Long-term health effects of Vietnam-era military service: A quasi-experiment using Australian conscription lotteries

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ABSTRACT

This paper estimates the long-term health effects of Vietnam-era military service using Australia's National conscription lotteries for identification. Our primary contribution is the quality and breadth of our health outcomes. We use several administrative sources, containing a near-universe of records on mortality (1994–2011), cancer diagnoses (1982–2008), and emergency hospital presentations (2005–2010). We also analyse a range of self-reported morbidity indicators (2006–2009). We find no significant long-term effects on mortality, cancer or emergency hospital visits. In contrast, we find significant detrimental effects on a number of morbidity measures. Hearing and mental health appear to be particularly affected.

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1. Introduction

Although it is nearly 40 years since the Vietnam War ended, there remains considerable uncertainty about its health effects for veterans, despite an extensive body of multidisciplinary research (Autor et al., 2011)[1]. One key reason for these mixed findings is the considerable empirical difficulty in identifying the long-term health consequences for veterans (see MacLean and Edwards, 2012). In addition to the lack of detailed data available to researchers on individual or even group-specific exposures, there is the issue of selection bias. Selection bias arises because individuals are not randomly assigned into military service (the "healthy soldier effect"), or to overseas deployment (the "healthy deployer" effect), making it difficult to select an appropriate control or comparison group for estimating unbiased causal effects. In recent years, a number of studies have attempted to overcome these difficulties by using a quasi-experimental IV framework (see Angrist, 1990; Angrist et al., 1996). This approach relies on the random assignment into military service that occurred through conscription (draft) lotteries. These studies have tended to suggest that many previous estimates of the health effects of Vietnam service were over-stated (Dobkin and Shabani, 2009; Angrist et al., 2010). In particular, Angrist et al. (1996, 2010), Siminski and Ville (2011) and Conley and Heerwig (2012) found no significant evidence of heightened long-term mortality risk for Australian and US veterans. This contrasts with the higher mortality found for veterans in many earlier studies (see, for example, Watanabe and Kang, 1995, 1996; Wilson et al., 2005a). So far, however, this quasi-experimental approach has not been widely applied to morbidity measures, with the exceptions of Dobkin and Shabani (2009) and Angrist et al. (2010). These two studies found little overall evidence of adverse long-term morbidity outcomes for US veterans.

The ongoing uncertainty regarding effects of the Vietnam War means that the long-term health and wellbeing of Vietnam

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[1] See, for example, the range of findings and discussions in Hearst et al. (1986), Breslin et al. (1988), Centers for Disease Control Vietnam Experience Study (CDCVES) (1988a, 1988b), Boyle et al. (1989), Watanabe and Kang (1996), Department of Veterans' Affairs and AIHW (1999), Wilson and Horsley (2003), Wilson et al. (2005a,b,c), Boehmer et al. (2004), Boscarino (2006), MacLean and Elder (2007), McLaughlin et al. (2008), O'Toole et al. (1996, 1999), O'Toole et al. (2009), and McBride et al. (2013). Some of the key health concerns for veterans that the literature has focused on are: poorer mental health, especially with respect to post-traumatic stress disorder (PTSD) and alcohol-related problems; greater risk of certain types of cancers resulting from chemical exposure in Vietnam (such as soft-tissue sarcoma); and a general heightened mortality risk, including from suicide and accidents.

veterans, who are now mostly in their 60s and 70s, remains an important issue for further research. Better estimates can help inform the appropriate nature and level of current health care and welfare services required by veterans, as well as what will be needed over the coming decades. The timeframe is even larger if we consider the health and wellbeing of the spouses and children of veterans as well (Levy and Sidel, 2009). More generally, learning about the potential long-term health consequences of previous military involvement can provide some useful information for assessing the potential long-term health costs of more contemporary and future military operations (MacLean and Edwards, 2012). However, that said, lessons taken from one war for another should be applied to other periods with a degree of caution, given the context-specific differences in the nature of warfare and the differences in exposure to conflict, stress, trauma, infectious diseases, and chemicals. A consideration of institutions – including health care services, welfare provisions, and compensation entitlements – in place for returning veterans is also important for this understanding.

We overcome the empirical difficulties in identifying the long-term health consequences for veterans by using the assignment of young men into army service through the Vietnam-era national service conscription lotteries in Australia that took place between 1965 and 1972. The main contribution of this study is to apply the conscription lottery instrumental variable (IV) identification approach to a much wider range of health outcome measures. We draw on morbidity (physical and mental health) and quality of life data from a large-scale population survey collected in 2006–2009 that does not explicitly reference military service, thus reducing concerns that have been raised over potential justification bias (Bound, 1991; Angrist et al., 2010). We also use data on mortality (1994–2011)[2], cancer episodes (1982–2008), and emergency hospital visits (2005–2010) from official administrative records[3]. The chosen health outcome variables represent those most often studied (e.g. mortality, cancer and mental illness) and correspond to conditions for which veterans are commonly claiming disability pensions (e.g. hearing loss). Emergency hospital visits provide an additional measure of health care utilisation that can capture a wide-range of health issues, including episodes of drug and alcohol abuse, and accidents and injuries. We believe these health outcomes represent the most comprehensive range of measures used in any one study within this quasi-experimental literature.

