PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Health conditions in a cohort of New Zealand Vietnam veterans: hospital admissions between 1988 and 2009
AUTHORS	Cox, Brian; McBride, David; Broughton, John; Tong, Darryl

VERSION 1 - REVIEW

REVIEWER	Alfred Franzblau University of Michigan Ann Arbor, Michigan USA
REVIEW RETURNED	22-Jun-2015

GENERAL COMMENTS	Summary: Previous studies have examined mortality and cancer incidence among New Zealand Vietnam veterans (and other veteran groups). The present study employs the same New Zealand Vietnam veteran cohort (all male New Zealand Vietnam veterans with service between 1964 and 1972), but employs a record linkage approach to assess patterns of first-time hospitalization for various medical conditions. All first-time admissions to tertiary level care hospital facilities (including all public and private New Zealand hospitals) for the period 1/1/1988 through 12/31/2009 were assessed and compared to corresponding national male age-specific hospitalization rates to calculate standardized hospitalization ratios (SHRs). Despite the 'healthy soldier effect', the overall SHR for all-cause hospitalization was elevated (SHR=1.18, 99%CI: 1.15-1.21). Notable condition-specific significantly elevated SHRs included ischemic heart disease, cerebrovascular disease, chronic renal failure, chronic obstructive pulmonary disease and alcohol-related mental disorders. Some of these conditions showed increasing trends with time period. The authors conclude that "routine surveillance of veterans by way of a 'flag' in national and primary care databases would facilitate the recognition of service related conditions and the appropriate provision of health care." Comments/Questions: The manuscript is novel in that it utilizes administrative data to identify potential health concerns of Vietnam veterans that have not been previously examined. The authors have appropriately noted a number of limitations in their data (e.g., the cohort was modest in size (n=2783 were traceable); the already-noted healthy soldier effect; and, the fact that hospitalization rates likely underestimate the incidence of some conditions, such as mental disorders). They also note that a number of the positive outcomes found (e.g., COPD) are probably related to lifestyle factors, such as cigarette smoking, but

	no administrative data on smoking at the individual level were available for analysis. The paper also has a number of key strengths: 84% of the veteran cohort were traceable; reliance on administrative data from all tertiary hospitals in the New Zealand. I believe that the novelty and strengths of the manuscript outweigh the limitations. The paper is well-written, and the results are clearly displayed in tables in the manuscript and supplemental materials.

REVIEWER	Peter Leggat James Cook University, Australia
REVIEW RETURNED	28-Jul-2015

GENERAL COMMENTS	This is an interesting study of veterans in New Zealand over an extended period of time linking hospital admission data. While lose to follow up may underestimate hospital admission risk, an 84% follow up is nonetheless a creditable result. It is a pity that 10% of the loss to follow up were those living abroad and if these were mainly in Australia, presumably there was no way of accessing data for this group. The other limitations of the study are noted and the absence of smoking data is a concern, but expected given the methodology. Clearly high rates of admission for COPD, along with chronic renal disease were key findings. Was there confidence that the first observed conditions related to the hospital admission captures all relevant diagnoses? Alcohol related mental disorders are mentioned in the results in the abstract and the main text, but not really discussed to any extent in the discussion in the body of the main paper. It is not clear if this aspect would be a specific focus of future research or intervention. Presumably there were difficulties providing context for this study given the 10 references, perhaps due to a dearth of relevant literature.

REVIEWER	Louisa Jorm Centre for Big Data Research in Health UNSW Australia
REVIEW RETURNED	29-Jul-2015

