

Strengths and Weaknesses in the NZ Military's Response to Infectious Diseases in the First World War: A Brief Review

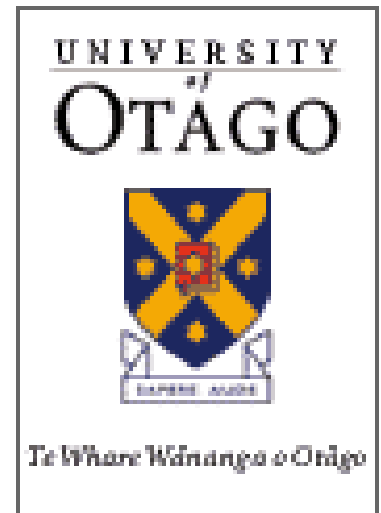
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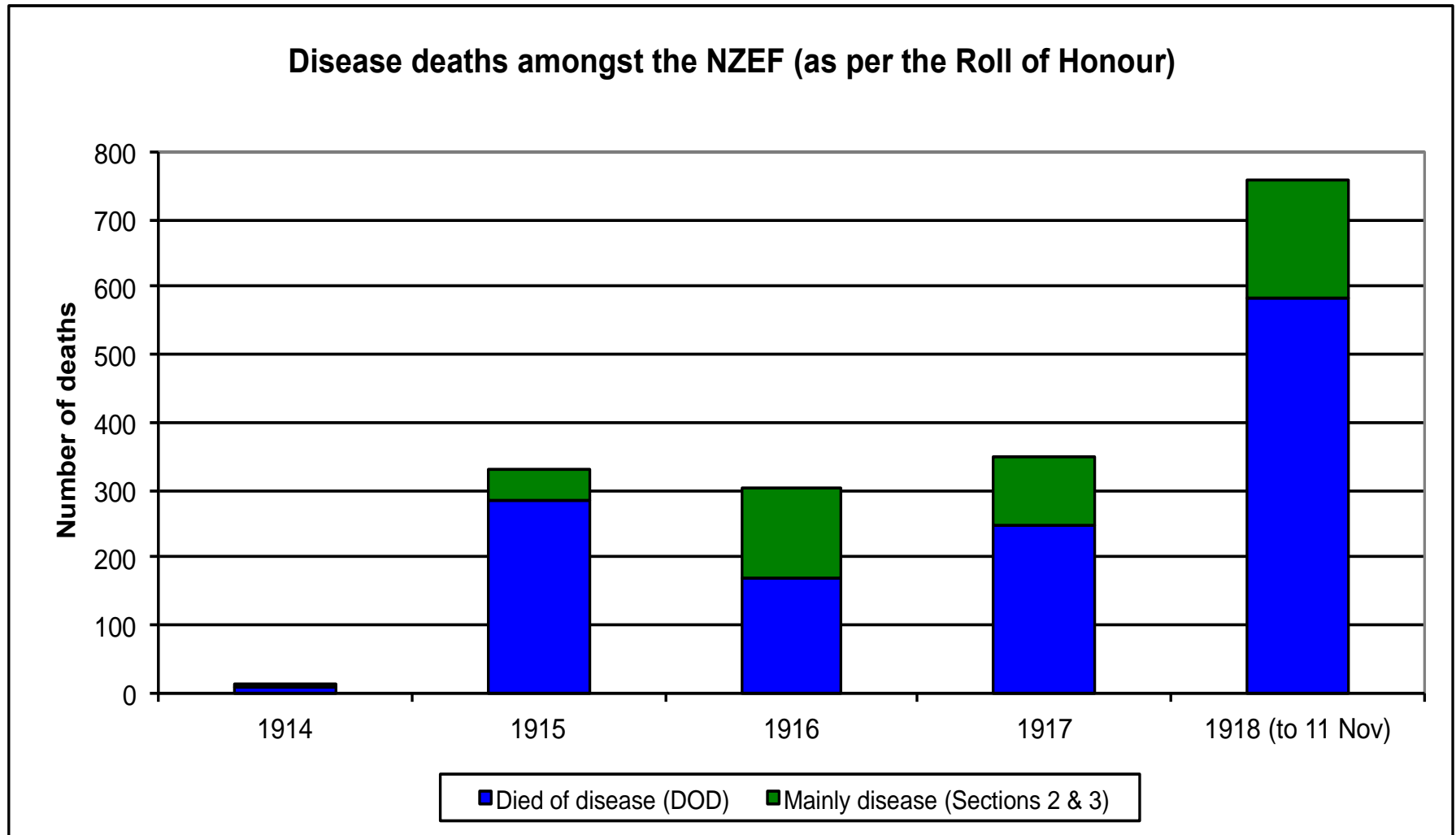
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Burden of deaths from disease

