



The Economic Outcomes of
Maternal Mortality and
Morbidity

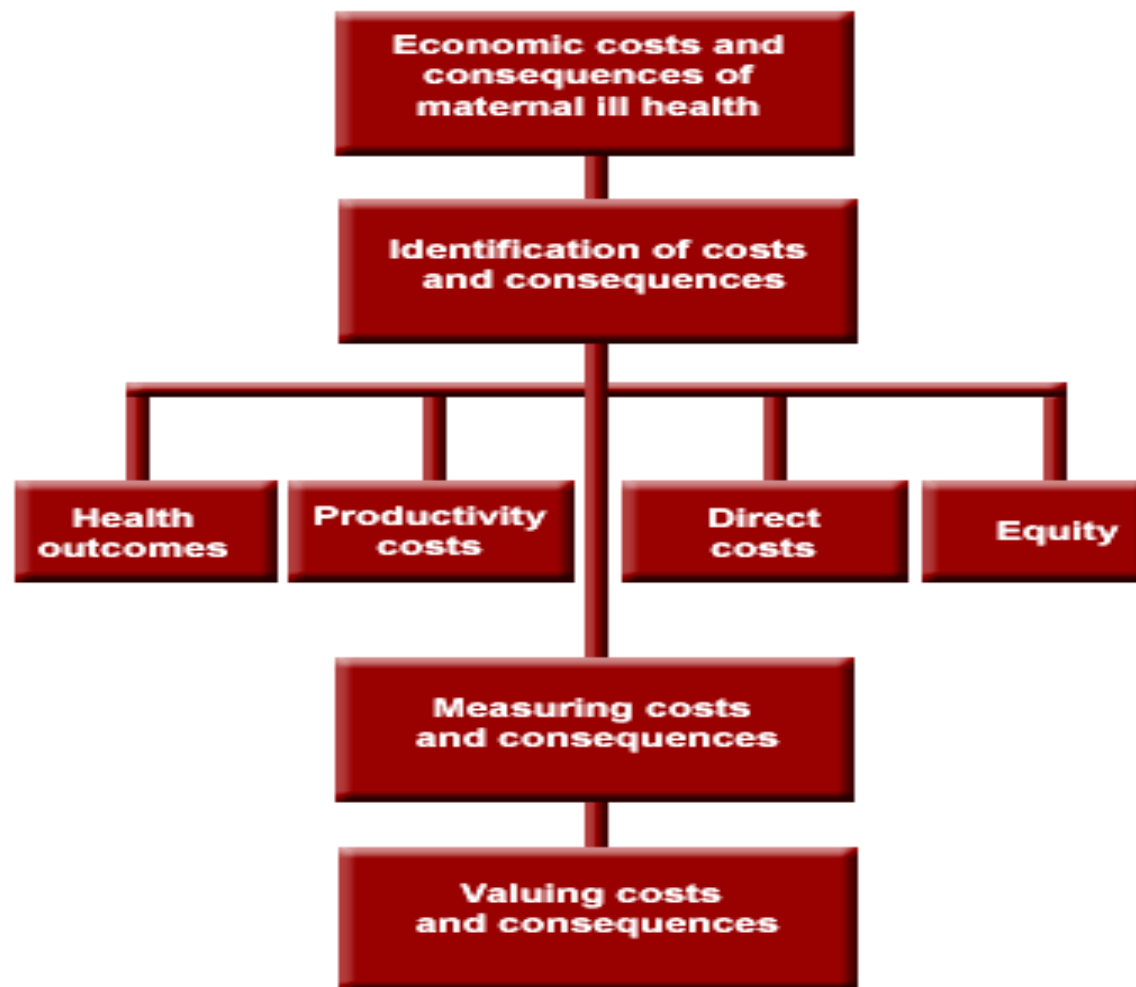
- Overview of the Economic Outcomes work, and
- The valuation of maternal health outcomes – **David Newlands**
- The direct costs of safe motherhood programmes – **Zahidul Quayyum**
- The productivity costs of maternal mortality and morbidity – **Dr Felix Asante**
- The valuation of maternal health equity, and
- Overall synthesis – **Dr Paul McNamee**

Overview of the Economic Outcomes work

- An essential part of the systematic evaluation of any health care policy, such as a safe motherhood strategy, is an examination of its economic implications
- All resources – of people, time, facilities, equipment and knowledge – are limited
- The techniques of economic evaluation of health care are comparatively tried and tested in developed countries, less so in developing countries, even though the necessity of using scarce resources effectively is most pressing in developing countries

- The Economic Outcomes Work Programme has sought to adapt economic techniques evolved in developed countries to the particular circumstances of safe motherhood strategies in developing countries
- While the focus has been on the exploration and testing of alternative methods – the development of the tools of research and evaluation – the research work conducted has yielded some relevant findings

