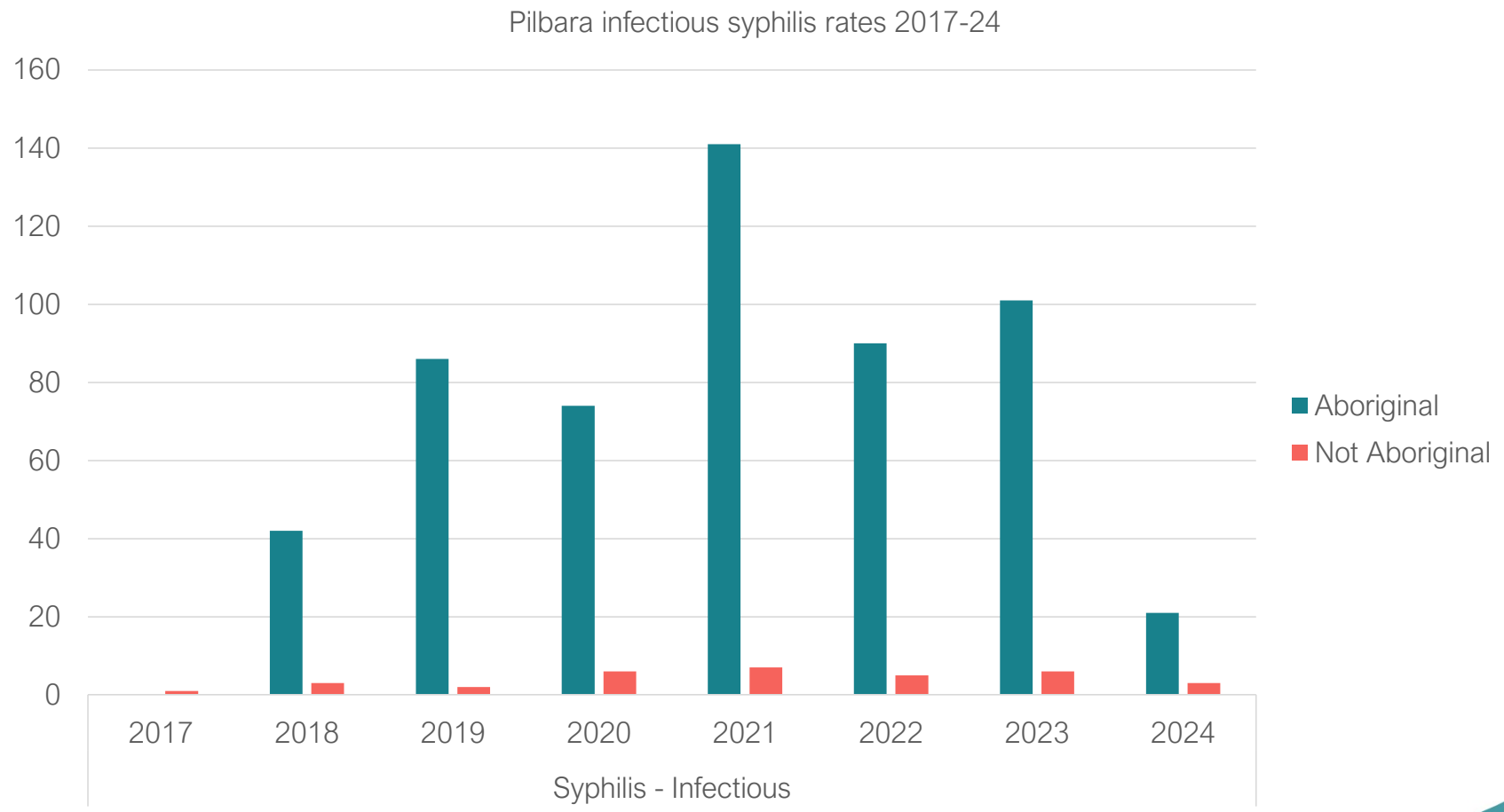
Late 2011 increase cases of syphilis noted in Northern QLD