(at least 1297 deaths; 8% of all deaths in the NZEF)



Strength: Use of vaccines for prevention

- Study of **mixed bacterial** vaccine – evidence of benefit (pandemic influenza) & modern re-analysis supports this
- Impressive even doing a study given wartime difficulties [Chien et al 2010, *JID*]
- **Typhoid** vaccine used by the NZEF (modern review supports benefit in WWI) [Bresalier 2011]
 - Still 126 deaths in NZEF [Carbery 1924]

Strength: Use of vaccines for prevention

- Anti-**tetanus** serum (modern evidence of benefit in WWI)^[Wever & van Bergen 2012]
 - Only 3 tetanus deaths in NZEF^[Carbery 1924]
- **Smallpox** vaccine (including post-outbreak)
 - Only 6 deaths in NZEF^[Carbery 1924]

But vaccination was perceived somewhat negatively:



Wairarapa Archive 11-151/1 as reproduced in: Frances N. "Safe Haven". Masterton; Wairarapa Archive / Fraser Books 2012

Strength: Effective malaria control (some areas)

Eg, diagnostic stations used in Palestine (Australian & NZ army) helped diagnosis & facilitated mosquito control activities eg, drainage of mosquito sites [Shanks 2009 *MJA*]



Strength: Aspects of Sexually Transmitted Infection (STI) Prevention

- Improved provision of recreational options eg, soldiers clubs (some settings) – probably reduced sex worker contact.
- Access to condoms – at canteens & free (albeit only from 1917)
- One report: after free condom provision the VD rate in NZEF in the UK in 1918 declined from: 3% to 1.5%^[Carbery 1924]

Strength: Prevention & Treatment of STIs

- Provision of DIY treatments [Carbery 1924]
 - some antibacterial properties
- Provision of facilities for post-sex disinfection
- Fear-orientated “health education” on the hazard – possible deterrent for some?

“For Army use only”



<http://www.ep.tc>



Strength: Response to the meningitis outbreak (Trentham Camp)

- Successful breakup of the camp in 1915 ended the epidemic with no further spread (camp reduced to $\frac{1}{4}$ of the population)
[Carbery 1924]
- Inquiry triggered improvements: drainage, roading, acceleration of building huts, limit on camp size (at 4000), permanent medical staff

Weakness: Initial overcrowding eg, Trentham (1915) & again at Featherston (1918)



