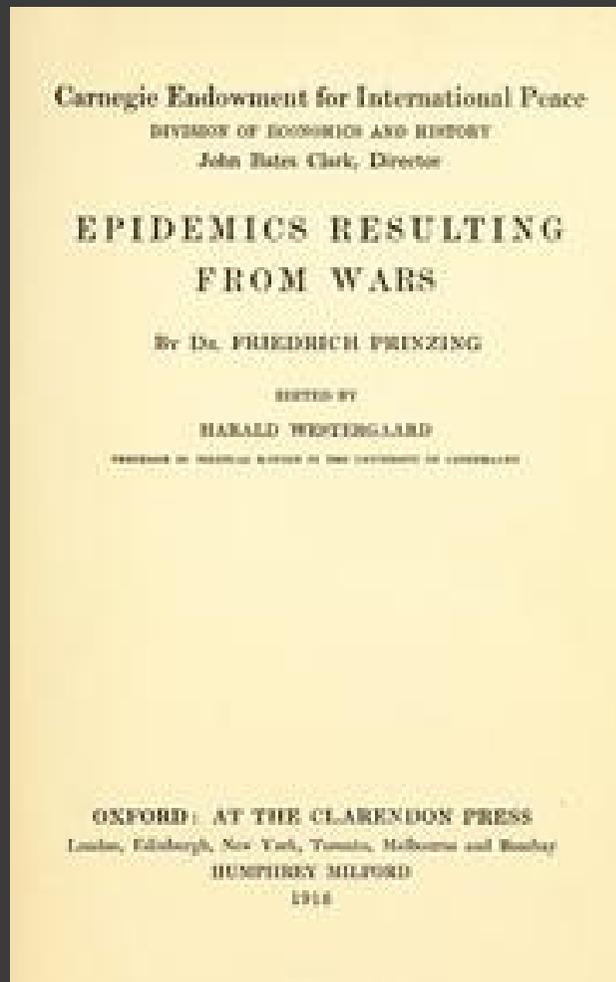


Investigation of an outbreak of scrub typhus in a military population in North Queensland

Dr Csongor Oltvolgyi

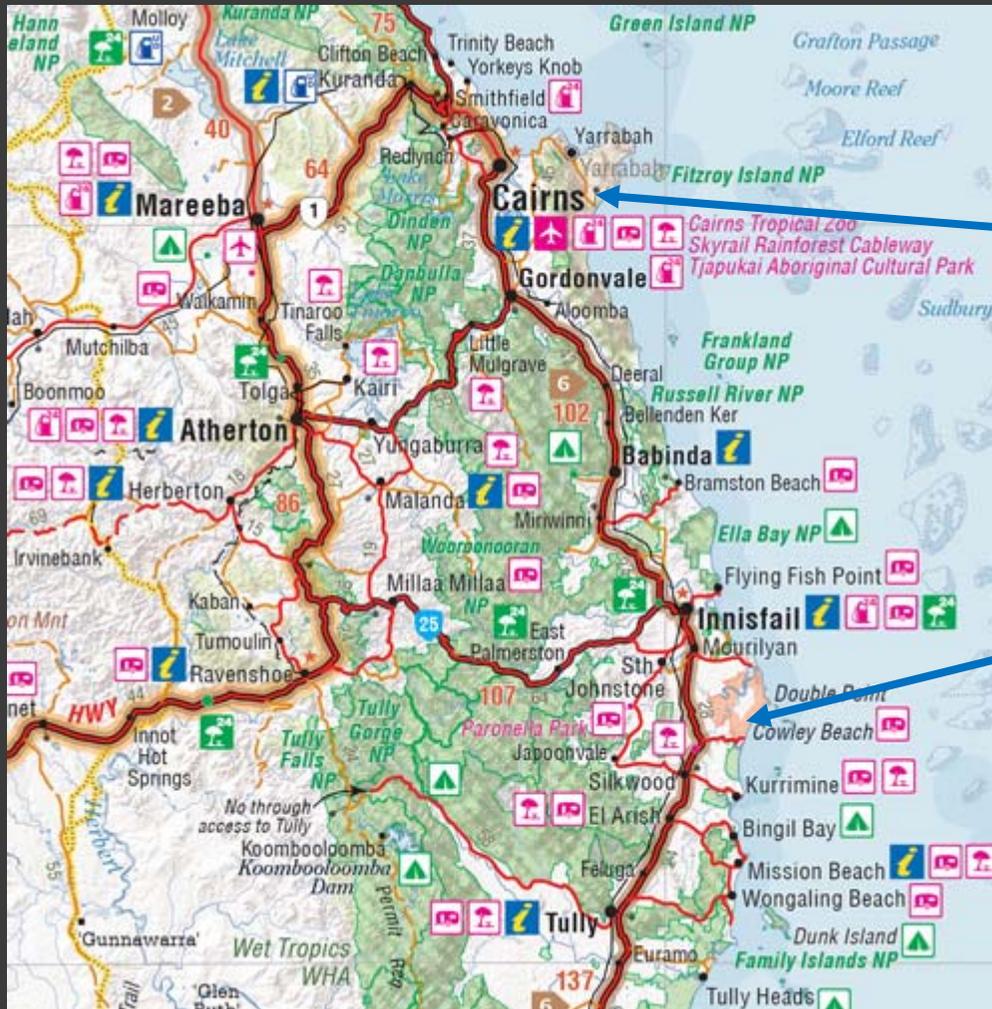
Ramazzini Presentation
RACP Congress, Melbourne
8 May 2017