- The Economic Outcomes research has been concerned with the identification, measurement and valuation of the economic outcomes of safe motherhood strategies
- Four principal research areas have been pursued:
 - the valuation of health outcomes
 - the measurement and valuation of productivity costs
 - the measurement and valuation of direct intervention costs as part of the Economic Outcomes inputs to the evaluation questions in Burkina Faso, Ghana and Indonesia
 - the measurement of equity



- We sought to value health outcomes, such as the reduction of maternal mortality and morbidity, using stated preference methods including willingness to pay (WTP) and discrete choice experiments (DCEs)
- Productivity costs are losses of production due to illness, disability or death; we sought to extend the methods used in developed countries by seeking to measure and value other household production losses

- Direct intervention costs of safe motherhood strategies are borne by the health care system and by the women concerned, their families and communities
- Equity is important since the success of safe motherhood strategies cannot be judged solely by health gains; there should be analysis of the distribution of the costs and benefits of particular interventions across the population

The valuation of maternal health outcomes

- Economic Outcomes research sought to test methods to value health outcomes using stated preference methods
- Three stated preference surveys were undertaken as part of the valuation of health outcomes work: two Willingness To Pay (WTP) surveys and a Discrete Choice Experiment (DCE)
- Stated preference techniques were used because they can at least in principle address a wider range of economic outcomes than other approaches

- This survey was conducted in collaboration with the Centre de Recherche en Santé de Nouna (CRSN) in Burkina Faso
- Tested the feasibility and validity of using willingness to pay (WTP) techniques
- Interviewer administered, structured questionnaires were used to elicit individual WTP
- A random representative sample of households was taken from the Household Survey (HHS), a subset of the Demographic Surveillance System (DSS)

- Conducted extensive development phase to ensure feasibility and appropriateness of questionnaire and methods
- Conducted focus group, pre-test and pilot in Nouna community
- Translated into French and local language, Dioula
- Respondents asked if they would make a one off out-of-pocket payment for the scenario
- Used the 'bidding game' technique to elicit maximum WTP

Let's start with a sum of 5000 CFA.

B1 Would you be prepared to pay 5000 CFA?

- Yes (Go to B2)
- No (Go to B6)

B2 Would you pay 5500?

- Yes (Go to B3)
- No (Stop)

B3 Would you pay 6000?

- Yes (Go to B4)
- No (Stop)

B4 Would you pay 6500?

- Yes (Go to B5)
- No (Stop)

B5 Would you pay 7000?

- Yes ASK: What is the most you'd be willing to pay?.....
- No (Stop)

- This survey was also conducted in collaboration with CRSN
- Designed to test the feasibility/validity of an alternative WTP method
- Assessed the value that members of the community place on avoiding cases of both maternal and perinatal mortality
- It thus sought to value outcomes that accrue beyond the health of the mother

- This survey involved a Discrete Choice Experiment which is based on the idea that individuals gain benefit from the different characteristics (or “attributes”) of a good or service
- To date, most DCE studies within health economics have been undertaken in developed countries; objective was to test the feasibility/validity of the DCE approach in developing countries
- The survey valued individual preferences for five attributes of hospital based maternal health care: care by skilled attendants, staff attitude, time taken to get to hospital, availability of vital equipment, and cost of care

- Survey was in two parts:
 - (1) principal survey was part enumerator-administered and part self-administered, with 662 respondents purposively selected from educated groups
 - (2) additional study using visual aids was put to 200 community respondents, mostly of limited literacy

Example of a discrete choice

Choice 1	Hospital A	Hospital B	
Care by skilled attendants	Trained Midwife	Nurse	
Staff attitude	Friendly	Unfriendly	
Time taken to get to hospital	120 Minutes	60 Minutes	
Availability of vital equipment	All	Some	
Cost of care	¢ 240,000	¢ 60,000	
Which Scenario would you choose?	Prefer A	Prefer B	No preference