GENERAL COMMENTS	Jargon is used in the paper that is not familiar to those working outside military health. In particular, the introduction uses terms including "recognition algorithm", "presumptive list" and "Statements of Principle" without clearly describing what these are or what they are used for and by whom. "Gulf War syndrome" is mentioned as an example of the difficulties in assessing exposure-outcome relationships in military-specific studies without any description of what it is or why it is a good example. I would suggest that the long, dense, single-paragraph introduction be broken up into several paragraphs that more clearly describe in jargon-free terms the rationale for the study, the evidence gaps it addresses and the research question/s. It would also be worth describing in the introduction any specific features of health care for veterans in NZ that might impact on hospital admission rates, especially for more "discretionary" admissions (for example elective surgery). Are they subject to the same waiting lists as other patients, do they get subsidised private

	care, are there specific services and hospitals for veterans? if so, these also need to be addressed in the discussion of study limitations. Calculation of 99% confidence intervals is described as a method for "adjusting" for multiple comparisons. This is incorrect, use of 99% rather than 95% confidence intervals is simply a more conservative approach noting that multiple comparisons are being made, not a form of "adjustment". There is only very limited discussion of the findings of this study in the context of studies of morbidity and mortality from other Vietnam veteran populations (e.g. Australia, USA) and there were no references to these that I could see. Are the findings consistent with those from elsewhere? Loss to follow-up is discussed as one of the study limitations. Follow-up of 84% is good compared to many cohort studies. However, it would be relatively simple to perform sensitivity analyses (for example assuming that none of those lost to follow-up were admitted) for some of the key outcomes that would quantify the amount of bias that might be introduced by loss to follow up. I suggest that this is done. Finally, The last sentence on page 12 (commencing "In contrast to the reduced mortality..." doesn't make sense and needs revision.

VERSION 1 – AUTHOR RESPONSE

Reviewer 1, Al Franzblau.
We thank the reviewer for his comments.

Reviewer 2, Peter Leggatt.
Thank you for your helpful comments, they have facilitated further explanation.
1. We attempted to follow up in Australia, but after protracted negotiation the ‘fence’ for accessing the data was simply set too high for New Zealand researchers. We plan a further follow up and a collaborative effort with Australian colleagues.
2. We are confident that the principal discharge code reflects the main reason for admission, while recognising that co-morbidity is likely in this age group. This is however a complex matter as we explain, page 12, lines 5-10.
3. We agree that some further discussion of alcohol was necessary. We now discuss the role of post traumatic stress disorder (page 13, lines 27-31), interventions (page 14, lines 1-3) and prevention strategies, lines 4-5.

Reviewer 3, Louisa Jorm.
Thank you, your comments have led us to make several changes to improve readability and provide further explanation.
1. Paragraph 1 page 4 has been re-written with ‘recognition algorithm’ removed. We do however feel that the presumptive list, lines 12-15 page 4, has been adequately described: it is a list of conditions presumed due to Vietnam service. We also describe the statements of principle (lines 26-28) which is an ‘informed’ list of conditions to help decide eligibility for health benefits.
2. We now, lines 9-11 page 4, explain that health treatment is paid for only when there is no other source of funding.

3. We calculate 99% CIs as a conservative approach to assess multiple comparisons, line 25 page 6. Thank you.
4. There is limited discussion on mortality and cancer incidence because this was the subject of another paper[1] as explained on page 12, lines 1-4. We believe that our study is unique in terms of hospital discharge data, but report on an Australian survey of Vietnam veterans, page 13 line 7 et seq. This does show the extent of under-reporting, especially of psychiatric conditions, which we now comment upon.
5. We have performed the sensitivity analysis suggested, assuming that those lost to follow up were not hospitalised, which is unlikely to be the case because Vietnam veterans resident in Australia are still eligible for NZVA benefits. However we now provide this data in supplementary table 2 and explain on page 11, line 29 et seq. This reduced the 'all causes' SHR to 1.02, 99% CI 0.99-1.04, with the lower bound of the confidence intervals below unity for several conditions. We do not have data for Australian Vietnam veteran hospitalisation, but standardised incidence ratios for cancers in our incidence data[1] tended to be lower than that of Australian Army Vietnam veterans, which suggests that our findings may in fact be an underestimate.
6. The last sentence on page 12 now appears on Page 14, lines 6 and 7, and has been amended. Thank you.

Reference

1. McBride D, Cox B, Broughton J, et al. The mortality and cancer experience of New Zealand Vietnam war veterans: a cohort study. BMJ open 2013;3(9):e003379. doi:10.1136/bmjopen-2013-003379