The author replies as follows:

SIR—In their letter Severson and Grove argue that our New Zealand study of occupation and cancer of the prostate was biased due to the inclusion of patients with lymphomas, leukaemias, and multiple myelomas in the control group. However, they are incorrect to base their criticisms on data from our previous New Zealand studies in which 44% of non-Hodgkin’s lymphoma cases and 57% of the multiple myeloma cases were agricultural workers. The prostate cancer study used the current or most recent occupation at the time of cancer registration. The interview studies quoted by Severson and Grove ascertainment the percentage of cases who had ever been agricultural workers. More appropriate data are provided by a preliminary analysis which used Cancer Registry occupational information (and are also cited by Severson and Grove). It was found that 19% of the cases were agricultural workers. In the prostate cancer study itself 15 (22%) of the 68 controls with lymphomas, leukaemias or multiple myeloma (and known occupation) were agricultural workers, and excluding these from the control group changed the relative risk from 1.08 to 1.10.

Despite this methodological error, it is important to consider the more general points raised by Severson and Grove concerning the use of other cancers as controls. The prostate cancer study is one of a series of New Zealand studies which have used this study design, and the issues are discussed in a recent paper. The main advantage of using other cancers as controls is the minimisation of information bias (the potential for information bias is illustrated by the differing figures for agricultural work given above).

The main potential disadvantage is that selection bias may occur if agricultural workers are at increased risk for other cancer sites. However, our previous studies have incorporated three different methods of assessing selection bias, and each of these indicated that such bias was not occurring. Firstly, the overall cancer mortality in farmers was found to be virtually identical with that of other employed persons. Secondly, the occupational distribution of the cancer controls was found to be very similar to that expected on the basis of national census data. Finally, one interview study involved both cancer controls and general population controls, and the two control groups gave very similar findings.

Severson and Grove’s assertion that patients with lymphomas, leukaemias, and multiple myeloma should be automatically excluded from a control group of other cancer patients is also incorrect. Farmers are at increased risk of certain cancer types, including lymphomas, leukaemias, and multiple myeloma, but are at decreased risk of other cancer types including lung cancer. As noted above, the overall cancer mortality in New Zealand farmers is virtually identical with that of other employed persons. Including all other cancers in the control group thus gives a valid estimate of the proportion of agricultural workers in the study base which generated the cases (in this instance cancer registration is virtually complete and the base population comprises all New Zealand men aged 20 years or more in 1979). If those cancers for which farmers have increased risks were excluded, the remaining controls would largely comprise cancer sites for which farmers have decreased risks. These issues are discussed in more depth in a recent paper.

Finally, I agree that it would be premature to conclude that there is no association between agricultural workers and prostate cancer. Our study was not designed to reach a decision regarding causality but to contribute to the pool of relevant information by measuring the relative risk for prostate cancer in New Zealand agricultural workers. The overall picture is consistent with the hypothesis that farmers are at increased risk of prostate cancer, but there remain some interesting anomalies, including our New Zealand findings.

References
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