

Review of Skin Infections: Epidemiology & Treatment

Dr Asha Bowen

Paediatric Infectious Diseases Specialist
NHMRC Early Career Fellow



WESFARMERS
CENTRE OF
VACCINES
& INFECTIOUS
DISEASES



Princess Margaret
Hospital for Children



THE UNIVERSITY OF
WESTERN AUSTRALIA

Acknowledgement of Country





Overview

- Epidemiology
- Systematic Review
- The importance of partnerships: SToP Trial

Epidemiology

Impetigo

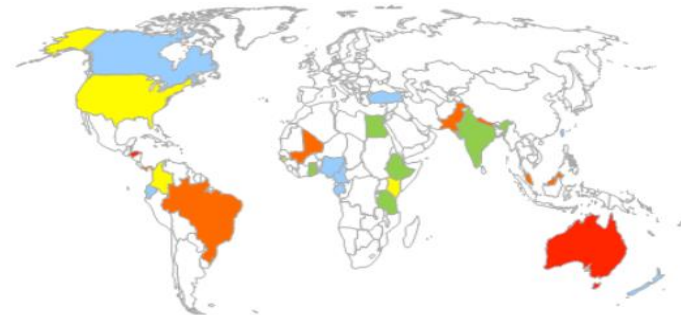


- Bacterial infection of superficial skin
- GAS and *S aureus*
- LL > UL
- Painful, itchy, inflammatory
- More than a benign, nuisance condition

Impetigo: Global Burden

- 89 studies over 45 y, >145 000 children
- Median prevalence **12%** (IQR 4 – 19%)
- Pooled prevalence **17%** (IQR 13 – 21%)
- > 162 million children with impetigo
- Top 50 most prevalent diseases globally

Figure 2: Map of countries with available population-based studies of impetigo prevalence, highlighted and colour coded by median prevalence of impetigo.



Bowen et al PloS One 2015,
Hay et al 2014

Coding of median prevalence 0–5% blue, 5.1–10% green, 10.1–15% yellow, 15.1–20% orange and >20% red. Source: Map from powerpointworldmaps.com (accessed 14/10/2014).



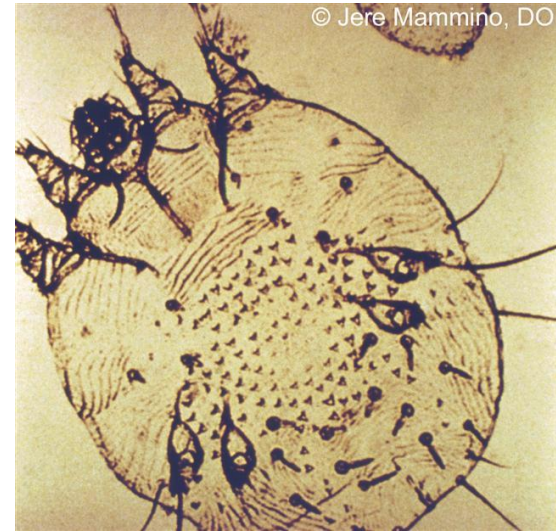
Impetigo: Australian burden

- 10 studies, all remote Aboriginal populations
- Median prevalence 45% (IQR 34 – 49%)
- 16,000 children with impetigo at any one time in remote Qld, NT and WA
- Unchanged over 20 years
- Top 3 reason for clinic visit NT & WA

The Global Epidemiology of Impetigo: A
Systematic Review of the Population
Prevalence of Impetigo and Pyoderma

Asha C. Bowen^{1,2,3*}, Antoine Mahé⁴, Roderick J. Hay^{5,6}, Ross M. Andrews¹, Andrew C. Steer^{7,8}, Steven Y. C. Tong^{1,9}, Jonathan R. Carapetis^{2,3}

Scabies



- Parasitic infection of the superficial skin
- Painful, itchy +++, inflammatory
 - Sleeplessness, poor concentration, missed school
- UL > LL

