

## Problem Set on Multidimensional Poverty Measures

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### A) Paper-Based Problems:

Given the following matrix of distribution of three dimensions (income, self rated health, and years of education):

$$X = \begin{bmatrix} 4 & 1 & 5 \\ 8 & 4 & 6 \\ 12 & 1 & 11 \\ 3 & 4 & 6 \\ 15 & 1 & 9 \\ 12 & 5 & 12 \end{bmatrix}$$

- a) Calculate H, M0, M1 and M2 using a cutoff value of  $k=2$  and equal weights. Assume that the poverty lines are (10, 3 and 8 correspondingly).
- I. Which is the contribution of each dimension to M0?
  - II. Which is the contribution of the group of the first three individuals to overall M1?
  - III. What happens to each of the measures if individual 2 reported a health status of 2 instead of 4?
- b) Calculate H, M0, M1 and M2 using nested weights: assigning a value of 2 to income, and 0.5 to health and education respectively.

### B) Computer-Based Problems (Using Stata):

First make sure to count with enough memory to work with the data:

set memory 256m

Open the data set distributed to you, called 'Half\_Sample\_Bhutan.dta'

Variables to use:

- Poor: 1 if income poor, 0 otherwise
- HHEducation: 1 if at least one household member is literate and all children between 6 and 15 years old are attending school.
- Proom: number of people per room
- Dwater: 1 if the household has access to drinking water.
- Electricity: 1 if the household has access to electricity.

Using the four mentioned variables write a *dofile* that estimates the Multidimensional Headcount and the M0 measures. Use equal weights for each variable. Ignore the population weights for this exercise. Do it for:

- a) The overall sample, with the different k values
- b) Distinguishing between urban and rural areas
- c) What is the percentage of people deprived in each dimension? How are these percentages in rural and urban areas? Which dimensions present the highest levels of deprivation?
- c) How do the measures change as k increases? How is M0 with respect to H? Why? For k=2, in the estimates of the whole sample, what is the average deprivation share among the poor (A)? How do you interpret this?

	Multidimensional H			Mo		
k	Total	Rural	Urban	Total	Rural	Urban
1						
2						
3						
4						
5						