On Women's Empowerment and Child Health:
The Case of Mozambique.

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1. Introduction

Two citations:

- "The poor suffer worse health and die younger. They have higher than average child and maternal mortality, higher levels of disease, and more limited access to health care and social protection. And gender inequality disadvantages further the health of poor women and girls" (OECD-WHO report, 2003).

- "Within countries, not only is child mortality highest among the poorest households but also there is a social gradient: the higher the socioeconomic level of the household, the lower the mortality rate" (Marmot, 2005).

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- The purpose of this study: take a closer look at the determinants of the health of children, with a focus on the role that women's empowerment may play.

- We follow somehow a recent study by Zereyesus et al. (2017) who wondered whether women's empowerment in agriculture mattered for the health status of children.

- Their study looked at data covering Northern Ghana.

- We use the 2009 Demographic and Health Survey to analyze the determinants of children's health in Mozambique.

- Like Zereyesus et al. (2017) we implement the so-called MIMIC approach:

  - a structural equation: the health of children is a latent

     variable influenced by various determinants.

  - two measurement equations: they link the observed health variables (z-values of the height by age and weight by age of children up to the age of five) to latent children's health variable.

Outline

- Section 2: a review of the various aspects of women's empowerment
- Section 3: the MIMIC model
- Section 4: the empirical results
- Section 5: concluding comments

2. On Women Empowerment

- During the past decades research has indicated that gender differences in time use and in access to assets and credit limit women's opportunities.

- To analyze this type of issue feminist economists intensively used the concept of "gender norms", whether as a feature of intra-household bargaining, an influence on women's labor force participation or a determinant of women's access to land and resource rights.

- Gender norms are evidently related to the concept of women's empowerment.

On the concept of women empowerment

- Kabeer (2011) discusses this notion of women's empowerment which she considers as a multidimensional process of change which covers many aspects of women's lives.

- Kabeer refers here to

    - their sense of self-worth and social identity

    - their willingness and ability to question their subordinate status in society

    - their capacity to exercise strategic control over their own lives and to negotiate better terms in their relationships with others

    - finally their ability to participate on equal terms with men in reshaping society in the direction which is conform to their vision of social justice.

- Kabeer (2011) adds that the pathways through which processes of empowerment take place are shaped by the gender-related structures of constraint which prevail in the societies in which they occur.

- She then explains that in Bangladesh family and kinship relations are organized along corporate patriarchal lines,

- "with authority vested in a senior male household head. Descent and property are transmitted through the male line, leaving women effectively without property and genealogically irrelevant. Patrilocal marital practices mean that they must leave their natal home on marriage to reside with their husband's family and become part of his patrilineal group.
- Their position within marriage is strongly bound up with their capacity to produce sons to carry on the family name and inherit the family property. Purdah, or female seclusion, restricts their mobility and opportunities in the public domain while simultaneously conferring on them the status of a protected group. Their social interactions tend to be restricted to the 'given' relations of family and kinship.
- They remain dependent on male family members for much of their lives, passing from the responsibility of father to husband to son. This marked dependence on men for economic needs and social protection leaves women particularly vulnerable to the likelihood of abrupt declines in their economic welfare and social status, should they find themselves bereft of male guardianship.

- The risks and uncertainties attendant on women's dependent status within such structures paradoxically engender in them greater incentives to comply with, rather than challenge, male dominance, and to manipulate the norms of male obligation and protection to shore up their own position within their families."

Women empowerment and the ability to make choices

- Kabeer (1999) argues that women's empowerment is about the process by which those who have been denied the ability to make strategic life choices acquire this ability.

- For her, *choice* necessarily implies the possibility of alternatives, the ability to have chosen otherwise. Some choices are evidently more crucial in terms of their consequences for people's lives. There is hence a case for making a distinction between first- and second-order choices.

- The former are strategic life choices which are critical for people to live the lives they want (such as the choice of livelihood, whether and whom to marry, whether to have children, etc.).

- Second-order choices are less consequential choices even though they may affect one's quality of life.

- Since empowerment is assumed to be about change, it must refer to an expansion in people's ability to make strategic life choices.

Women empowerment and intra-household resource allocation

- Since the early 1990s a growing literature has paid attention to the role that intra-household resource allocation plays in affecting the outcome of development policy.

- This literature questions the traditional view that individuals within the household share the same preferences or pool their resources (see, Becker's famous treatise, 1981).

- These unitary models represent a special case of cooperative collective models where preferences are identical and, as a consequence, resources are pooled. In such a model individuals have a choice between remaining single or forming a household. They choose the latter option when the advantages associated with being in a household outweigh those derived from being single.