Scabies: Global burden

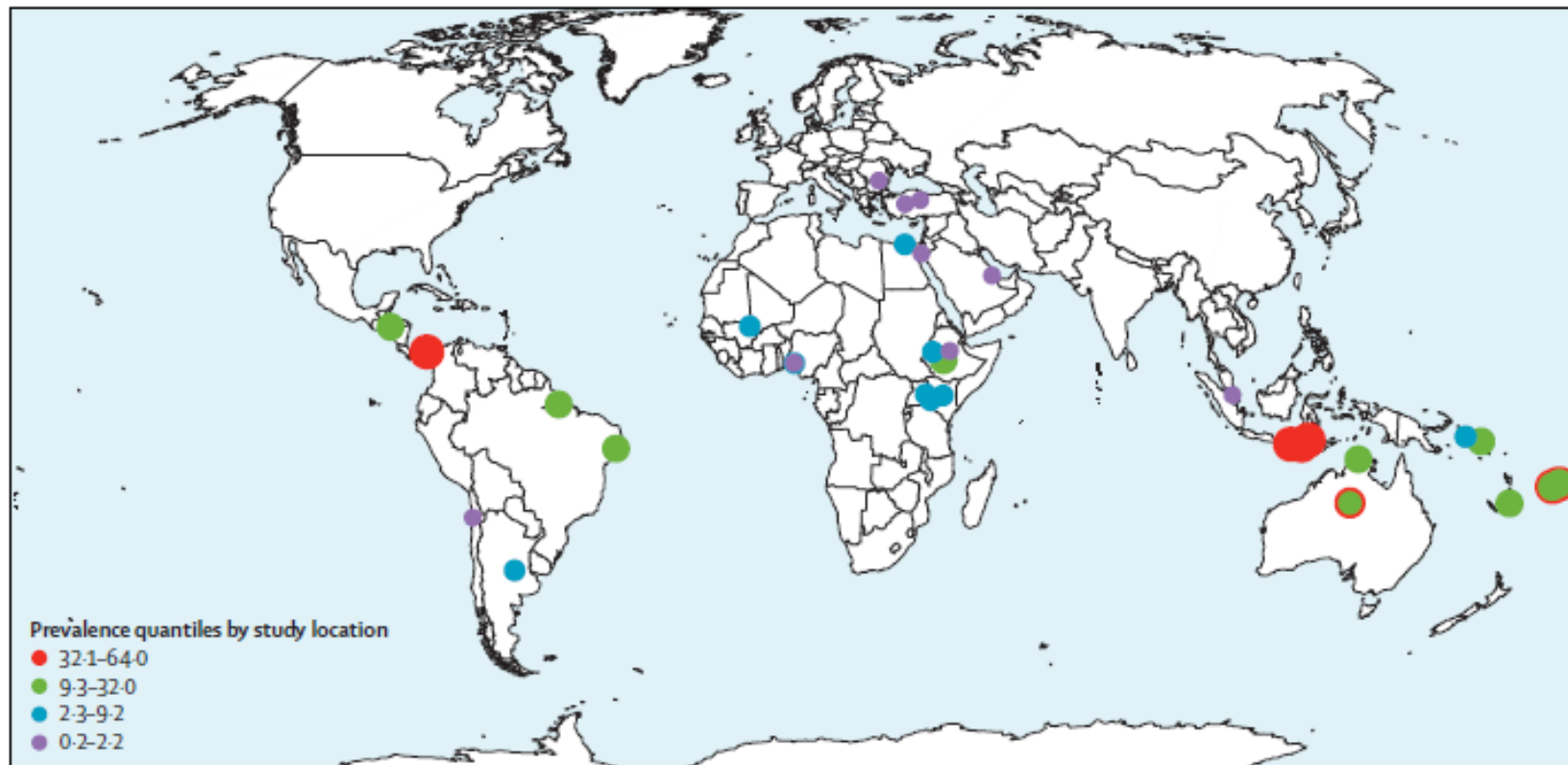


Figure 2: Map of scabies prevalence in children younger than 19 years

This map shows the study sites for the 32 studies reporting data in children younger than 19 years (three studies were done at two sites).

