Measurement of Policy Outcomes: Homework 2

Please send your answers before September 30th, 2019 11:59 A.M. to measurement.homework@gmail.com

Date of the tutorial session: October 2nd, 2019

Four pages of text should be enough.

1 Child Mortality in Côte d'Ivoire (6 points)

Attached to this document you will find a STATA dataset extracted from a household representative sample for Cote d'Ivoire (1986-88): "**civ88_mort.dta**". In each surveyed household, one woman between 15 and 49 years old has been randomly drawn and asked about all the children she has given birth to during her life. For each child born, the sex and the year of birth have been collected, as well as whether the child is still alive. The age at death was also collected. We extract information only for children born less than 10 years before the survey.

1. Sampling **(1 points)**
   (a) How should you transform pweight to obtain a weight that allows you to estimate statistics on the population of women in Cote d'Ivoire ? Explain your computations.
2. Measurement of under 5 mortality rate **(5 points)**

   One finds two different practices for measuring mortality under 5 years of age:

   – Either take the population of children born 0 to 4 years ago and divide the number of deaths by the number of children;
   – Or take the population of children born 5 to 9 years ago and divide the number of deaths between 0 and 4 years of age (i.e. before reaching age 5) by the number of children.

   (a) What method can be deemed preferable and why?
   (b) Child mortality rates in Côte d'Ivoire.
      i. Compute mortality rates with both methods for boys and girls separately (don't forget the weights)[1].
      ii. Compare and comment.

2 Health status, nutritional status and wealth in Côte d'Ivoire (7 points)

Height stature (measured in centimeters) is an anthropometric indicator that is deemed to be determined during the early years of children growth, i.e. between 0 and 5 years of age. At the individual level, height is

[1] Hint: you can specify your model as follows: lm(y ~ x, data, weights = weight_variable)

determined by (i) genetic inheritance (children with tall parents are taller); (ii) infectious environment faced during childhood (the aggression of pathogens slows down child growth); (iii) quantity and quality of food intakes received during childhood (number of calories, proteins, etc.). In a sufficiently large population, it can be considered that genetic factors are normally distributed around the mean, so that the population's mean height is no longer influenced by genetics but only by the infectious environment and the quantity and quality of food. It is the reason why height stature is used to trace back the health and nutritional status experienced by different cohorts when they were young.

The dataset "**civ88-08_nutri.dta**" gives the height stature in centimeters of children for a nationally representative sample of households living in 1988, 1993 and 2008 in Côte d'Ivoire. It also contains the sex, age and weight (in kilograms) of the child, the gender of the household head and his level of education, the rural-urban and north-south location, consumption per capita and size of the household.

Stunted children are defined as children showing a height stature that is lower than the median of the reference population by 2 standard deviations measured on the same reference population. That is children such as the z-score is lower than -2 ($\mathbf{z} \leq$ -2), where the z-score is given by the following formula:

$$\mathbf{z} = \frac{\text{height} - \mathbf{WHOMedian}\,(\text{sex}, \text{age})}{\mathbf{WHOstdev}\,(\text{sex}, \text{age})}$$

where WHOMedian and WHOstdev are respectively the median and the standard deviation of height estimated by the World health Organisation for a given population.

1. In 2008, the weight could be measured in either kilogram or hectogram. However, the unit was not systematically reported. It was therefore assumed that all the weights are reported in kilograms. Under which condition(s) can we safely compare weight over time? **(.5 point)**

2. Using the variables medheight and stdheight, compute each child's z-score. **(.5 point)**

3. Height Stature over time and across regions **(3 points)**

   (a) Estimate the stunting rate for 2–4 years old children over time at the national level, in North and South. Comment your results.

   (b) Estimate the stunting rate for 2–4 years old children over time for boys and girls at the national level. Comment your results.

4. Height Stature and poverty **(3 points)**

   Here, one would like to study how the gradient of the number of stunted children aged 2–4 years and household consumption per capita has changed over time.

