

ADULT IMMUNISATION FORUM

2023

This event will start at 8:30am AWST

22 JUNE 2023

8:30AM–5:00PM AWST



IMMUNISATION
COALITION

SESSION 3



Tony Cunningham

Herpes Zoster



Laurens Manning

Adult Strep A Disease and the
Potential Impact of a Vaccine



Deb Strickland

Immunomodulatory
Therapies

Laurens Manning

Adult Strep A Disease and the
Potential Impact of a Vaccine

Associate Professor - University of Western
Australia



Acknowledgement of Country



I would like to acknowledge the Nyoongar Wadjuk Boodjar people, Traditional Custodians of the land on which we gather today and pay my respects to their Elders past and present and extend that respect to Aboriginal and Torres Strait Islander people here today.

I recognise and thank them for their valuable contributions to Australian society and our research.



What are the prospects for a Strep A vaccine for adults?

As of my knowledge, there is **no commercially available vaccine specifically targeted for Strep A in adults**. Strep A infections can lead to various illnesses including strep throat, scarlet fever and invasive diseases such as **cellulitis, necrotizing fasciitis and streptococcal toxic shock syndrome**. The existing Strep A vaccine is **primarily developed for prevention of Strep A infections in children**.

Developing a vaccine specifically for adults poses some challenges. Unlike pneumococcus and meningococcus, **Strep A has a complex array of virulence factors and a highly variable M protein on its surface which makes it more difficult to develop a universally effective vaccine**.



Will a Strep A vaccine provide cross protection against Group C/G Streptococci (SDSE)?

Would depend on several factors, including specific antigens targeted by the vaccine and the degree of similarity or cross reactivity between different strains

What about a Strep A vaccine to prevent cellulitis?

Prevention strategies for cellulitis generally involve maintaining good skin hygiene. Here are some general tips to reduce the risk of cellulitis.

Strep A: 5th most lethal pathogen, most neglected

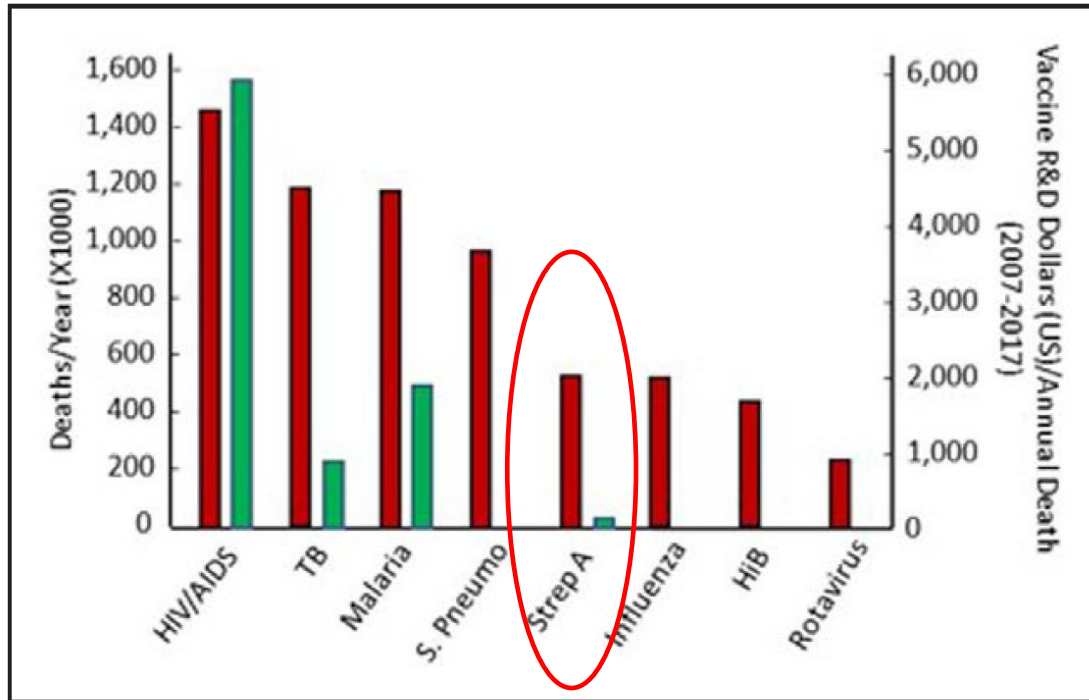
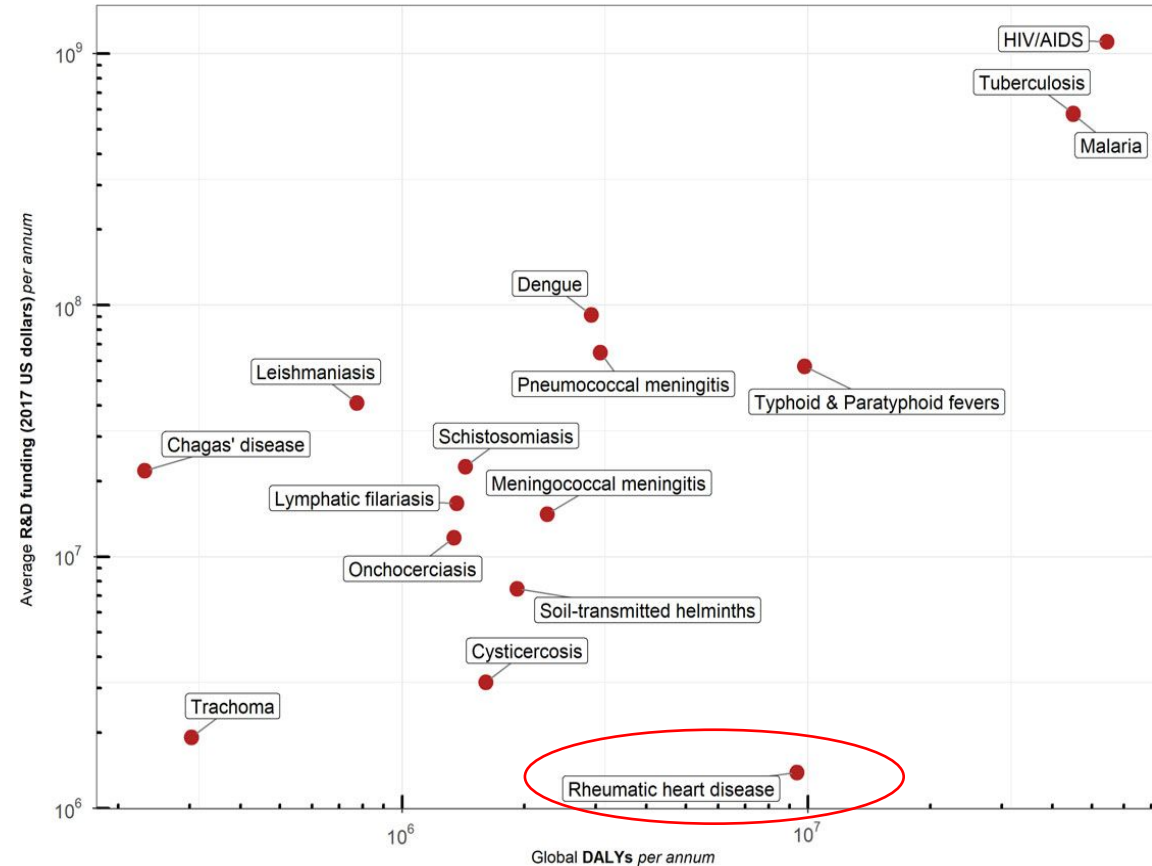