Prevalence of scabies and impetigo worldwide:
a systematic review

Lancet Infect Dis 2015;
15: 960-67

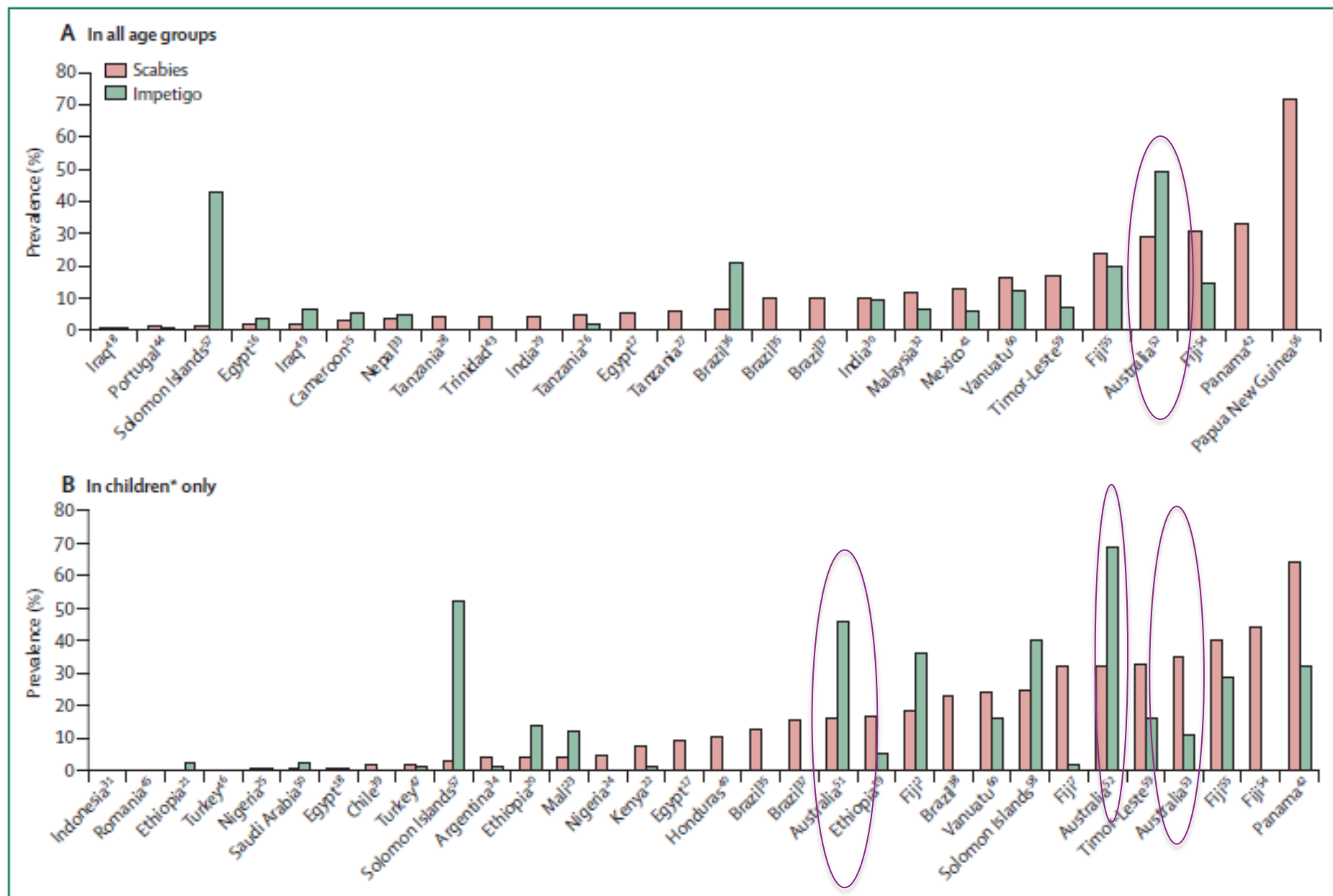


Figure 3: Scabies and Impetigo prevalence by Increasing scabies prevalence

*Younger than 19 years.