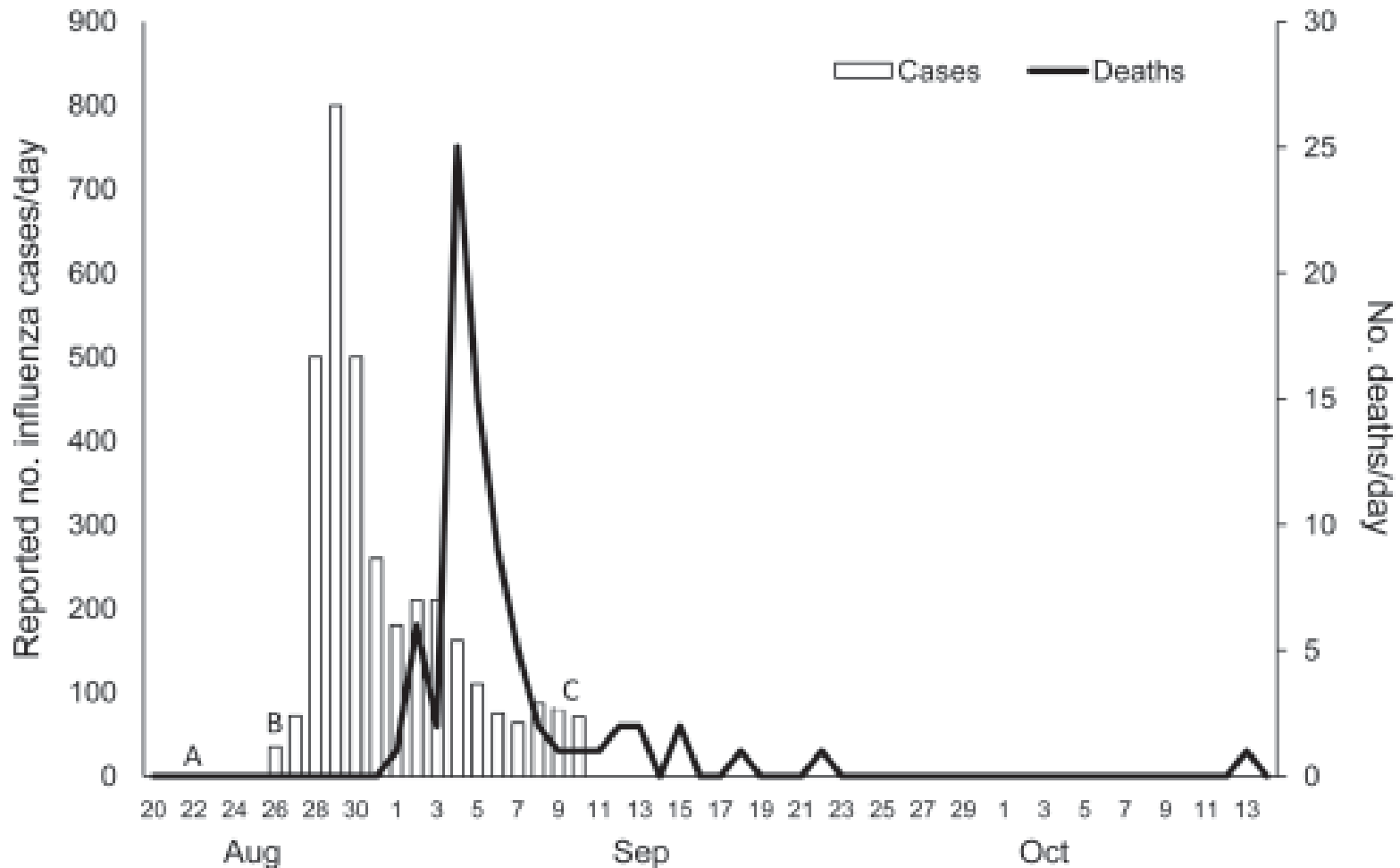
Tents at Trentham (left) and huts at Featherston (but still extensive tent use at Featherston in 1918)