- Cholera
- Dysentery
- Plague
- Smallpox
- Typhoid fever
- Louse-born typhus
- Yellow fever
- Malaria

'infectious diseases which in the course of centuries have usually followed at the heels of belligerent armies'

Cowley Beach



Cairns

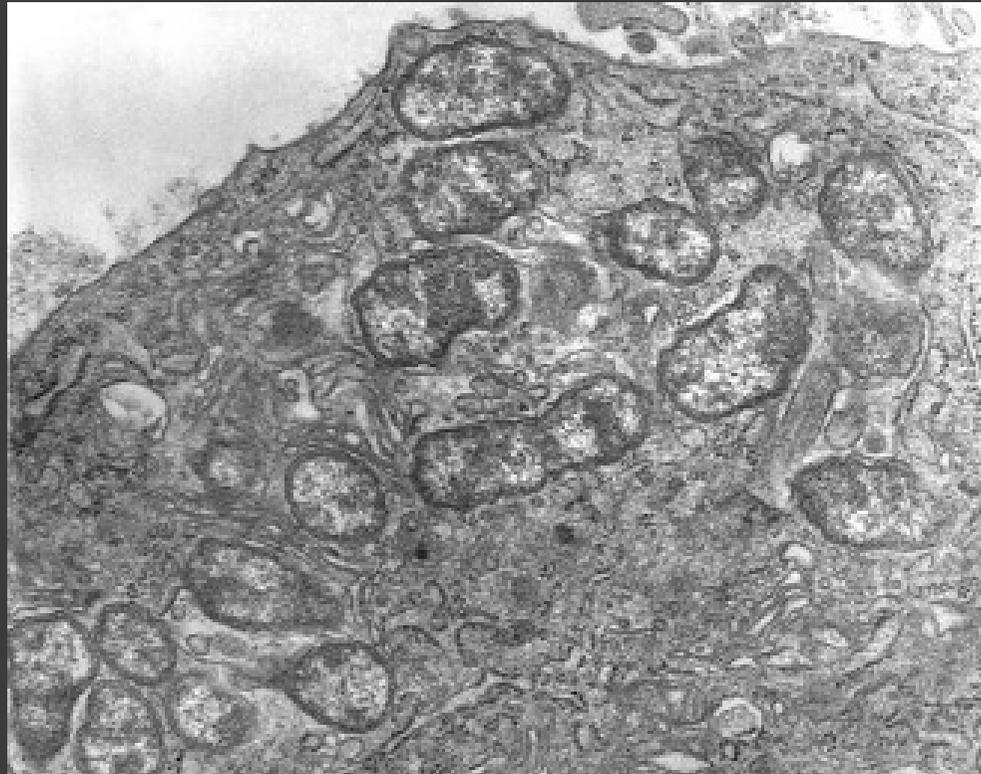