Scabies: Australian burden

- 5 studies with scabies prevalence data in impetigo systematic review
- Mean 22%, median 23% prevalence
- 1st episode often by 2 months of age
- 70% have had scabies by 1 yo

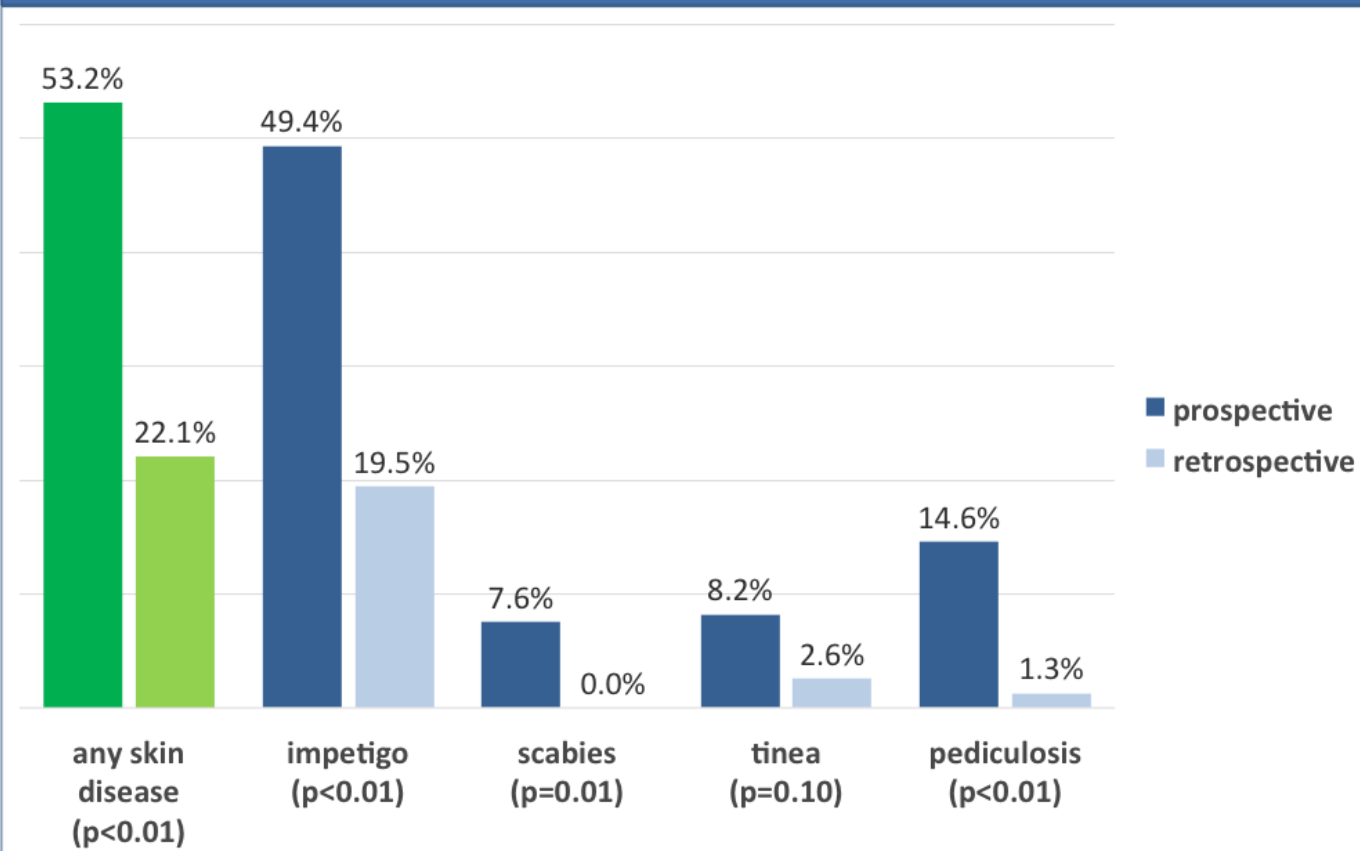
The Global Epidemiology of Impetigo: A
Systematic Review of the Population
Prevalence of Impetigo and Pyoderma

