The Relationship between Poverty and Maternal Morbidity and Mortality in Sub-Saharan Africa

A presentation for the AERC/Hewlett Foundation Workshop, "Poverty and Economic Growth: The Impact of Population Dynamics and Reproductive Health Outcomes in Africa"

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by
Chad Meyerhoefer
Agency for Healthcare Research and Quality (AHRQ)*

David E. Sahn
Cornell University

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*The views expressed in this presentation are those of the authors, and no official endorsement by the Agency for Healthcare Research and Quality, or the U.S. Department of Health and Human Services is intended or should be inferred.

The Relationship between Poverty and Maternal Morbidity and Mortality in Sub-Saharan Africa

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Good maternal health is of fundamental importance to a country's well-being and ability to prosper. It is also the case that, during the period surrounding childbirth, health

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risks to women are particularly acute. Protecting the health of mothers during reproduction safeguards their future contributions to society and ensures the health and productivity of future generations. If either the health of mothers or their newborn offspring is compromised, there will be grave negative consequences for their families, communities, and the entire process of economic and social development at the national level.

According to joint estimations by the WHO, UNICEF, and UNFPA for the year 2000, the MMR of maternal deaths per 100,000 live births was 920 in Sub-Saharan Africa, compared to 20 among all developed regions. Despite the fact that Asia accounted for a slightly larger number of total maternal deaths than Africa, no other region in the world came close to the high mortality risk per birth found in Sub-Saharan Africa. When the region's risk of mortality per pregnancy is combined with the prevailing fertility rate in the calculation of an individual's lifetime risk of maternal death, the disparity is even more pronounced. Over a women's lifetime, the risk of maternal death in Sub-Saharan Africa is 1 in 16, compared to 1 in 2,800 in the developed world, and 1 in 46 in the region with the next highest risk, South-Central Asia

(WHO/UNICEF/UNFPA, 2004). This is why the United Nations has set as one of its eight Millennium Development Goals (MDGs), the reduction of the maternal mortality ratio (MMR) by two-thirds in the developing world by the year 2015. By most accounts, however, it is unlikely that Sub-Saharan Africa will be able to reach this goal without a significant commitment of financial and intellectual resources.

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There is no doubt that poverty in the region contributes to the significant disparities that exist in maternal morbidity and mortality (MMM) between Sub-Saharan Africa and the developed countries, in addition to explaining a large share of the within country inequality of health in Africa. For example, there is a strong association between

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the shares of women of reproductive health who are severely underweight and the quintile of the wealth distribution in which they fall.

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A similar story is found for anemia, another maternal risk factor that is widespread in Africa, as well as for the subsequent birth weight of their children.

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Indeed, there are many ways in which poverty might lead to high MMM. For example, extreme poverty is often associated with limited access to necessary antenatal medical care as well as appropriate medical resources during and after delivery. Furthermore, the lack of access to family planning and reproductive health services may result in a demographic profile, such as young age of first birth and high overall fertility, which increases the reproductive risks to mothers and their offspring. The poor may not

have access to fresh water, and may live in sub-standard dwellings and be at greater risk of contracting malaria or parasitic infections that compromise a woman's immunity during pregnancy.

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Of course, the relationship between poverty and maternal morbidity and mortality also goes in the opposite direction. Clearly, illness or death resulting from childbirth will limit a women's future productivity in the labor market and earning power, thereby contributing to a cycle of poverty and poor maternal health outcomes. The result is a poverty trap whereby mothers are more likely to die or become ill during or after pregnancy because they are poor, and more likely to be poor in the future as a result of negative health shocks during this period.

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An equally serious negative consequence of MMM is reduced productivity in domestic and caretaking activities. The inability of poor mothers to care for their newborns greatly increases the risk of infant mortality or other adverse health events which can have long lasting consequences (Strong, 1998).

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See, for example, the association between poverty and stunting of children less than 24 months of age.

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Beyond child quality, there may be effects of maternal morbidity (and obviously mortality) on the quantity of children, and the subsequent feedback through the impact of maternal depletion. And as I will discuss later this afternoon, the tradeoffs between the

number of children and their human capital is one of the central concepts in the household economics literature, as depicted by the arrow linking these two outcomes.

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Other household members are also inevitably affected by MMM. For example, the need for pre-existing children to take over the mother's domestic and caretaking responsibilities can lower educational attainment and reduce future earning potential. This problem is particularly relevant to young girls, who are the likely substitutes for women in caretaking roles. The same girls who are therefore likely to withdraw from school are both likely to have high levels of fertility and be primarily engaged in low skilled and low wage self-employment and home production. Thus, there are important dynamic elements not captured by this simple framework, both within the life course of individuals, but also across generations as childhood experiences subsequently affect both adult health and fertility.

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Finally, I next illustrate the role of exogenous influences – policies, programs and interventions – and how they may impact upon the multifaceted and complex relationship between MMM and poverty. Specifically, I highlight the role of health shocks and economic shocks, the role of non-earned income, remittance and transfers, and finally the role of the public goods and other publicly provided services, and their role in affecting the various pathways and outcomes in this diagram. I will discuss these in more detail in the remainder of my talk, focusing on potentially fruitful areas for future research. But my main purpose in showing these exogenous influences on this framework is to reinforce the importance of investigating each of these types of interventions as part of a

unified theoretical framework. Doing so requires data that enable researchers to construct the types of complex empirical models that can capture a range of linkages implied in my previous comments. While a detailing of methodological considerations are beyond the scope of this short presentation, I will devote the remaining time I have to first, discussing examples of salient and pressing policy issues in the realm of understanding the linkages between MMM and poverty, and the methodological challenges and research opportunities for the AERC network in Africa.

