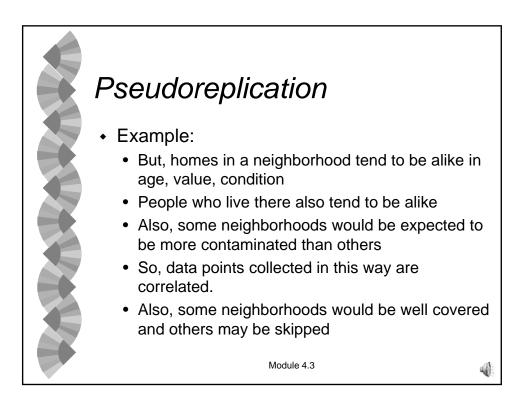


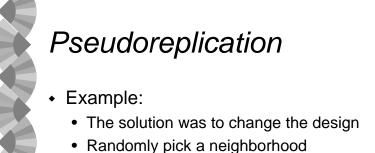


- Example:
 - In a study I was involved with, a graduate student was to collect data on lead contamination in homes in the Bunker Hill Superfund area
 - The plan was to drive to a neighborhood and go door-to-door asking if they would participate. If yes, then information and samples were collected and they went next door and continued.
 - At the end of the week, the data collection would end.

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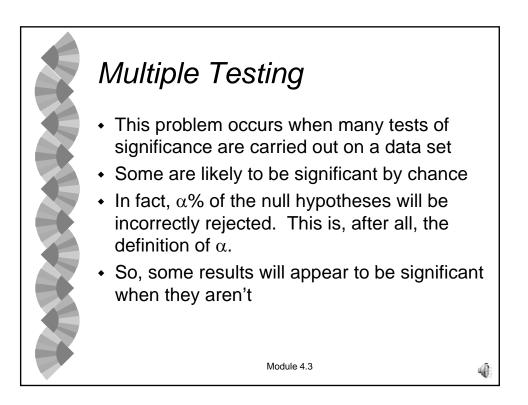


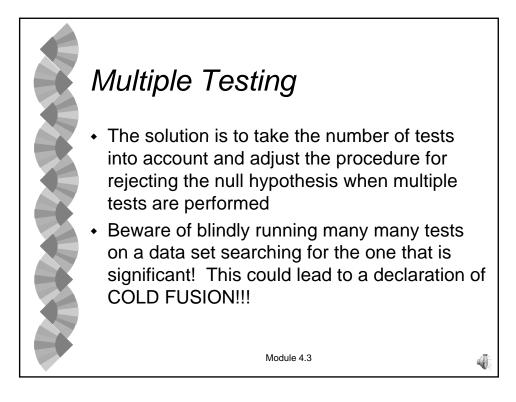


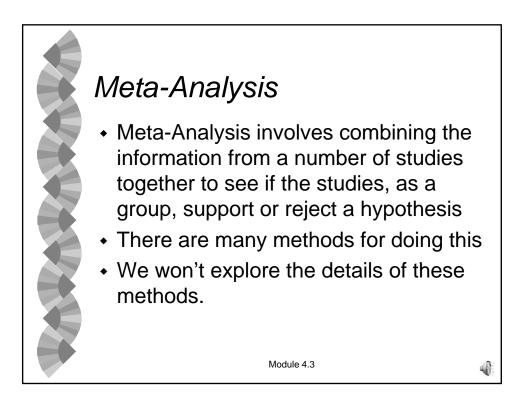
- Go door-to-door until someone agrees to
- Go door-to-door until someone agrees to participate. Collect that data.
- Then randomly pick another neighborhood
- The difference is that each data point is chosen at random from the entire population and should be uncorrelated with the others

