Background
The purpose of this study was to examine an outbreak of pandemic influenza on a troop ship in 1918 (His Majesty's New Zealand Transport (HMNZT) Tahiti), and to identify the risk factors for mortality from influenza among those onboard.

On the 10 July 1918, the Tahiti departed New Zealand with the 40th Reinforcements, a unit largely consisting of infantry replacements.

Methods
Historical information was obtained from Archival sources held in Archives New Zealand (2, 5).

Mortality and descriptive data for military personnel from various data sets were analysed. These datasets contained individualised information on all troops onboard the Tahiti.

Results of analyses
The military personnel onboard the Tahiti experienced a cumulative incidence of pandemic influenza of around 90%, with an overall mortality rate of 68.9 per 1,000 (see Figure). This specific outbreak was one of the worst worldwide for the 1918/19 pandemic in terms of both morbidity and mortality.

Accommodation in cabins versus other areas with hammocks was associated with increased mortality (rate ratio (RR) = 4.28, 95%CI = 2.69 – 6.81).

Individuals aged 25 to 34 years experienced the highest mortality rate (108.1 per 1,000) - which was statistically significantly higher than all the other age groups combined.

Findings from the Archival documentation:
• Archival evidence suggests this outbreak resulted from the spread of infection to personnel on the Tahiti when the ship visited Sierra Leone. The data coincide with the outbreak of the more severe second wave of the pandemic in Western Africa (6).

• A subsequent Court of Inquiry stated that one of the main reasons for the high mortality in this outbreak was the poor ventilation systems onboard the Tahiti (2). Anecdotal evidence also suggests that the cabins with bunks had poorer ventilation than other accommodation.

Conclusions
It is likely that the outbreak on the Tahiti represents a worst-case scenario with non-immune soldiers intensively exposed to a highly pathogenic virus, combined with crowding and ineffective isolation measures. Such closed and crowded settings may need special attention when designing pandemic plans.

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References:

Image 1: The troop ship Tahiti in Wellington Harbour ca 1914-1919, by an unidentified photographer (3)

Image 2: HMNZT Tahiti with World War One troops, alongside a Wharf ca 1915, photograph taken by David James Aldersley (4)