RESEARCH THEMES

The scope and need for research in the area of maternal reproductive health and its relationship with poverty are quite vast. While there has been a fair amount of research on maternal morbidity and mortality in the family planning and health services literature, few if any studies offer a comprehensive analysis of this issue in the context of the mother's broader economic and social environment. Therefore, I would like to highlight several areas for further consideration.

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Health and Economic Shocks

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Perhaps the most interesting finding of the recent surge in qualitative poverty analysis is the emphasis that poor people place on vulnerability when they define their own poverty or concerns over their health. Time and again, the risk of falling into poverty (measured in many possible dimensions) and falling ill receives as much

attention as deprivation itself in conversations with the poor. While people everywhere face risks, these risks are larger for poor, agrarian economies, and in tropical ecologies. Likewise, they are worse in countries, such as throughout Africa, where the poor have fewer means for dealing with the risks and shocks that they face.

In this regard, it is hard to place enough emphasis on the important gender dimension of vulnerability to shocks. Women, particularly of reproductive age, have risk assessments that differ systematically from men's, emphasizing issues of health and violence – often of a sexual nature – far more frequently (Narayan *et.al*. 2000; Smith, Barrett and Box 2001). There is thus a particular need for policy-oriented research that identifies vulnerability in a gender-sensitive fashion that focuses on the vulnerability of women in their reproductive experience, and subsequent roles as caregivers. Of particular importance are downside risks associated with negative shocks. While research on poverty dynamics shows much movement in and out of poverty over time in Africa, downside health risks, especially associated with childbirth and deleterious health related events, represent the type of shock that contributes to a poverty trap. In other words, the family's ability to fully recovery from a maternal death or severe maternal morbidity is often limited, inducing a recurring cycle of crisis and deprivation. This often has an inter-generational aspect, as illness of a mother may force the family to pull children, especially girls, out of school. Hence, it is important to understand, for example, the extent to which child labor acts as a coping mechanism against vulnerability, especially given that it imposes severe costs by reducing future productivity and insuring that poverty and deprivation is transmitted across generations. Likewise,

research on the role of policies to reduce risk and vulnerability, rather than just reacting to the shock itself, is of critical importance.

Public Provision of Services

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Even though there are many traditional and modern strategies for dealing with the vulnerability of, and risks faced by mothers and women of reproductive age, it is clear that they are far from adequate in Africa. Clearly, there is a need for public policy to both assist women in getting access to reproductive health care, as well as reduce the vulnerability of women, especially those risks associated with their roles bearing and caring for children.

Government's role as provider of public goods is widely acknowledged. However, there is little evidence that African governments have responded to this need, especially in health care. Donors and governments have been working hard at innovations to target interventions to the poor and to reduce vulnerability, but little has taken hold sustainably in Africa thus far. These run a wide range from specific reproductive health interventions, such as the provisions of family planning services, to social funds, cash transfers and experiments with workfare and microfinance targeted toward women. Understanding both the incidence of benefits associated with the provision of public services, and why these public policy options do not work in Africa, and whether they can work in Africa, is an important area for research, as is thinking about the possibilities for alternative policies or institutions that might be effective. This implies examining not only the nature and constraints of institutions that are charged with delivering services, but behavior response of vulnerable women and their households.

Demand Behavior

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One of the most direct inputs into the production of health is the consumption of various types of reproductive and health care, as well as the demand for food and nutrients. Estimates from structural demand models of price and income, as well as other factors such as the quality of facilities and providers, allow us to determine the impact of poverty, or low income levels, on the demand for health and reproductive health care, nutrients, as well as the production of health. Research is important when parents are expected to contribute to financing services that are in part financed by public sources.

A number of researchers have investigated medical care utilization among the poor in developing countries, primarily in the context of how access to care is influenced by user fees and distance to health care providers. Because user fees are generally not means tested they tend to be regressive in the sense that they represent a larger share of a poor household's income than a wealthier household's income. This would be the case even if the price responsiveness of medical care was invariant across all members of the population. However, the regressive nature of user fees is compounded by the fact that several researchers have found that higher prices for medical care reduce utilization by the poor proportionally more than by wealthier individuals.

Although neither of these studies is focused specifically on the demand for maternal health services, it is reasonable to assume that the same relationship between price and demand that holds for medical care in the aggregate applies to these services as well. Therefore, increases in the price of maternal care presumably limits access by the

poor more than the wealthy, making the poor particularly vulnerable to the imposition of user fees for reproductive health services.

However, some interesting research questions remain poorly understood. First, studies of demand for maternal health services in Africa are extremely rare. Second, there is a need to go beyond looking at the role of user fees and explore the extent to which there are other rationing mechanisms for maternal and reproductive care in Africa. Even in places where user fees are zero, access to health services is often limited by the substantial distances many households must travel to reach public medical facilities. But there is also a need to explore the effect of facility and care quality, as well as other demand side impediments that revolve around characteristics of the mother, for example, her education, that of her spouse, and related cultural norms and attitudes. And finally, research that takes into account the joint nature of production and consumption decisions in Africa, something which we discuss below in more detail, is important to understand how demand for nutrients, leisure and services interact.

Impact of Improved Maternal Health on Poverty

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The links between maternal morbidity and mortality and poverty are only beginning to be appreciated and quantified, especially as mediated through the productivity of the mother in her roles in the labor market and as the provider of care for her children. The latter role is especially critical across generations as the human capital and behavior of mothers is increasingly understood as the key determinant of quality society's stock of future human capital, or children.