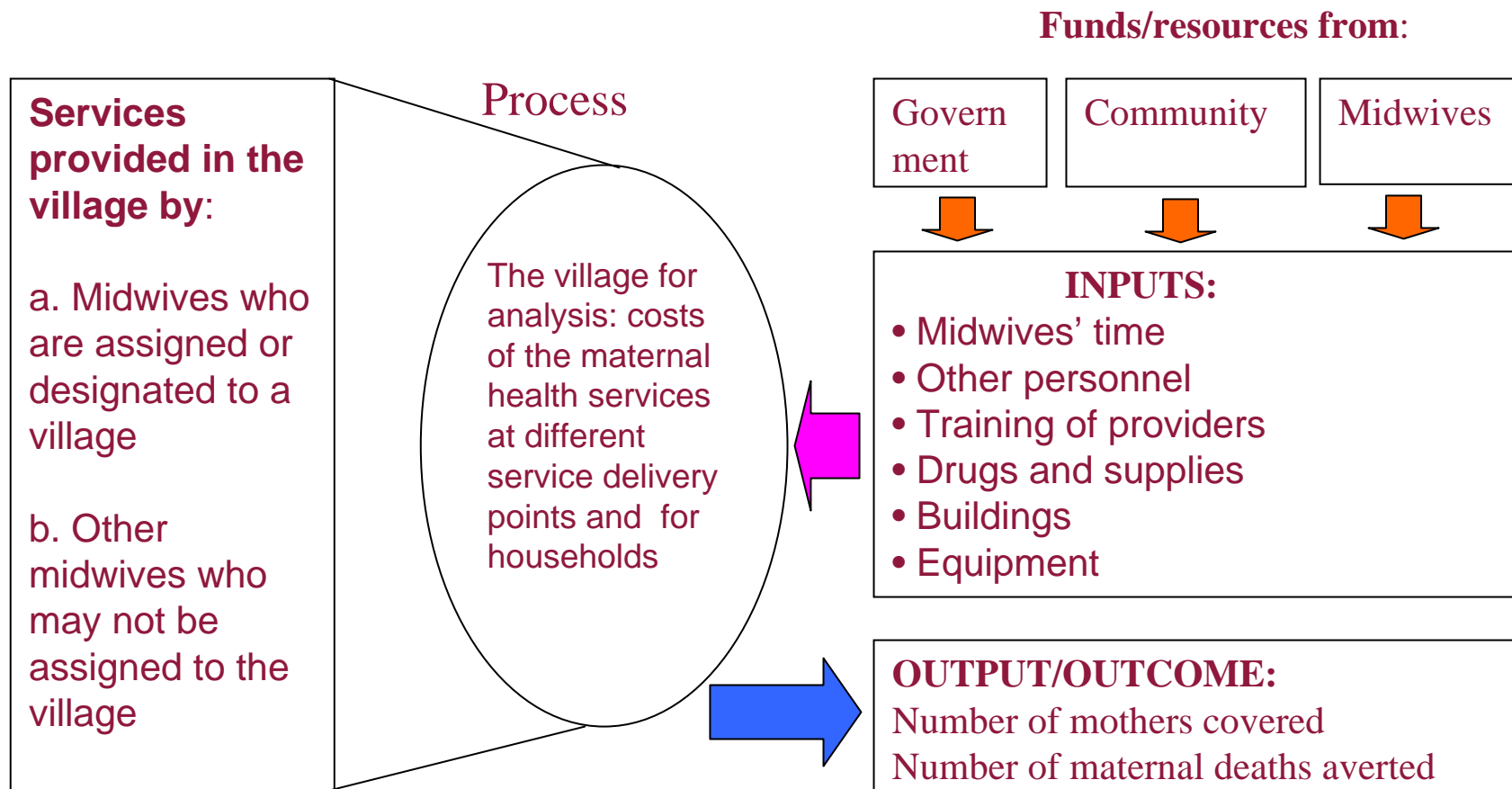
- There were 1236 respondents, with 1205 (97.5%) having a positive willingness to pay (WTP)
- The mean WTP for a 25% reduction in the number of maternal deaths was 2715 CFA
- Respondents reporting a current pregnancy in the household, with experience of maternal complications or a maternal death in the household were all willing to pay more
- Male respondents had a significantly higher mean WTP than female respondents; however, this does not take into consideration any differences between the sexes, for example in age and education
- Interestingly, this trend reversed when analysed as a percentage of income, female WTP as a proportion of income being higher (10% versus 4%)

The direct costs of safe motherhood programmes

- Costing safe motherhood strategies provides necessary inputs for:
 - Cost-effectiveness analysis
 - Cost efficiency analysis of interventions
 - Analysis of resource implications and economic impact of interventions
 - Evidence of cost estimates of alternative strategies
- Estimating costs to households in accessing care permits analysis of the effect of payments for care on household income/consumption

- Burkina Faso
 - Evaluated the effectiveness and cost-effectiveness of the Skilled Care Initiative of Family Care International
 - Economic Outcomes estimated the cost of maternal health care at the community level health centres and household costs
- Ghana
 - Evaluated the effects of the policy of universal fee exemption for deliveries
 - Economic Outcomes determined household costs to examine the changes in financial barriers and the cost of maternal health services at facilities