Cowley Beach

Cowley Beach



Scrub typhus - the pathogen

- ◎ Rickettsia family - *Orientia tsutsugamushi*

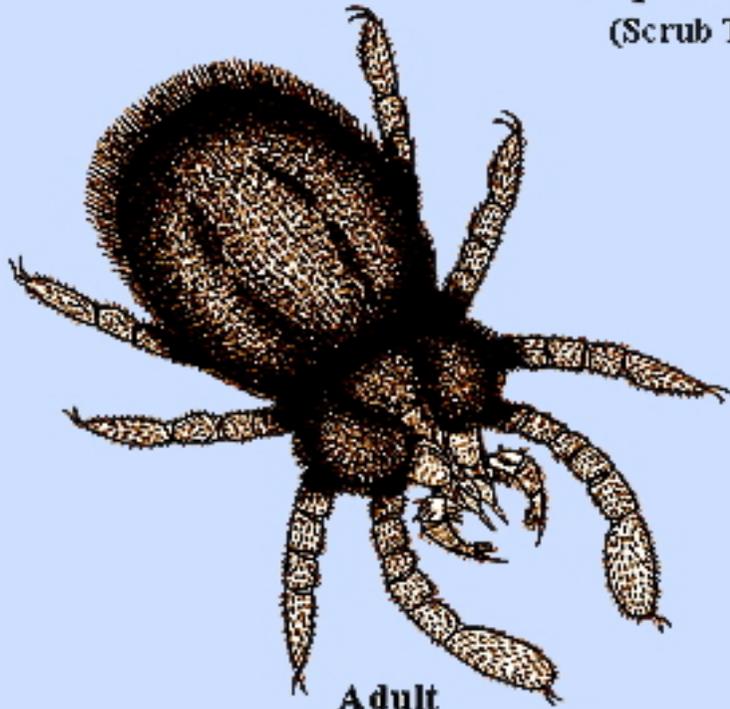


Scrub typhus - the vector

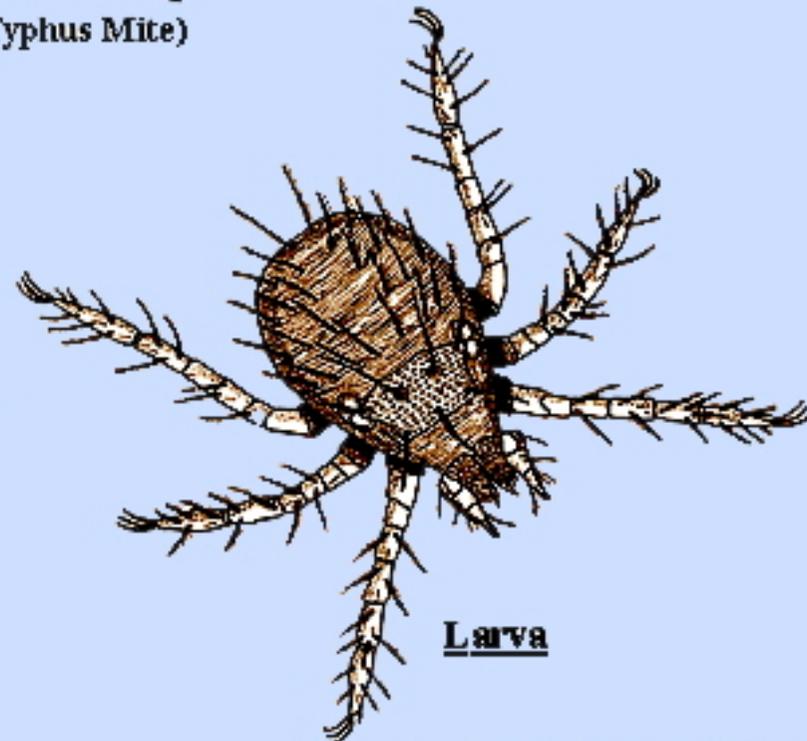
TROMBICULIDAE

Leptotrombidium sp.

(Scrub Typhus Mite)



