

This work is licensed under a [Creative Commons Attribution-NonCommercial-ShareAlike License](https://creativecommons.org/licenses/by-nc-sa/4.0/). Your use of this material constitutes acceptance of that license and the conditions of use of materials on this site.



Copyright 2006, The Johns Hopkins University and Karl Broman. All rights reserved. Use of these materials permitted only in accordance with license rights granted. Materials provided "AS IS"; no representations or warranties provided. User assumes all responsibility for use, and all liability related thereto, and must independently review all materials for accuracy and efficacy. May contain materials owned by others. User is responsible for obtaining permissions for use from third parties as needed.

## Statistics for laboratory scientists

### Solutions for the homework problems for lecture 3

1. False---one need's to look at the *rates*. The population was 248 million in 1990 and 180 million in 1960, so the death rate actually went down.
2.
  - a. line 1 (28% versus 25%)
  - b. line 3 (46% versus 44%)
  - c. line 2 (71% versus 54%)
  - d. The lower income parents were less likely to give consent, and their children were less likely to get polio.
  - e. These people differ in ways other than the treatment; this comparison would be biased *against* the vaccine.
3. No. It wasn't participation in the study that led to the higher rate of polio; rather, the children of consenting and non-consenting parents had differed in the chance that they would get polio.
4. No. Rather, the investigators focussed on areas at higher risk.
5. No. The second trial is more trustworthy than first and showed no effect. The apparent effect in the first study was likely due to bias on the part of the doctors doing the evaluations.
6. This is likely the placebo effect---the subjects probably understood that they likely had received some treatment by the end of the study.