Weakness: Tahiti troopship outbreak, 1918

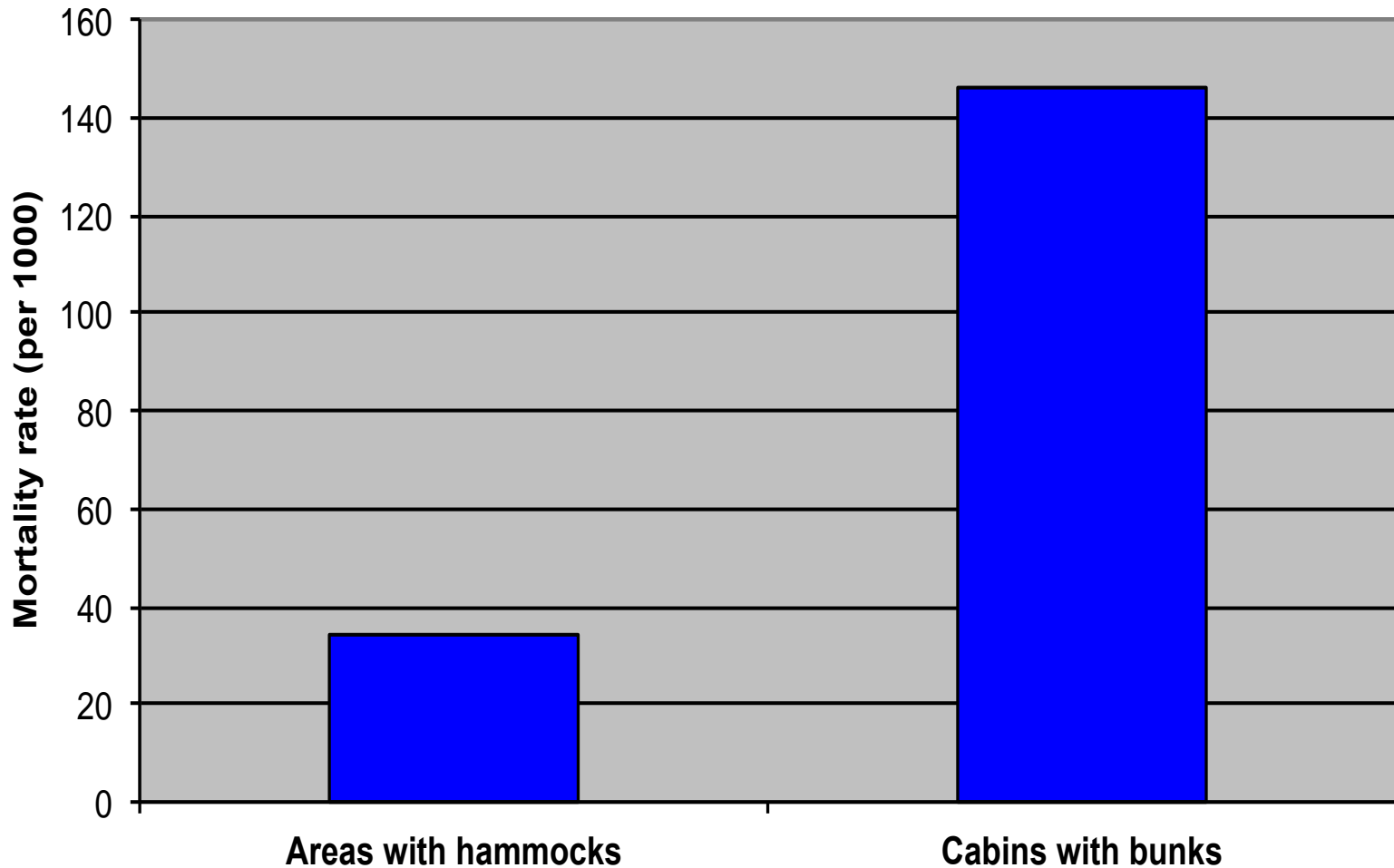
- Overcrowding
- Poor ventilation
- Inadequate quarantine