By 2014 the outbreak had reached the Kimberley region

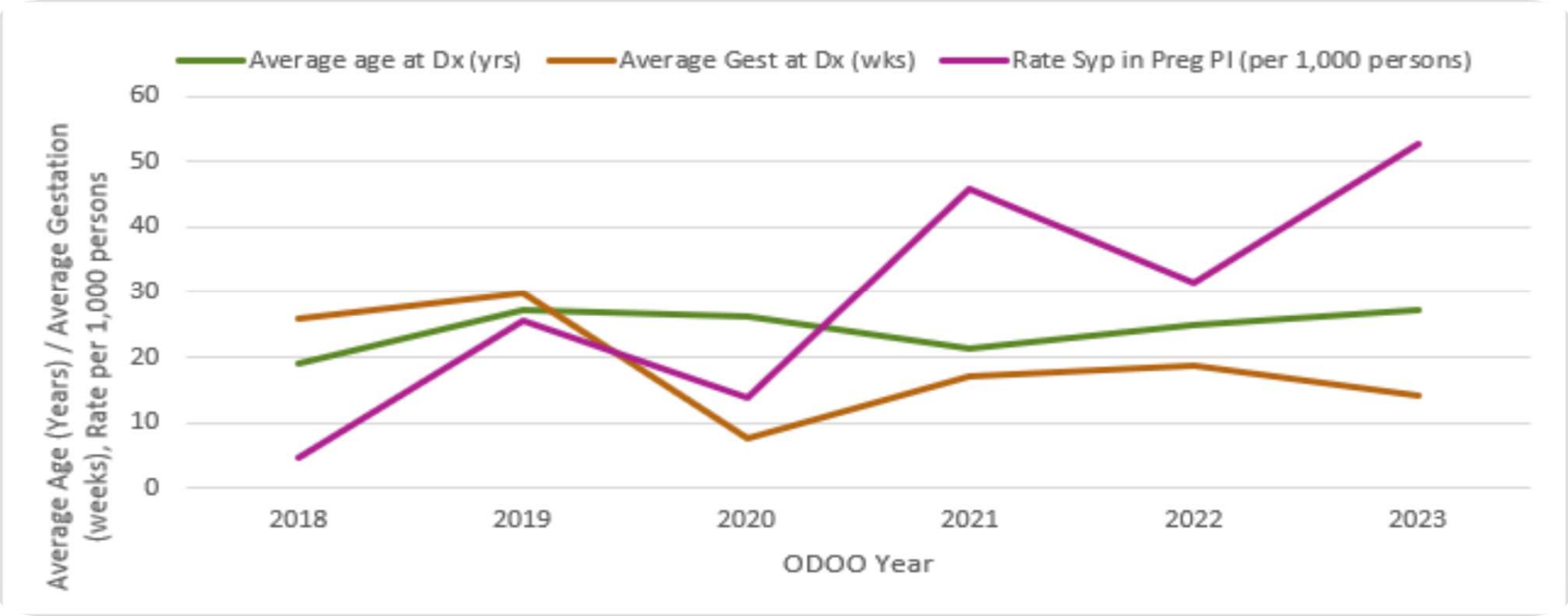
2018 the Pilbara detected its first cases of syphilis that were linked to the wider national outbreak

By 2023 the outbreak has now reached Metropolitan Perth with 4 cases of congenital syphilis

Pilbara outbreak 7 years on



Rates of syphilis in pregnancy in the Pilbara overall, by average age of diagnosis and average gestation of diagnosis, 2018 - 2023



High Risk Groups

It is important to understand the different high risk groups and develop education testing and treatment options that maximise engagement, within the regions limited resources.

A review of the fourth Pilbara congenital syphilis case in 2022 highlighted that some woman only access antenatal care through the emergency department.

Presenting for pregnancy testing in ED late, often 20+ weeks.