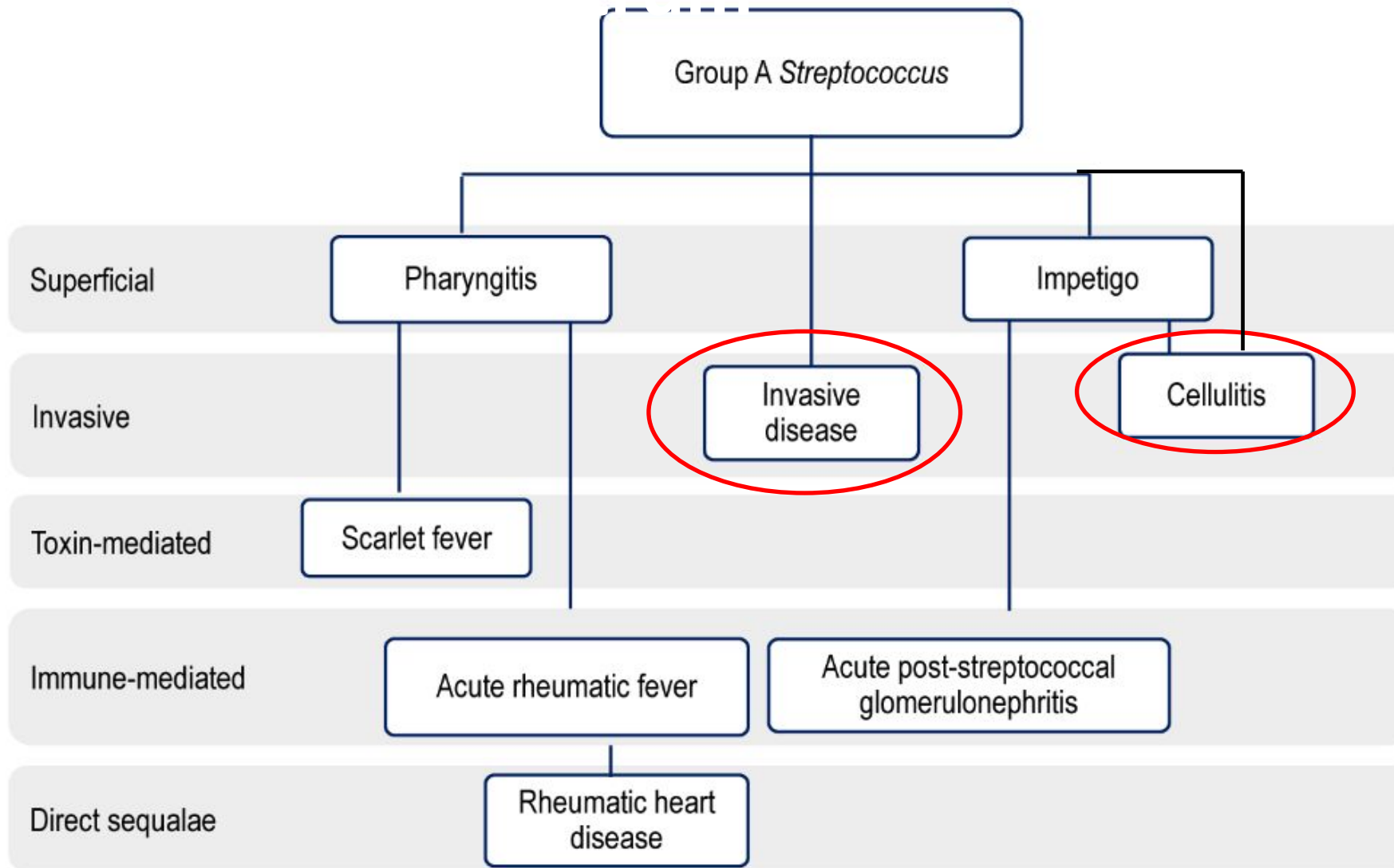
Figure 1. Annual mortality* (2010 GBD [Global Burden of Disease]³³) attributed to the 8 leading infectious agents (red) with all-source research and development (R&D) funding for vaccine development (green) for pathogens without a vaccine (G-FINDER, 2007–2017).³⁴

Beaton et al. *Circulation* 2020



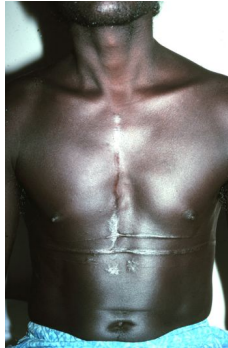
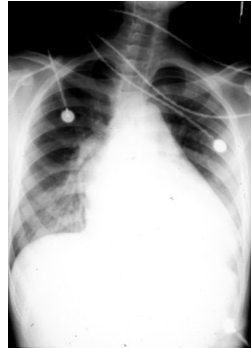
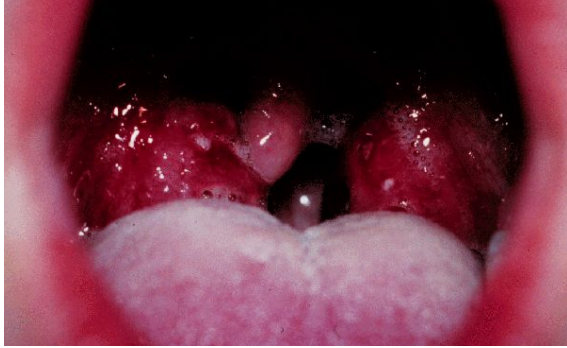
McLeod et al. *TRSTMH* 2019

* In terms of R&D spend relative to disease burden

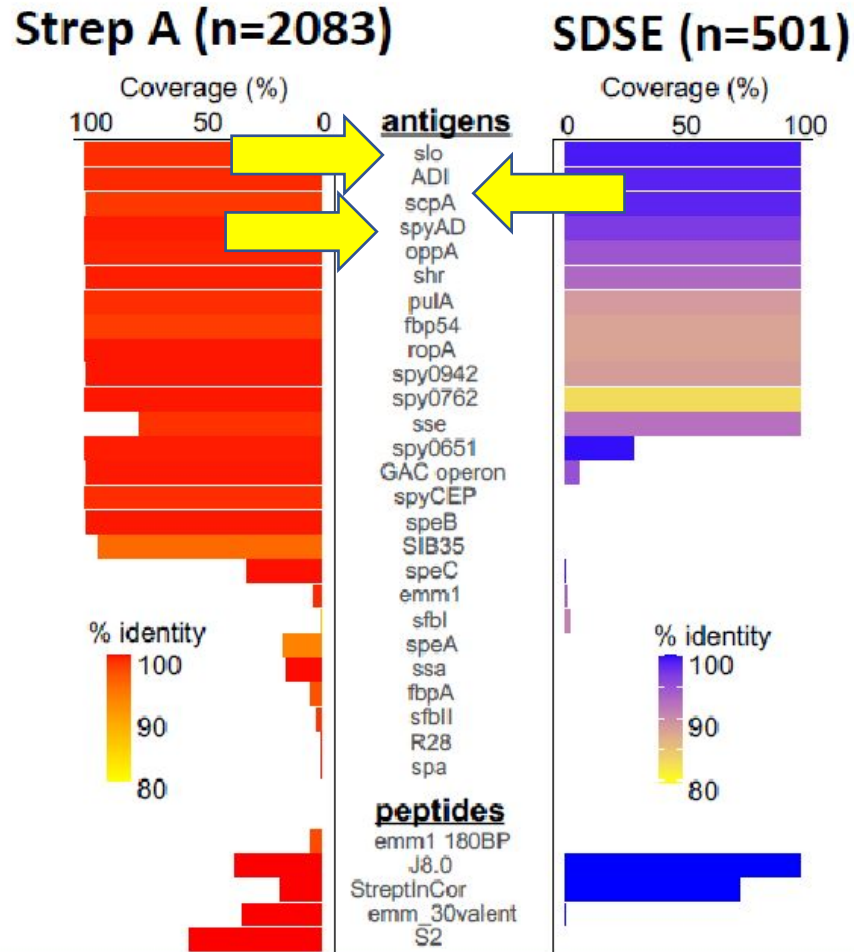


Adapted from Cannon et al. **An economic case for a vaccine to prevent group A *Streptococcus* skin infections.** Vaccine, 2018.

