GPJ

GHANA POLICY JOURNAL

Volume 3

August 2009

A Publication of The Institute of Economic Affairs, Accra, Ghana

IEA Ghana

THE GAP BETWEEN THE HEALTH STATUS OF RURAL AND URBAN WOMEN IN GHANA : A CASE STUDY OF PATIENTS AT A MISSION HOSPITAL IN THE ASHANTI REGION

by

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ABSTRACT

Rural women play an important role in sustaining the agricultural sector which is often the backbone of many developing countries. However, their share of the national pie does not often reflect the importance of their contribution to the economy. This can have a negative impact on their health. This study used maternity data from a mission hospital in Kuntenase district in the Ashanti region of Ghana to compare the health status of rural and urban women. The results showed that rural women had poorer health status than urban women. In addition, improvement in health was more likely to occur among urban women then rural women. The paper recommends some policies to improve the health of rural women.

Keywords: gender-related health care, health economics, health status, rural women, urban women, women health

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*** This paper was accepted for publication in September 2008.**

1. INTRODUCTION AND PROBLEM STATEMENT

The agricultural sector is the backbone of many developing economies. Since farming technologies in such economies are often labour intensive, the health of the rural population is crucial for sustaining the economies. Women form a significant proportion of the rural population and are often involved in the farming of foodstuffs traded domestically to feed the nation's population. Rural women's health then is fundamental to economic and social development. In order to encourage farming in Ghana a public holiday was introduced in honour of farmers and fishermen and women. Awards for the best national and regional farmers have also been instituted. However these awards tend to favour large scale farming. Such a policy is likely to favour men rather than women since women are less likely than men to be involved in large scale farming. Women tend to be involved in small scale semi-subsistence farming activities. Because profit in small scale farming is in general less than that of large scale farming, rural women are often low-income earners.

As discussed in Ballantyne (1999), the health impact of social and economic status differs between men and women with women's health being more sensitive to economic status than men (Denton and Walters, 1999). Rural women are also more likely, than urban women to be uneducated. There is an extensive literature on the impact of gender disparities on women's health and the resulting impact on children. For example, Wisdom *et al.* (2005) have shown that socioeconomic status and health accessibility have significant impact on women's mortality and mental health. Macassa *et al.* (2003) have shown that gender inequality has a negative impact on women's health whether or not individuals have first hand experience of discrimination. Kahn *et al.* (2000) argue that income inequalities negatively impact low income women with young children. Institute for Food and Policy Research (2003) as well as the World Bank (2003) have documented the positive relationship between women's social status and child wellbeing.

These findings imply that an improvement in women's status in society has a positive impact on the health of women and children. The literature has also compared the health status of urban and rural women and shows unequal utilisation of health care between the two groups of women. Among the reasons given for such differences include lack of access to health information and health care, poor quality, culture and cost in the rural areas (Byles *et al.*, 2006; Centre of Excellence for Women's Health (CEWH), 2004; Leipert and George,

2008; Wong *et al.*, 1995). These factors have varying impact on the health of rural women. According to the literature, the impact of culture on rural women's health can be positive or negative. Some studies found the closeness of rural communities is a positive factor in providing social support for rural women to handle the multiple stressors and challenges of rural life and hence reduce the need to use conventional health care (Byles and George, 2006). Other studies however found that the closeness of rural communities deter sick women from seeking the needed health care especially if the illness is stereotyped (Thorndyke, 2005).

These studies in general found that urban women are more likely to use conventional health care than rural women either because of differences in access or differences in preference for conventional health care. However, the impact on the health on rural women varies across studies. Byles and George (2006) found no difference in the health of rural and urban Australian women in spite of the difference in health care utilisation. Others however found rural women sicker than urban women. For example two separate studies found that rural Canadian women have higher mortality rates (CEWH, 2004) and lower life expectancy (Leipert and George, 2008) than those in the urban areas. Chinese data have also shown a higher maternal mortality rate among rural Chinese women (Wong *et al.*, 1995).