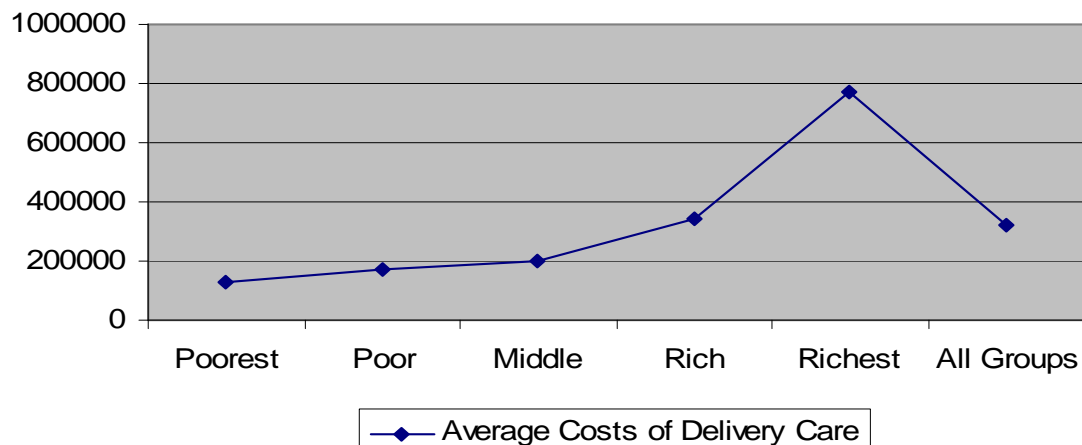
- Indonesia
 - Evaluated the effectiveness and cost-effectiveness of the strategy of posting village midwives
 - Economic Outcomes estimated costs of village level midwifery provision in well served compared to poorly served villages and costs to households



- **Costing Provision/Providers** of midwifery care in the community: midwife interviews, secondary data (Indonesia)
- **Facility Costing Questionnaire:** mainly in Burkina Faso and Ghana, but also in Indonesia: facility surveys, secondary data, panel discussions and expert opinion, and assessment of resources used
- **Time allocation of providers:** self administered allocation of time for midwives (Indonesia), skilled attendants (Burkina Faso)
- **Household Cost Questionnaire:** Survey to collect information on direct and indirect costs to households (Indonesia, Burkina Faso, and Ghana)

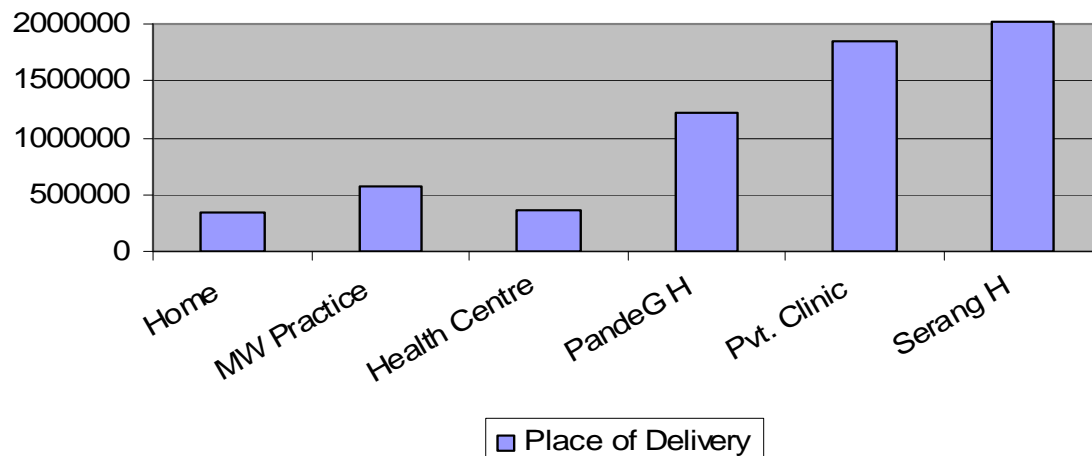
- Average cost of midwifery provision per village with:
 - Resident midwife: US \$5,072
 - Non-resident midwife: US \$4,198
 - Non-resident midwife, covering more than 1 village: US \$3024
- Average cost per delivery in village with:
 - Resident midwife: US \$48
 - Non-resident midwife: US \$81
 - Non-resident midwife, covering more than 1 village: US \$59
- The share of total costs of midwifery care:
 - 35% of the cost covered by the Government
 - 8% is covered by the community
 - remainder, 57%, covered by midwives but passed on to women in form of user charges

