

The next Bergen biostatistical seminar will be given

Monday 19 Sep 2016, 12.00-13.00

by

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Title:

Assessing paradoxes in epidemiology: Do not forget the frailty

Abstract:

Many associations in epidemiology appear to be counter-intuitive, and several epidemiological paradoxes are claimed to exist. Nevertheless, these associations may appear due to inappropriate analytic strategies, and directed acyclic graphs (DAGs) will often reveal several potential sources of bias. The DAG, however, does not provide information on the magnitude of the spurious effects. To profoundly understand the consequences of a bias, we need quantitative estimates.

The sources of bias are often unmeasured, but unknown heterogeneity can be estimated by parametric models. In particular, an extensive framework exists in survival analysis, where frailty models are applied to deal with unmeasured heterogeneity in risk. These models can also be used to explore the magnitude of biases in epidemiology. We study the effect of unknown heterogeneity in several paradoxical associations in epidemiology. By supplementing the causal DAGs with quantitative frailty models, we reveal effects that are often neglected. First, we explore the consequences of observing a treatment over time, and we show that a time-dependent Simpson's effect often may occur. Then, we study a competing risk setting, where false reductions in risk will appear. Finally, we assess studies that select subjects based on an initial event, i.e. index-event studies, and our mathematical expressions suggest that spurious effects will be present.

Epidemiologists should recognize these spurious effects, and exploring the magnitude of bias by frailty models is often appropriate.

Place:

Armauer Hansen's House, Haukeland University Hospital, room 337 (Bjørgvin).

The seminar is open for everyone interested.

Welcome!

Geir Egil Eide, Centre for Clinical Research, Haukeland University Hospital