Strep A (and SDSE) infections in adults

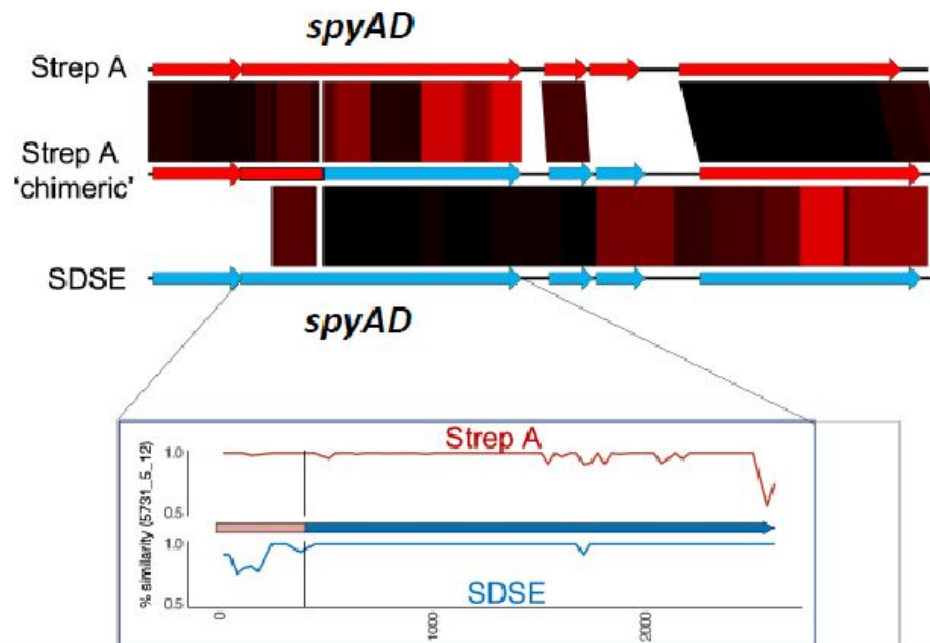


Group C/G Strep – *S. dysgalactiae* ss *equisimilis* (SDSE)



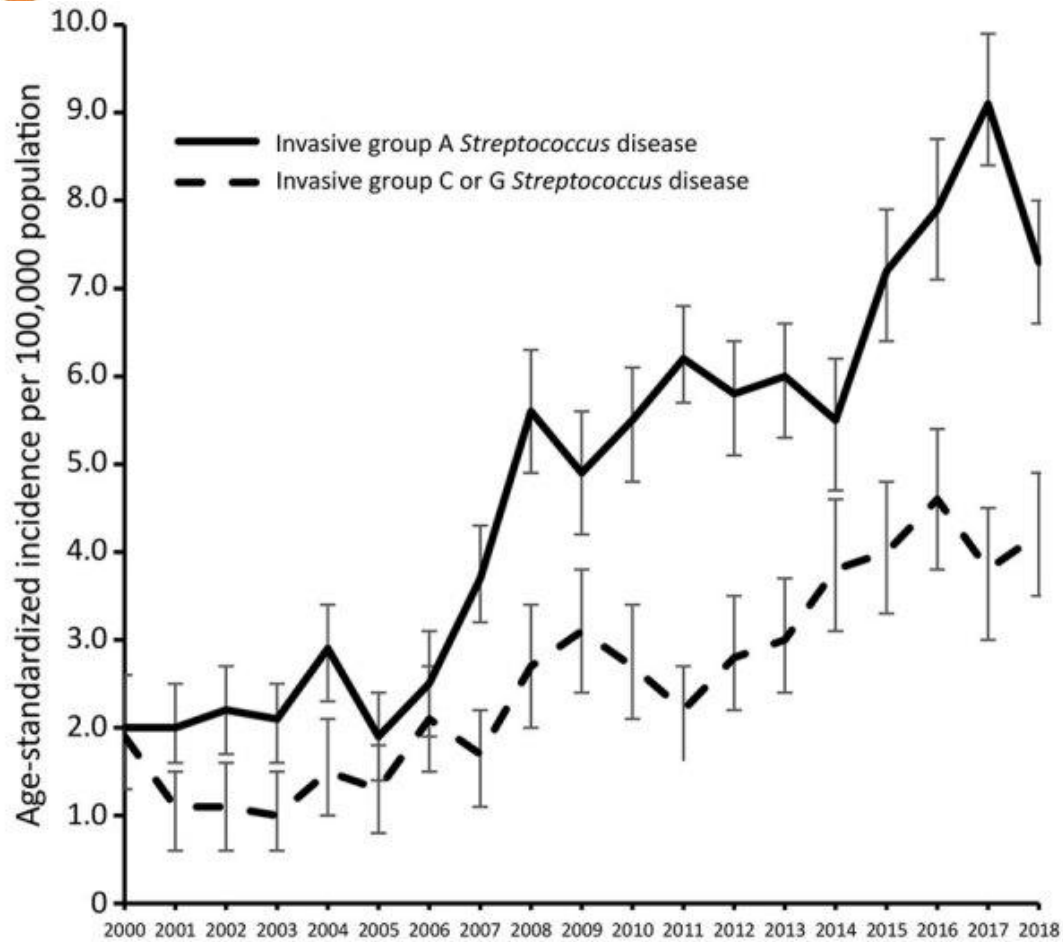
Interestingly.....

At least 5 conserved vaccine antigens display signatures of likely inter-species recombination (spyAD, pulA, shr, oppA, fbp54)

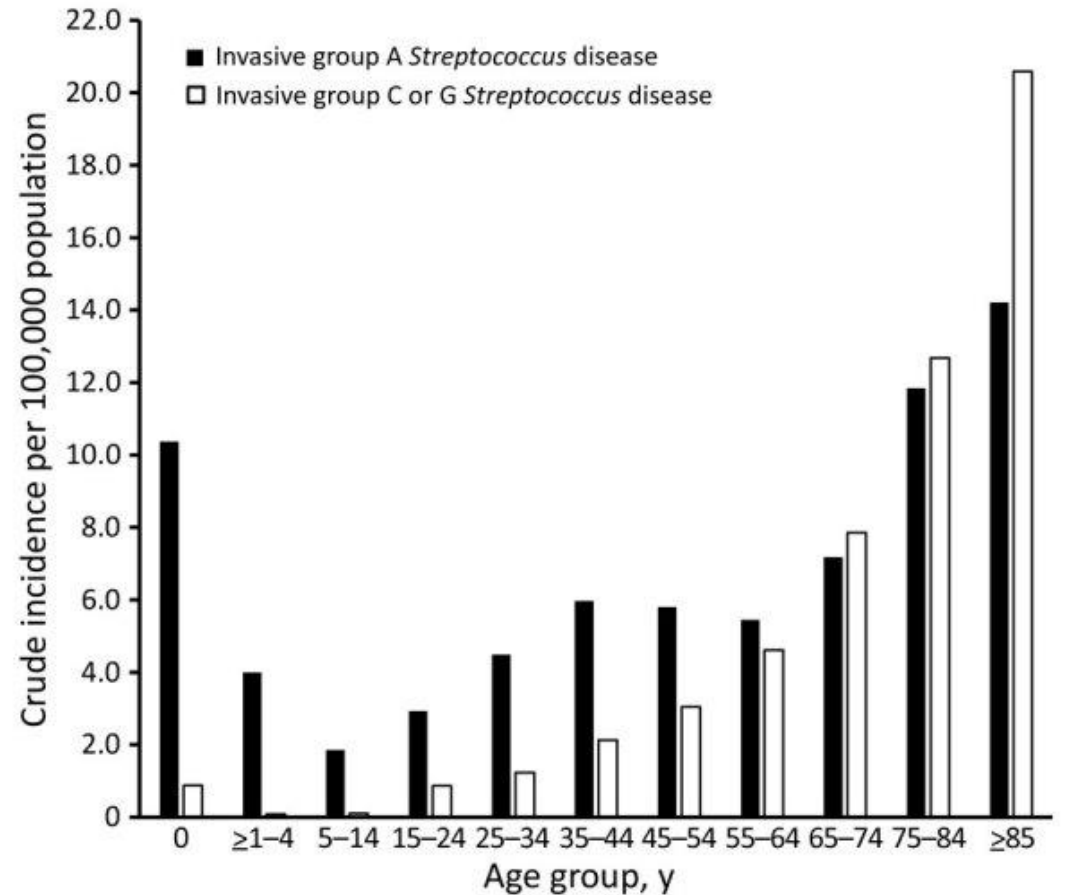


~12 Strep A candidate vaccine antigens would theoretically impact global SDSE population

