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Margaret Faulkner
Wellington School of Medicine

WARG Wellington
Asthma Research
Group

Mein Street, Newtown, Wellington
PO Box 7343, Wellington South, New Zealand
Tel: (64) 04 385 5999 Fax: (64) 04 389 5427

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Gary Lewis
Secretary for War Pensions
Income Support
National Office
P.O. Box 12-136
Wellington

Dear Mr Lewis

Thank you for sending me the report of MacDonald et al on "Mortality and health effects in participants of atmospheric nuclear weapons tests: a critical review".

I agree with quite a lot of what the report concludes, and I agree that there is little point in further research on the New Zealand atomic veterans. However, I am writing to express my concern about several issues.

The usual procedure for a report of this type would be to give interested parties the opportunity to comment on a draft, or at least to meet with them to discuss any issues of concern. If this had been done with the current report, I would have been able to correct several mistakes which Dr MacDonald has made with regard to her review of my own studies [1-4].

In particular, I was rather surprised to read the statement on p5 about serious methodological issues that must be addressed with regard to my studies. When I read further to try and find out what these "serious methodological issues" were I found that these were primarily criticisms of the use of SMRs in the analyses. In making these criticisms, Dr MacDonald has quoted extensively and uncritically from the report of Roff (1977). In fact, the use of SMR approach is entirely standard, and results in virtually no bias when the age distribution of the two populations being compared is similar (as it is in my study [1]). Dr MacDonald could have confirmed this by consulting the standard text on occupational epidemiology (Checkoway H, Pearce NE, Crawford-Brown DJ. Research methods in occupational epidemiology. New York: Oxford University Press, 1989. [ISBN 0-19-505224-2]). I know the section on SMRs well, because I wrote it. I don't believe that Dr MacDonald could have read this (or any other epidemiology text for that matter) because she states that:

"Roff (1977) contends that crude SMR/RRs calculated in this manner are bound to underestimate the relative risk since "528 exposed men are compared with 1504 (presumably) unexposed men - a difference in sample size of 35.10%" (p9). She goes on to argue that if the 70 participant deaths are compared with 35.10% of the 179

deaths among the controls (i.e. 70:62:82), the RR would be 1.11, an 11% increase in crude death figures among the participants.”

This passage is ridiculous in the extreme and displays absolutely no understanding of how SMRs are calculated. Let me explain. Firstly, there is no problem with comparing 528 exposed men with 1504 unexposed men because, in the simplest case, we are interested in the percentage of men who died in each group. It wouldn't matter if we were comparing the 528 men with 528 men, 1504 men, or 100,000 men, since in each case we would be comparing percentages, not total numbers. Secondly, when we calculate the percentages we find that 70 of the 528 test participants had died, and that 179 of the 1504 controls had died. When we take the ratio of these percentages we get a relative risk of 1.11 (as Roff correctly notes); when we take the ratio of the SMRs (which indirectly adjust for the small age differences between the exposed and non-exposed groups), we get a very similar ratio of 1.08 [1,2]. The former figure (1.11) was reported in our summary of the study findings which was sent to all study participants. The latter figure (1.08), which is more correct because it takes the small age differences into account, was reported in our report on the study [1], and in the publication in the British Medical Journal [2]. Thus, what Roff reports as a striking finding was reported in our original report. However, the report goes on to show that this “excess death rate” was entirely due to an excess of haematological cancers, and that there was no excess for other types of cancer, or for non-cancer deaths.

I could go on, but suffice it to say that the job of a reviewer of epidemiological studies is to understand the methodological issues involved, and to comment critically not only on the studies themselves, but also on the criticisms of these study. Furthermore, these are all epidemiological studies and you should have hired an epidemiologist to review them. Roff (1997) makes mistakes which a first year student of epidemiology would be embarrassed about, and MacDonald should be embarrassed for having quoted these criticisms so uncritically and regarding them as having unearthed “serious methodological issues”.

Having said that, I don't necessarily disagree with the recommendations on p4, particularly with regard to the conclusion that “the most consistent evidence was that pertaining to an increased risk in test participants for haematological cancers, in particular leukaemia”, although it is confusing that MacDonald then goes on to say that there may also be an increased risk for multiple myeloma, apparently not realising (although this was clear in the tables in my report) that multiple myeloma is a specific type of haematological cancer.

Next time you should hire an experienced epidemiologist, who is able to critically review the material, rather than just quoting what other reviewers say, and is prepared to make the draft report available to interested parties, or at least meet with them, in order to allow factual errors to be corrected and methodological issues to be clarified.

Yours sincerely



Neil Pearce
PROFESSOR

References

1. Pearce NE, Prior IAM, Methven D, Culling C, Marshall S, Auld J, de Boer G, Bethwaite P. Mortality and cancer incidence in New Zealand participants in United Kingdom nuclear weapons tests in the Pacific. Wellington: Department of Community Health, Wellington School of Medicine, 1990.
2. Pearce NE, Prior IAM, Methven D, Culling C, Marshall S, Auld J, de Boer G, Bethwaite P. Follow-up study of New Zealand participants in United Kingdom atmospheric nuclear weapons tests in the Pacific. *Br Med J* 1990; 300: 1161-6.
3. Pearce NE. Mortality and cancer incidence in New Zealand participants in United Kingdom nuclear weapons tests in the Pacific: Supplementary Report. Wellington: Department of Medicine, Wellington School of Medicine, 1996.
4. Pearce N, Winkelmann R, Kennedy J, Lewis S, Purdie G, Slater T, Prior I, Fraser J. Further follow-up of New Zealand participants in United Kingdom nuclear weapons tests in the Pacific. *Cancer Causes and Control* 1997; 8: 139-45.