Historical Approaches in Studying Past Influenza Pandemics: The Value of Military Archival Sources

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Background

‘unfortunately until the basis of influenza virulence is understood, the human population will be defenceless against similar outbreaks in the future’ [1].

Knowledge of pandemic influenza risk factors, the likely speed and pattern of spread, and the expected impact on a healthcare system, is based on the study of past pandemics. Therefore the understanding of how to use historical records to obtain this knowledge is imperative for such research.

Methods

As the 1918-19 influenza pandemic occurred during World War One (WW1) (figure 1), many of the best-documented aspects from this period are held within military files. These military records exist in a number of nations internationally and also in New Zealand (NZ). They usually contain detailed information: socio-demographic, military, and in particular for NZ, anthropometric measures.

In NZ, an increasing proportion of records are being digitised and/or made freely available online or onsite through both government and military authorities [2-7] (figure 2). These data provides an opportunity to describe this pandemic at both the population and individual level.

Results

Several recent studies have used NZ military records [8-11]: the results of which are applicable to future pandemic planning at a national level. We have found that these records are relevant to understanding influenza epidemiology, enabling exploration of mortality risk (and to some extent morbidity) for sub-populations in the military. This work has some likely generalisability given the NZ military in 1918 represented around 10% of the total NZ general population or 40% of the male population of eligible military age.

Acknowledgments: the authors thank the University of Otago and the Maurice and Phyllis Paykel Trust for providing grants for conference attendance costs.

Figure 1: Rows of 1918-19 influenza pandemic deaths of NZ WW1 military personnel (cemetery near a former military camp – Featherston, NZ).

Figure 2: Example of individual NZ military casualty roll entry of a 1918 influenza pandemic death [7].

In particular, a range of methods can be used to assess multiple variables extracted from enlistment data: occupational class, pre-enlistment residence (for data to measure rurality and likely vitamin D levels from sunlight), locality during the pandemic, health status (both pre- and during WW1), military variables (such as rank or time in service), ethnicity, body mass index, marital status and even complexion.

Other recent research has also used military archival sources in order to further understand and explore the different elements/features of the 1918-19 influenza pandemic in diverse settings (such as Australian, British, Japanese, US, and Canadian sources) [12-17]. Nevertheless, caution must be maintained in trying to generalise the results from both an extremely virulent pandemic and a militarised population to modern day pandemic scenarios. For example, some military populations were exposed at various times to: various diseases (eg, malaria, dysentery), lung damage from poisonous gas, poor diet, crowding, severe cold and heat, and even to experimental vaccines.

Conclusions

The use of archival military sources for epidemiological research is growing; both because of the increasing availability of records, but also because of the increased scientific need to better understand the nature of influenza pandemics.

Further research into past influenza pandemics will improve our understanding of influenza, especially regarding the control of its impact and the optimal targeting of limited health care resources during a pandemic to a population. Additionally, given the severity of the 1918-19 pandemic, this event could arguably be described as a worst-case scenario for guiding future population-based pandemic planning.

References