Increasing incidence of invasive Strep A (and C/G) in Australia



Wright et al. MJA 2021



Wright et al. EID 2022



The number of invasive strep A cases reported to authorities has been rising nationally

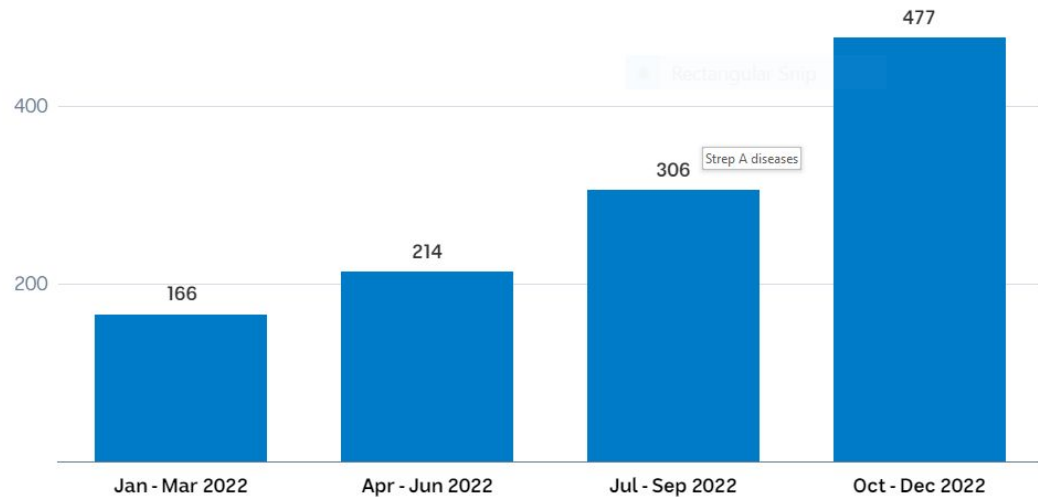


Chart: ABC News / Source: National Notifiable Disease Surveillance System

Teenager turned away from NSW hospital three times before dying of a severe infection

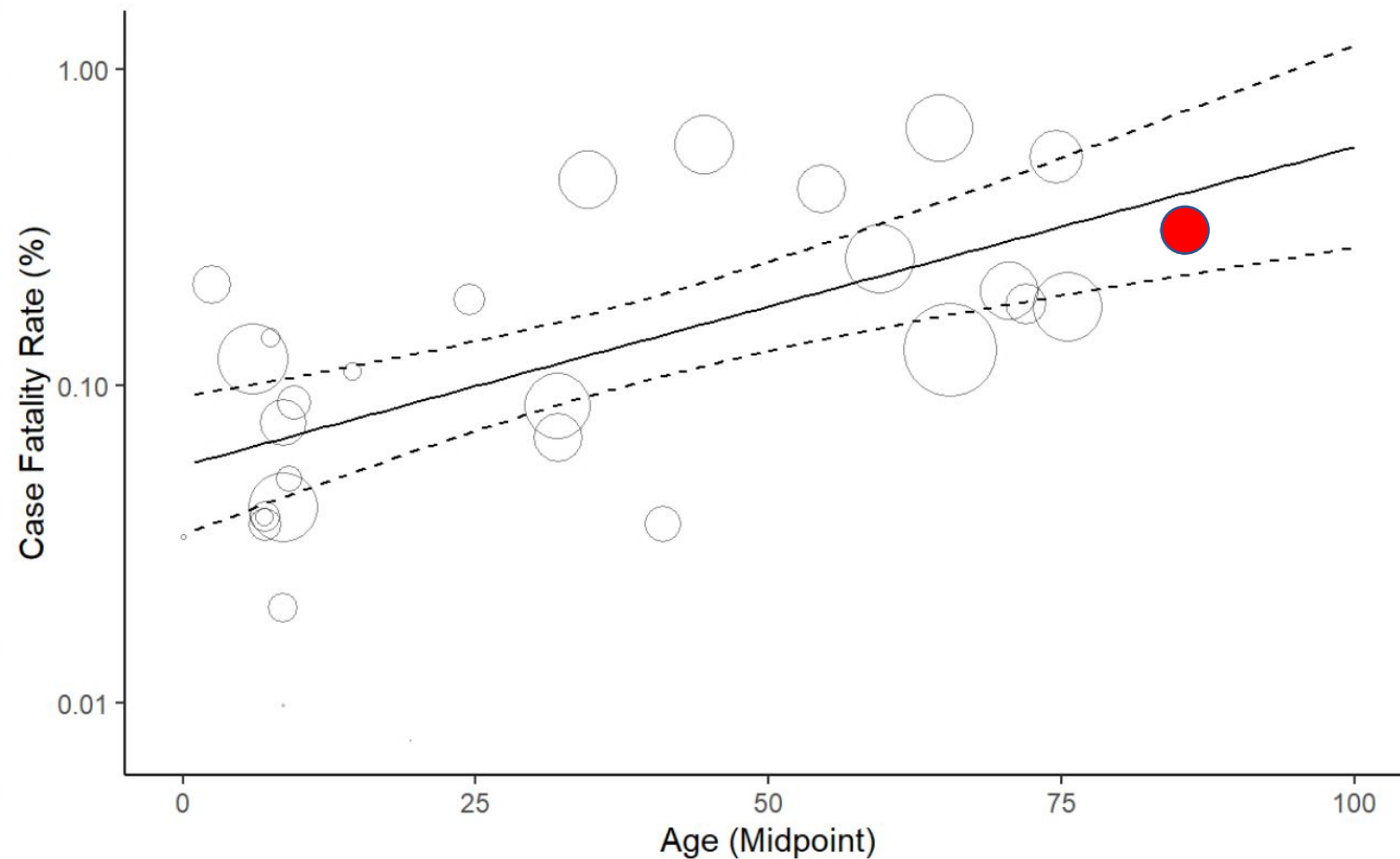
A doctor who later saw Alex Braes said the 18-year-old was 'the sickest patient he'd ever seen at Broken Hill' hospital



▲ Except for one nurse at one presentation noting the teenager's temperature as 'normal' and his pulse as 'regular', no vital signs were recorded until Alex Braes' fourth presentation to Broken Hill hospital in NSW. Photograph: Dean Lewins/AAP

A teenager dying of a severe infection and blood poisoning went to a [New South Wales](#) country hospital four times in 32 hours before his blood pressure and other basic readings were recorded, a coroner has heard.