Delivery Care Costs to the Households - Rp

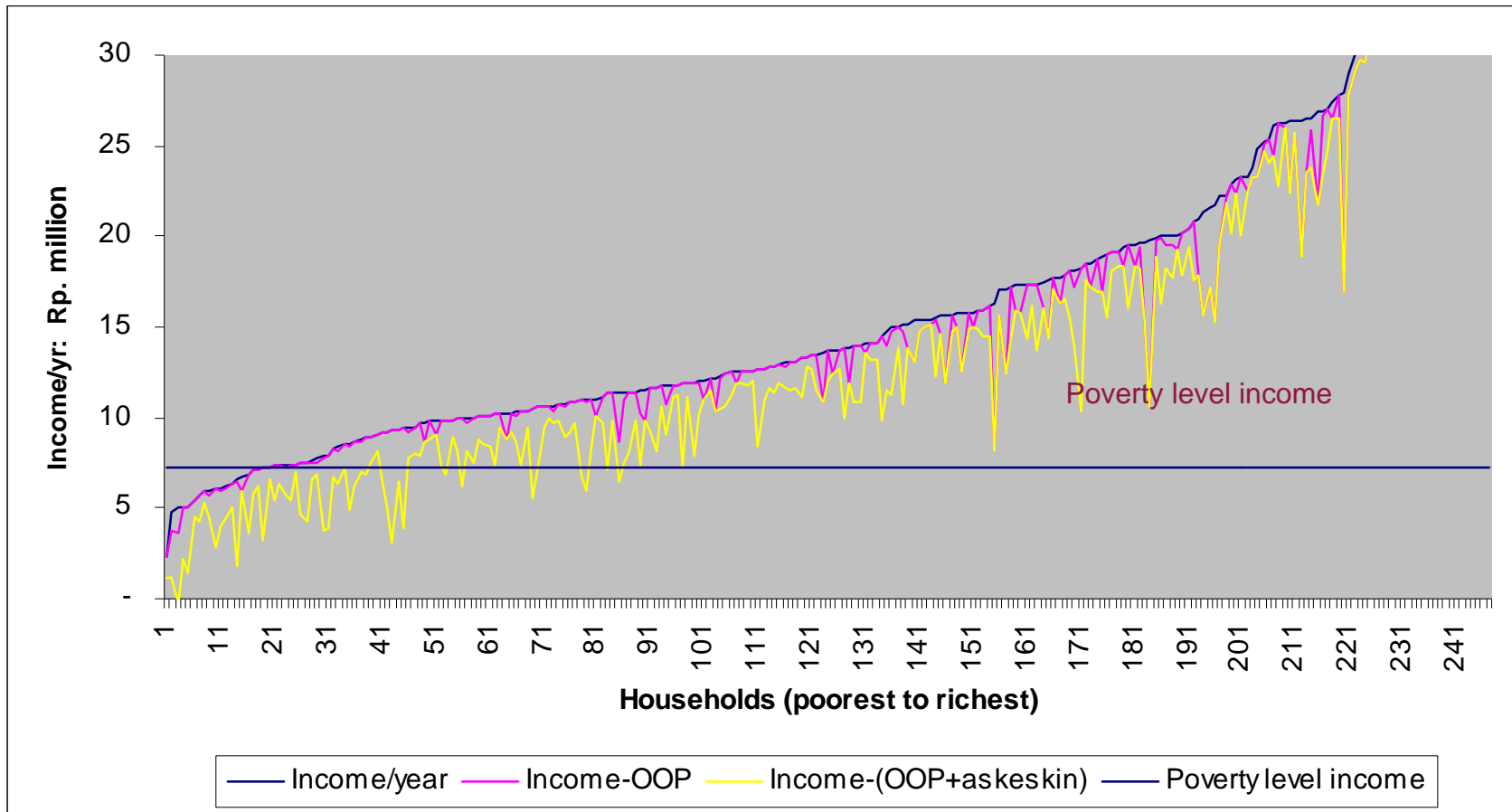


Delivery care costs: poor households, on average, pay less than the rich for delivery care; the poor tend to use home deliveries and the rich tend to use hospitals and spend more

Household Costs of Delivery Care- Rp



- Effect of payment for obstetric care on poverty and role of insurance in protecting households from catastrophic payments



- Tools need to consider complex health systems with multifaceted approach or complex interventions; difficult to identify which elements of a programme may lead to changes, hence difficult to identify which inputs to cost
- Perspectives: societal perspective or provider perspectives; societal or wider perspective preferable
- Approaches: top down versus bottom-up approach
- Presentations of findings to general audiences and policy makers; economic and financial costing

The productivity costs of maternal mortality and morbidity

- Productivity costs, as applied to economic evaluation of health care interventions, refer to the value of specific categories of one's time that are adversely influenced by poor health
- Understanding of the size and distribution of productivity costs is also important as it contributes towards explaining the intricate link between poverty and health
- Few studies that have attempted to measure productivity costs in developing countries have focused on endemic diseases – mainly malaria, schistosomiasis, and more recently HIV/AIDS