Many challenges exist in terms of understanding these linkages, especially the dynamics across time and generations. For example, we know that healthier mothers give birth to healthier children, and that more educated mothers invest more in their children, especially girls. However, disentangling unobserved heterogeneity from causal effects is far more difficult. That is, if the similarity of the health and education of the parents is largely a result of a selection process, improving the well-being of mothers will have little effect on their children. Alternatively, there may be some direct causal factors operating in terms of the inter-generational transmission of human capital. The extent to which explanation is more prominent has important implications for designing appropriate interventions to break the cycle of poor reproductive health outcomes and the consequent deleterious impact on the human capital of children. While economic theory provides many possible alternative explanations for intergenerational links between the human capital of parents and children, all of which are important in terms of explaining poverty traps in the developing world, the magnitude of these links is far from clear, despite being critical for the evaluation of policy interventions.

Fertility and the Demand for Children

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The demographic transition whereby fertility declines in the wake of mortality declines has been extensively studied and discussed in the literature. While the explanation for the link between these two events is the subject of much scrutiny and speculation in the more macro literature, there still remains a paucity of research at the micro level on what is driving the demand for children among women in Africa, and how

this relates to maternal health. The conventional explanation of high fertility among poor agrarian households is that large families are needed to provide inexpensive labor for agricultural production, and that children serve as a form of old-age insurance for their parents. Despite the initial perception that poor households are less likely to be able to support additional children than wealthier ones, economic theory predicts fertility decisions are made by comparing the marginal productivity of each additional child with the cost of supporting it. As long as productivity exceeds cost, parents will continue to reproduce.

There are a number of factors, however, that are either not captured, or need to be incorporated into this framework that represent areas of potential future research. Investments made in children, in the form of education or greater nutrient availability, for example, should raise their productivity making additional children less necessary. Why is it that we don't see more investment in children among the poorest households? Is it because these types of investments don't sufficiently increase productivity when households do not have access to improved technologies, or is it because uncertainty regarding a child's future health and productivity leads risk adverse parents to forgo such investments? Likewise, there are issues related to credit market failures, as well as lack of access to quality schools that contribute to under-investment in children. In either case, the lack of health-related and educational investment in children decreases their survival probabilities, making it more likely that households will continue to reproduce frequently in order to sustain the available pool of child labor.

Fertility and Maternal Health

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While further investigation into the root causes of high fertility among the poor is necessary, it is equally important to explore the relationship between fertility and maternal health. To date, the literature on the impact of high fertility on maternal morbidity and mortality is both sparse and inconclusive. While there is much anecdotal support for the concept of "maternal depletion," where a mother's health is compromised by the stress and strain of repeated childbearing, studies find varying relationships between parity and health outcomes. Merchant (1994) hypothesizes that the reason for inconsistent evidence of maternal depletion is related to poor measurement of the mother's nutritional status throughout the various stages of reproductive cycle, and equally poor measures of reproductive stress. With regard to the latter, researchers often use parity, or the number of delivered children, as a measure of reproductive burden, but this masks important factors such as time between pregnancies and time allocations to physically demanding versus more sedentary activities during recuperative periods. Likewise, the use of BMI as a measure of nutrient availability during a women's reproductive cycle does not accurately reflect nutritional status, nor does it account for the fact that a women's weight may vary due to a variety of factors, ranging from water balance to their own pre-natal experience that may condition their propensity to accumulate body fat as an adult.

While more evidence on the extent and implications maternal depletion needs to be done, an equally salient question is, why do couples reproduce with such frequency that it compromises maternal health? One answer may be found in terms of the lack of

access to information and related reproductive health services, contributing to the discordance between desired and actual fertility. However, the answer to this question may be more complex, and follow from behaviors that do not seem to follow the standard collective model of household decision making and rationality. It seems that this is an area where adult preferences within the household are not uniform, and that the relatively weak bargaining power of women in poor households leads to fertility decisions not in their best interest. This is particularly true of younger brides who are at greatest risk for pregnancy related complications, but under the most pressure to reproduce.

In order to explore these issues, further research using intrahousehold bargaining models is necessary to tease out power structures within the household that influence maternal health outcomes. The existence of maternal depletion also suggests there are market failures in the provision of objective information on contraception and family planning services. This suggests that contraception may be an effective means of reducing the short birth intervals that lead to maternal depletion as well as empowering women to take more control of their reproductive destiny. However, public policy aimed at increasing contraceptive use will certainly benefit from economic research on the most cost-effective means of provision of information and services to the poor.

METHODOLOGICAL CHALLENGES

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Addressing the types of research discussed above presents many challenges, both in terms of methods and models, as well as in terms of requisite data. Below we

highlight five methodological challenges that we think are important examples of the types of considerations that should be incorporated into future research.

Collective versus Unitary model

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In determining the causal pathways through which poverty impacts MMM and vice versa, it is useful to formalize the process of individual health production using a general economic framework. This will serve as a basis for how poverty status interacts with the health of mothers and their newborn offspring. The basic framework for research in this area lies heavily on the standard neoclassical approach to utility maximization at the household level. While this approach is fundamentally based on individual preferences and decisions, the significant pooling of resources and joint nature of decision-making among members of the same household has traditionally led to the measurement of most economic variables at the household level. Assuming the household can be treated as a single decision making unit also greatly simplifies the presentation of the underlying theoretical model. For this reason, as well as to maintain consistency with the data, the unitary household model is still in wide use in both the theoretical and empirical development economics literature. Of course, the model is only strictly appropriate if all household members share the same preference structure or the household head is able to impose his/her will on the other members in a perfectly dictatorial fashion. These assumptions remain reasonable approximations to reality in many cases. However, they are surely violated in some situations, which present some interesting research possibilities and challenges.