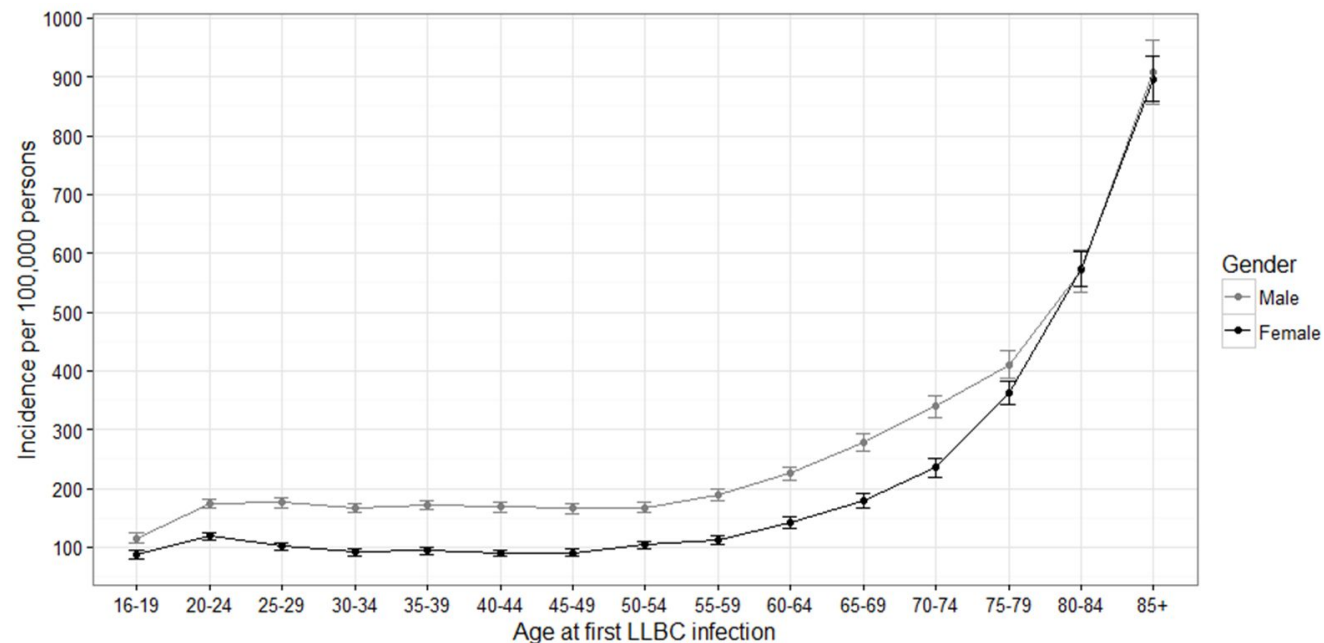
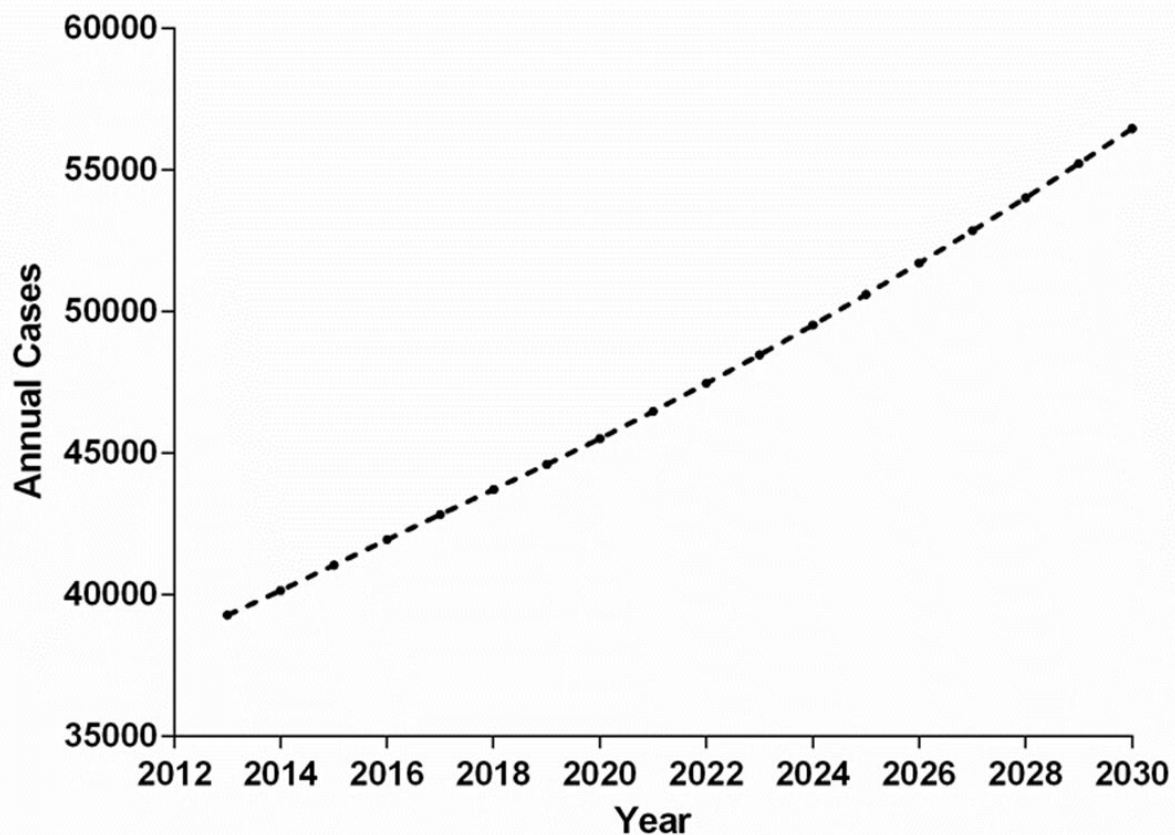
Invasive Infection: Global CFR



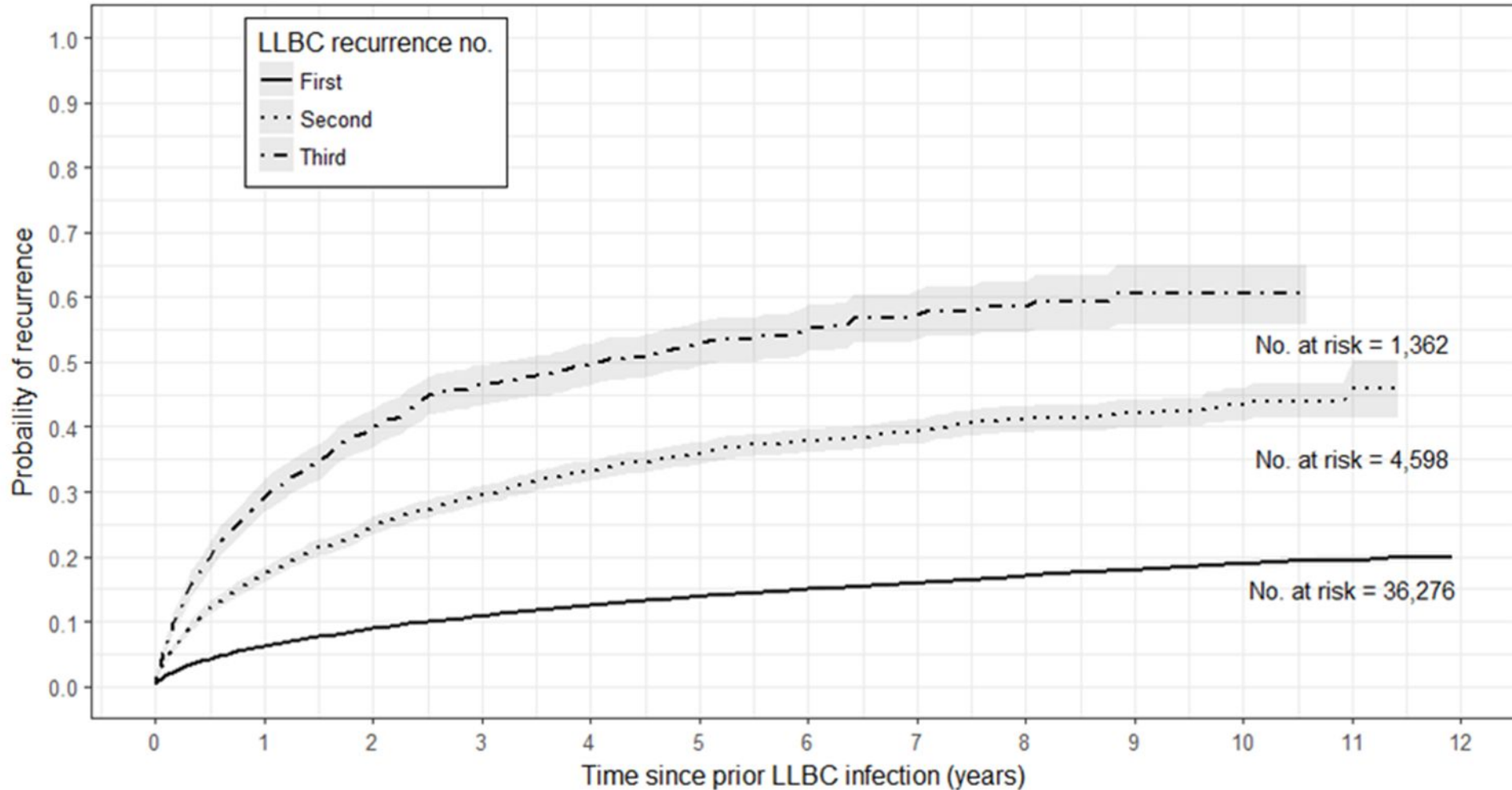
Cannon, et al. The global epidemiology of invasive infection by group A *Streptococcus*: A systematic review and meta-analysis. Manuscript in preparation.