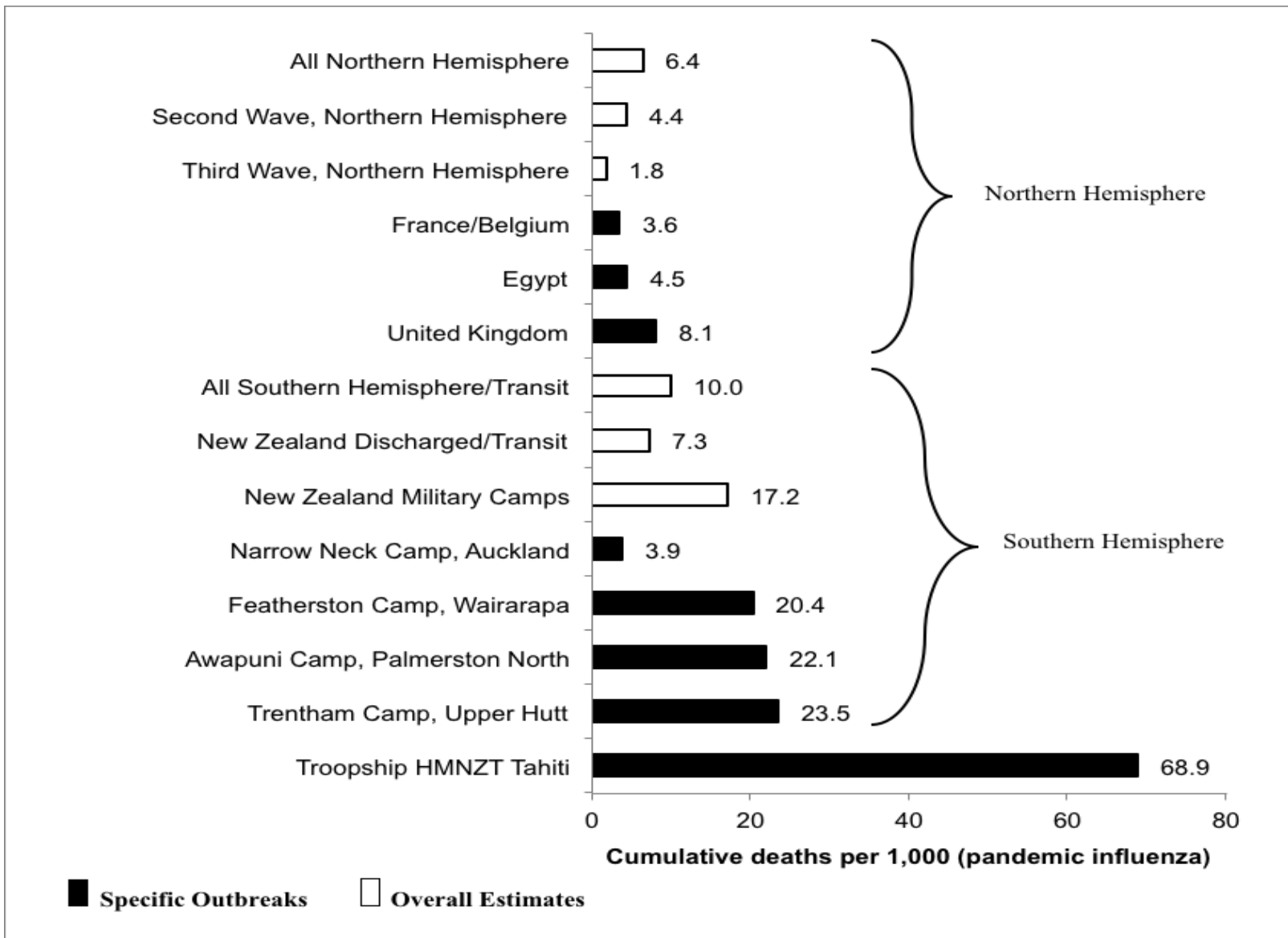
Tahiti troopship outbreak – pandemic influenza (77 deaths) [Summers et al 2010]



Mortality from pandemic influenza by accomodation type on the Tahiti troopship (1918) [Summers et al 2010]



Pandemic influenza mortality rates – NZEF in 1918 [Summers et al 2013]

