Department of Epidemiology
School of Public Health
University of California, Los Angeles

PROBLEM ONE (GRAPHICS)

This problem was given to students in Session 2 of the 20-session course (i.e., 10 weeks). The intention was to have them become familiar with MS *Powerpoint* and the use of graphics to present epidemiological findings.

When presenting the results of rapid surveys to policy- and decision-makers, graphs tend to have a greater impact than complex tables filled with numbers. During Session 1, you were asked to read an article by Grabowsky and colleagues,[1] describing how insecticide-treated bednets were successfully distributed in Ghana during a measles vaccination campaign. The results were presented by the authors in two tables, but no graphs. Your assignment in this problem is to address this omission, using the Microsoft *Powerpoint* program. You will be producing in a small report three graphs using data from Table 1 and a short explanatory narration on each figure. You will also be deriving a risk ratio in a table, similar to what was presented in Table 2. The graphs should not be done in color since the cost of reproducing the report will be too costly for local officials in a developing country. The table should be done to whatever standard you like, but hopefully based on an esteemed professional journal.

Please work alone on this problem. It is graded and should reflect your individual work, and not that of a friend or colleague. Later in the final project, you will have the opportunity to work with others.

Finally, be aware that calculations may not be as they seem. Research articles are often published with mistakes, leading to erroneous conclusions about the biologic and sociologic universe.

Specifically...

1. Prepare a short report with three figures and one table. Briefly present the study findings in the three graphs and one table following the style of a typical "results" section of a journal article (if needed, check journals in the UCLA Biomedical library for examples - be high-minded in your selection).

2. For **Figure 1**, Create a bar graph and 95 percent confidence interval that compares the percent of homes in which a bednet was used as reported at the exit interview (i.e., "before" the vaccination campaign) versus the percent of homes in which a bednet was observed in the community survey five months later (i.e., "after" the vaccination campaign).

   Hint: useful is the stock graph with volume, high, low and close.

   Hint: the standard error of a proportion, if derived as a simple random sample, is:

[1] Grabowsky M, Nobiya T, Ahun M, Donna R, Lengor M, Zimmerman D, Ladd H, Hoekstra E, Bello A, Baffoe-Wilmot A, Amofah G. Distributing insecticide-treated bednets during measles vaccination: a low-cost means of achieving high and equitable coverage. *Bulletin of the World Health Organization* 83(3),195-201, 2005.

$$se(p) = \sqrt{\frac{p\,q}{n-1}}$$

and the 95% confidence interval of a proportion, also if derived in a simple random sample, is:

$$95\%\ CI = p \pm 1.96\ x\ se(p)$$

3. For **Figure 2**, compare by wealth quintile the percent with a bednet reported in the home *before* the measles vaccination campaign versus the same variable in the community survey *after* the vaccination campaign.

4. For **Figure 3**, present in a pie chart and bar graph (i.e., bar of pie) the insecticide-treated bednet (ITN) coverage and proper ITN each-night adherence.

   Hint: the concepts of "coverage" and "adherence" are discussed on p. 199, column 1, paragraph 4 of the article.

5. For **Table 1**, compare the risk of receiving a ITN among those who received a measles vaccination versus those who did not, as reported by caregivers in the population-based survey. Be sure to include the four values, two risks, one risk ratio and a 95% confidence interval for the one risk ratio.

   Hint: useful is the *Statcalc* untility program in *Epi Info*.

Problem 1 was due at the beginning of class of Session 6 (i.e., two weeks after being handed out). The problem was worth 15% of the final grade. If late, there was a reduction of 5 percentage points or 0.05 x 15% or 0.75% of the final grade, not much but irritating if on the borderline.

I wish you well in the process. Please be sure to work alone. Professional ethics follow examination ethics, molding character along the way.