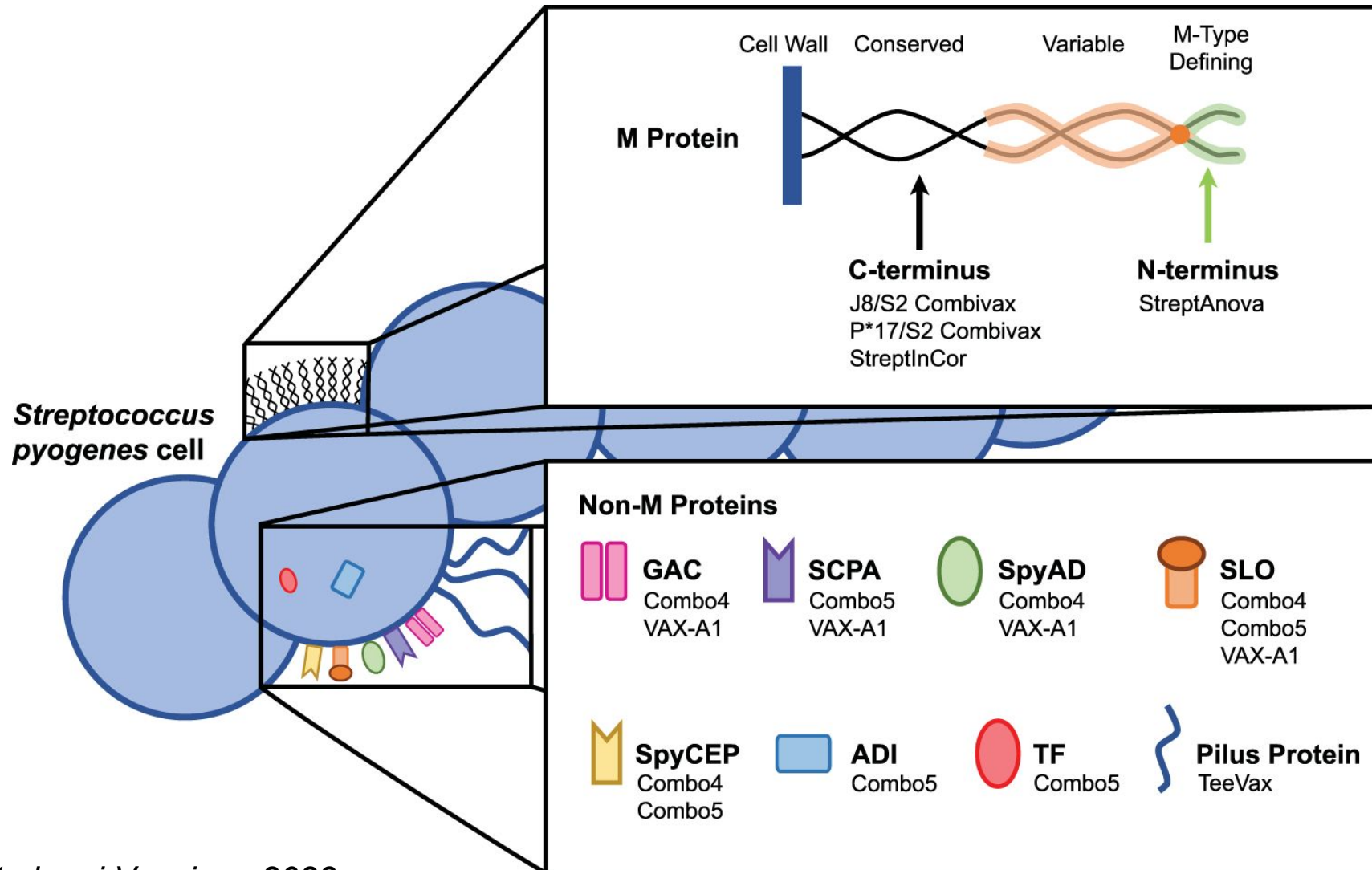
Epidemiology of cellulitis – 1st hospitalisation; elderly