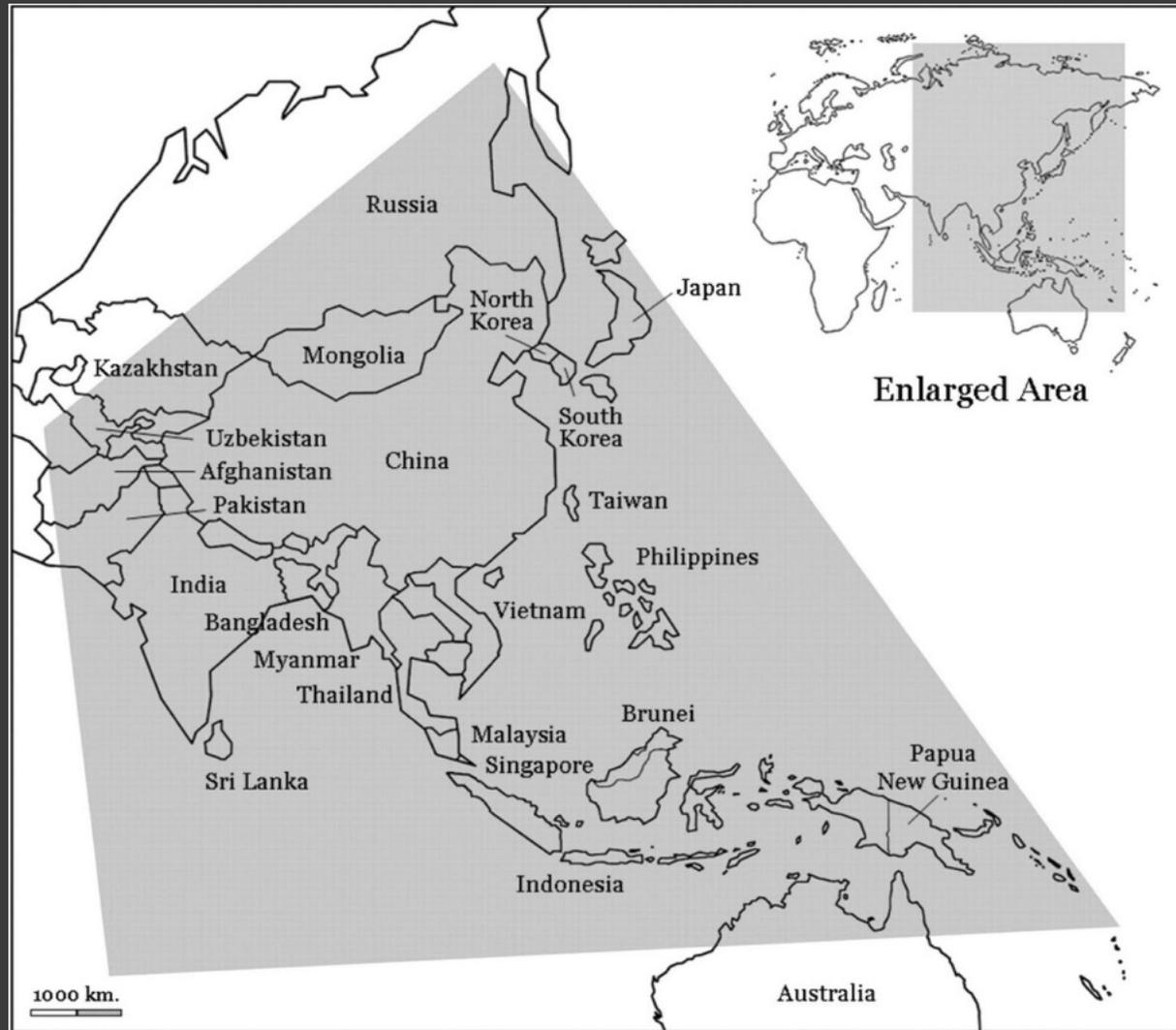
Adult



Larva

[Modified from Service 2008]

Scrub typhus - distribution



Index case

- ◎ 27 Apr 2011 – Newcastle
- ◎ 19 yo male infantryman, Australian Army
- ◎ Fever, rash, headache, joint pains
- ◎ Onset 24-48 hrs prior
- ◎ Standard septic screen unhelpful
- ◎ PCR (blood) and culture (eschar biopsy) were positive for *Orientia tsutsugamushi*
- ◎ Stated he took his doxycycline prophylaxis

Index case - rash and eschar



Outbreak

- Same presentation in individual soldiers in Sydney, Melbourne, Brisbane, Townsville



Townsville

Brisbane

Newcastle

Sydney

Melbourne

Outbreak

- ⦿ All infantrymen of the same rifle company based in Townsville
- ⦿ All were on exercise at Cowley Beach
- ⦿ 10 – 24 Apr
- ⦿ Many proceeded on leave 24 Apr
- ⦿ Most had similar symptoms
- ⦿ 1 in ICU with myocarditis and L heart failure

Case definition

⦿ Clinical:

- deployed on the Cowley Beach exercise, and
- presented unwell between 23rd April and 5th May 2011, and
- displayed at least two of the following symptoms:
 - Headache
 - Fever
 - Maculopapular rash
 - Arthralgia

Case definition

⦿ Laboratory:

