

# Ethnic Gradient in Mortality Amongst the New Zealand Military Personnel in World War One

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## Background

The ethnic distribution in mortality rates for New Zealand (NZ) military personnel in World War One (WW1) has never been described, possibly due to an absence of ethnicity coding. We aimed to describe these patterns to provide a more detailed historical context to the long term patterns of health inequalities in NZ.

## Methods

Mortality data for military personnel in the NZ Expeditionary Force (NZEf) were obtained from an electronic dataset (Roll-of-Honour) covering all deaths in these personnel during WW1 and the immediate post-war period (1914-1923).

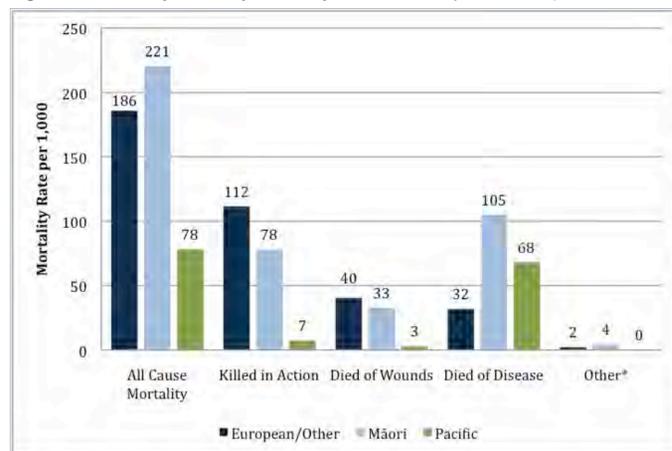
For denominator data we randomly sampled 1,000 individuals (slightly over a 1% sample) out of the Cenotaph database which is the most complete record of all personnel in the NZEF.

All NZEF personnel were allocated into the following ethnic groups: European/Other, Māori and Pacific peoples. Ethnicity classification used a range of data eg, for Māori/Pacific peoples it included having a Māori/Pacific language surname or first/second name; or having a parent with a Māori/Pacific name. NZEF personnel identified as coming from a Pacific Island village were also identified as Pacific ethnicity. All other NZEF personnel were categorised as European/Other.

## Results

There were 18,307 deaths amongst NZEF personnel for the WW1 period, with most of these being in European/Other (97.8%), followed by Māori (1.9%) and Pacific peoples (0.3%). The highest all-cause mortality rate (deaths from enemy action, wounds, disease, accident etc) was amongst Māori personnel and this was significantly higher than that for European/Other personnel (Figure 1).

Figure 1: Mortality rates by ethnicity for all NZEF personnel (1914 to 1923)

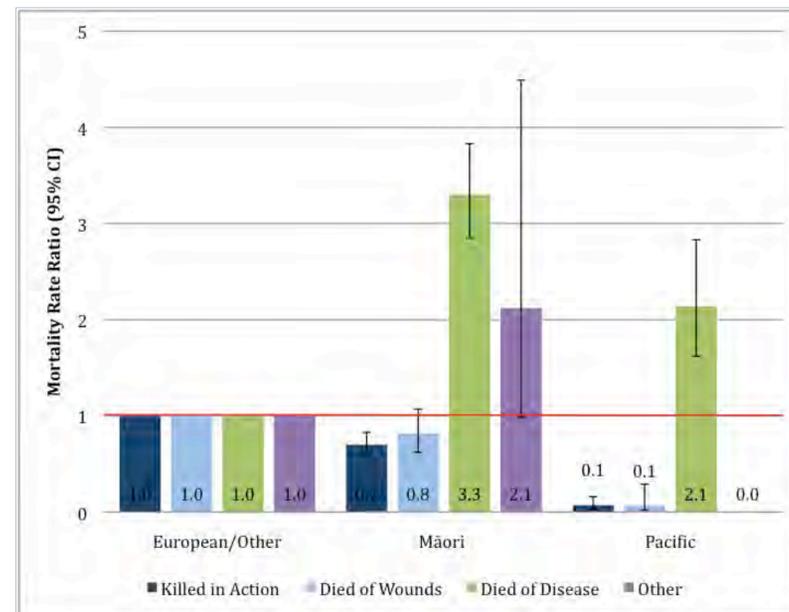


\* Other refers to death by the following: accident, suicide, executed or drowned.

In contrast, Pacific personnel experienced a significantly lower all-cause mortality rate when compared to European/Other. The majority of deaths amongst European/Other and Māori personnel were a result of being killed in action.

Mortality rates from disease varied greatly by ethnic group, with Māori and Pacific personnel both experiencing significantly higher rates than European/Other personnel (Figure 2).

Figure 2: Mortality Rate Ratios by ethnicity for all NZEF personnel (1914 to 1923)



The 1918-19 influenza pandemic struck this military population during and after the war period; however mortality from disease occurring before the pandemic period was still found to be significantly higher amongst Māori and Pacific personnel compared to European/Other (Rate ratio (RR) = 3.92; 95%CI = 3.14 – 4.91; and RR = 3.45; 95%CI = 2.42 – 4.91, respectively).

## Discussion

One of the consistent findings in this study is the high mortality rates from disease (before and during the pandemic period) amongst both Māori and Pacific personnel, compared to European/Other personnel. A partial explanation is that at this point in history, Māori and Pacific peoples were known to have higher rates of certain infectious diseases such as tuberculosis (which may not have always been detected on entry into the military).

Another factor may have been the much higher proportion of Māori and Pacific personnel coming from rural backgrounds, resulting in less immunity to pathogens such as influenza and *Streptococcus pneumoniae*. Additionally, pre-war nutritional status may also have played a role but there is no evidence of differentially poorer living conditions in the combat zones.

Pacific personnel experienced lower mortality rates from all causes than European/Other and Māori, possibly from less exposure to the frontline.

The methods used to assign ethnicity to historical records are less valid than those now used for health records. Nevertheless, given the strong relationships found, such misclassification is unlikely to have explained the associations found in this study.

## Conclusions

We document for the first time higher all-cause mortality burden amongst Māori military personnel compared to European/Other personnel for New Zealand's WW1 effort. Also identified is the large variation in disease mortality, with Māori and Pacific personnel suffering disproportionately. These historical results serve as a reminder that tackling health inequalities is a long-term commitment that requires ongoing public health attention.



Image 1: Members of the Pioneer Battalion performing a haka for ministers Massey and Ward, Bois-de-Warnimont, France, 1918 (1).

## Acknowledgements:

The authors thank Professor Peter Dennis (University of New South Wales at the Australian Defence Force Academy) for providing an updated version of the NZEF Roll-of-Honour, and the staff of the Auckland Museum for providing data from the Cenotaph dataset. The authors thank Dr George Thomson and Professor Dennis Shanks for assistance with the coding work.

## Reference:

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