- It has however been argued that a model of household behavior that assumes that individuals share the same preferences and pool their resources (the so-called unitary model) is likely to lead to policy failures (Haddad, Hoddinott, and Alderman 1997).

- Alternative models have been proposed such as the "collective models" where "nothing is assumed a priori about the nature of the decision process; that is, it does not directly address the question of how individual preferences lead to a collective choice. If one is willing to put more structure on the decision making process, two subclasses of collective models emerge, one rooted in cooperative and the other in non-cooperative game theory" (Quisumbing, 2003).

- Cooperative models assume that household decisions are the outcome of some bargaining process and apply the tools of cooperative game theory. (see, Manser and Brown, 1980; McElroy and Horney, 1981). Here the emphasis is on the influence of outside options (the "exit options") on the bargaining power of spouses and hence on intra-household welfare. As a consequence policy makers may try to affect intra-household welfare by modifying the exit options of disadvantaged groups.

- Non-cooperative game theory models (e.g. Lundberg and Pollak, 1993) assume that individuals cannot enter into binding and enforceable contracts with each other and that an individual's actions are conditional on those of others. Such a conditionality of action implies that not all non-cooperative models lead to Pareto optimal allocations of resources.

On Norms

- Agarwal (1997), as well as Sen (1990) have treated norms as endogenous to households.

- Agarwal thus argued that norms can operate in four ways:

    - norms set limits on what can be bargained about

    - they determine or constrain bargaining power

    - they affect how bargaining is conducted (for example, covertly or overtly, aggressively or quietly)

    - they constitute a factor to be bargained over, that is, social norms can be endogenous, themselves subject to negotiation and change.

Women empowerment and capability

- Another crucial notion is that of *agency*, that is, the ability to define one's goals and act upon them. Agency refers not only to decision-making but also to bargaining and negotiation, deception and manipulation, subversion and resistance.

- This concept is related to what Sen called *capabilities,* that is, the potential that people have for living the lives they want, of achieving valued ways of `being and doing'.

Women empowerment and violence against women

- Traditional beliefs that men have a right to control women make women and girls vulnerable to physical, emotional and sexual violence by men.

- Violence against women is most often perpetrated by an intimate partner, but it may take other forms: violence by a family member, sexual harassment and abuse by authority figures, trafficking for prostitution, child marriages, dowry-related violence, honor killings, sexual violence committed by soldiers during conflicts.

- The health consequences of such violence can be physical injuries and unwanted pregnancies, sexually transmitted infections, depression and even homicide or suicide (see, World Health Organization, 2009).

- Empowering women by giving them access to assets and a decent employment can then decrease significantly gender-based violence because women would then be able to escape such violence, whereas if they are poor and economically dependent on their husband/partner they have quite limited alternatives.

Women empowerment and mobility

- The impact of social norms on women's mobility is particularly striking in the case of policies aiming at providing bicycles in rural areas. Many cultures in fact do not accept that women use bikes.

- Riverson et al. (2005) stressed the fact that in most developing countries women have very limited access to transport services and technology. The distances to sources of water and firewood are thus critical factors in determining the scale of transport tasks for women and the consumption of water tends to decrease when the source is more than 1 km away.

- Several studies show that very few women have access to or use donkeys, mules or other intermediate means of transport to transport water, fuel, household goods and food, so that women experience not only the *physical burden of transportation by back loading and head loading* but also *the time burden as a result of the lack of transport*.

Empirical studies of women empowerment

- The issue of women empowerment has been empirically examined by <u>Hanmen and Klugman (2016)</u> who systematically explored what can be learned from Demographic and Health Survey (DHS) data for fifty eight countries, representing almost 80 percent of the female population of developing countries.

- They concluded that women living in richer households were more likely to be able to exercise agency, but the impact of wealth was not as large as that of education.

- As far as violence is concerned, it appears that the risk of suffering violence at home is systematically related to the husband's use of alcohol, as well as to the woman's own attitudes to violence.

- Education has a protective effect against violence but this impact is evident only at secondary and higher levels for women and with higher education for men.

- The data indicate that countries that have made progress in advancing women's reproductive health and rights have lower levels of violence against women (see, UNFEM, 2010).

- <u>Ballon (2012)</u> proposes a structural model for measuring female empowerment, using a capability perspective.

- Like in Kabeer (1999) empowerment is defined as the decision making ability of a woman regarding her strategic and non-strategic life choices. The strategic decisions are decomposed into self-choices which refer to decisions concerning the woman herself, and familial choices which mainly involve her children.