Presenting in ED for pregnancy related issue with no prior antenatal care.

Presenting in ED for health issue unrelated to pregnancy coincidentally being dx as pregnant (often in the second or third trimester).

Challenges of Antenatal care in the Pilbara

- Higher risk population with lower health literacy with respect of syphilis, sexual health and child birth.
- Location, availability, and cultural safety are all barriers to pregnant women engaging with health services or engaging late.
- Competing priorities of family and cultural expectations can also result in a woman's ability to access regular pregnancy care.
- Increasing numbers of vulnerable higher risk child bearing women with syphilis particularly Inland/East Pilbara
- Fragile referral systems with challenges to consistent antenatal care
- Inconsistent antenatal syphilis risk management in antenatal care

Case Study

19 yr old “patient X” currently ~11/40 wks gestation by LMP presents to your practice.

What next?

What is the recommended syphilis screening schedule in pregnant and post partum women in WA?

Recommended Antenatal Syphilis Serology Testing in all WA

Booking Visit (+BBV/STI), **28 & 36 weeks** gestation

Ideally test 3 x in pregnancy

What are the additional pregnancy related tests for syphilis in the outbreak regions of the Kimberley, Pilbara and Goldfields – why is this so?

If women living in regions affected by the ongoing outbreak in Aboriginal communities, i.e. Kimberley, Pilbara and Goldfields*:

Booking Visit (+BBV/STI), **28 & 36 weeks** gestation (+SOLVS,+/-anal or throat swab)

Delivery and **6 weeks post partum.**

Ideally test 5 x in pregnancy

Maternal syphilis screening table

Patient characteristics	Testing schedule
Standard testing in Western Australia for every pregnancy	Test syphilis serology three times: 1. Antenatal booking visit 2. 28 weeks 3. 36 weeks or at time of any preterm birth Other STI / BBV screening recommendations. See WNHS Antenatal Care Schedule and STI guidelines in Silverbook- STI Screening Recommendations in Pregnant and Post-partum Women (external website)
Resident in a regional outbreak area with the highest rates of transmission • Kimberley • Pilbara • Goldfields (See WA map Appendix 1)	Test syphilis serology five times: 1. Antenatal booking visit 2. 28 weeks 3. 36 week 4. Birth and 5. 6 weeks post-partum Other STI/ BBV screening recommendations: See WNHS Antenatal Care Schedule and STI guidelines in Silverbook- STI Screening Recommendations in Pregnant and Post-partum Women (external website)
Minimal or no antenatal care or no evidence of syphilis testing in this pregnancy as per schedule	• Syphilis maternal serology at presentation to care • Full STI screen- Chlamydia / Gonorrhoea PCR, Hepatitis B, Hepatitis C, HIV serology • Tests should be requested URGENTLY. Liaising with on call microbiologist is recommended on weekends / after hours. • See also Silverbook- STI Screening Recommendations in Pregnant and Post-partum Women (external website)
Stillbirth > 20 weeks	• Syphilis serology recommended
Tested positive to syphilis	• Full STI screen- read section Maternal follow-up • See also Silverbook- STI Screening Recommendations in Pregnant and Post-partum Women (external website)

Patient X was referred to O&G after presenting to ED 3/12 later for a non-pregnancy issue. Antenatal bloods were taken at the time.

She has a positive syphilis result Total Ab detected, TPPA 3+, RPR 512.

She is given 2.4mu of Benzathine Penicillin G and admitted for observation.

She reports no recall of genital, anal or oral ulcers, lymphadenopathy, rash or hair loss.

Parallel testing was carried out on stored blood from her first antenatal screen and her RPR was 32.