Asha C. Bowen^{1,2,3*}, Antoine Mahé⁴, Roderick J. Hay^{5,6}, Ross M. Andrews¹, Andrew
C. Steer^{7,8}, Steven Y. C. Tong^{1,9}, Jonathan R. Carapetis^{2,3}

Are scabies and impetigo “normalised”? A cross-sectional comparative study of hospitalised children in northern Australia assessing clinical recognition and treatment of skin infections

Daniel K. Yeoh^{1,2,3,*}, Aleisha Anderson^{1,3,4}, Gavin Cleland^{2,3}, Asha C. Bowen^{1,2,5,6}

Figure B. Prevalence of Skin Disease in Prospective vs Retrospective Case Review



Systematic Review

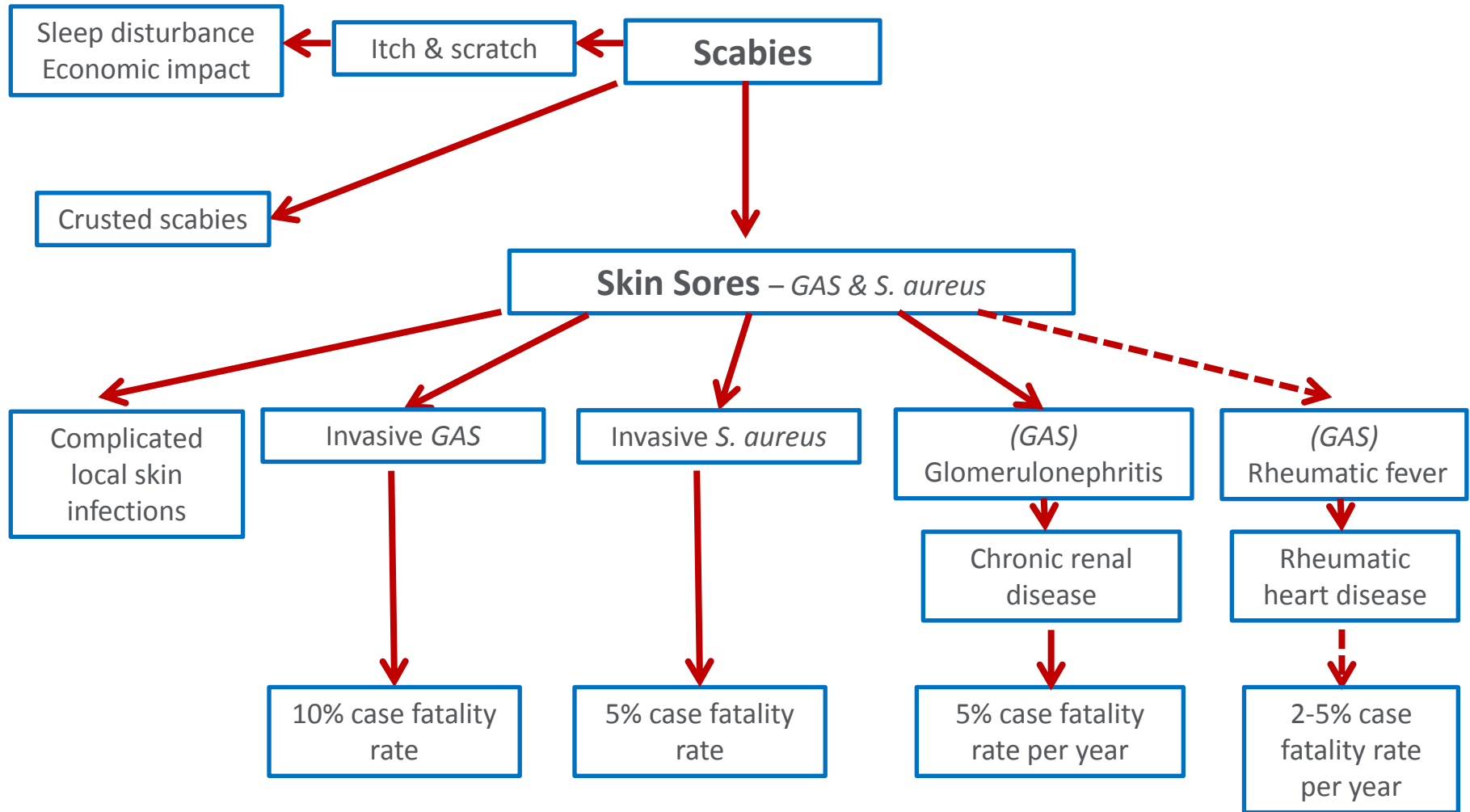
Pippa May



A systematic review of the treatment, prevention and public health control of skin infections in endemic settings

- **Scientific Leadership:** Pippa May, Asha Bowen, Steven Tong, Andrew Steer, Ross Andrews, Bart Currie, Sam Prince, Louis Schofield, Jonathan Carapetis
- **Data extraction:** Aleisha Anderson, Ingrid Duff, Claire Ferguson, Myra Hardy, Thérèse Kearns, Ella Meumann, Lauren Thomas, Georgia Walker, Dan Yeoh
- **Funding support:** HOT NORTH and Wesfarmers Centre of Vaccines and Infectious Disease

Public Health importance of skin infections



Evidence-based management of skin infections in Aboriginal communities



- Systematic appraisal
- Impetigo
- Scabies
- Crusted scabies
- Fungal infections
 - Tinea corporis,
 - tinea capitis,
 - tinea unguium
- To inform the national guideline for prevention and management of skin infections in endemic settings



Why did we do this SR for populations with endemic skin infections?

- Cochrane SR on impetigo and scabies: only RCTs
 - large hospital-based settings in well-resourced populations
 - Lower quality studies relevant to resource-limited settings not considered for inclusion
- What is best management and prevention for our priority population?



Methods: Eligibility criteria

- **Participants:** Any age or sex and diagnosed with impetigo, scabies or fungal skin infections