- In Ballon's model resources, values/traditions, and decision-outcomes interact into a system of structural equations.

- Resources refer to factors that pre-condition the ability to choose and include the age at marriage of women, the household's wealth or assets, the woman's educational level, her parents' level of education (or years), and the age and educational difference between the spouses.

- Ballon (2012) uses a MIMIC model and applies it to a study of Cambodian female empowerment in 2005.

Women empowerment and child health

- Malapit et al. (2015) provide empirical evidence on the relationship between empowerment gaps between men and women in the same household and children's well-being. Their analysis is based on nationally representative data from the 2012 Bangladesh Integrated Household Survey (BIHS).

- They conclude that increasing women's decision making over credit and assets is associated with improvements in girls' nutritional status while increasing women's life satisfaction and participation in groups are associated with improvements in boys' nutritional status.

- Lépine and Strobl (2013) looked at the impact of women's bargaining power on child nutritional status using data from rural Senegal. They made a correction for the potential endogeneity of women's empowerment by introducing an exogenous instrument (IV), the information on a mother's ethnicity relative to that of the community she resides. The authors concluded that while standard OLS suggests that if a mother has more bargaining power, her children will have a better nutritional status, their IV estimates indicate that the true impact is underestimated if the endogeneity of bargaining power is not taken into account.

- Ziaei et al. (2014) investigated the association between women's exposure to intimate partner violence (IPV) and their children's nutritional status, using data from the 2007 Bangladesh Demographic and Health Survey (BDHS).

- Of 2042 women in the BDHS survey with at least one child under 5 years of age, 49.4% reported lifetime experience of physical partner violence while 18.4% reported experience of sexual partner violence.

- Using a logistic regression the authors concluded that women were more likely to have a stunted child if they had lifetime experience of physical IPV. The policy implications of these findings is that there is a need to incorporate efforts to address IPV in child health and nutrition programs.

- <u>Yimer and Tadesse</u> (2015) believe that maternal and children's dietary diversity are linked, not only with the circumstances of the household in general, but also with the status of women in particular.

- Their argument is that the extent to which women have access to and control over resources largely determines the kind of care they provide for their children and for the rest of the household.

- Using Ethiopian household survey data from 2013, they investigate the impact of women's empowerment in agriculture on the nutrition outcomes of children and women.

- The data were collected in five regions of the country and cover more than 7,000 households in 84 districts ("woredas").

- Using multivariate regression methods and instrumental variable techniques to establish the relationship between women's empowerment and the dietary diversity of women and children, the authors conclude that all of the women's empowerment indicators used are positively related to better dietary diversity for both children and women.

- The policy implications of these findings are clear: interventions which increase women's empowerment will contribute to improving child nutrition as well as their own well-being.

3. The data sources and variables

- We assume that evaluating the degree of empowerment of women requires taking a multidimensional approach to the measurement of these variables.
- Several domains of women empowerment have been distinguished (management of daily life, use of violence by husband/partner, attitude of the woman towards this use of violence)
- Here is the list of variables used for each domain distinguished.

A) Women Empowerment

Financial Decision Making:

- "Person who usually decides what to do with money husband earns": variable equal to 1 if wife is the one deciding.

Actual use of violence by husband:

- "Ever been humiliated by husband/partner": variable equal to 1 if wife was not humiliated.
- "Ever been insulted or made to feel bad by husband/partner": variable equal to 1 if wife was not insulted.
- "Ever been forced into other unwanted sex by husband/partner
- "Ever been forced into other unwanted sexual acts by husband/partner":
  (for 2 last questions variable equal to 1 if wife was not forced).

Attitude towards use of violence:

- "The wife thinks that beating is justified if she goes out without telling husband": variable equal to 1 if wife does not think so.
- "The wife thinks that beating is justified if she neglects the children": variable equal to 1 if wife does not think so.
- "The wife thinks that beating is justified if she argues with husband": variable equal to 1 if wife does not think so.
- "The wife thinks that beating is justified if she refuses to have sex with husband": variable equal to 1 if wife does not think so.
- "The wife thinks that beating is justified if she burns the food": variable equal to 1 if wife does not think so.

Resources of household

Durables goods and basic facilities:

- "Time to get to water source": variable equal to 1 if on premises
- "Household has: radio": variable equal to 1 if there is a radio.
- "Household has: television": variable equal to 1 if there is a television.
- "Household has: refrigerator": variable equal to 1 if there is a refrigerator.
- "Household has: bicycle": variable equal to 1 if there is a bicycle.
- "Household has: motorcycle/scooter": variable equal to 1 if there is a motorcycle/scooter.
- "Household has: car/truck": variable equal to 1 if there is a car/truck.
- "Main floor material": variable equal to 1 when wood plank, parquet or polished wood, tiles
- "Main wall material": variable equal to 1 when bricks or cement blocks
- "Main roof material": variable equal to 1 when made of calamine, cement fiber, ceramic tiles or cement
- "Type of cooking fuel": variable equal to 1 when electricity of natural gas
- "Household has: telephone (land-line)": variable equal to 1 if there is a land-line telephone.