Goal

- To develop approaches for adapting existing methods for measurement and valuation of production losses that result from illness to maternal health contexts in low-income countries, using Ghana as a Case Study

Objectives

- To test the validity of a survey instrument designed, as part of the research, to collect data that can be used to assess productivity costs due to maternal ill-health in low-income countries
- To adapt the methods of the Human Capital Approach (HCA) and Frictional Cost Approach (FCA) to the valuation of time lost due to maternal ill health in low-income country settings

- To identify strategies that households use to minimise production losses arising from maternal ill health in Ghana
- To determine how best to adjust existing methods for measuring time lost to ill health to account for households' coping strategies and thus make them applicable to most developing country contexts

- A comprehensive assessment of productivity costs due to maternal ill-health ought to follow women from conception through to childbirth and the end of the puerperium
- This study however only observed women and at a single point in time and thus assessment of productivity costs only pertains to the last time women were ill during their current pregnancy or after their most recent childbirth
- The household was chosen as the sampling unit and the survey was conducted in the Central Region of Ghana
- The target population for the study comprised women who were pregnant or who had delivered in the 3 months leading to the survey
- Study interviewed a sample of 650 women – 416 who were pregnant and 234 who had recently delivered

Absenteeism

- Work time lost due to complete absence from normal activities

Presenteeism

- Work time lost when women continue to work when ill but with reduced productivity

Human Capital Approach

- Measurement of productivity costs (sum of absenteeism and presenteeism) where no allowance is made for household coping strategies

Frictional Cost Approach

- Measurement of productivity costs (sum of absenteeism and presenteeism) adjusting for time recovered through inter- and intra-household coping strategies

- The average period of absenteeism due to a single episode of illness during pregnancy is 18.7 days
- On average, the equivalent of 7.5 days work was lost due to the reduced productivity of women continuing to work while in a state of poor health
- Women lose on average 26.2 work days due to a single episode of illness based on the HCA assessment of productivity costs
- Once the household accounts for time recovered through inter- and intra-household coping strategies (FCA measurement), women lose on average 14.0 work days as a result of a single episode of illness
- Coping strategies are thus able to recover 42 percent of the time that women lose in a single episode of illness during pregnancy

- The average period of absenteeism due to maternal illness in the six weeks after delivery was 20.6 days
- On average, the equivalent of 2.0 days work was lost due to the reduced productivity of women continuing to work while in a state of poor health
- Women lose on average 22.6 work days based on the HCA assessment of productivity costs
- Once the household accounts for time recovered through inter- and intra-household coping strategies (FCA measurement), women lose on average 15.4 work days
- Coping strategies are thus able to recover 32 percent of the time that women lose in a single episode of illness after delivery

- While existing methods have been developed and tested in industrialised country contexts, they are not directly transferable to the context of maternal ill health in developing countries
- While it is easy to identify productivity costs due to absence from formal paid employment, there is a need to develop and test methods that can be used to identify absenteeism in the case of self-employment within and outside the household
- There is also the need for further development and testing of approaches that can be used to measure work-time lost due to presenteeism and that have equal relevance in different work settings
- There is the need to develop approaches for identifying labour reallocation strategies that women and their households engage in to avert production losses that may arise due to pregnancy as well as approaches that can be used to measure them in the assessment of productivity costs

The valuation of health equity

Addressing three questions:

- Can methods be used amongst all people irrespective of level of education, gender and age?
- Do individuals care about the size of inequalities in the number of maternal deaths?
- Do individuals care about how gains in life expectancy are distributed?

- Questionnaire survey of 824 respondents in Serang, Indonesia
- Interviewer administered
- Discrete Choice Experiment (DCE) method
- Person Trade-Off (PTO) method

- 18 pairwise choices
- Choices reflect strength of preference for avoiding inequality
- “Veil of ignorance” approach

Choice 3	A	B	
High	500	460	
Middle	300	340	
Low	100	220	
Which society would you choose?	Prefer A <input type="checkbox"/>	Prefer B <input type="checkbox"/>	They are roughly the same <input type="checkbox"/>

- Up to 40 pairwise choices
- Choices reflect strength of preference for health policies that are life-saving for small number of people, or policies that extend life expectancy for large numbers of people