- **Setting:** Tropical regions; remote Aboriginal and Torres Strait Islander communities; resource-limited populations in OECD countries; low, low-middle and middle income countries
- **Intervention:** any treatment or public health intervention, with any comparator
- **Study design:** any experimental or observational (with assessment of exposure on outcome)



Search Strategy

- Any study published since 1960 in English
- Peer reviewed literature: PubMed, EMBASE, Global Health
- Grey literature: AIHW, Oalster, Informit, WHO website, IndigenousHealth/InfoNet
- Clinical trial registries: ClinicalTrials.gov, ANZ Clinical Trials Registry, WHO International Clinical Trials

Data extraction

- Completed by 2 independent reviewers in Covidence software
- Cochrane Risk of Bias Assessment



Results: pending

Research Partnership





Situational Analysis

- Understanding the landscape of skin care in the Kimberley in 2017
 - >25 interviews
 - >65 survey monkey responses
 - Service mapping
- Extensive community consultation

SToP: skin sores & scabies



SToP Trial

Study Visit	1	2	3	4	5	6	7	8	9	Maintenance
Time	Sep 2017	Feb 2018	Jun 2018	Nov 2018	Feb 2019	Jun 2019	Nov 2019	Feb 2020	Nov 2020	2021
Study phase	Baseline		Step 1			Step 2			Follow-up	Maintenance
Community 1										
Community 2										
Community 3										
Community 4										



Pre-trial when communities will receive standard care through the clinic and school-based surveillance programs will establish baseline prevalence



The whole community transitions to the intervention



The period outside the school year when higher mobility occurs with individuals having a mix of standard care outside the community or trial within the community



The trial will continue into the follow-up phase for all communities and will conclude with the final school surveillance at the end of 2020

