

Self reported health outcomes in Australian male Vietnam veterans and their children

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Introduction

There have been concerns that the Vietnam War, and its possible exposure to chemicals such as the herbicide Agent Orange, may have had adverse effects on the health of Vietnam veterans and their children. The National Academy of Sciences has recently published two reviews of the literature concerning the health effects of exposure to herbicides in Vietnam.^{1,2} These reviews have concluded that there is evidence that several adverse health effects, such as non-Hodgkin's lymphoma (NHL) and soft tissue sarcoma (STS), may have been caused by exposure to herbicides in Vietnam.

A study of the reproductive outcomes in Australian male veterans did not reveal any difference from the Australian norm.³ However, studies of American veterans have suggested that there might be an elevated rate of spina bifida in the children of male Vietnam veterans, and latest NAS review has concluded that there is limited or suggestive evidence that paternal exposure may increase the risk of fathering children with spina bifida.²

This study aimed to undertake a survey of all surviving Australian Vietnam veterans, asking them a limited number questions about their own health, and that of their spouses and children. Where appropriate community data could be found, comparative analyses were performed.

Material and Methods

There were 59 036 male Vietnam veterans in Australia, of which 3 804 are known to have died, and an additional 5 458 may have died or have been lost to follow up. An address from the electoral roll was found for 49 944 veterans.

The questionnaire was designed in consultation with representatives of the veteran community. It was limited to four A4 pages. Thus, there were a limited number of questions that could be asked.

The veterans were sent a reminder if they had not returned their questionnaire about three weeks after the initial questionnaire had been posted. If they had not responded after a further four weeks, they were sent a second reminder, and an additional questionnaire.

A telephone survey of a stratified sample of the non-responders was also undertaken. After comparing the results obtained in the telephone questionnaire with that obtained in the postal questionnaire, it was concluded that the non-respondents are not posing a significant response bias.

Results and Discussion

There were 40 030 veterans who returned a questionnaire, representing a response rate of completed questionnaires of 80.1%.

In terms of their self-perception of their own health, veterans rated their health as much poorer than the general community, with the results outlined in Table 1. Self-rated health has been shown to predict mortality in a number of studies in various countries.^{4,5,6}

Table 1— Reported Self Health

Male Vietnam Veterans Self-Assessed Health Rating	Number Reported By Veterans	Expected Number
Excellent	1 953 (5%)	6 959
Very Good	5 732 (14%)	11 926
Good	11 647 (29%)	12 234
Fair	13 612 (34%)	6 130
Poor	6 474 (16%)	2 273

In terms of specific diseases, veterans reported that they had more cancers than would be expected, more of a range of diseases, such as motor neurone disease (MND), more multiple sclerosis (MS) and more diabetes mellitus.

Table 2 – Reported Prevalence of Selected Cancers

Type of Cancer	Reported Prevalence	Expected Prevalence	95% CI ^(a)
Lung	120	65	49-89
Prostate	428	147	123-171
NHL	137	48	34-62
STS	398	27	17-37
Carcinoma of Colon	405	117	96-138

(a) Confidence Intervals

Table 2 outlines the reported and selected rates of selected cancers. Elsewhere at this conference, the results of two mortality studies are reported, which show evidence for an increase in mortality from lung cancer and, to a lesser extent, prostate cancer in Australian Vietnam veterans. However, these same studies show no evidence of an increase in mortality from NHL and STS, and a previous cancer incidence study of this cohort, which was not subject of recall bias, did not show an elevation in NHL and STS incidence.⁷

The remarkable elevation in MND is likely to be due in large part to reporting bias, (see Table 3) and the difficult nature of the diagnosis of this disease. Similar concerns may be expressed for MS. The finding of an elevated prevalence of ischaemic heart disease is unexpected in a population that should be subject to the healthy worker effect. Likewise, the elevated rates of diabetes is unexpected, although the Ranch Hand study has reported an increase in diabetes with increasing dioxin level. ⁸

Table 3 – Reported Prevalence of Selected Diseases

Type of Cancer	Reported Prevalence	Expected Prevalence	95% CI ^(a)
Multiple Sclerosis	84	19	17-22
Motor Neurone Disease	128	2	1-2
Ischaemic Heart Disease	5 965	3 236	2 782-3 739
Diabetes	2 391	1 780	1 558-2 003

^(a) Confidence Intervals

In terms of their children, Vietnam veterans report that their children have much greater rates of congenital abnormalities, such as spina bifida and tracheosophageal fistula (see Table 4). The children of Vietnam veterans also are reported as suffering from more Wilms' tumour and slightly more leukaemia (see Table 5). Although the veterans report that their children have died from illness at a rate similar to the general population, they report that their children have much higher rates of suicide, and for death from accidents and external causes (see Table 6).

Table 4 – Reported Prevalence of Congenital Abnormalities

Type of Deformity	Reported Number	Expected Number	95% CI
Spina bifida	379	33	22-44
Anencephaly	51	16	8-24
Down's Syndrome	143	92	73-111
Tracheosophageal Fistula	128	23	14-32

Table 5 – Reported Number of Children Suffering From Cancer

Type of Tumour	Reported Number	Expected Number	95% CI
Leukaemia	78	57	42-72
Wilms' Tumour	47	7	2-12
Tumour of Nervous System	126	48	34-62
Total Cancer	716	333	297-369

Table 6 – Reported Causes of Death in Children

Cause of Death	Reported	Expected	Expected Range
Illness	893	805	749-861
Suicide	247	75	58-92
Accident/Other	887	365	328-402

It is probable that some of these results are explicable, at least in part, to a reporting bias. This would particularly apply to spina bifida, where it is likely that cases of spina bifida occulta were reported in this survey, where as the comparative figures related to spina bifida manifesta. However, it would seem less likely that an elevation in the overall death rate would be a result of report bias.

The effects of possible exposure to herbicides may partly explain these health effects in Vietnam veterans and their children. However, there are alternative explanations for some of the health effects. For example, the elevation in suicide in the children of veterans could be due to the effect of war-caused post traumatic stress disorder, resulting in dysfunctional families and subsequent increases in suicide among offspring.

This study had a number of strengths, among which were the large size of the study group and the high response rate. The ability to follow-up the non-responders was also a strength.

It had a number of weaknesses, the most severe of which was the reliance of self-reported data, as over-reporting, under-reporting and mis-reporting are known to occur in this type of study. It also suffers from the lack of a comparable control group, and lack of data about specific exposure to various agents, such as herbicides, in Vietnam.

The results of this study are the subject of a validation study. In the validation study, all veterans who report suffering from a cancer, from MND and from NS, and all congenital deformities, cancer and death in their children, will be confirmed by reference to medical records. This study should be completed within a year.

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