No further treatment was required at this point

Report : **Syphilis Serology**

SYPHILIS SEROLOGY

Specimen: Serum Collected: 16/11/2022 15:40 Received: 18/11/2022 13:57

Test Name	Result	Flag	Ref-Range	Units
Syphilis Serology				
T. pallidum Total Ab (CMIA)	Detected		AB	
TPPA	Positive (3+)		AB	
RPR	Negative			

SYPHILIS SEROLOGY

Specimen: Serum Collected: 20/07/2022 09:45 Received: 20/07/2022 11:20

Test Name	Result	Flag	Ref-Range	Units
Syphilis Serology				
T. pallidum Total Ab (CMIA)	**Detected**		**AB**	
TPPA	**Positive (3+)**		**AB**	
RPR	**256**		**AB**	
RPR Parallel Testing				
Parallel Specimen	C925009716 : 14/06/2022			
RPR	256			

SYPHILIS SEROLOGY

Specimen: Serum Collected: 16/02/2022 14:30 Received: 18/02/2022 12:00

Test Name	Result	Flag	Ref-Range	Units
Syphilis Serology				
T. pallidum Total Ab (CMIA)	Detected			
RPR	4			
Syphilis Serology Comment				
Comment	See below			

Evidence of successful treatment of active syphilis is provided by a four-fold or greater decline in RPR titre within 12 months of commencing treatment. Contact a Clinical Microbiologist for advice if required.

(CMIA = Chemiluminescent Microparticle Immunoassay)
Patient syphilis testing history (selected results):
06/08/2021 - RPR 32, TPPA Pos(3+), T.pallidum Total Ab Detected.
23/08/2021 - RPR 16
22/10/2021 - RPR 8
10/11/2021 - RPR 8
22/12/2021 - RPR 4

Review Comment Reviewed.

No single result can be interpreted accurately on its own. Without previous records and patient history, all could be –
previously treated infections
untreated new infection
untreated old infections

The Pilbara public health unit will always assist with interpretation of results.

ashm DECISION MAKING IN SYPHILIS

4 Disease staging and symptoms

	Disease Stage (often not distinct)	Symptoms and signs (most patients do not have all or most of these)
Infectious	Primary syphilis	Genital, anal or oral ulcer. Inguinal lymph enlarged.
	Secondary syphilis	Fever, malaise, headache, lymphadenopathy, rash, alopecia, oral, anal or genital lesions
	Neurosyphilis	May arise in context of secondary or less commonly tertiary syphilis. **Neurological symptoms or signs:** visual changes, tinnitus, deafness, cranial nerve palsies, severe headache or meningitis.
	Early Latent (<2 years) syphilis	Positive syphilis serology no clinical symptoms or signs no evidence of adequate past treatment. Negative test or a 4-fold increase in RPR within past 2 years.
Non-infectious	Late latent (>2 years) syphilis	Positive syphilis serology no clinical symptoms or signs no evidence of adequate past treatment. No negative test within 2 years.
	Tertiary syphilis	Destructive skin, cardiovascular or neurological disease.
Congenital syphilis		Severe multi-organ disease with very high mortality and morbidity in both in-utero and in neonatal periods.

These stages are often not distinct, most patients do not develop all or most of these symptoms and signs.

5 Treatment

Refer to sections *3 Interpretation of syphilis serology* and *4 Disease staging and symptoms* before commencing treatment. Repeat syphilis serology at day of treatment (baseline)

Syphilis treatment

Symptoms or signs of primary or secondary syphilis. Consult with a specialist if not familiar with these. OR documented negative serology in past 2 years OR documented treatment in past 2 years with decline in RPR OR PCR positive	all other cases	penicillin allergy or unavailable	Pregnant OR Child OR Neurological symptoms or signs
Benzathine benzylpenicillin 2.4 MU (1.8g), stat, given as two injections containing 1.2 MU (0.9g)	Benzathine benzylpenicillin 2.4 MU (1.8g), stat, given as two injections containing 1.2 MU (0.9g)	seek expert advice	Urgently refer
stat x 1	weekly x 3		

Repeat syphilis serology at 3, 6 and 12 months. Test and presumptive treatment of all partners of infectious syphilis.

