Use of the prevalence ratio v the prevalence odds ratio in view of confounding in cross sectional studies

Editor—Since we first submitted our letter on the prevalence ratio v the prevalence odds ratio in cross sectional studies of common disease,1 as first discussed by Lee and Chia,2 Strömberg has made two comments on this matter.4 In his second letter he is critical of our notion that a different pattern of confounding is present when considering the prevalence ratio (PR) compared with the prevalence odds ratio (POR)—that is, that the use of POR implies confounding even when the study base is not confounded in terms of prevalence data (and the reverse is also true). Then, by constructing a set of cross sectional data, where an extraneous factor F affects the prevalence ratio but not the prevalence odds ratio, he suggests that "F may modify the effect of exposure without being a confounder in the conventional meaning; moreover, F may modify the POR and not the PR, and vice versa".

By calculation of the adjusted PR and POR (in Strömberg’s example 2-14 and 2-83, respectively), we find that there is no difference for PR whereas the crude POR is lower than the adjusted POR. This implies negative confounding when the POR analysis is applied.5 This shows what our comment was about, but Strömberg seems to suggest that F is not confounding the prevalence (and the PR), it is not a confounder for the POR either. The problem is, however, that with a POR analysis, F is no longer only a modifying factor but behaves as a confounder because it is differently associated with the exposures among the healthy people. Our point was that this phenomenon should be noted and avoided by proper analysis when a disease is common, but the difference is negligible when the disease is rare.

Our arguments for preferring the PR as a measure of risk rather than the POR were given earlier. It might be added here that even if the POR under certain circumstances can be taken as an incidence (density) ratio it is not appropriate to use a POR estimate as a basis for obtaining the aetiological fraction, or perhaps better terminology, the excess fraction.7 It is worth noting as Strömberg also briefly mentions aetiological aspects in his comment.

Strömberg is critical of the use of Cox’s proportional hazards model and concludes that "there is no useful statistical model for directly estimating a PR with adjustments for several covariates". An estimation of POR is hardly a solution in this context, either it involves logistic regression or it does not, as it may lead to distortion rather than adjustment for confounding covariates. Nor has an overall POR analysis any role in the evaluation of a modifying effect from a covariate on the PR (as in the hypothetical data provided by Strömberg), as this in principle is a matter for stratum specific evaluations.

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NOTICES


The Australian Insulation Wool Research Advisory Board (IWRAB) is organizing a symposium to present the latest information on the health effects of fibrous materials (asbestos) that are used in industries. The symposium will be held on 26 April 1996 and is open to the public.

For further information contact: Geoffrey Berry, Health Effects of Fibrous Materials Symposium, PO Box 746, Turramurra, NSW 2074, Australia. Telephone: +61-2-449-1525. Fax: +61-2-485-7496.


The health and environmental consequences attributed to the accident at the Chernobyl nuclear power plant in the U.S.S.R. that occurred on 26 April 1986 have been subject to extensive investigation. A clearer picture on the health consequences of this accident is expected to emerge from the pilot phase of the International Programme on the Health Effects of the Chernobyl Accident (IPHECA).

Concurrently with the publication of the report on the results of the pilot phase of IPHECA, the World Health Organization is planning to convene a major international conference. This conference will not only put IPHECA results into focus but will also review new findings from other radiological events. Its broad objectives can be stated as follows:

• Highlight major findings from IPHECA phase I
• Compare IPHECA phase I results with those of other studies on health effects of Chernobyl
• Obtain improved (updated) understanding of the type, magnitude, and severity of presently known and expected future health effects from the Chernobyl accident
• Add new results from investigations of health effects of other radiological events to complement the health effects picture
• Examine the effectiveness of remedial measures regarding health during and after accidents and propose future improvements
• Advance or confirm current knowledge of health effects related to radiation
• Provide information to the ongoing or new investigations of UNSCEAR
• Point out interesting trends and developments that need research attention in the future

Recast and expanded table from Strömberg,4 with prevalence ratios (PR) and prevalence odds ratios (POR) by stratum and overall, crude and adjusted: the stratification factor, F, modifies but exerts no confounding on the prevalence of disease, but F differently influences the proportion of healthy subjects among exposed and non-exposed people, thereby exerting confounding on the POR

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<th>Exposed</th>
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<th>PR</th>
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<td>250</td>
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*Adjusted either by Mantel-Haenszel weighing or as standardised mortality ratio.

The confounding POR = 2.83/3.00 = 1; similarly, the confounding PR = 2.14/2.14 = 1—that is, negative and no confounding, respectively.