

# Missing Piece Surveillance Study

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Skin Health Team & Group A Strep Team | Perth, Australia  
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## Introduction

Group A  $\beta$ -haemolytic Streptococcus (GAS), a bacterium that causes skin, mucosal, systemic and autoimmune complications. **Repeated GAS infections can lead to serious autoimmune diseases** such as acute rheumatic fever (ARF) and rheumatic heart disease (RHD). **Australian indigenous population leads the world in ARF/RHD incidence and mortality**, which renders this study important and urgent.

Past beliefs based on evidence gathered mainly in temperate climates recognized GAS pharyngitis as the sole link to ARF. However, Australian indigenous population presents a different trend of GAS burdens: **low pharyngitis and high impetigo rates, which is opposite of the epidemiologies recorded in past studies about GAS pathogenesis**. Thus hypotheses have been made that GAS impetigo may also contribute to ARF development.

Because of inconsistent methods of examinations, lack of continuous public surveillance, etc., many theories suggesting GAS-impetigo-ARF links are not yet universally accepted, and require more data for corroboration. **A crucial missing piece of evidence - documentation that GAS pharyngitis is truly rare in Australian indigenous children - has yet to be provided.** This main goal of this study is to find this missing piece. Other aspects of this study will also serve as a platform to further investigation of the concurrent GAS burdens in WA aboriginal children.

## Research Questions

- Is GAS pharyngitis truly rare among Australian indigenous children?
- What is the concurrent burden of GAS pharyngitis and GAS impetigo, and their links to ARF/RHD?
- What are the epidemiology and molecular epidemiologies of GAS pharyngitis and GAS impetigo in this population?

## Objectives

For Australian indigenous populations,

1. Evaluate the concurrent burden of GAS pharyngitis and GAS impetigo
2. Describe the epidemiologies of GAS
3. Test the specificity, sensitivity, and feasibility of the multiple assessment tools employed (RADT, DBS/ ASOT, photography, etc.) for GAS in remote telehealth settings.
4. Evaluate the validated clinical diagnosis guidelines against the gold standard of laboratory culture for GAS

## Methods

Type: observational surveillance study

Participants: 5-14 year-old children at schools in the remote regions of WA (Kimberley)

### Surveillance

1. **Screening:** Every child is screened, at the start, middle, and end of the surveillance period.
  2. **Active Surveillance:** Weekly surveillance of only those with skin sores or sore throats.
- \*\*\*Throat and skin swabs, dried blood spot test, and rapid antigen detection test are employed as determined by the protocol.

### Lab

1. Culturing the throat and skin swabs to see whether they are positive for GAS bacteria.
2. ASOT levels calculated and calibrated from DBS.
3. *emm*-typing of GAS strains



Figure 1. Positive swab culture for Group A Strep bacteria.

## Results/Discussion

*No results available/disclosable for the public yet.*

The results of this study will help inform primary prevention strategies for indigenous children in WA, and provide more evidence to the advocacy for more government intervention and attention. This will also inform the development of a global GAS vaccine on strains coverage.

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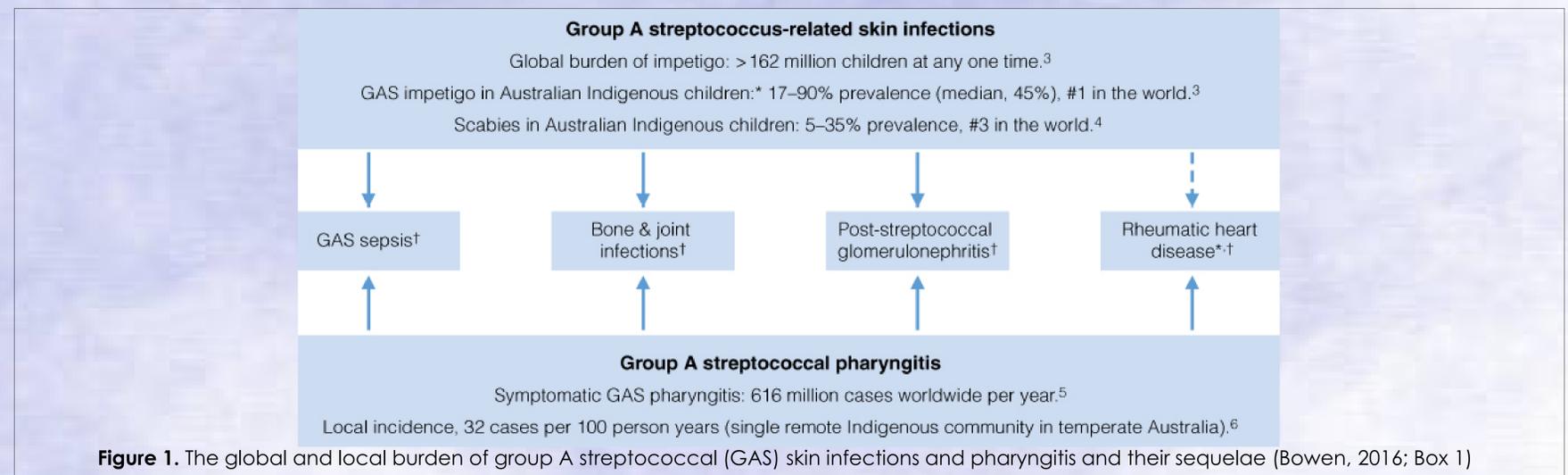


Figure 1. The global and local burden of group A streptococcal (GAS) skin infections and pharyngitis and their sequelae (Bowen, 2016; Box 1)