When household resources are only just adequate, intra-household allocation decisions may protect some members of the household, those that have a more powerful voice or contribute more to earnings and decision making, at the expense of others. This is a particularly acute concern when it comes to the range of issues regarding gender roles, and particularly the reproductive choices and health of women. For example, the increasing prevalence of HIV/AIDS in Africa has increased the demand for young brides by older, more financially secure men. After entering such a marriage, substantial pressure is put on the young bride to justify her dowry by producing offspring. In order to establish themselves in their new families and increase their social position, the brides comply, putting themselves at risk for a number of serious reproductive health complications, including obstetric fistulas, vaginal tears, and excessive bleeding (Nour, 2006). The analytical requirements for researching intra-household arrangements are great, and so, too, are the challenges of intra-household policy interventions. Thus, one of the research issues that arises is the need to explore modalities of improved targeting to individuals, and how to—and the implications of—further empowering women in all aspects of their health and related choices in terms of raising and caring for their children.

Incorporating the Joint Nature of Production/Consumption Decisions

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The production process we are most concerned with corresponds to the individual health of mothers and their family members. In the developed country context where markets are more complete and nutrient availability is less constrained, the standard health production framework would likely be considered sufficient to model health,

nutrition, and fertility separate from production decisions. However, this separability between consumption and production generally does not apply in developing regions for two main reasons: 1) Many rural households in developing countries engage in both own-account agriculture and the cultivation of cash crops, so their food consumption and production decisions are jointly determined; 2) Nutrient availability is more variable and often reaches levels at which health and labor market productivity are adversely affected. As a result, labor market productivity and agricultural production must be modeled jointly with household consumption decisions, including those that affect health outcomes.

In order to capture health and nutrition impacts on productivity, it is therefore important that the wage is modeled as an endogenous variable dependent on consumption decisions impacting health and nutrition in Africa, unlike situations in developed countries where labor markets function well and chronically poor health is rare. In those cases, the wage could be treated as exogenously determined by prevailing labor markets, unlike the case for rural farm households or the non-wage sectors where most African women are working.

Program Evaluation

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There is no question that the evaluation of public policies and interventions to address the relationship between poverty and maternal morbidity and mortality is an important domain of research. What is debatable is the best method for evaluating the success of various programs. In recent years there has been an increased interest in

randomized experiments. The strength of this approach is obvious: if well implemented, randomized experiments will provide unambiguous results regarding the impact of policies such as enhancing the quality and availability of reproductive health services on outcome of interest, such as fertility, productivity, and human capital of children. The drawbacks of these approaches are also manifest, including the complexity of successfully designing and implementing randomization and the expense of doing so. The latter is in part an artifact of the need to randomize over a large number of clusters in order to discern an impact. Likewise, much has been made of the limits of drawing broader inferences from experiments, in contrast to structural models based on rigorous statistical analysis that relies on non-experimental survey data. Of course, the latter is widely acknowledged to have inherent and widespread weaknesses, especially reliance on weak exclusion restrictions when employing instrumental variables to deal with endogeneity of program participation.

Employing both randomized and non-experimental approaches is appropriate for the AERC researchers. Existing data sets should be fully exploited, and these need to be utilized carefully to ensure the up-most in rigor. However, to the extent that AERC research can work with governments, NGOs, and other stakeholders to design and implement randomized experiments to examine impact of important interventions, such as the provision of child care, expanding the availability of reproductive health care services, and so forth, this would seem like an important avenue to pursue.

Dynamics

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Our focus on notions of vulnerability and risk associated with reproductive health strongly suggest research approaches that employ methods that allow us to focus on dynamics of behaviors and outcomes. Outcomes and choices regarding pregnancy and the broad range of factors that contributes to maternal morbidity and mortality, as well as issues related to choices women make in terms of caring for children, are inherently part of a complex dynamic process. Women who are lucky or are more adept at accessing services and opportunities will help protect themselves against the ravages that are often associated with the risks of childbearing. Other less fortunate households suffer shocks, such as unwanted pregnancy, maternal mortality and morbidity, loss of employment, and so forth, with long-term repercussions that send them spiraling downward into greater poverty. Understanding these processes is key to understanding how policies might help the poor to rise out of poverty, and requires data on households' events and circumstances over time.

The most obvious form of such data are longitudinal and panel surveys, which only very recently have become available for Africa. In panel surveys, households are interviewed at different points in time. Analysis of dynamics using such data for developing countries is new, but rapid progress is being made on methodologies and treatment of specific statistical issues such as measurement error and attrition bias. Panel data of sufficient length allow researchers to make a crucial distinction between chronic and transitory poverty, and the role of maternal and reproductive health in this regard. Furthermore, they allow researchers to control for differences in genetically determined

health endowments that impact the decisions of individuals, but are unobservable in most survey data.

Indeed, we know that key determinants of long-term changes in poverty status are likely to include accumulation or dis-accumulation of assets; policy-induced changes in returns on those assets; and shocks, particularly those associated with women's reproductive experiences. In principle, these factors are identifiable from household surveys. In addition, initial conditions are likely to be important and can also be measured to varying degrees in surveys. These include levels of human, social, and physical capital; presence of physical and social infrastructure; access to markets; and access to, demand for, and utilization of services.

