

The CDC Study of Vietnam Veterans' Risks of Fathering Infants with Birth Defects

The subject of birth defects in children is a public health problem of deep concern not only to the Vietnam veterans of this nation, but to any American family that shares the experience of giving birth to a child with defects. The Centers for Disease Control (CDC), an agency of the Public Health Service, has completed a study to determine if Vietnam veterans had an increased risk of fathering babies with birth defects (1). This study investigated Vietnam veterans' risks for fathering babies with major structural birth defects. The case-control study is based on a comparison of health histories from the parents of a case group of nearly 5,000 babies born with defects, and the histories from parents of a control group of about 3,000 babies born without defects. Both groups were drawn from 323,421 births in Atlanta, Ga., during the years 1968 through 1980.

For data analysis, the defects which affected the case group babies were divided into 96 diagnostic category groups. One group comprised all types of defects combined and was identified as the complete case series; some groups were formed by various groupings of specific types of defects. However, most of the 96 groups were comprised of specific defects, such as anencephaly, ventricular septal defect, and Down's syndrome. The results of the study are as follows:

- No evidence was found to indicate that Vietnam veterans have had a greater risk than other men for fathering babies with defects when all types of serious structural birth defects are combined. All parents are at some risk that they will have a baby born with birth defects. All men who father babies, Vietnam veterans and non-veterans alike, have this same "background risk"—about 2 or 3 chances out of 100 that their babies will have serious structural birth defects.
- With few exceptions, no evidence was found to indicate that Vietnam veterans have had a greater risk than other men for fathering babies with birth defects in the other 95 defect groups studied.
- There was little evidence that Vietnam veterans who had greater estimated opportunities for Agent Orange exposure have had different risks from other men for fathering babies with birth defects.

In any large study involving multiple statistical testing, some exceptions are expected which can be due to

chance occurrence alone. Some of the exceptions in this study are worthy of specific comment. The estimated risks for fathering babies with spina bifida; cleft lip, with or without cleft palate; and "other neoplasms" were higher for Vietnam veteran fathers who may have had higher opportunity for exposure to Agent Orange. Vietnam veterans, in general, had lower risk for fathering babies with cardiovascular defects classified as "complex" defects. This group includes babies with two or more cardiovascular defects. Vietnam veterans who stated that they had contracted malaria while in Vietnam had a higher estimated risk for fathering babies with hypospadias.

The relative risks for the exceptions noted previously are of such a level that they could be due to unmeasured confounding factors, and they may not be biologically significant. The same reasoning can be applied to the statistically significant higher association of malaria and hypospadias and the statistically significant lower association observed for babies with complex cardiovascular defects fathered by Vietnam veterans.

This study cannot prove that some factor associated with service in Vietnam was or was not associated with the occurrence of rare types of defects, of defects in the babies of selected persons, or defects in the babies of small groups of veterans. Assessing Vietnam veterans' risks associated with exposure to Agent Orange is difficult. The measures of exposure that can be obtained are imperfect. The ability of Vietnam veterans to give valid reports of exposure is unknown, and the records that were used for the assignment of exposure opportunity scores were made for military purposes, not for health studies. This limitation makes it particularly difficult to assess whether the few statistically significant associations with greater Agent Orange exposure opportunities found in this study are likely to reflect true effects of exposure, or whether they are merely chance occurrences.

The most important conclusion to be drawn from the study is that the data contain no evidence to indicate that Vietnam veterans, in general, have had a greater risk than other men for fathering babies with all types of serious structural birth defects.

The Journal of the American Medical Association, in an editorial about this study, has summed it up in a way which speaks for all of us concerned with public health. The editorial said that these findings "may be of little

consolation to those who have suffered the unfortunate circumstances associated with birth defects. But perhaps it will encourage us to expend more effort in preventing birth defects in any child”(2).

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References

1. Erickson, J.D., et al.: Vietnam veterans' risks for fathering babies with birth defects. *JAMA* 252: 903-912, Aug. 17, 1984.
2. Dan, B. B.: Vietnam and birth defects [Editorial]. *JAMA* 252: 936-937, Aug. 17, 1984.

LETTERS TO THE EDITOR

Erratum in "The Population Attributable Risk of Hypertension from Heavy Alcohol Consumption"

In reading our paper, by E. B. Larbi, J. Stamler, et al., *Public Health Reports* for May-June, 1984, pages 316-319, we note a formulation in the first sentence of the last paragraph, on page 318, that is inaccurate and meriting correction. Specifically, that first sentence should read: Moreover, if it is assumed, as has been found in several studies, that the relationship of alcohol use and blood pressure is continuous (curvilinear), then in countries such as the United States, where the per capita consumption is high (26, 27), the population at risk of alcohol-related hypertension is enormous.

This correction is necessary, since the sets of data available do *not* indicate a linear relationship (as stated in our original report), but a continuous curvilinear one.

We would appreciate your printing this correction.

Let me make it clear that the inappropriate formulation was ours and not the responsibility of *Public Health Reports*.

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Smoking, Sex, and Longevity over 60 Years

In considering the differences of opinion between Dr. Miller and Dr. Gerstein on the one hand (1,2) and Dr. Feinleib and Dr. Luoto on the other (3), I find it useful to look at the mortality of males and females over as long a period as possible.

In Florida, the excess of age-adjusted death rates of males over females among whites was 14 percent in 1920, 34 percent in 1930, 53 percent in 1950, 70 percent in 1960, 83 percent in 1970, and 87 percent in 1980. The figures and the trend in the United States as a whole have been about the same. In the case of nonwhites, the trend has been the same. The differences in the mortality rates between the sexes, though less, have progressively approached the differences in whites.

If the differences in smoking habits are responsible for the differences in male and female mortality, then the difference in smoking habits of men and women should be more or less parallel during this 60-year period. Actually, the smoking (and drinking) habits of women seem to have approached those of men over this period. And, as more and more women have entered the workforce, their risk of death from accidents has increased.

A look at the mortality rates of two undoubtedly nonsmoking-age groups suggests that there are other factors involved. In the white population of the United States in 1950, in the age group under 1 year the male death rate was 34.0 per 1,000 population as compared to 25.7 for females, an excess of 32 percent. In the age group of 1-4, the excess was 27 percent.

Although there can be no reasonable doubt that smoking contributes heavily to the excess mortality of men over women, I doubt that "present differences in longevity between men and women will disappear" if their smoking habits become the same (4).

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1. Miller, G. H., and Gerstein, D. R.: The life expectancy of nonsmoking men and women. *Public Health Rep* 98: 343-349, July-August 1983.
2. Miller, G. H., and Gerstein, D. R.: Others would get similar longevity results if they took greater care [letter to editor]. *Public Health Rep* 99: 223-224, May-June 1984.
3. Feinleib, M., and Luoto, J. L.: Longevity of nonsmoking men and women [letter to editor]. *Public Health Rep* 99: 223, May-June 1984.
4. Sowder, W. T.: Why is the sex difference in mortality increasing? *Public Health Rep* 69: 860-864, September 1954.