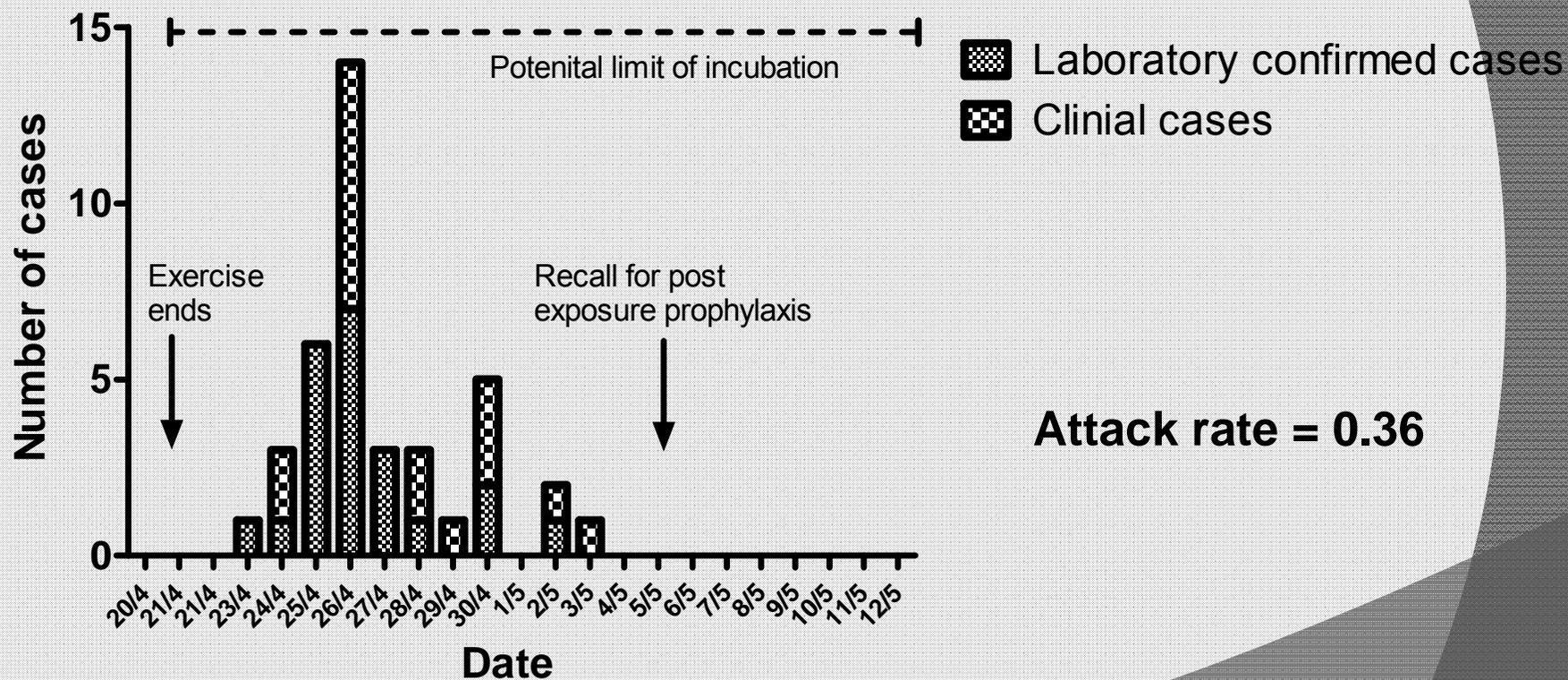
- ≥ 4 -fold rise in IgG titres to *O. tsutsugamushi* between acute and convalescent serology, or
- positive PCR on blood or tissue, or
- positive culture from clinical specimens

Outbreak continued

- 90% of company recalled from leave in Townsville on 5 May (still inside incubation window – up to 21 days)
- Prophylaxis use likely incomplete
- All given doxycycline 200mg stat
- No further clinical presentations
- Eventually 45 cases identified (of 124 exposed)