Mixed Methods

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Analysis of the issues discussed above inevitably requires some expansion of boundaries between disciplines, and potentially, research strategies that combine quantitative and qualitative methods. There are various models for achieving these objectives, including concepts such as **"**triangulation," where to paraphrase Robert Chambers (2001), qualitative and quantitative researchers engage in their own effort, and subsequently bring them together to compare results. Triangulation checks for similar findings from the different methods. A different model, the idea of "sequential mixing" **(**Martin Ravallion 2001) often involves beginning research programs with focus groups, unstructured interview, or ethnographies – that bring out interesting ideas and perspectives on a particular research theme. A quantitative analyst could then devise

hypotheses consistent with these ideas to be tested empirically with data from representative samples. Yet a third model is to insert qualitative methods directly into a quantitative study, and vice-versa.

We at Cornell have practiced these approaches successfully in Africa already. We see several further concrete possibilities for simultaneous mixing of research strategies in the context of the AERC project. One concrete example would involve the use contingent valuation, a method in which the researchers conduct a quantitative-type survey, but with questions more familiar to psychologists than economists. In particular, researchers explore the value of public services, such as family planning services, or institutions to recipients by asking a carefully phrased equivalent of "how much is this worth to you?" A similar effort at contingent valuation was made in the context of a survey in Tanzania designed to examine health status and service delivery in Tanzania. One of the objectives of the survey was to understand the factors that influence the demand for health services, particularly the influence of school and clinic quality. We are interested in exploring the use of such methods in our research, particularly when evaluating public goods. Thus, while we would argue strongly that sound empirical and quantitative analysis is the appropriate focus of AERC's initiatives in exploring the reproductive health/economic growth nexus, consideration should be given to incorporating mixed methods and disciplinary perspectives into the research.

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Cornell University

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Chad Meyerhoefer
Agency for Healthcare Research and Quality (AHRQ)*

David E. Sahn
Cornell University

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Motivation: Health of mothers during reproduction critical to their families, communities, and the entire process of economic and social development

Scope of Problem:

- MMR (maternal deaths per 100,000 live births) was 920 in Sub-Saharan Africa, compared to 20 in developed regions
- Over a women's lifetime the risk of maternal death in Sub-Saharan Africa is 1 in 16, compared to 1 in 2,800 in the developed world, and 1 in 46 in South-Central Asia
- The MDG of reducing MMR by two-thirds is out of reach

3

Strong Link Between Poverty and Income and Maternal Morbidity and Mortality

MMM is:

- higher in Africa
- higher among the poor within a country
- particularly acute in rural areas with lack of access to reproductive and related health services

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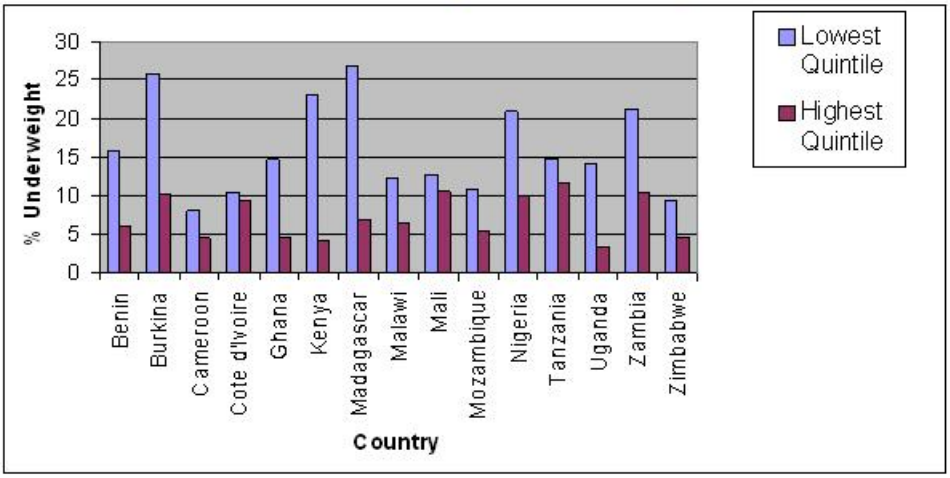
Share of Severely Underweight Women by Lowest and Highest Wealth Quintile



Source: Authors' calculations from the Demographic Health Surveys. Estimates are preliminary: Please do not cite or quote without permission.

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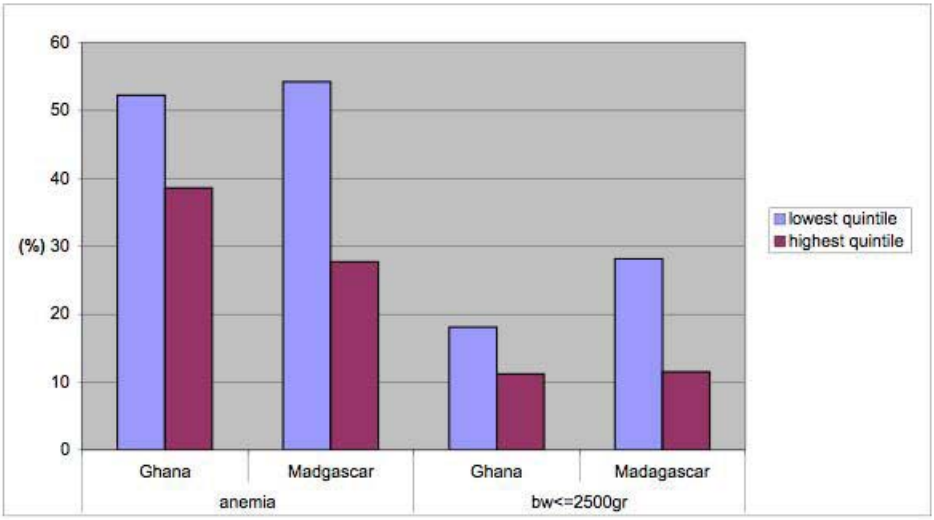
Share of Anemic Women and Low Birth Weight Children, by Wealth Quintile



