

Exposure assessment. The exposure assessment in the AHS will be inaccurate. Exposure assessment will be based on historical usage as reported by the farmer or applicator on the study questionnaire(s). There are two problems with this approach: 1. usage does not necessarily mean exposure (work practices/equipment/environmental conditions determine exposure to a large degree); 2. recall can be faulty or biased, especially when historical usage information is collected. Attempts at verification over a 3 year period have found less than 70% agreement between purchasing records and reported usage.

Inaccurate exposure classification can produce spurious results. The conventional thinking in epidemiology is that exposure misclassification will most often obscure exposure disease relationships. More recent thinking has begun to recognize that it can also create spurious exposure disease associations. In a study of this size, there will be some, perhaps many, spurious exposure-disease findings due to exposure misclassification.

Accurate disease classification. The AHS will have accurate disease classification for their cancer studies. In these studies, diagnoses will be determined from population based cancer registries in both states. The registries used medical records as a basis for their diagnostic information and have quality control programs in place to insure accurate diagnoses.

The non-cancer research will have less accurate disease classification. This is especially true for the initial studies where disease information is self-reported with no medical verification. Here, disease itself is not being studied, rather reports of disease are being studied.

Data analysis. NCI and NIEHS have a group of very able statisticians. We can expect a complicated analysis for most of their studies.

One important statistical issue for the AHS is the multiple comparison problem - large studies with many statistical analyses will have a number of "statistically significant" findings by chance alone. The researchers have been very vague about how they will handle the multiple comparison problem.

We also have to keep in mind that even the most sophisticated statistical analysis can't correct for other aspects of the study that are less than optimum (e.g. exposure misclassification).

Bias. Bias (really research errors or extraneous factors that favor an incorrect outcome - not prejudicial judgment)