   In particular you are asked:

   (a) Study how the number of stunted children varied with household consumption per capita over time.

   (b) Comment your results and their limits.

3 A meaningful table (6 pts)

Please visit the following website: https://stats.oecd.org/Index.aspx?DataSetCode=MIG

Construct a small statistical table showing a meaningful and policy relevant social fact about migration in the world. You may focus, or not, on a given region or country of origin, or on a particular subgroup of the population (children, etc.) A combination of originality, policy relevance and statistical accuracy will be very much appreciated. The table should fit in the top half of a page. It should have the attributes of a proper research-paper table: title, notes, etc. Table notes should indicate the source of data, the coverage

(countries and population), the definition and units of variables and any other kind of information that is needed to read and understand the table. The bottom half of the page should be dedicated to a brief text, commenting upon the social fact that the table reveals.

Remember that macro data from the World Bank (and on income inequality from the UN University at WIDER) can be freely downloaded at these 3 Weblinks:
http://ddp-ext.worldbank.org/ext/DDPQQ/member.do?method=getMembers&userid=1&queryId=135
http://www.wider.unu.edu/research/Database/en_GB/wiid/_files/79789834673192984/default/WIID2C.xls
http://info.worldbank.org/governance/wgi/#home

These macro data can be merged with the data upon migration. You may also find other sources by yourself.

Nota bene: **please note that any answers to this problem exceeding one page will be graded 0.**

4 Appendix

Table 1: Variables of the Dataset **civ88_mort.dta**.

Variable	Definition	Unit	Items
hhid	Household Id	number	1,...,2707
pid	Personal identifier within household	number	1,...,19
pweight	Sample weight	continuous	The mean of weights is normalized to 1
n_wom	Number of women 15-49 y.o. in the household	count	1,2,3...
age_m	Age of selected woman	years	15, 16..., 49
boys	Number of boys born between 0 and 10 years ago	count	1,2,3...
dboys	Number of boys dead	count	1,2,3...
girls	Number of girls born between 0 and 10 years ago	count	1,2,3...
dgirls	Number of girls dead	count	1,2,3...
boys_l5	Number of boys born between 0 and 5 years ago	count	1,2,3...
girls_l5	Number of girls born between 0 and 5 years ago	1,2,3...	
dboys_l5	Number of boys dead among those born between 0 and 5 years ago	count	1,2,3...
dgirls_l5	Number of girls dead among those born between 0 and 5 years ago	count	1,2,3...
dboys_u5	Number of boys dead before reaching the age of 5	count	1,2,3...
dgirls_u5	Number of girls dead before reaching the age of 5	count	1,2,3...
alpha	Household head literacy	dummy	1=Can read & write 0=Cannot
rur	Household is in a rural area	dummy	1=Rural Area; 0=Urban Area
conspc88	Consumption per capita in household	FCFA (1988 prices)	continuous
sizeh	Number of household members	count	

Table 2: Variables of the Dataset **civ88-08_nutri.dta**.

Variable	Definition	Unit	Items
year	Year of survey wave	calendar years	1988, 1993, 2008
hhid	Household Id	number	1003,...,3200016
pid	Personal identifier within household	number	1,...,6
pweight	Sample weight	continuous	The mean of weights is normalized to 1
hhsize	Number of household members	count	2,...,95
north	Household lives in Northern region	dummy	1=north; 0=south
rur	Household is in a rural area	dummy	1=Rural; 0=Urban
age	Age	months	0,...,60
sexe	Gender	dummy	1=male; 0=female
education	Highest Grade Completed	categorial	0,..., 6
height	Child's height	centimeters	continuous
medheight	Median height (WHO)	centimeters	continuous
stdheight	Standard deviation of height (WHO)	centimeters	continuous
weightkg	Child's weight	kilogram	continuous
agehead	Age of Household head	count	15,...,99
educationhead	Highest Grade Completed by Household head	categorial	0,..., 6
conspc88	Consumption per capita in household	FCFA (1988 prices)	continuous