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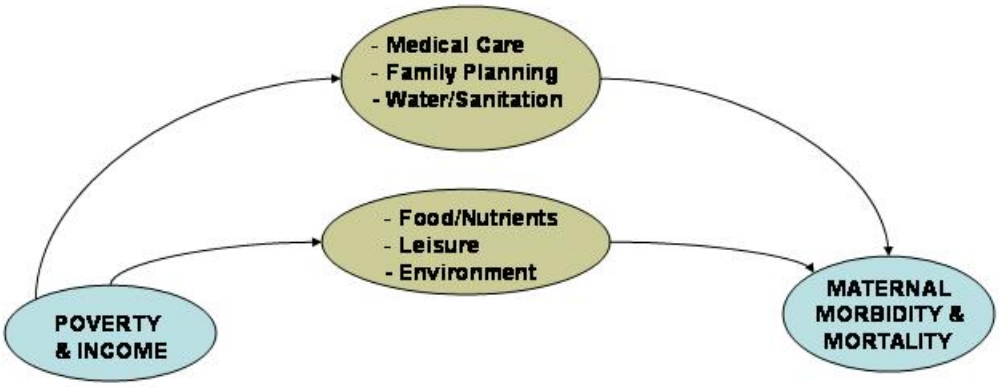
Relationship between Poverty and Income and Maternal Morbidity and Mortality



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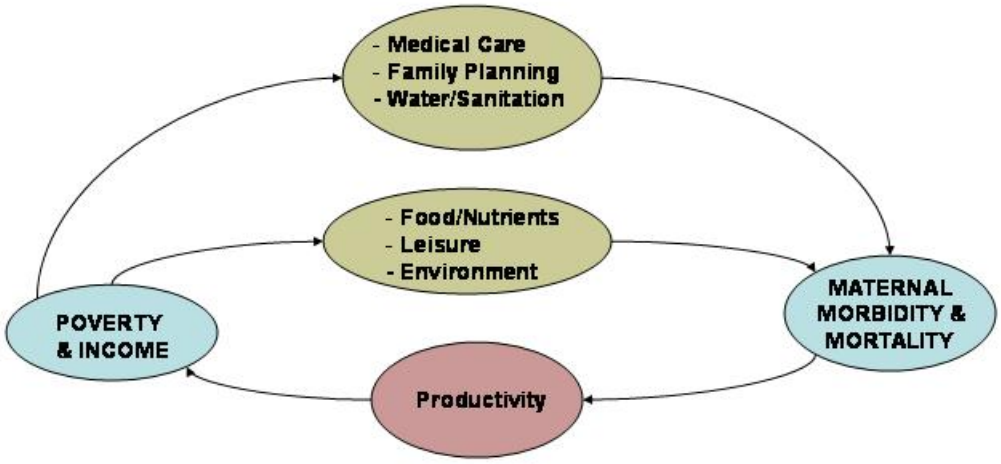
Relationship between Poverty and Income and Maternal Morbidity and Mortality



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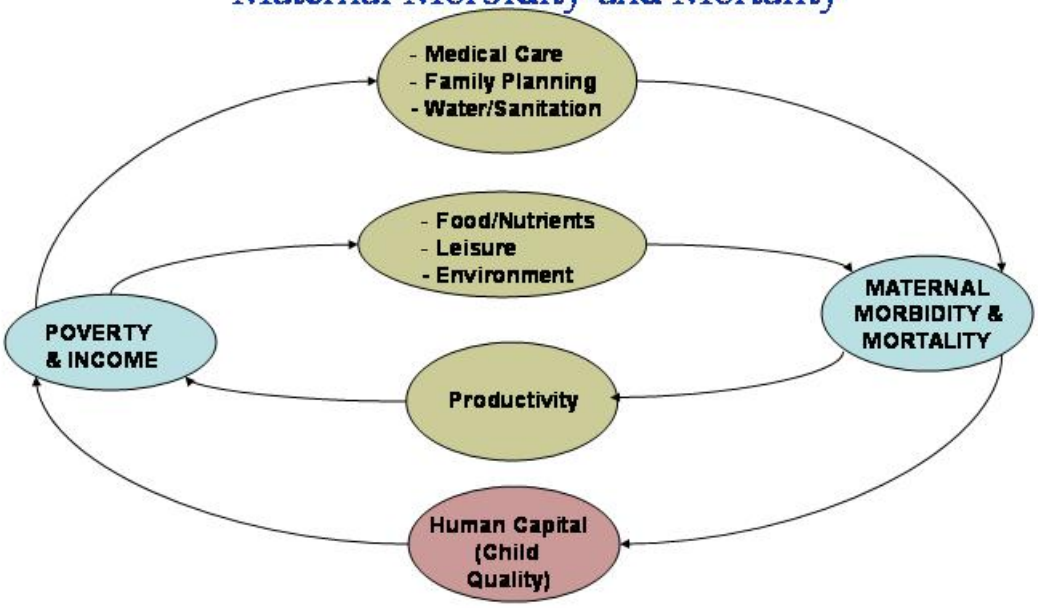