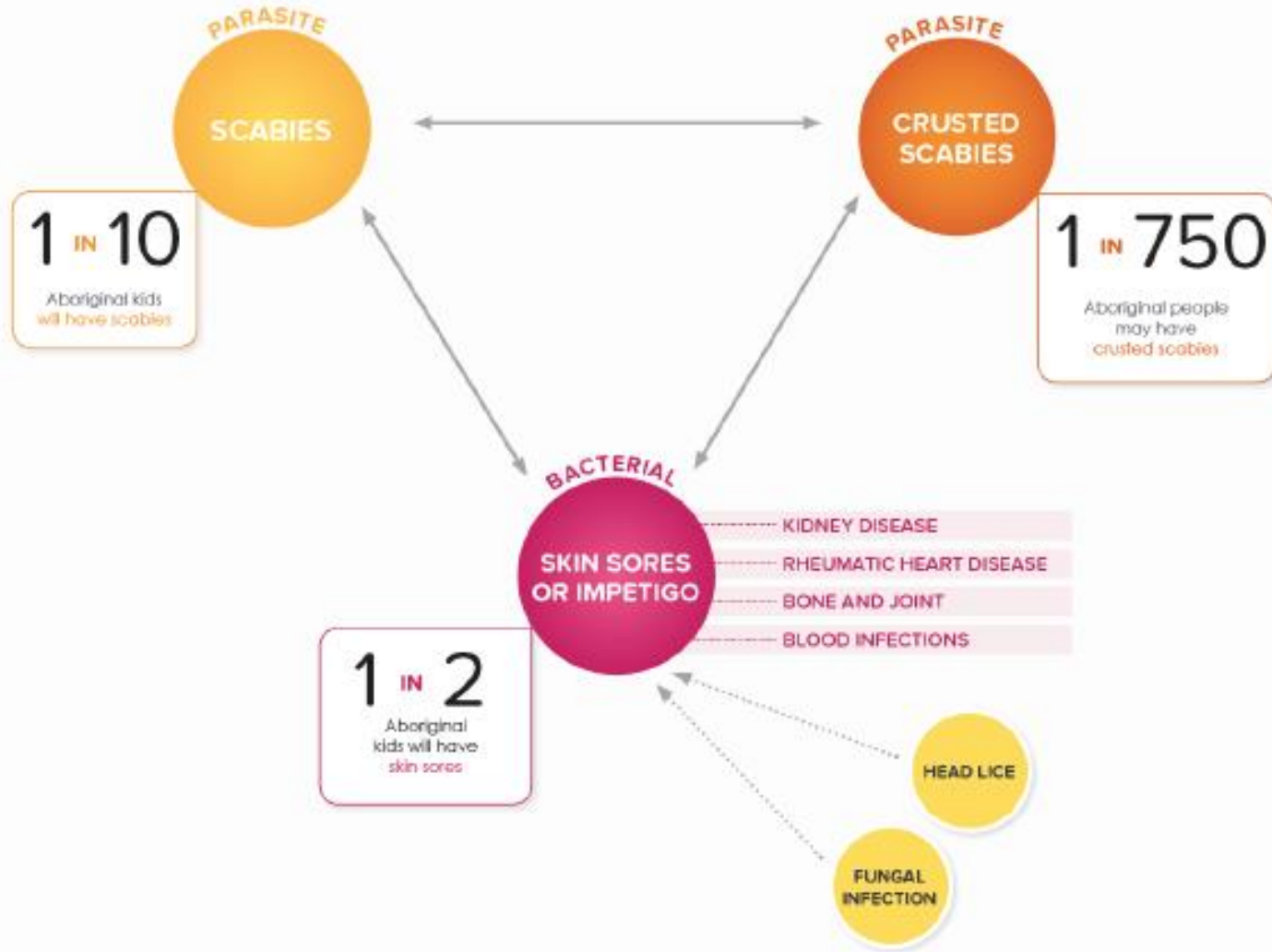


Post-trial measurements will occur

- “See” sores & scabies
- “Treat” sores & scabies
- “Prevent” sores & scabies
- A cluster randomised trial with a stepped wedge design in the Kimberley