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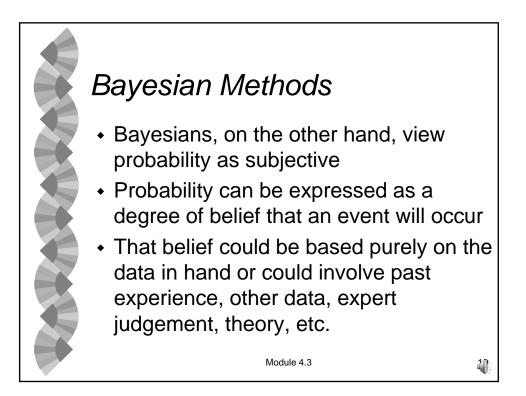


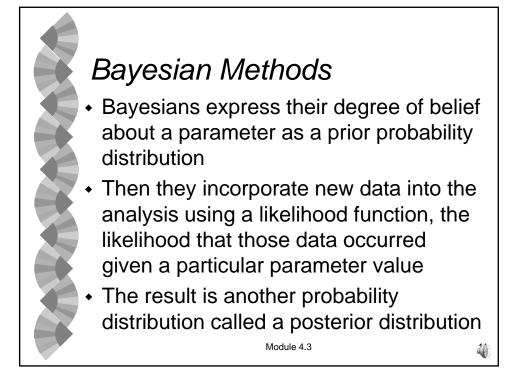


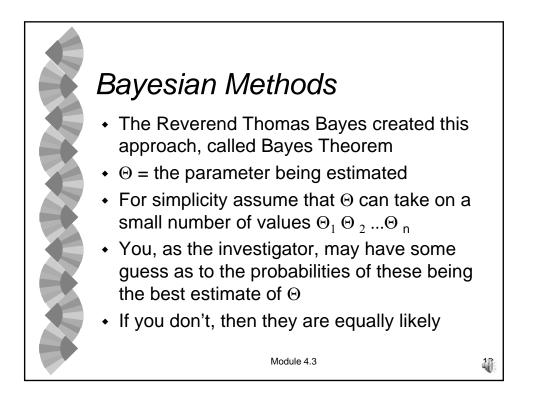
Bayesian Methods

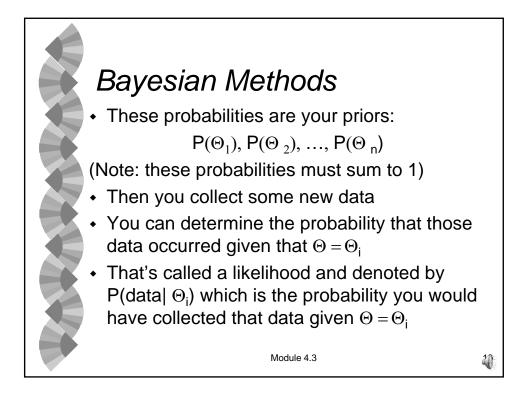
- There are two types of statisticians in the world, Frequentists and Bayesians
- Frequentists view probability as completely objective. They look at all statistical methods from a standpoint of what would happen in the long run if a sample were taken over and over
- Statistics is often taught by them beginning with coin flips, pulling balls from an urn, or using a deck of cards

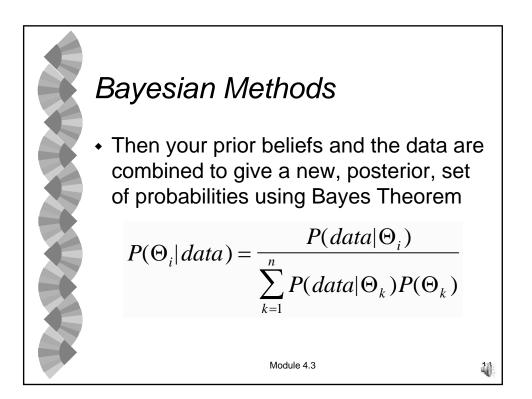
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 If, instead of a small number of possibilities for the parameter, it could fall anywhere in a range then the summation is replaced by an integral

 These methods are being used more and more in environmental science since events are rarely reproducible, data sets are limited, and expert judgement often must be used.

Module 4.3

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