We produce two sets of estimates: one set for the effect of Vietnam-era service (regardless of deployment), and another set for the effects of deployed service. For the second set of results to be valid, we invoke an assumption that the long-run health of non-deployed servicemen was unaffected by service. We conduct tests which provide support for this assumption.

It is important to emphasise that the results we present apply only to Australian National Servicemen; they cannot necessarily be generalised to the health effects for regular soldiers who served in Vietnam[4]. Neither can they be generalised to the case of U.S.

veterans, whose combat exposure was greater[5]. Also, the results are contingent on institutions—including the health care services, welfare entitlements and compensation schemes that have been available to Australian veterans over the last four decades. That is, it is impossible to estimate what would have been the health of national service veterans today if these services and provisions had not been made available. Our working assumption is that these large investments in the health and wellbeing of veterans, at least to some extent, will have mitigated some of the adverse health and wider consequences of war for veterans. This is consistent with the stated aims of the Commonwealth Department of Veterans' Affairs (DVA). For example, In 2013/2014, the Australian Commonwealth Government allocated around $12.5 billion to the DVA, with the DVA providing a wide-range of programs and services split broadly into three components: Care, Compensation, and Commemoration. Finally, available data do not allow us to estimate short-run health effects of service.

The remainder of the paper is structured as follows: Section 2 provides further detail on the empirical challenges involved and describes the national service (conscription) lotteries that took place in Australia between 1965 and 1972. In Section 3 we outline the data sources we use, and in Section 4 we describe the empirical methodology we adopt. Our results are presented in Section 5, where several limitations of the analysis are also noted. Section 6 concludes.

2. Australian Vietnam-era conscription lotteries

The introduction of National Service in 1964 by Prime Minister Menzies was central to Australia's effort to boost its regular army with National Servicemen (known as "Nashos") in order to meet projected manpower needs. Those enlisted were expected to complete two years of continuous full-time service in the army followed by three years of part-time service. Over this period, the civilian jobs of those enlisted were to be protected. From 1965 to 1972, around 804,000 young men were registered for the national service lotteries, in which 20-year olds were "balloted in" and therefore liable to be enlisted if their birth date corresponded to one of the marbles drawn from a lottery barrel. Unlike the U.S. ballots, the order in which the marbles were withdrawn from the barrel had no significance. At each drawing, only a subset of the marbles were drawn, which represent the draft-eligible DOBs. The number of marbles drawn at each drawing was pre-determined and chosen to match projected manpower requirements. Shortly after each drawing, registrants were notified whether they were 'balloted-in' or 'balloted-out' (they were not given a sequence number). Through 15 biannual lotteries, 63,735 men were conscripted to service in the army, with 19,450 serving in Vietnam after initial training in Australia (Davies and McKay, 2012). In most cases this was for a one-year tour of duty. With the exception of around 150 national servicemen deployed to Borneo, the remainder were not deployed, and served only in Australia. A comprehensive description of the conscription process, and a wider discussion of Australia's history of military conscriptions, can be found in Ville and Siminski (2011).

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[2] Our mortality analysis is an update of Siminski and Ville (2011), which shows corresponding results for deaths registered between 1994 and 2007. Importantly, while this update includes only four more years of data, the death rate increases steeply in this age range, so the number of included deaths is 70% larger in this study.

[3] We do not observe mortality before 1994. However, if veterans experienced higher mortality in the earlier years (e.g. through higher rates of suicide or accidents), then we are under-estimating the effects of Vietnam service. However, the Census data show that "balloted-in" men are not disproportionally "missing" from the population in 2006 (the first Australian Census to collect DOB) (Siminski, 2013), which suggests this is not a major threat to validity. We discuss this issue further in Section 5.4.

[4] More precisely, the results apply only to a sub-set of National Servicemen—those who were induced into the army by the outcome of the main conscription ballots

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(compliers). Whilst most National Servicemen are compliers, there are several categories of National Servicemen who are not. This includes: men who volunteered for National Service; conscripts who *would have* volunteered for army service in the counterfactual of being "balloted-out"; men who were absent from Australia at the time of the ballots and were subject to latter (orthogonal) ballot drawings; and men who were automatically considered eligible for conscription be virtue of failing to register for the ballots.

[5] The proportions of deployed American soldiers killed (1.7%) and wounded (8.9%), were higher than for Australian soldiers (0.9% and 5.2%, respectively) (U.S. Department of Veterans Affairs (US DVA), 2015; Wilson et al., 2005a).