Funding: WA Health, NHMRC

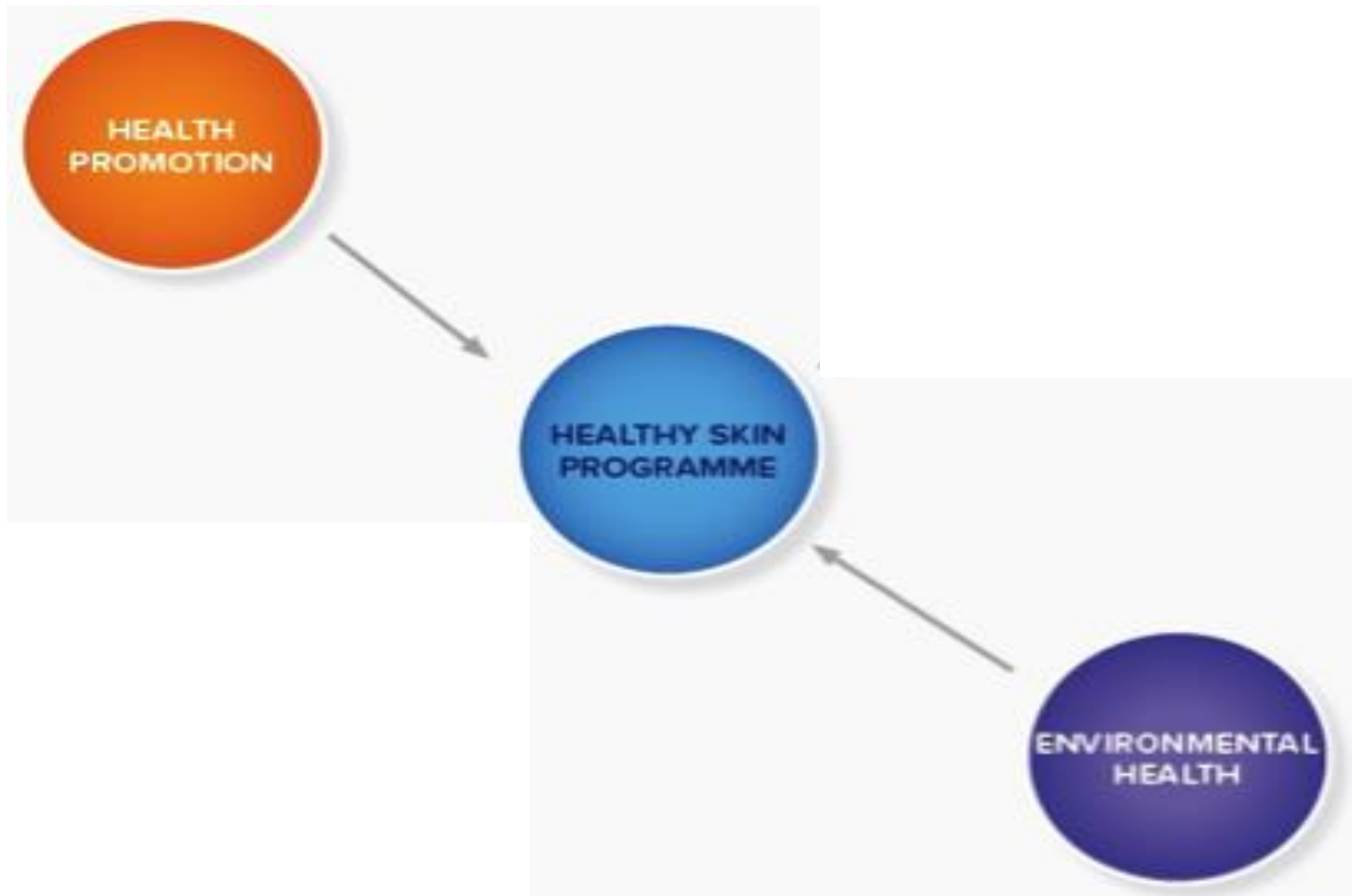
See: How common?



Treatment: better options



Prevent: sores & scabies





SToP: Aims

- Reduce skin sores in school kids by 50%
- **Measurement:** school based skin surveillance of 5 – 9yo three times / year
- Improve overall health of Aboriginal children

SToP Trial: see, treat, prevent





Thank you