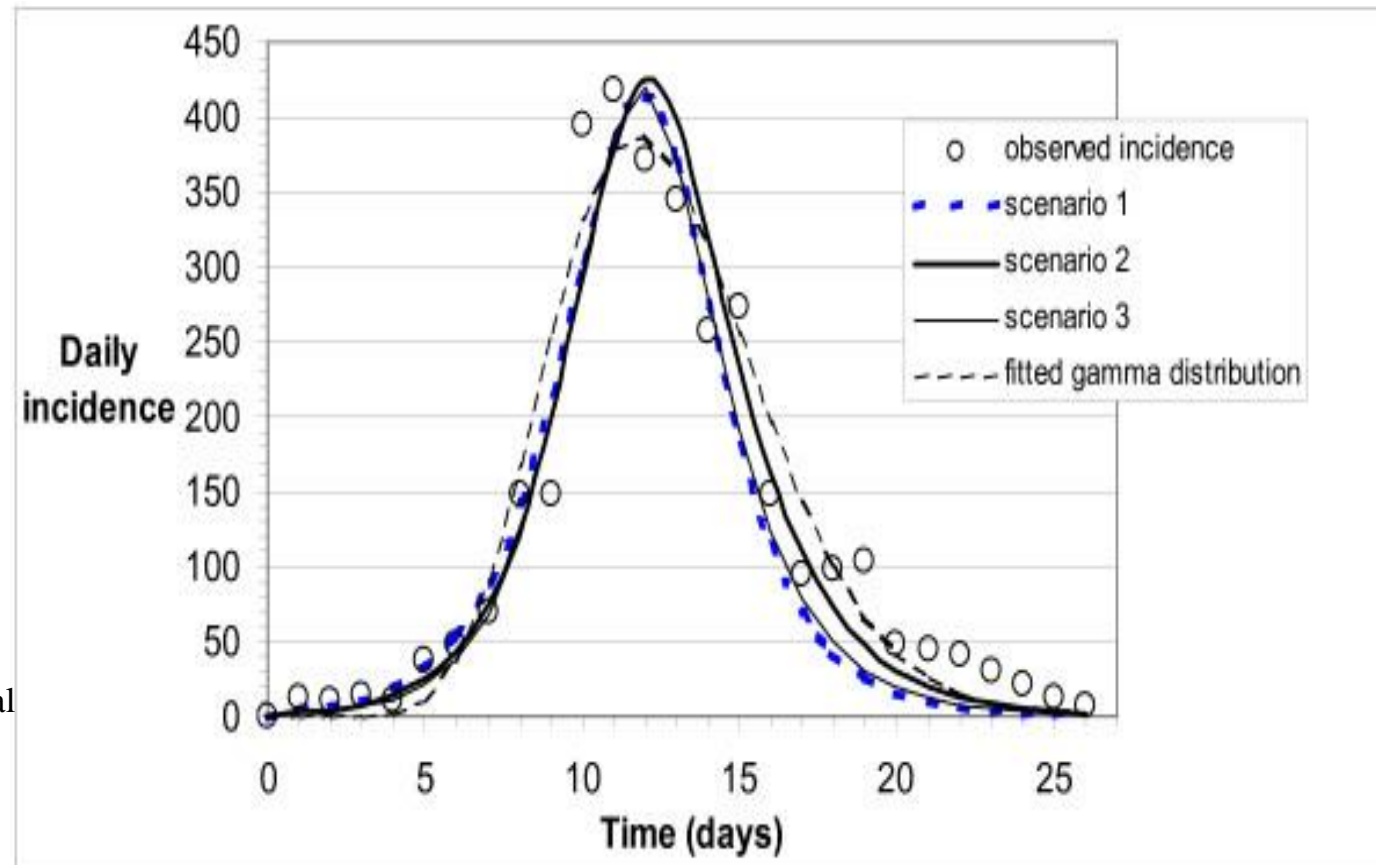


Weaknesses?: Response to the influenza pandemic 1918

- Not promptly closing the military camps (in contrast to some successful isolations in NZ) [Rice 2005] [Wilson et al 2005]
- But such prompt action rare internationally (US military: naval base, San Francisco [Markel et al 2006] & American Samoa)
- More widespread use of the mixed bacterial vaccine may have helped prevent deaths in the Feb/March wave in Europe in 1919.

