



## **AFRICAN ECONOMIC RESEARCH CONSORTIUM**

*Collaborative PhD Programme in Economics for Sub-Saharan Africa*

**COMPREHENSIVE EXAMINATIONS IN CORE AND ELECTIVE FIELDS**

**FEBRUARY 11 – MARCH 13, 2014**

### **HEALTH ECONOMICS**

**Time: 08:00 – 11:00 GMT**

**Date: Tuesday, February 18, 2014**

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#### **INSTRUCTIONS:**

Answer a total of FOUR questions: ONE question from Section A, ONE question from Section B, and TWO questions from Section C.

The sections are weighted as indicated on the paper.

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#### **SECTION A (15%): 27 Minutes**

**Answer only ONE Question from this Section**

#### **Question 1**

- (a) State and explain using real life examples, two assumptions of the neo-classical economics that are violated in the healthcare market. **[7 Marks]**
- (b) Using an appropriate diagram, explain why provision of charity care would be less than optimal in the absence of government intervention. **[8 Marks]**

#### **Question 2**

Armed conflicts continue to exert a significant toll on human life in Sub-Saharan Africa. However, an end of conflict also brings new health challenges to contend with.

- (a) Discuss any four challenges the post-conflict government is likely to grapple with in the process of rebuilding the health sector. **[8 Marks]**
- (b) Explain three principles you consider to be of help in charting a new development path for the health sector in the post-conflict era. **[7 Marks]**



## **SECTION B (25%): 45 Minutes**

**Answer only ONE Question from this Section**

### **Question 3**

State whether the following statements are **True**, **False** or **Uncertain**, and justify your answer.

- (a) Health Maintenance Organizations that pay doctors a set fee per patient give doctors an incentive not to engage in excessive testing. **[5 Marks]**
- (b) Health Maintenance Organizations that pay doctors a set fee per procedure ensure the right amount of care is provided to patients with complicated health conditions. **[5 Marks]**
- (c) Government mandated health insurance coverage for all would not solve the problems caused by asymmetric information. **[5 Marks]**
- (d) Education is strongly correlated with better health, but there is no evidence that the relationship is causal. **[5 Marks]**
- (e) Holding all else constant, the severity of job lock for a worker with two children is less than the severity of job lock for a worker with a spouse who gets health insurance from her own employer. **[5 Marks]**

### **Question 4**

The delivery of health care in almost every country involves some form of public–private partnership (PPP). While some forms of public–private partnerships are a feature of health care design and operation in all countries, there is increasing interest in a delivery model in which public authority collaborates with private firms to design, build and operate an entire health care system. Though there has been a wide adoption and application of PPP across Sub-Saharan Africa, the success of the outcomes is mixed.

- (a) Discuss any four types of PPPs. **[8 Marks]**
- (b) What is the rationale for increased adoption of PPPs in the health sector? **[7 Marks]**
- (c) What are the constraints that might hinder the optimal application of PPPs? **[10 Marks]**



## **SECTION C (60%): 108 Minutes**

**Answer TWO Questions from this Section;**

**Either Question 5 OR 6 and Either Question 7 OR 8**

### **Question 5**

Suppose your utility function is  $U=3Y^{1/2}$ . Your labour income (Y) when you are well is \$4900. There is a 40% chance that you will get sick (and a 60% chance that you will stay well) which will cost you all of your income in lost earnings.

- (a) Are you risk averse, risk loving or risk neutral? **[5 Marks]**
  
- (b) What is the certainty equivalent of your income distribution associated with getting sick and staying well? **[5 Marks]**
  
- (c) What is the maximum premium you would be willing to pay for health insurance to cover the cost of treatment in the event you fall sick? **[5 Marks]**
  
- (d) What is your risk premium? **[5 Marks]**
  
- (e) Using a graph, describe your findings from (a) to (d) above. **[5 Marks]**
  
- (f) Assume the price elasticity of demand for health insurance is -0.6; interpret this elasticity. **[5 Marks]**

### **Question 6**

The Grossman human capital model treats health both as a consumption commodity as well as an investment commodity. Gross investments are produced by the household production functions that relate a health output to health inputs such as utilization of health care, diet, exercise, cigarette smoking and alcohol consumption. Grossman's pure investment model shows that if healthy time did not enter the utility function directly, or if marginal utility of healthy time were equal to zero, the optimal amount of  $H_t$  ( $t < n$ ) can be found by the following standard Grossman derivation:

$$\frac{W_t G_t}{\pi_{t-1}} \equiv \gamma_t = r - \tilde{\pi}_{t-1} + \delta_t$$



- (a) Critically comment on this derivation (be sure to interpret the variables and any parameters in this equation). **[8 Marks]**
- (b) Explain what is meant by the shadow price of health. **[7 Marks]**
- (c) What is the relationship between the shadow price of health and the health stock? **[5 Marks]**
- (d) What does the Grossman's model predict about the shadow price of health? **[7 Marks]**
- (e) Write down the equation that determines the optimal stock of health in the last period of life. **[3 Marks]**

### **Question 7**

The inadequacy of life expectancy as a measure of health status has given rise to new measures that account for the disability rate that characterizes the life course. To capture the disability component and assign value to health state, both Standard Gamble, and Time-Trade-Off techniques have been prominently applied in the literature.

- (a) Enumerate and discuss the features and processes involved in applying each of these techniques? **[15 Marks]**
- (b) Given that both techniques assign values to health states from different perspectives, can there be convergence between the two? Explain. **[15 Marks]**

### **Question 8**

Concentration indices for health needs, and medical care received are the basis for measurement of both vertical and horizontal equity in health of the population. Since concentration indices are usually computed from sample data, there is need to examine and test for existence of their dominance relations.

- (a) Show how to test for vertical and horizontal inequity dominance. **[15 Marks]**
- (b) What are the possible outcomes and conclusions from such tests? **[7 Marks]**
- (c) Depict your answer in (b) above graphically. **[8 Marks]**