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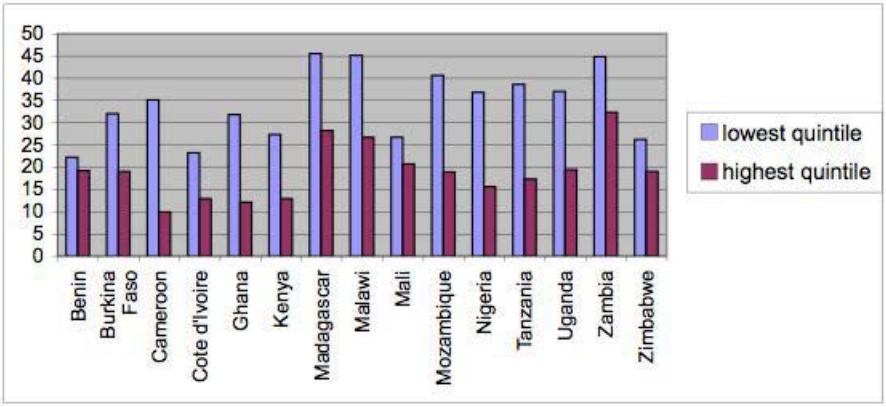
Share of Stunted Children by Lowest and Highest Wealth Quintile



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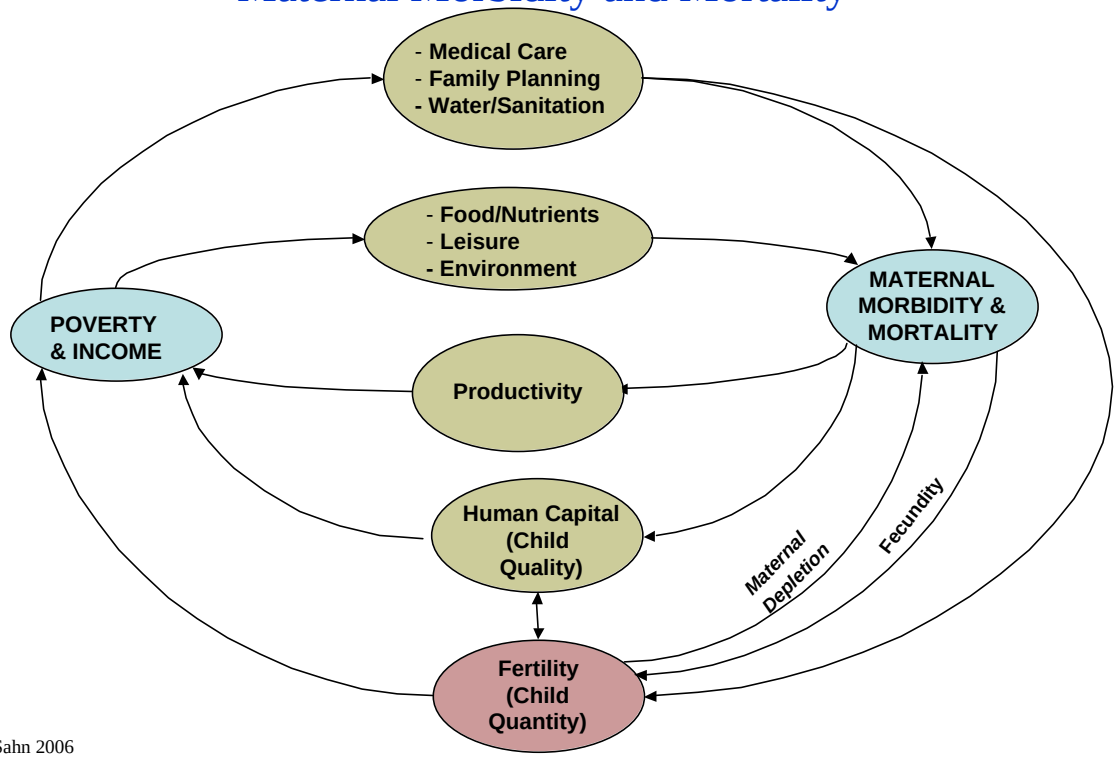
Relationship between Poverty and Income and Maternal Morbidity and Mortality



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Link between MMM and Productivity

Adverse affects on other HH members

- Direct effects through lower quality care – especially for young children
- Indirect effects by young girls substituting for sick/low productivity mothers

Contributes to poverty traps

- Within the life course of individuals
- Across generations as childhood experiences affect adult health and fertility