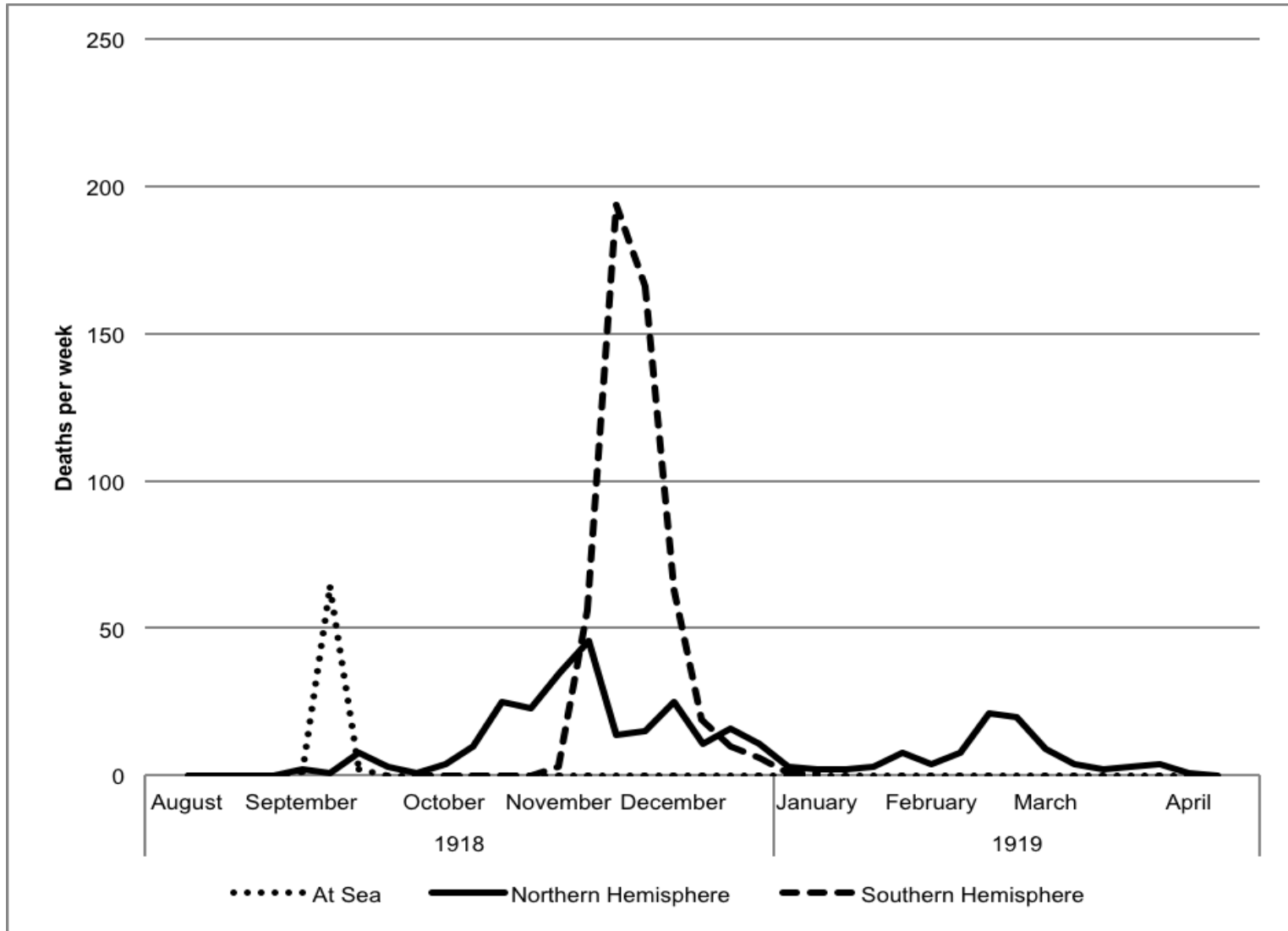
Weakness?: Response to the influenza pandemic

- Promptly closing Featherston camp – might have prevented the estimated 163 deaths



Epidemic curve for
this outbreak [Sertsov et al
2006]

Pandemic Influenza deaths amongst NZEF personnel (1918-1919) [Summers et al 2013]



