



## Critical Appraisal of a Case-Control Study on Environmental Health

### Advantages of using a case-control study design:

- Efficient when studying rare outcomes or those with a long latency period
- Can study multiple risk factors or exposures
- Useful when it is difficult to follow-up a dynamic population

<b>Title Page and Introduction</b>	
Who sponsored the study and what are the authors' affiliations?  <i>Bias in study design and interpretation may be a concern</i>	
Is there a convincing rationale and purpose (hypothesis) for doing the study? Does it address a specific issue?	
<b>Study Methods</b>	
Is an appropriate study design used to answer the author's question  <i>example, a case-control design is best suited for rare outcomes.</i>	
Is the case recruitment adequate, with cases defined precisely?  <i>It is preferable that the case definition be independently validated</i>	

<p>Were a sufficient number of cases selected to allow adequate study power?</p> <p>Were cases representative of the specific population?</p> <p><i>The number of cases may be justified by power calculations. Hospital-based cases only may not be representative of community cases</i></p>	
<p>How were the controls selected?</p> <p>Were they matched by a specific characteristic(s) or selected randomly?</p> <p>Were controls representative of a specific population?</p> <p><i>Often age group and sex are matching variables.</i></p>	
<p>Were the cases and controls comparable in the distribution of potential confounders?</p> <p>Do the authors account for confounding in their analysis?</p> <p><i>When not matched for, confounders should be adjusted for in the analysis</i></p>	
<p>Was the exposure accurately ascertained and verified?</p> <p>Do the measures of exposure reflect what they are supposed to measure?</p> <p>Were measurement methods similar for both cases and controls?</p> <p><i>Recall of occupational exposures may be verified by work records. There is the potential for interviewer bias (conducting interviews differently for cases and controls)</i></p>	

<p>Did the exposure precede the outcome?</p> <p>Was the typical latency of the outcome taken into account when assessing exposure?</p> <p><i>Adult cancer usually requires a latent period of 5 to 20 years from first exposure depending on the agent and dose.</i></p>	
<p style="text-align: center;"><b>Results and Discussion</b></p>	
<p>How strong and precise is the association between exposure and outcome?</p> <p><i>The odds ratio indicates the strength of the association, and the 95% CI indicates precision</i></p>	
<p>Can confounding, systematic biases (such as selection bias) or random error be disregarded as alternative explanations?</p> <p><i>Selection bias may occur since both the exposure and disease/outcome have occurred by the time the subject is recruited into the study.</i></p> <p><i>Cases and controls may be selected differentially on the basis of their exposure status or there may be differences in reporting exposure.</i></p>	
<p>Can the study findings be generalized to other people and situations, such as, to the local population?</p> <p><i>For example, were minority populations included? Do the findings apply to a Canadian setting? Can they be applied to your population of interest?</i></p>	
<p>Do the results suggest a causal association? (e.g. Bradford Hill Criteria)</p> <p>Are there other studies to support this association?</p>	

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## References

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