Consult with a specialist:

- Before commencing on treatment. Interpretation of syphilis serology is complex.
- Diagnosed during pregnancy. Seek urgent specialist advice for congenital syphilis.
- Positive syphilis results in a child. Additionally, discuss results urgently with child protective services.
- Unable to obtain Benzathine benzylpenicillin which is supplied as 1.2MU pre-filled syringes.
- Allergy to principal treatment choice and seeking alternative treatment option.
- Complicated syphilis. Refer those with acute neurological signs, symptoms or suspected tertiary disease to local sexual health or infectious diseases clinic.
- HIV co-infection.
- RPR is rising or a 4-fold drop is not achieved by 12 months.
- Contact tracing is unclear.

6 Follow-up

Contact tracing:

- **Primary syphilis:** 3 months plus duration of symptoms
- **Secondary syphilis:** 6 months plus duration of symptoms
- **Early latent:** 12 months
- **Late latent syphilis:** long term partners only

- ✓ Advise no sexual contact for 7 days after treatment is administered.
- ✓ Advise no sex with partners from the last 3 months (primary syphilis), 6 months (secondary syphilis) or 12 months (early latent) until the partners have been tested and treated if necessary.
- ✓ Contact tracing and presumptive treatment of partners.
- ✓ Provide patient with factsheet.
- ✓ Notify the state/territory health department according to local procedures.

Syphilis stages in pregnancy

Stage of syphilis	Time after infection	Clinical features and perinatal transmission risk
Primary	10-90 days post exposure	• Painless ulcer, usually on external genitalia. • May be present elsewhere e.g. in the mouth or on the anus/rectum • Infectious • **Vertical transmission risk 70% if untreated**
Secondary	30-150 days post exposure	• Rash, often macular-papular, may involve palms and soles, mucosal ulcers, condylomata lata, lymphadenopathy, hepatitis, iritis, arthritis, glomerulonephritis, hair loss, cranial nerve palsies. *Clinical signs spontaneously resolve at 3-12 weeks • Infectious • **Vertical transmission risk 70% if untreated**
Early Latent	<2 years post untreated infection	• Asymptomatic • Infectious • **Vertical transmission risk 40% if untreated**
Late latent	>2 years post untreated infection	• Asymptomatic • **Vertical transmission risk 10% if untreated** • Sexual transmission uncommon
Tertiary	2-30 years post untreated infection	• Neurological symptoms / signs, aortic regurgitation, aortic aneurysm, destructive lesions bones and soft tissues • **Vertical transmission risk negligible**

- Look particularly at the vertical transmission risk.
- Note that even if an infection is considered **late latent (non-infectious),** there is **still a considerable congenital syphilis risk** if Mum is untreated.

Patient X

Assessing successful treatment within the narrow timeframes of a pregnancy can be complex (slow decrease in RPR) and a higher level of caution is used compared to a person who is not pregnant.

Repeat screen 4 weeks post treatment RPR 128
Repeat screen 32 weeks RPR 16
Request neonatal management at 34 weeks from KEMH
> two titre or four fold drop within 12 month of treatment = adequate treatment

Goal – successful treatment >4 weeks before birth, with no reinfection

Response to Congenital syphilis public health review findings of latest Pilbara case

- Extra monitoring of woman diagnosed in current pregnancy
- In Hedland they will be labelled as High Risk with fortnightly meetings
- Neonatal Management Plans documented @ 34 wks via KEMH ID
- Encourage opportunistic screen of pregnant woman through ED
- Improve referral system for ED to maternity directly
- Workforce development opportunistic syphilis education/awareness in ED
- Pre printed antenatal screening pathology
- Results alert maternity staff to possible unknown pregnancy in the community or woman that have been hard to engage or regularly DNA