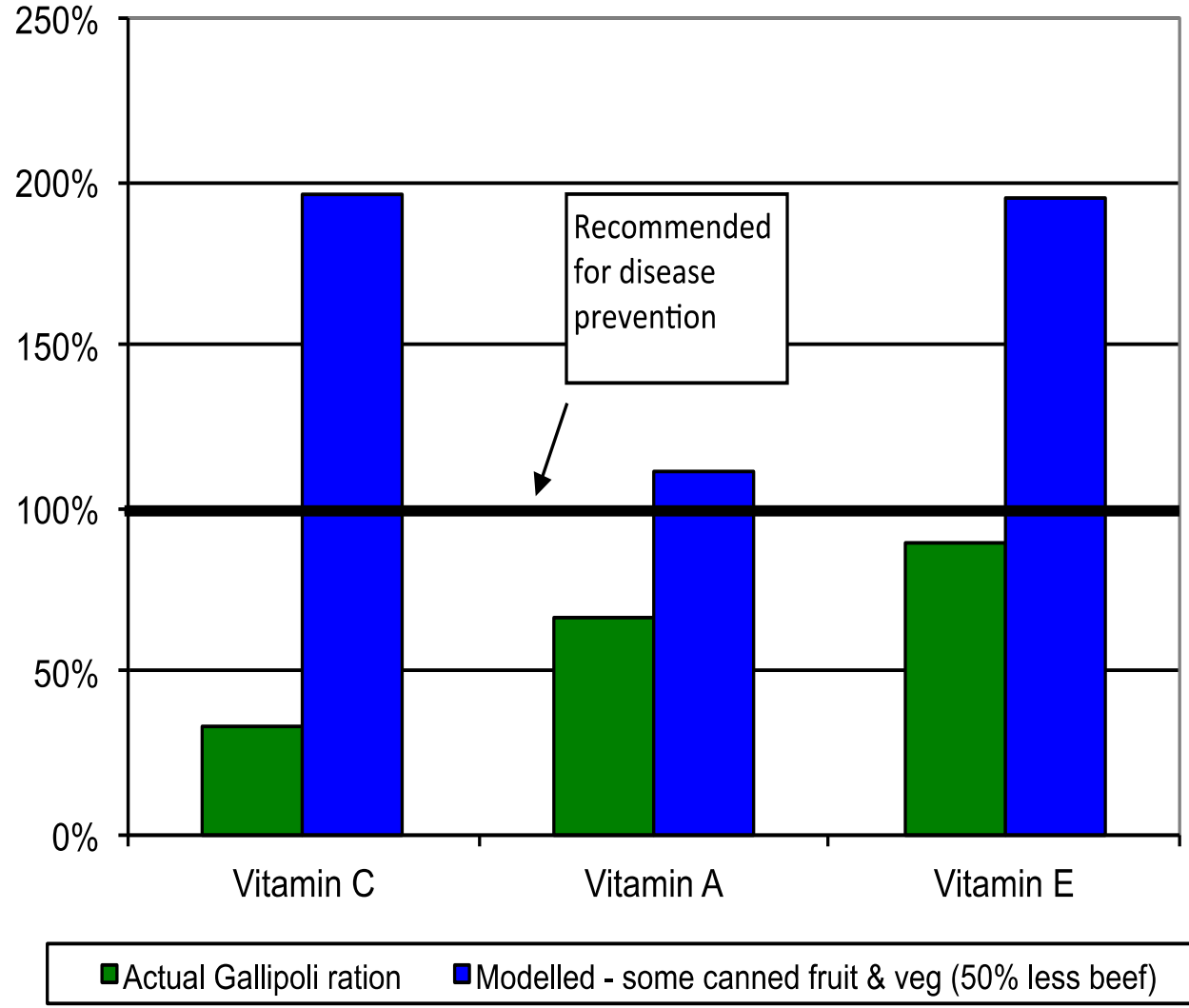
Gallipoli: multiple problems

Over 200 disease deaths (dysentery)

- Poor nutrition
- Poor hygiene
- Insufficient medical services



Nutrient levels of the Gallipoli rations vs modern recommendations for vitamins impacting on immune function; and showing a slightly improved ration with some fruit & vegetables



Gallipoli: lack of water → poor hygiene



Weaknesses: Other aspects of STI control

- “Punitive” and degrading approach with punishment [Kampf 2008] → possibly reduced treatment seeking
- Apparent excessive focus on the women eg, “brothel inspections” in France (false reassurance of risks?)
- Inadequate alcohol control? → probably increased risk of sex/unsafe sex?

Conclusions (i)

- **Strengths:** vaccine use (some innovative); malaria control; Trentham outbreak control; aspects of STI prevention (condoms).
- **Weaknesses:** overcrowding of camps & troopships; inadequate quarantine (Tahiti) & camp closure; Gallipoli (nutrition, hygiene, medical services); other aspects of STI prevention.

Conclusions (ii)

- More research could better clarify these issues but it appears that careful planning (using knowledge of the time) could probably have prevented some of the infectious disease burden – perhaps even hundreds of deaths (especially influenza and dysentery).