Results

Scrub typhus epidemic curve - Cowley Beach outbreak 2011

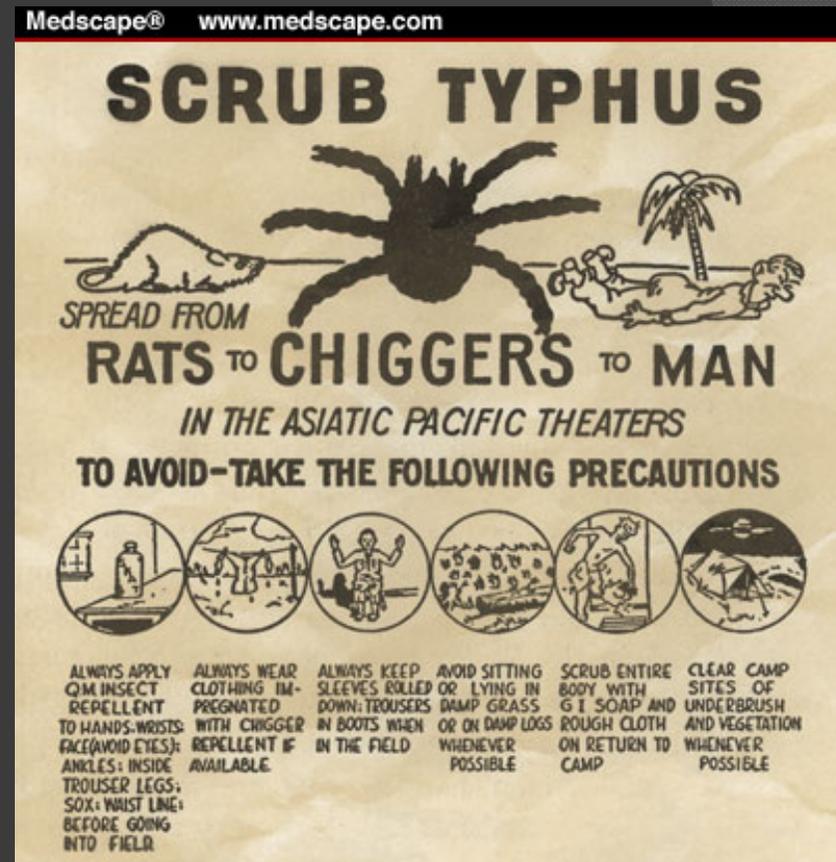


Results continued

- ⦿ Attack rate = 0.36
- ⦿ 27 met laboratory definition
- ⦿ 18 met clinical definition only
- ⦿ 14 cases hospitalised (1 in ICU)
- ⦿ Mean age 25.1 yrs (range 18 – 47)
- ⦿ Of 42 cases with clinical details:
 - 39 headache
 - 35 fever
 - 34 rash
 - 30 polyarthralgia
- ⦿ Isolated strain susceptible to doxycycline

Conclusion - hazard control

- Doxycycline prophylaxis
- Land/Site management
- Control of host (rodents, marsupials)
- Control of disease vector (mite)
- Clothing – treatment & physical barrier
- Personal repellent



Conclusion

- ⦿ Incomplete adherence with doxycycline
- ⦿ Pathogen not resistant
- ⦿ Continue current controls:
 - Correct doxycycline use
 - Permethrin-impregnated clothing
 - DEET insect repellent

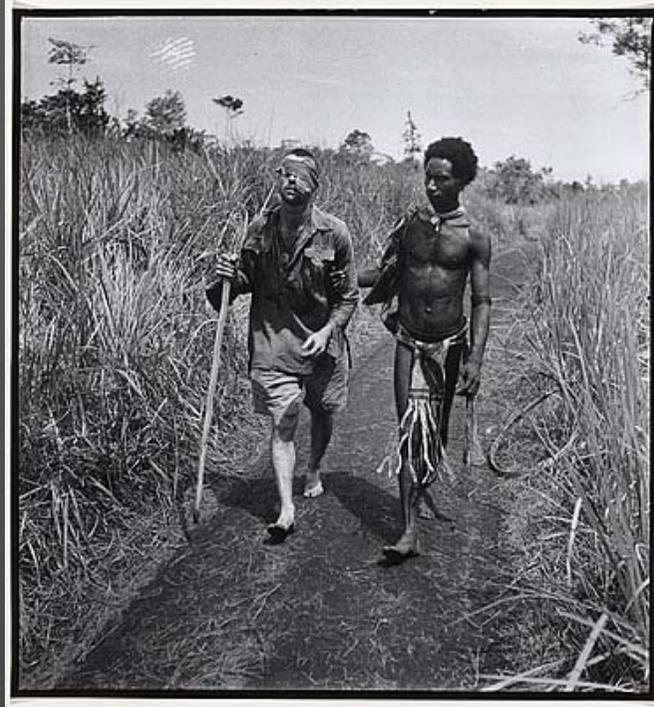
Thank you to Dr Patrick Harris and Dr Stephen Graves, and their teams, for their clinical microbiological contribution

This presentation does not necessarily reflect ADF or Army policy.
The views are those of the author.

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Questions?



PTE George "Dick" Whittington, Buna PNG, 25 Dec 1942
Wounded in battle for Buna Air Strip
Recovered from wounds but died of scrub typhus 12 Feb 1943