PROBLEM ONE

Vital and health statistics reports in developing countries are usually published annually or semi-annually by government agencies, and then shared with the World Health Organization (WHO). Often such country-specific reports contain data on births and deaths, hospital admissions (or discharges), communicable diseases and the findings of special surveys. Unfortunately the data are frequently of questionable value due to problems of under-reporting, recording errors and the like. While there may be many problems with the quality of data, there are ways to enhance the presentation of the information so that what is available will be used. Most administrators are too busy to read and make sense of the endless tables found in many vital and health statistics reports. Instead, they would like to have the most important findings summarized in a form that leads to effective decision-making. Graphs are ideal for this purpose. Many health professionals in developing countries do not use graphs because they are difficult and time consuming to create. With a microcomputer and Excel, however, the tedious process of graph creation has become much easier.

In this problem, you will demonstrate your knowledge of spreadsheet tables and graphics (i.e., using Excel). You are to produce two tables and four graphs which address the problem, can easily be understood by non-epidemiologists, and are suitable for publication in a report. The problem is due Thursday, January 31, 2008 at the beginning of class, and will represent 15% of your final course grade. You must work alone on this project and not consult with students who have taken this class in the past. Doing so is both unethical and foolish, limiting the value of your educational investment (i.e., less personal empowerment). If you need assistance, please ask for it from either Drs. Frerichs or Rimoin.

THE PROBLEM

The World Health Organization (WHO) is the office of the United Nations that addresses the world’s health problems (www.who.org). As part of their activity, WHO gathers data from participating countries on a variety of health measures including cause-of-death mortality (http://www.who.int/healthinfo/morttables/en/index.html). Table 1 in the WHO website shows the numbers and rates of registered deaths for a wide variety of conditions for many countries of the world. For this problem, select a developing country that interests you, and compare the mortality experience in this country to the United States during the same year (or close to the year, if not available).

In the first part of this problem you will create two graphs (Figures 1 and 2) with Excel showing the death rates for all deaths by age and sex, and be using the direct method to adjust the mortality data by age and sex, using both all ages (Table 1) and ages 0-74 (Table 2). Your reference (or standard) population will be the estimated population of the United States, divided into 9 and 10 age-sex groups, respectively.

In the second part of the problem, you will be creating graphs of the five leading causes of infant deaths in your selected country and in the United States during the same year (i.e., Figures 3 and 4),
and will briefly be comparing the two. Finally, you will review the mortality data for infants (i.e., children under 1 year of age) in your selected country and in the United States, and briefly present how program priorities might different in the two countries in dealing with their respective causes of death.

The text to accompany the two tables and four graphs should be no more than five double-spaced pages, including references, if appropriate. All tables and graphs should be presented as shown in a typical research journal, readily available in the Biomedical Library. The text should be written as intended for administrators and planners who are not epidemiologists or statisticians. Grading will be based on style (i.e., professional), format (i.e., research journal), and content (i.e., appropriate to a graduate of the UCLA School of Public Health).

THE SPECIFIC STEPS

Before doing the problem, please completed the Software Training Manual.

1. Go to the WHO website and download the mortality data for your country of interest and the same-year USA data.

2. Using Excel, for all deaths in the United States and in your selected country, produce...

   a. **Table 1** with data for direct age-sex adjusted mortality rates for all ages, comparing the United States to your selected country. Included should be the age-sex adjusted rates for the United States and your selected country, and the mortality ratio comparing your selected country (in the numerator – observed) to the United States (in the denominator – expected).

      i. The headings should include age-sex group, standard population, mortality rates per 100,000 for the United States, the expected number of deaths for the United States, the mortality rates for your selected country, and the expected number of deaths for your selected country.

      ii. Use 20 age-sex categories (i.e., <1, 1-4, 5-14, 15-24, 25-34, 35-44, 45-54, 55-65, 65-74, and 75+ for males and females)

      iii. While population estimates are not given, review the available data and consider how the underlying population numbers might be derived. Your standard population will be the estimated population in the United States.

         (1) Include all deaths (i.e., both ill-defined and defined)

         (2) Hint: double check with another source the populations of your two countries

      iv. Briefly describe Table 1, in style and content appropriate for a program administrator.

   b. **Figure 1**, comparing the age-specific mortality rates between your assigned country and the USA (i.e., two lines)

      i. Use the line graph procedure.
ii. Briefly describe Figure 1 in your text.

c. **Figure 2**, comparing the logarithmic-scale age-specific mortality rates between your selected country and the USA (i.e., two lines)

   i. Reset the scale to “logarithmic”
   ii. Briefly describe Figure 2 in your text, focusing on how it differs from Figure 1.

d. **Table 2** with data for direct age-sex adjusted mortality rates for all ages except 75+, comparing the USA to your selected country. Included should be the age-sex adjusted rates for the USA and your selected country, and the mortality ratio comparing your selected country (in the numerator) to the USA (in the denominator).

   i. Use the same format as in Table 1, but missing two lines (i.e., males 75+ and females 75+)
   ii. Briefly describe Table 2, in style and content appropriate for a program administrator, comparing the two age-sex adjusted mortality ratios (i.e., in Tables 1 and 2), keeping in mind what you observed in Figures 1 and 2.

3. Using Excel, for five leading causes of infant deaths (plus a sixth bar with “all other”) in the USA and your selected country, produce...

   a. **Figure 3**, a bar graph of the five leading causes of infant deaths in your selected country and a sixth category, “all other.”

      i. The top bar should be the leading cause of infant death and the bottom bar should be the “all other” causes of infant death.

   b. Use abbreviations in the graph (but cite the full name in your text), but when describing in text, use the complete cause name.

   c. **Figure 4**, a pie chart of the five leading causes of infant deaths in the United States and a sixth category, “all other.”

      i. The first mentioned in the legend should be the leading cause of infant death and the last mentioned the “all other” causes of infant death.
      ii. Briefly compare the findings in Figures 3 and 4 in your text.

   d. In the text, based on what you observe in the five leading causes of death among infants, compare the mortality experience of your selected country and the USA, and briefly address the varying program priorities suggested by the data in the two countries.

      i. Write as if you are addressing a program administrator eager to glean your opinion, but is not well versed in advanced statistics or epidemiology.

4. The total text should be no more than five double-spaced pages.
EPI 415 is a practical course (i.e., in the 400 series) with many realistic examples presented in class. Your answers are expected to reflect this spirit of realism, rather than just an academic assignment. Remember, the work should be your own, without help from others. Your salary in the work-place will be paid based on your aptitude and ability, and hopefully not lowered because you cannot do the work and must rely instead on others for technical assistance. Make this course a good investment in your development.