- "Owns a house alone or jointly": variable equal to 1 if the wife owns a house alone or jointly.
- "Owns land alone or jointly": variable equal to 1 if the wife owns land alone or jointly.

Human capital

- "Highest educational level of the wife": variable equal to 1 if she has a secondary or higher educational level

Information:

- "Frequency of reading newspaper or magazine": variable equal to 1 if at least once a week
- "Frequency of listening to radio": variable equal to 1 if at least once a week
- "Frequency of watching television": variable equal to 1 if at least once a week

Other characteristics of household

- "Type of place of residence": variable equal to 1 if lives in an urban area.
- "Age": current age of the mother and squre of age
- "bmi": body mass index of the mother.
- "female": variable equal to 1 if the child is female.

D) Health variables of children

- "Height/Age": z-value of height/age of the child (number of standard deviations from the mean this variable is).

- "Weight/Age": z-value of weight/age of the child ((number of standard deviations from the mean this variable is).

- To aggregate the variables in the domains "Actual use of violence by husband", "Attitude towards use of violence", "Durables goods and basic facilities" and "Information", we successively used, separately for each of these four domains, correspondence analysis and then an aggregation technique introduced in the literature on the fuzzy approach to multidimensional poverty measurement.

- We assumed that the health of children is a latent variable and that the only elements that are observed are indicators of the children's health (height for age percentile, a variable referring to stunting, and weight for height percentile, a variable referring to wasting).

- We then used the Multiple Indicators Multiple Causes (MIMIC) model which links these child health indicators with the exogenous variables via the latent variable assumed to refer to the health level of the children.

4. The model (Jöreskog and Goldberger, 1975; Jöreskog, 2002)

- The so-called *structural equation* is written as

$$y^* = x\beta + u \qquad\qquad (1)$$

where y^* is a (n by 1) latent variable referring to the children's health, n being the number of individuals in the sample, and x (a n by k matrix) refers to a set of exogenous variables assumed to affect a child's health. β is a (k by 1) vector of parameters and u a n by 1 vector reflecting the stochastic error.

- Then there is a *measurement equation* which takes into account the fact that the observed child health variables are imperfect indicators of a child's health. In other words we write that

$$y = y^*\Lambda + \varepsilon \qquad\qquad (2)$$

where y is a n by m matrix referring to a set of m independent indicators of a child's health, Λ denotes a 1 by m vector of factor loadings and ε is a n by m matrix of measurement errors.

- Combining (1) and (2) we obtain the following reduced form

$$y = x\beta\Lambda + u\Lambda + \varepsilon = x\pi + v \qquad\qquad (3)$$

where $\pi = \beta\Lambda$ is a k by m matrix of coefficients and $v = u\Lambda + \varepsilon$ is a n by m matrix of reduced form disturbances.

5. Empirical results

- As mentioned previously, for our domains we used two aggregation techniques. In a first stage we used correspondence analysis, separately for each domain.

- Then we adopted, again separately for each of the four domains, a weighting procedure that had been proposed by Cerioli and Zani (1990) in their study of "fuzzy poverty".

- The intuitive interpretation of these weights is that if a high proportion of women give a positive answer (the variable is then equal to 1) to a first question (e.g. do you own a radio?) while a much smaller proportion gives a positive answer to another question (e.g. do you own a refrigerator?), then one should give a greater weight to the second question, that is: if a household has a refrigerator, something which is, let us say, rare, this should be a stronger indication of material wealth than if this household has a radio (something which, let us assume, is much more common).

