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## REVIEW OF VIETNAM VETERANS MORTALITY STUDY

A study of proportionate mortality among U.S. Army and Marine veterans who served between July 4, 1965 and March 1, 1973 and died before March 1, 1982 was reported by the Veterans Administration. The study included 19708 Army and 4527 Marine veterans who had served in Vietnam and 22904 Army and 3781 Marine veterans who had not served in Southeast Asia during this period. The study included a random sample of about one-third of the potentially eligible veterans who had died during this period. The selection of study subjects and recovery of information on them appears to have been unbiased and appropriate.

The major findings from this study included a statistically significant excess of accidental and drug related deaths and paucity of suicides among Army veterans who had served in Vietnam compared to those who had not served in Southeast Asia. In addition, there was a statistically significant excess of lung cancer and non-Hodgkins lymphoma among Marine veterans who had served in Vietnam compared to those who had not. Several other findings were not mentioned in either the conclusions nor in the narrative, but are evident in the tables. These include a statistically significant decrease in mortality due to genitourinary diseases and cancer of the extra-cranial nervous system among Army Vietnam veterans. In addition, there appears to have been a significant decrease in cancer deaths among enlisted Army veterans with only one tour of duty in Vietnam, and among similar Marine veterans before 1975. There was also a significant increase in accidental poisonings among enlisted Marine Vietnam veterans dying before 1975.

The authors computed Standardized Proportionate Mortality Ratios (SPMR) and tested with the Chi-Square statistic (not presented in the tables). According to the reference used to justify this procedure (ref # 13), Professor Monson suggests using the Poisson approximation of the variance of the expected deaths, i.e., that the expected number of deaths approximates the variance. If this procedure is applied to the information which can be deduced from the observed number of deaths and the SPMR as given in the tables, several additional SPMRs appear to be statistically significant. These include an excess of all cancer deaths among Marine veterans who served in Vietnam, particularly single tour enlisted Marines after 1975. Other possibly significant findings would include a decrease in deaths due to infectious diseases and diseases of the blood, an increase in deaths due to musculoskeletal and connective tissue diseases, and a decrease in deaths from thyroid cancer and non-Hodgkins lymphoma among Army Vietnam veterans.

While there is no way to determine which statistical procedures are "correct", these results indicate that more significant findings are available in these data than have been discussed in the manuscript. While this does not make it any easier to interpret the results, it does serve to point out the selective nature of the findings which have been emphasized in the manuscript. In particular, the inclusion of one-seventh of the abstract and considerable discussion in the narrative to Agent Orange is misleading. Other possible explanations for the findings should receive relatively more emphasis.



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