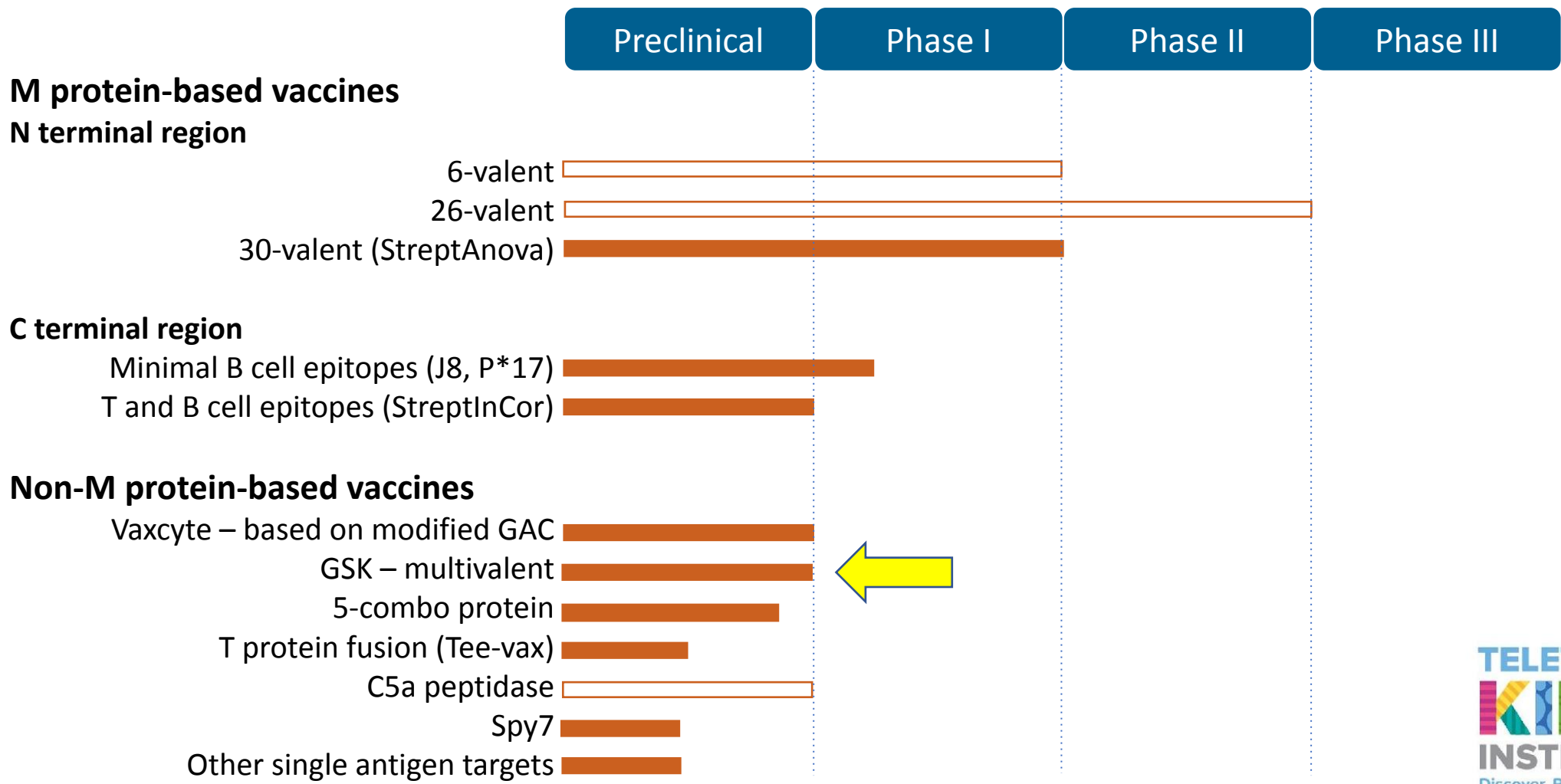


Cellulitis recurrence – a positive feedback loop



Strep A vaccine pipeline is sparse



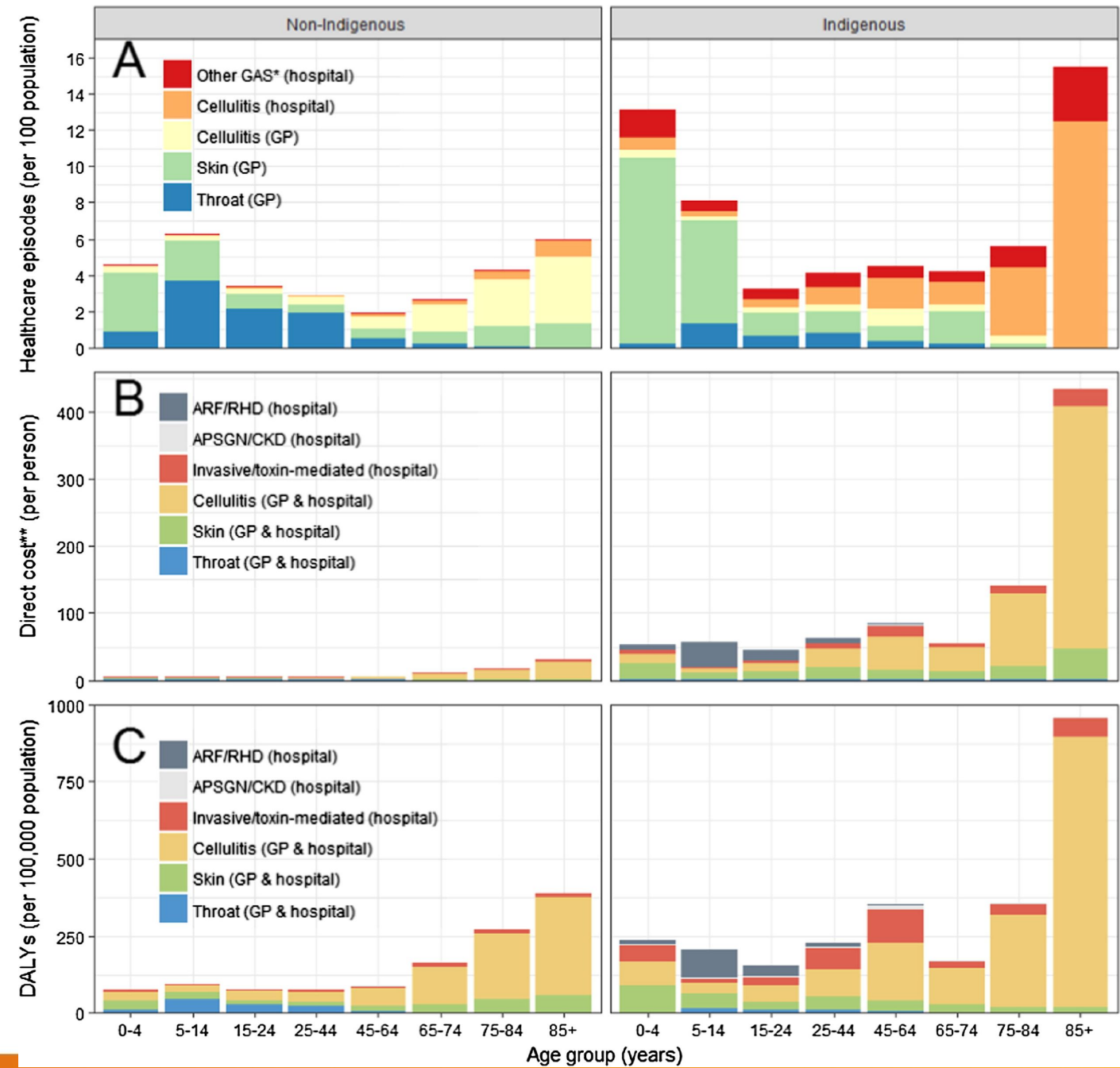


■ active program □ discontinued

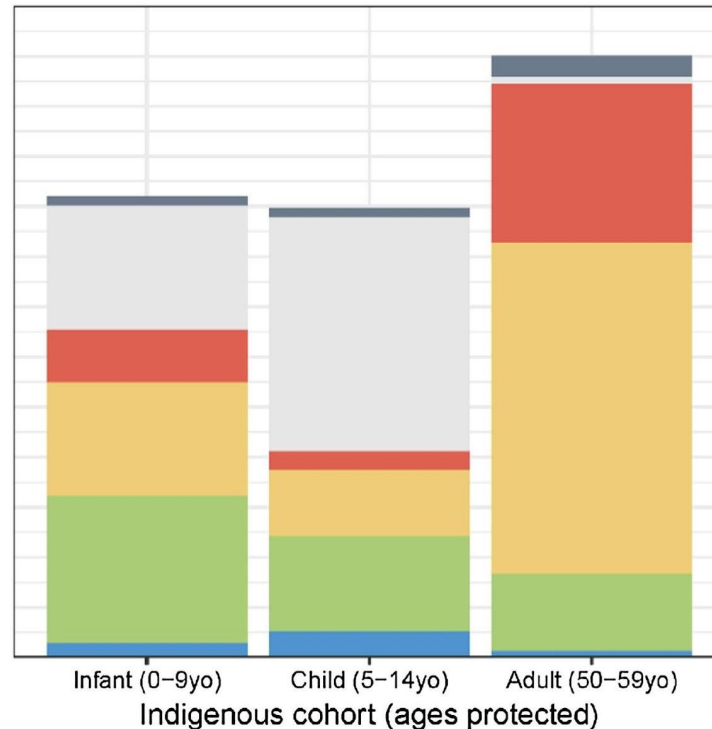
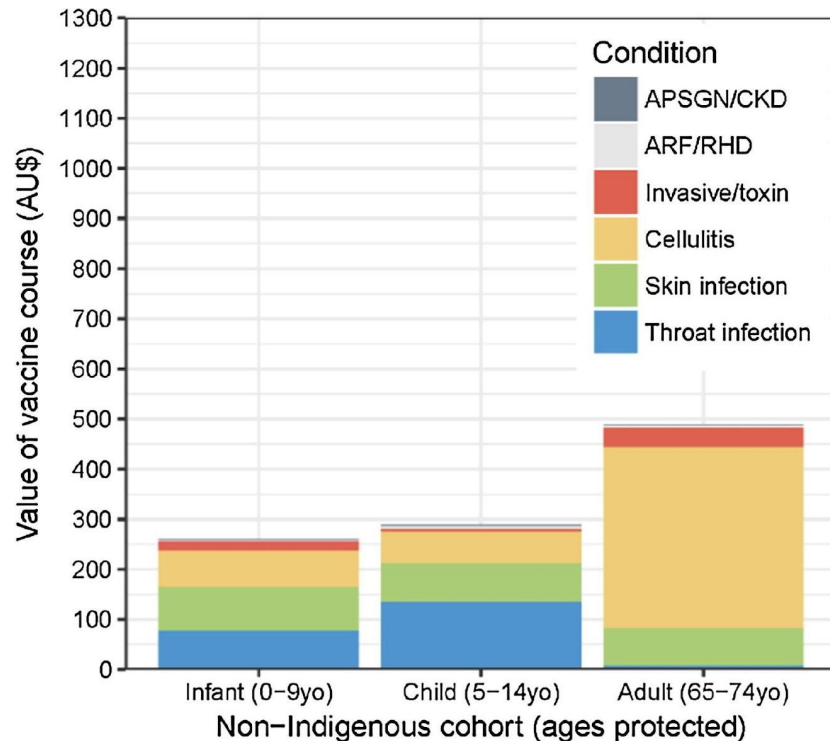