Table 1: Mean and Standard Deviation (number of observations: 4399)

Variable	Mean	Standard deviation
z-value of Height/Age times 100	-143.878	149.810
z-value of Weight/Age times 100	-93.882	116.404
Financial Decision Making	0.101	0.302
Experienced Violence	0.788	0.313
Attitude towards beating	0.884	0.235
Material wealth	0.079	0.104
Education of mother	0.119	0.324
Information	0.153	0.228
Residing in urban area	0.280	0.449
Age of mother	28.705	6.912
Square of age of mother	871.768	424.666
B.M.I. of mother (centigrams per square meter)	2238.521	316.246
Female child	0.501	0.500

- Table 1 gives the means of the different variables, when the second aggregation procedure is adopted.
- It then appears that only 10% of the women are the ones who usually decide what do with the money the husband earns.
- As far as violence experienced by women is concerned, a majority (78.8%) of women declared that they did not experience violence.
- As far as "Attitudes towards beating" are concerned, a majority of women (88.4%) declared that beating was not justified for the five cases mentioned for this domain.
- We used the same weighting procedure to derive an aggregate indicator of material wealth based on 14 dichotomous variables and it appears that the aggregated indicator of material wealth is small (7.9%).
- Table 1 also indicates that 11.9% of the women had a secondary or higher educational level and that 28% lived in urban areas.
- On average the women were 28.7 years old, their average body mass index was equal to 22.4 and 50.1% of the children were females.
- Finally the z-values of the height by age and weight by age variables were respectively equal to 1.44 and 0.94.

Table 2: MIMIC with correspondence analysis (1874 observations)

	Coefficient	Standard Error
Structural equation		
Financial Decision Making	12.26	8.40
Experienced Violence	3.36	6.88
Attitude towards beating	18.29	12.35
Material wealth	12.14	4.29
Education of mother	30.03	7.75
Information	0.66	4.23
Residing in urban area	17.64	6.66
Age of mother	1.58	2.85
Square of age of mother	-0.19	0.046
B.M.I. of mother	0.0585	0.0079
Female child	2.15	5.09
Log likelihood = - 60710		
Number of observations = 1874		
Measurement equations		
height/age		
Latent variable	1 (constrained)	
constant	-303.8	44.9
weight/age		
Latent variable	0.990	0.078
constant	-255.1	42.96

- Let us look at the results at Table 2 based on correspondence analysis.
- As far as the structural equation is concerned, it appears that the three variables assumed to measure the extent of women empowerment (financial decision making, experienced violence and attitude towards beating) do not really have a significant impact on the health of children.
- Material wealth of the household has a significant and positive impact on the health of children
- The extent of information available to the woman has no significant effect on their health.
- The educational level of the mother has an important positive impact on the health of children and the health of the children is also higher when the household lives in an urban area.
- The health of children appears to decline non-linearly with the age of the mother but we observe a positive relationship between her body mass index and the health of children.
- Finally the sex of the children does not appear to have a significant impact on their health.
- As expected we observe a positive link between the variables describing the health fo the children and the latent variable assumed to represent their health

Table 3: MIMIC with "fuzzy approach" (4399 observations)

	Coefficient	Standard Error
Structural equation		
Financial Decision Making	11.18	4.99
Experienced Violence	20.20	6.44
Attitude towards beating	-0.606	4.75
Material wealth	68.14	19.27
Education of mother	17.36	5.51
Information	2.38	7.90
Residing in urban area	9.79	3.84
Age of mother	-1.78	1.59
Square of age of mother	0.024	0.026
B.M.I. of mother	0.0667	0.0057
Female child	8.07	3.04
Log likelihood = - 127283		
Number of observations = 4399		
Measurement equations		
height/age		
Latent variable	1 (constrained)	
constant	-296.0	27.58
weight/age		
Latent variable	1.146	0.073
Constant	-268.3	29.2

- Table 3 is derived from the second aggregation procedure.
- The number of observations is here much higher (4,399 instead of 1,874) and more variables have a significant impact on the health of children.
- For the structural equation the impact of the variables describing the extent of women's empowerment is particularly interesting. Here it appears that financial decision making (by the woman) and experienced violence (variable equal to 0 when there is violence) have a significant impact on the health of children.
- This is however not the case of the variables describing the woman's attitude towards her husband's violence.
- Here also the extent of information available to the woman has no significant impact on the health of children
- As in Table 2, the health of children is higher among households residing in urban areas, the higher the educational level of the mother and her body mass index.
- Finally the health of children seems to decline with the age of the mother (a minimal value being reached when she is 37 years old) and rise afterwards.
- The coefficients of the measurement equations are quite similar to those observed in Table 2.

5. Concluding comments

- Using the 2009 Health Demographic Survey and implementing the so-called MIMIC approach to analyze the determinants of children's health in Mozambique, our empirical analysis led to several policy relevant conclusions.

- First financial decision making by the woman and the absence of violence experienced by the women in the household have a significant positive impact on the health of children.

- Second variables describing a woman's attitude towards her husband's violence do not seem to have an impact on the health of children and this is also the case for the extent of information available to the woman.

- Third the health of children is significantly higher, the higher the educational level of the mother and her body mass index, among female children and among households residing in urban areas.