Person Trade-Off example question



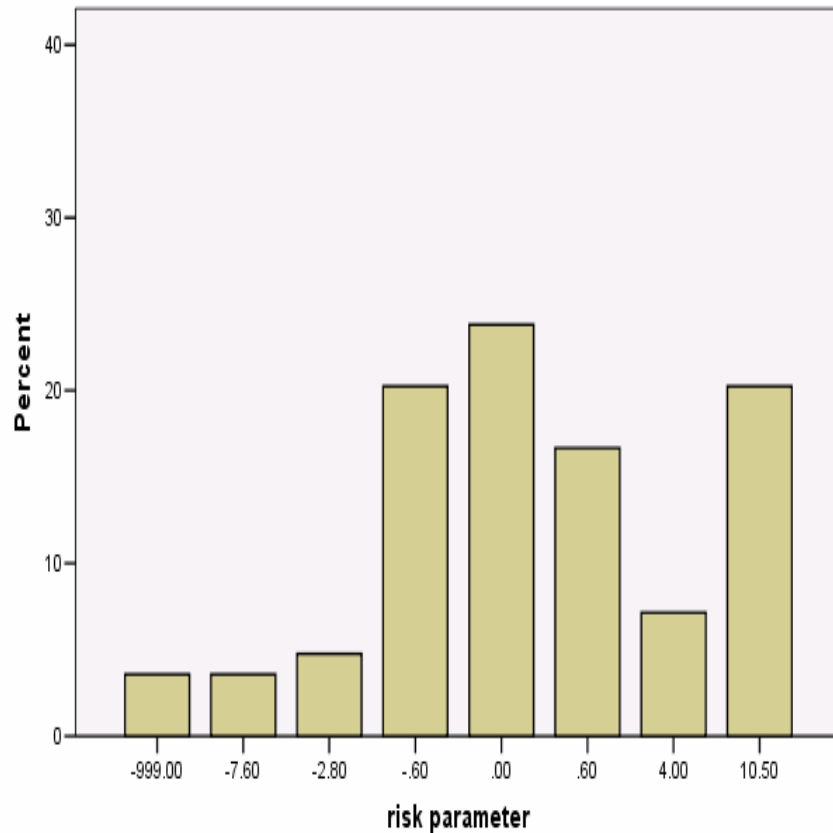
Choice 7	A	B	
Extra Years of Life	10	30	
Number of Mothers Affected	60	12	
Which policy would you choose?	Prefer A	Prefer B	They are roughly the same
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Under uncertainty %	No uncertainty %
Prepared to trade	71	75
Consistent	69	71

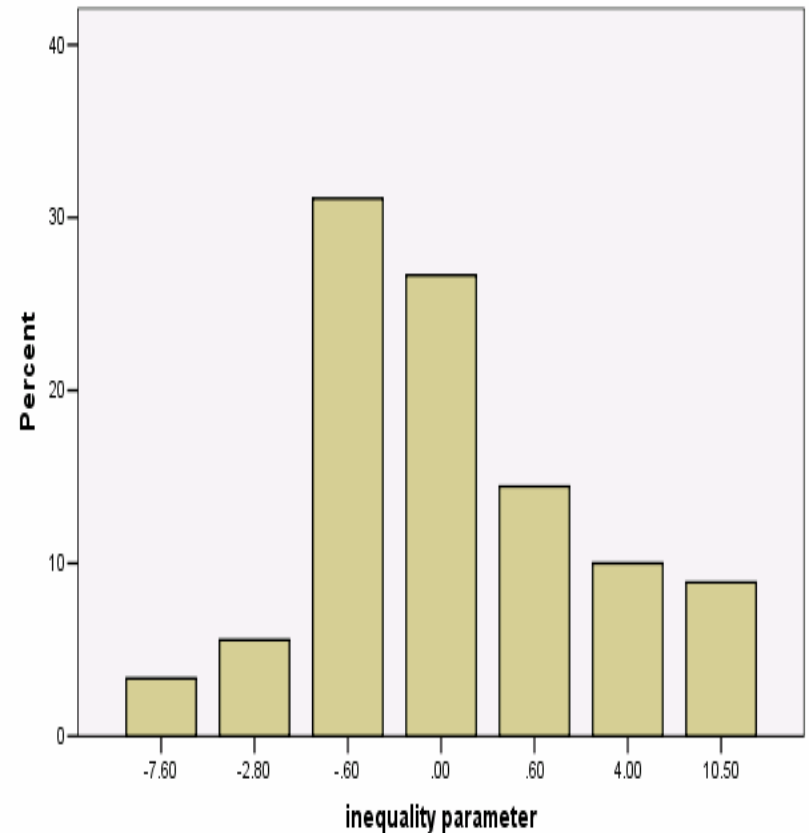
Characteristics of inconsistent responders (DCE)

	Under uncertainty (%)	No uncertainty (%)
<u>Education level</u>		
Below senior high	42*	40**
Senior high or above	29*	26**
<u>Gender</u>		
Female	30	32
Male	32	26
<u>Age group</u>		
15-29 years	40	35
30-44 years	25	23
45+ years	16	18
*p = 0.05		
**p = 0.005		