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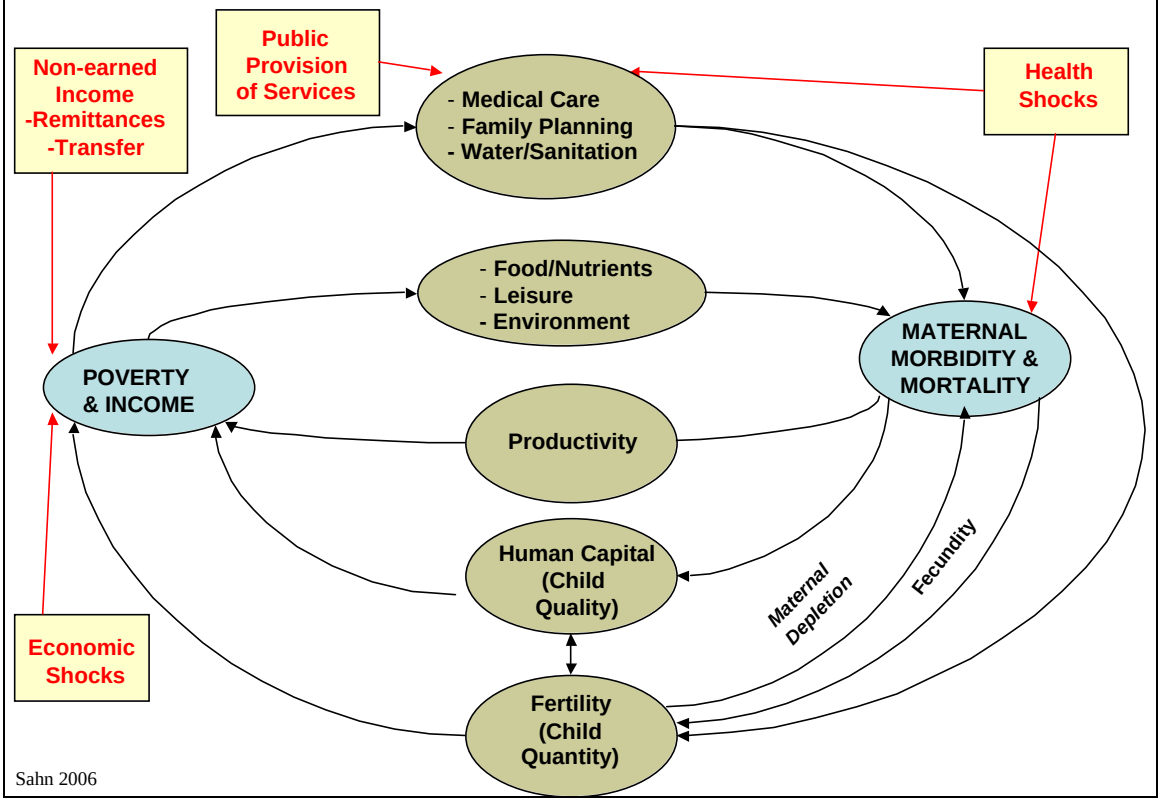
Relationship between Poverty and Income and Maternal Morbidity and Mortality



Sahn 2006

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Research Themes

- Vast scope to explore links between maternal reproductive health and poverty
- Relatively few studies provide comprehensive analysis in the context of the mother's broader economic and social environment
- Examples of research themes include:
  - Impact of Health and Economic Shocks
  - Effectiveness of Public Provision of Services
  - Health and Nutrition Demand
  - Impact of Improved Maternal Health on Poverty
  - Fertility and the Demand for Children
  - Fertility and Maternal Health

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Impact of Health and Economic Shocks

- Risk of illness particularly high for rural poor
- Risk assessments differ by gender, especially in regard to sex and reproduction
- Losses and complexity of responses, such as substituting as caregivers or income earners poorly understood
- Explore the role of policy and markets to mitigate downside risks

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Effectiveness of Public Provision of Services

- Government's role in providing public goods and targeted private goods, especially in health, well documented
- Experience in Africa has been discouraging, but reasons poorly understood
- Begin with examination of fiscal incidence
- Incorporate issues of role of institutions and behavior responses of target groups

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Health and Nutrition Demand

- Structural demand models of price and income, especially user fees
- Role of distance, quality of facilities and providers
- Cultural norms and attitudes
- Nutrient demand jointly determined with other time use choices, including utilization of health services, demand for leisure and earnings

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Impact of Improved Maternal Health on Poverty

- Conflicting roles of women as provider of care and in the labor market
- Especially complicated to disentangle static from dynamic effects — often come into conflict
- Econometric challenges of controlling for unobserved heterogeneity when examining effects of parental background on child outcomes

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Fertility and the Demand for Children

- Lack of micro research on the demand for children
- Limitations of conventional explanations for high fertility need for labor and old-age care
- Limitations of neo-classical economic model
- Need to better understand low level of investment in child quality, thus lowering survival probabilities and increasing fertility

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Fertility and Maternal Health

- Relationship between fertility and maternal health poorly understood, e.g., evidence of "maternal depletion"
- Why do women continue to have so many children if harmful to their health?
  - Role of access to information and services
  - Non-uniform preferences of women and men
  - Focus on intra-household bargaining models

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Methodological Challenges

- There are numerous challenges in addressing research discussed in terms of methods and models, as well as data. Examples of important considerations include:
  - Use of Collective versus Unitary Model
  - Incorporating the Joint Nature of Production/Consumption Decisions
  - Role of Program Evaluation
  - Incorporating Dynamics
  - Application of Mixed Methods

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Use of Collective versus Unitary Model

- Limitations of neoclassical approach of shared preferences or single decision maker
- Especially of concern when household resources limited
- Major analytical requirements for researching intra-household arrangements
- Focus on modalities of targeting services to women and empowering them in their reproductive choices

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Incorporating the Joint Nature of Production/Consumption Decisions

- Separability between production and consumption cannot be assumed
- Labor market, production and consumption (both of nutrients and services) jointly determined
- Poor functioning of labor markets implies that even wages are modeled endogenously

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Role of Program Evaluation

- Critical to evaluate public policies and interventions
- Role for randomized experiments
  - Successful randomization difficult
  - Limitation of inferences and generalizations that can be drawn from results
  - Requires new data
- Remains a need for non-experimental structural models
  - Can exploit existing data sets
  - Care in using IV estimates

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Incorporating Dynamics

- Outcomes and choices regarding reproductive health a dynamic process
- Draws attention to issues of risk and vulnerability, and related notions of poverty traps
- Major analytical challenges
  - Measurement errors
  - Need for panel data (and related issues such as attrition bias)

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Application of Mixed Methods

- Sound empirical analysis critical element
- Need to be on the frontiers of interdisciplinary work
- Incorporating qualitative methods
  - e.g, contingent evaluation to understand demand for reproductive health services

Cornell University