- **Impact:**
- 19,738–34,482 DALYs
- AU\$157.8–AU\$263.7 million

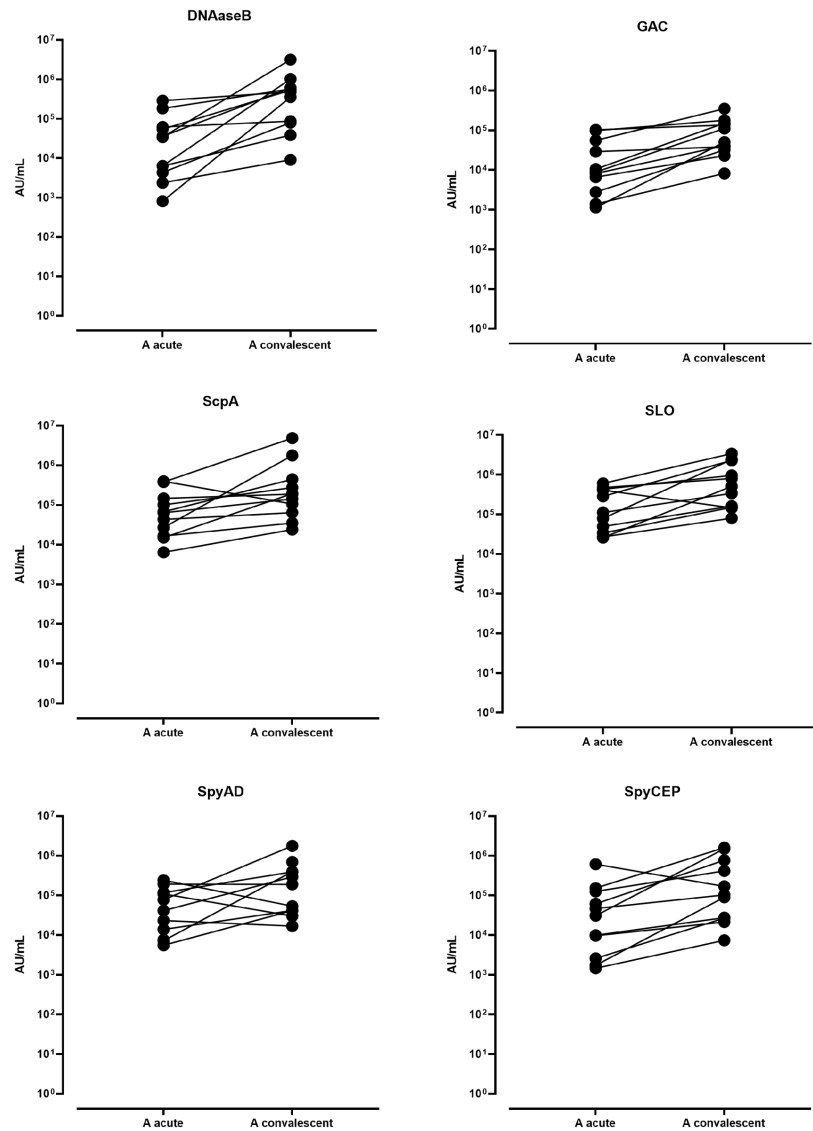


The value of a Strep A vaccine in Australian setting

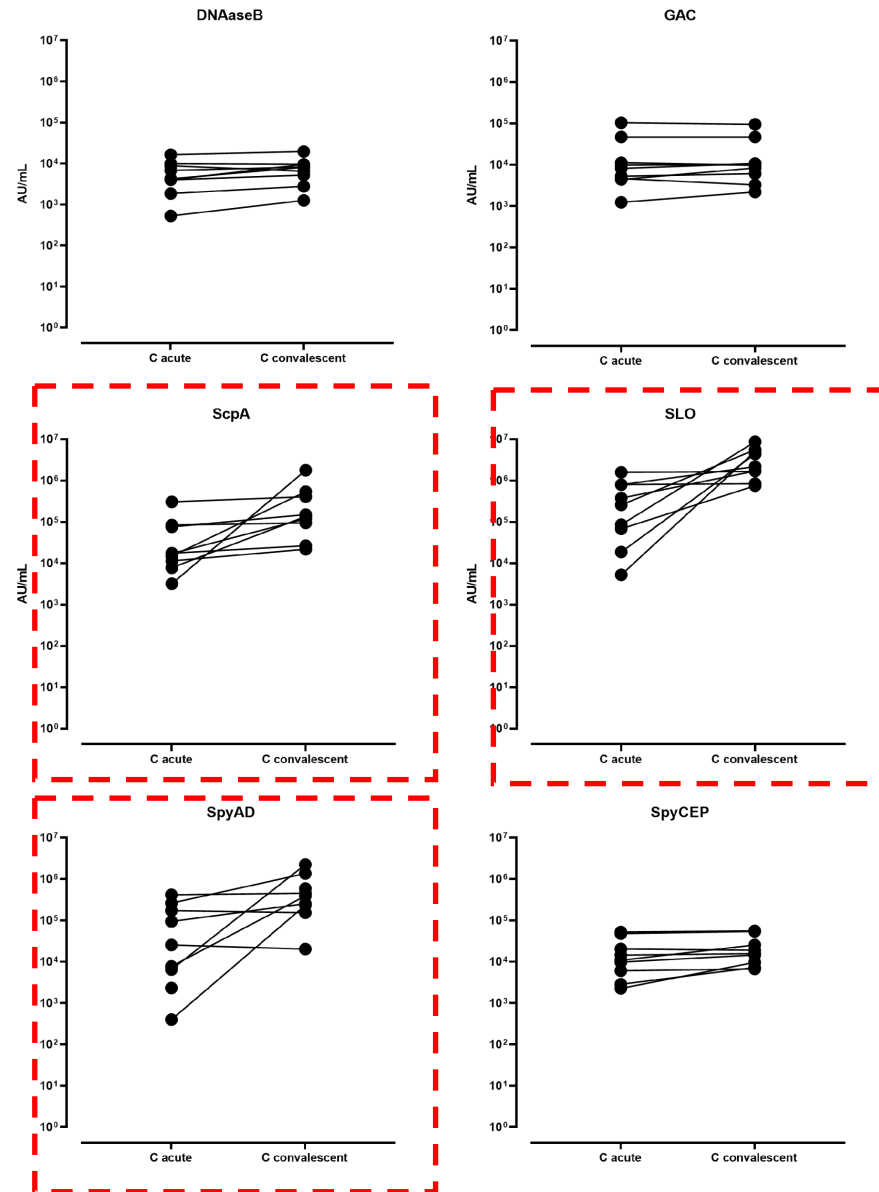


- **Assumptions:**
- 70% protection for 10 years
- Attributable proportion 27%

Strep A



Strep C/G (SDSE)





Hautarzt (1989) 40:215–221

Der Hautarzt
© Springer-Verlag 1989

Die Behandlung des chronisch-rezidivierenden Erysipels mit Streptokokkenvakzine

Uwe-Frithjof Haustein¹, Ulrich Biella¹, Irene Tausch² und Heide Knöll³

¹ Dermatologische Klinik und Poliklinik (Direktor: Prof. Dr. U.-F. Haustein) der Karl-Marx-Universität Leipzig

² Dermatologische Klinik und Poliklinik (Direktor: Prof. Dr. N. Sönnichsen) der Humboldt-Universität Berlin

³ Zentralinstitut für Mikrobiologie und Experimentelle Therapie (Direktor: Prof. Dr. F. Bergter)
der Akademie der Wissenschaften der DDR, Jena



What are the prospects for a Strep A vaccine for adults?

At present, the Strep A vaccine pipeline is gaining momentum. Childhood pharyngitis is considered the target endpoint for late stage clinical trials, with a view to prevention of acute rheumatic fever and RHD. Despite a clear health rationale in HIC, trials of (older) adults to prevent invasive disease or targeting cellulitis as a vaccine preventable disease are not considered priorities.



Will a Strep A vaccine provide cross protection against Group C/G Streptococci (SDSE)?

Many of the proposed multivalent Strep A vaccine candidates will impact SDSE populations, providing some degree of cross protection

What about a Strep A vaccine to prevent cellulitis?

A Strep vaccine for cellulitis could be considered as a primary prevention strategy in older adults with risk factors. Due to the high rates of recurrence, secondary prevention of cellulitis would be an ideal target condition for late phase trials.



“Which is more important,” asked Big Panda, “the journey or the destination?”

“The company.” said Tiny Dragon.

WE WOULD LIKE TO THANK THE FOLLOWING COMPANIES
FOR SUPPORTING THIS EVENT