Format 1 Distribution of risk aversion parameters



Format 1 Distribution of inequality aversion parameters

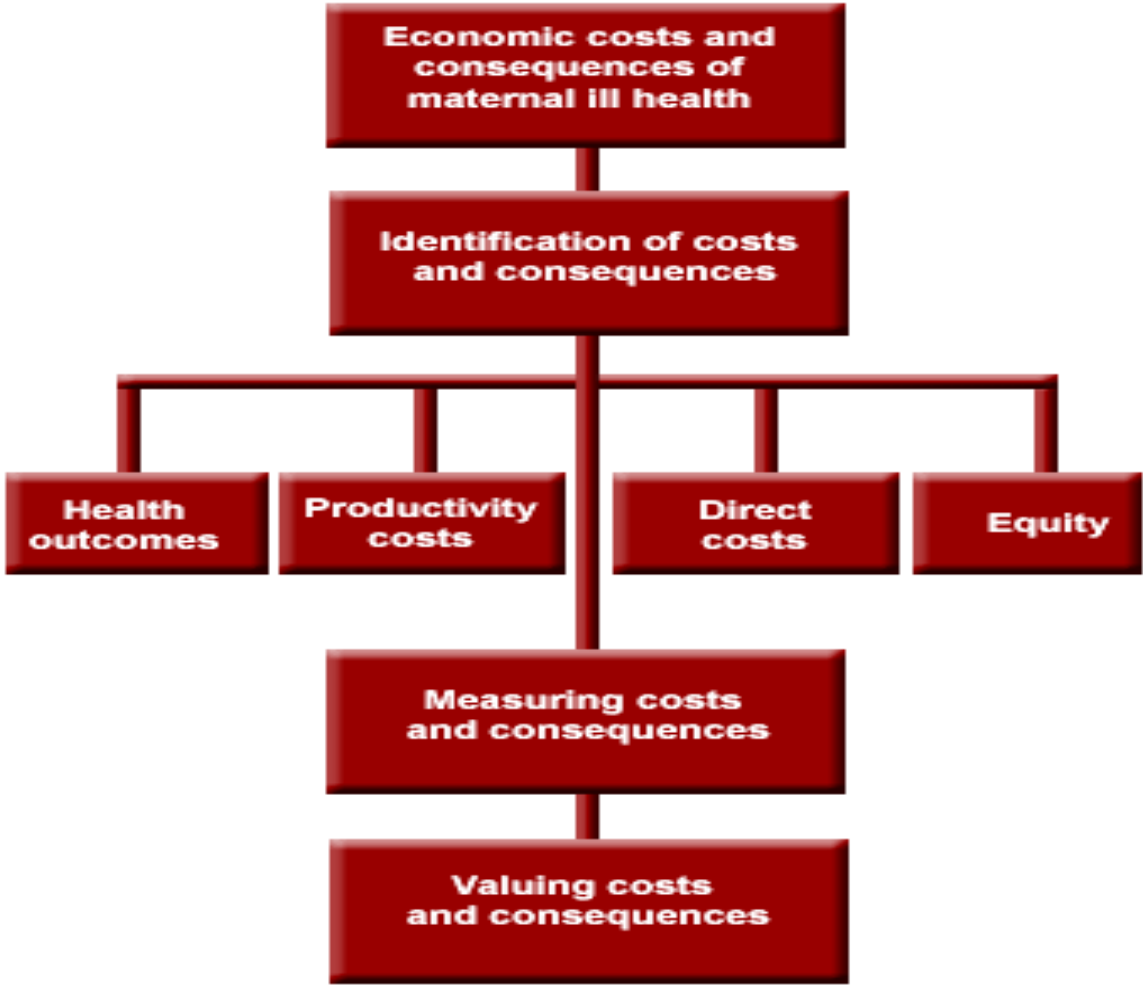


	%
Prepared to trade in at least one policy	80
Prepared to trade throughout	10
Not prepared to trade 1 year, 600 mothers	73
Not prepared to trade 5 years, 120 mothers	74
Not prepared to trade 10 years, 60 mothers	25
Not prepared to trade 50 years, 12 mothers	25
Consistency	51

	%
<u>Education level</u>	
Below senior high	59
Senior high or above	48
<u>Gender</u>	
Female	45
Male	52
<u>Age group</u>	
15-29 years	56
30-44 years	42
45+ years	44

- Task appears feasible for those with lower educational background
- A large proportion of respondents are risk and inequality averse (90%)
- Most respondents prefer policies that spread gains across population
- Strong preferences for avoiding inequalities, and for policies that extend life by a small amount over many mothers

Overall synthesis



- Development and adaptation of tools to local circumstances
- Demonstrated proof of feasibility
- Success partly depends on strength of collaborative partnerships
- Resources important, pre-testing and piloting are key stages
- Tools can be used more widely to inform and support decision-making, through integration with policy evaluations