DEMOGRAPHY, DEVELOPING COUNTRIES (ECON 3710/4710)

1 June 2004, 9.00-12.00

Allowed to bring: Calculator

Question 1 (counts 10%)

Which index do Hill and Upchurch (1995) use for girls' excess mortality? How do they motivate this index?

Question 2 (counts 10%)

A linear regression model is estimated for Infant Mortality Rate (IMR) in 400 districts of India. Three characteristics of the districts are included as independent variables:

U: average length of women's education (in years, typically 0-20)
S: average score on an index for women's autonomy (between 0 and 100)
I: GNP per capita (in 1000 USD, typically 0.5-4)

IMR is measured in deaths per 1000. The country average is about 90.

This is the model:

$$IMR = a_0 + a_1\ U + a_2\ S + a_3\ I + e$$

e is a normally distributed error term, as usual.

These are the estimates, with 95% confidence intervals in parentheses:

a_0 100.0 (90.0 - 110.0)
a_1 -5.0 (-6.0 -   -4.0)
a_2 -0.3 (-0.4 -   -0.2)
a_3 -4.0 (-9.0 -   1.0)

Explain very briefly what these estimates mean? Do the results accord with the course readings?

Question 3 (counts 15%)

In a population we observe, during a particular year, 125 000 births. The mortality statistics that year indicate that life expectancy is 80 years. Both at the beginning and at the end population size turns out to be 10 million. The population is closed for migration.

a) Which of the following statements is/are correct (more than one correct statement is possible)?

     a. The population is stable.
     b. The population is stationary.
     c. The population may be stable.
     d. The population may be stationary.
     e. The population is certainly not stable.
     f. The population is certainly not stationary.

Justify your answer.

b) Now we get an <u>additional</u> piece of information. Both the annual number of births, the annual number of deaths, and the age structure have been constant for a century already. Which of the following statements is/are correct (more than one correct statement is possible)?

     g. The population is stable.
     h. The population is stationary.
     i. The population may be stable.
     j. The population may be stationary.
     k. The population is certainly not stable.
     l. The population is certainly not stationary.

Justify your answer.

c) The practical use of stable population theory is illustrated, in the course literature, by an article entitled "Fertility and mortality estimation using model stable age distributions". The article contains an empirical illustration based on data for men in Brazil, 1960. Answer the following questions.

i) What is the purpose of the empirical illustration described in that article?

ii) Describe briefly what you consider to be the main <u>demographic</u> points of the article. (Do not describe the interpolation technique that the article uses - that is not demography, but statistics/mathematics in general.)

Question 4 (counts 10%)

In Kravdal's (2002) analysis of fertility in sub-Saharan Africa, a woman's birth rate is specified to depend both on her own educational level and that of other women in the community. What is the reason for including the latter variable?

Question 5 (counts 25%)

Discuss the similarities and dissimilarities between the family planning programmes in Bangladesh, China and Iran

Question 6 (counts 30%)

Discuss the impact that population growth may have on the physical environment in poor countries, under different conditions.

Good luck!