PathWest

ABN 83 459 340 804

PATHOLOGY REQUEST

Unit no. _____ Medicare Number _____

Surname _____

Given Names _____

Date of Birth _____ Age _____ Sex _____

Address _____

TESTS REQUESTED

URGENT ☐ PHONE ☐ FAX ☐

Ph / Fax Number: _____

FBP
Group and Antibody Screen
Syphilis Serology
Hepatitis B sAb / sAg / cAb
Hepatitis C Serology
HIV Serology
Rubella Serology
Varicella Serology
Vitamin D
Urine MC+S
Urine CT / NG PCR

PW23-0423

CLINICAL NOTES

Pregnancy Screen - ED Admission

Results to be: ☐ Faxed _____ ☐ Phoned _____

Consultant

Requesting Doctor
(surname and initials, provider number, address)

Dr C Claite 4013172B [CL884]

Hedland Health Campus
Colebatch Way
South Hedland WA 6722

Doctors Signature ✗ _____

Request Date _____

Page _____

Copy Reports to:

Fasting: Yes ☐ No ☐

Rule 3

Exemption: Yes ☐ No ☐

Anticoagulant Therapy
Warfarin ☐ Heparin ☐

Patient's Signature for Ancillary Test:
✗

Source / Hospital: HEDLAND

Ward / Clinic: EMER

Day For Collection
M T W Thu F S Su

When collecting ANTIBIOTIC or DRUG assays fill in this box:

Drug	Dosage	Date	Time

Date of Collection Time of Collection

CLOT		SST		CIT	
ACD		HEP		EDTA	
GLU		EDR		ABG	
URINE		24 URINE		DNAB	
SUDE		Other			

Collector's Signature
I certify that the blood specimen(s) accompanying this request was drawn from the patient named above and I established the identity of this patient by direct inquiry and/or by inspection of wrist band and immediately upon the blood being drawn I labelled the specimen(s)

✗ _____

Patient status at time of service or when specimens collected

	Yes	No
1. A private patient in a private hospital or approved day hospital facility	☐	☐
2. A private patient in a recognised hospital	☐	☐
3. A Medicare (public patient) in a recognised hospital	☐	☐
4. An outpatient of a recognised hospital	☐	☐

RCPA NATA

IS YOUR PATIENT PREGNANT?

We currently have a syphilis outbreak in the Pilbara. Syphilis can be contracted at any time during pregnancy.

Please consider providing full antenatal testing as this may be the **only time** this person presents in pregnancy.

Please use the pre-populated pathology form provided.

Tests requested for pregnant women should inlude:

FBC
Group and AB screen
Syphilis serology
Hep B/C/HIV serology
Rubella serology
Varicella serology
Vit D
Urine MC&S + PCR - Chlaymdia and Gonorrhoea

Specimens:

x2 Gold top tubes
x1 Purple top tube
x1 Pink top tube
x1 Urine jar

Case History study

Birth via SVB at 39+3 weeks

Paired maternal and neonatal serology

Mother RPR 2

Baby RPR negative

Even though low risk baby, Prophylactic treatment of IM benzathine penicillin was given until results were returned as negative

References

https://www.health.gov.au/our-work/national-response-to-syphilis#:~:text=Three%20population%20groups%20are%20especially,of%20regional%20and%20remote%20Australia

https://www.naccho.org.au/enhanced-syphilis-response-esr/

WA Syphilis outbreak response (health.wa.gov.au)
Syphilis in Pregnancy (health.wa.gov.au)

Syphilis - Community HealthPathways Western Australia

Syphilis | DermNet (dermnetnz.org)

Resources

If your service is interested in doing syphilis point of care testing contact syphilispoct@health.wa.gov.au

Guidelines and enrolment form for the WA syphilis point of-care testing program can be found at https://www.health.wa.gov.au/~/media/Corp/Documents/Health-for/Sexual-health/SORG/Guidelines-and-enrolment-form-for-the-WA-syphilis-point-of-care-testing-program.pdf

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The people and communities affected by syphilis in pregnancy and congenital syphilis throughout Australia including overrepresented Aboriginal and Torres Strait Islander communities.

Thank you for your time

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