

Limitations of Epidemiologic Studies

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Research Methods Summer Session
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Part 20

1

Limitations of Epidemiologic Studies

- Under what circumstances are we unable to identify an etiologic factor through nonexperimental studies of individuals?
 - 1) Magnitude of increased risk produced by the factor is too small to be reliably identified

2

Limitations of Epidemiologic Studies

- 2) Magnitude of increased risk theoretically not too small, but:
 - a. Insufficient variation among individuals regarding presence/levels of the factor
 - b. Unable to distinguish effect of the factor from that of other factors that are highly correlated with it
 - c. Practical problems cannot be overcome when trying to conduct studies of the effect of the factor
 - i. No valid measure of past presence/levels of factor
 - ii. Lengthy induction/latent period

3

“As seen in Table 5, the variation in risk of primary hepatocellular carcinoma (PHC) across communities correlates positively with the local levels of aflatoxin (AFB1) exposure. On the other hand, there is little association between prevalence of HBsAg positivity and PHC mortality in these same communities.”

Table 5 Prevalence of HBsAG in serum and age-adjusted mortality rate of PHC among cohort members by place of residence

Place of residence	Estimated mean level of AFB ₁ ^a (mg/person/yr)	No. of study subjects	Age-adjusted prevalence of HBsAg ^b (%)	PHC	
				No. of cases	Age-adjusted mortality rate ^b
A	51.8	1070	23.1	25	613.5
B	18.0	1417	24.7	16	288.5
C	2.3	953	24.8	8	182.2
D	0.3	1915	21.6	12	175.4
E	— ^c	2562	19.5	15	149.1

^a Based on food surveys conducted during 1978 to 1984 (6,7).
^b The person-yr distribution of the entire cohort was used as an internal standard.
^c —, no data on aflatoxin B₁ are available for this mining community.

a. Assume for the moment that there was no misclassification of HBsAG nor of PHC status. Even so, you would be loath to consider this lack of association between HBsAG positivity and PHC as evidence against a causal influence of hepatitis B infection. Why is that?

b. This study obtained data that have been particularly persuasive in suggesting that high levels of AFB1 ingestion can predispose to the occurrence of PHC, more so than the results of case-control studies that have addressed this question. Why do you think this particular ecologic study proved to be so helpful?

Epidemiologic Perspectives



• Ed Boyko, MD, MPH, Seattle ERIC Director, interviews Andrea LaCroix, PhD, MPH, Member, Fred Hutchinson Cancer Research Center; Professor of Epidemiology, University of Washington; Scientific Investigator, Center for Health Studies, Group Health Cooperative of Puget Sound, about issues in prevention trials.