To the author's knowledge no such comparative study has been done with African data. Any health comparison has mainly been on the use of contraceptives among African rural and urban women. For example, White and Speizer (2007) found that urban Zambians were more likely to use contraceptives than their rural counterpart as a result of lack of education of rural people on the use of contraceptives. Other studies have shown that the elderly women in rural Africa have higher preference for traditional healers than conventional health care (Nelms and Gorski, 2006).

Among the limited studies on women's health using Ghanaian data are Duda *et al.* (2007) which surveyed the prevalence of presumptive hypertension among women in Accra, the capital city of Ghana. The study found higher than anticipated prevalence of hypertension among the urban women and recommended steps to increase awareness of the disease among women. Such a study, useful though it was in providing information on women's health, did not provide any information on rural women's health. Recommended policies in the study then may not be applicable to rural women because, as stated in CEWH

(2004), urban solutions do not always solve rural problems. In an economy like Ghana where rural women play an important role in feeding the nation, the health status of rural women is an important determinant in the supply of foodstuffs in the economy. All things being equal, an improvement in the health of rural women could imply an improvement in the supply of foodstuffs and a resulting reduction in food prices; hence a reduction in inflation.

Despite such importance, no study has yet used Ghanaian data to compare the health status of rural women with that of urban women. Women's social status is partly determined by access to education, medical care and economic autonomy (Koenen *et al.*, 2006). Since independence in 1957, the status of urban Ghanaian women has improved. More women have tertiary education, are active in the labour market and so can afford good medical care. The positive impact on child wellbeing is partly seen in the increase in enrolment in education because an educated woman is likely to educate her children regardless of gender. Such improvement in women's status, however, exists mainly in the urban areas than in rural Ghana.

With the help of the poverty alleviation programme embarked on by the government, the rural girl-child may now have access to basic education and food. Rural women however remain largely uneducated and poor. Even though illiteracy may also be common among urban women, they are more likely to have access to health care in terms of shorter distances to health care centres than rural women who may have to travel long distances and/or may have to face problems with the availability of transport. Lavy and Germain (1994) found from Ghanaian data, a high negative correlation between distance and utilisation of health care. The Ghana Living Standards Survey of 1992 also showed that the opportunity cost in terms of time spent outside economic activity was higher among the non-salaried than salaried workers. Thus, rural women, because they require long travel time to access health care and are in general non-salaried farmers, face a higher cost of care than women in the urban areas. Rural women then are likely to consume less health care than their urban counterparts. It is therefore hypothesised in this study that rural women are likely to have poorer health status than urban women.

The major objective of this study is to analyse the health status of rural and urban women in Ghana using a case study of patients at a mission hospital in the Ashanti Region. The rest of the paper is organised as follows. The next section (Section 2) describes the model used for the study. This is followed by a

description of the analysis of the data in Section 3. The results of the analysis are reported in the fourth section. Thee conclusions and policy implications from the study are reported in the final section of the paper.

2. METHODOLOGY

The methodological approach used in this study has two parts. The first part uses the data to compute the traditional indicators for health status: maternal mortality and morbidity rates. The second part uses multivariate logistic regression to examine the difference in the impact of the factors that affect mortality rate depending on whether the subject lives in a rural or urban area.

For the first part, the type of mortality rate used is period mortality rate which is defined mathematically by Jack (1999) as follows in Equation 1:

$$\tau^{t}_{a,p}(n) = \tau^{t}_{a} + (1-\tau^{t}_{a})\tau^{t}_{a+1} + (1-\tau^{t}_{a})(1-\tau^{t}_{a+1})\tau^{t}_{a+2} + \ldots + (1-\tau^{t}_{a})\ldots(1-\tau^{t}_{a+n-1})\tau^{t}_{a+n}$$
$$= \tau^{t}_{a} + \sum_{i=1}^{n}\left(\prod_{j=0}^{i-1}(1-\tau^{t}_{a+j})\right)\tau^{t}_{a+i}$$

Equation 1

where $\tau^{t}_{a,p}(n)$ is the period n year probability of death for an individual of age a at time t. τ^{t}_{a+i} is the fraction of individuals at age $a + i$ that died within time t and so $\prod_{j=0}^{i-1}(1-\tau^{t}_{a+j})$ is the period survival function. The a represents the lowest age in the sample and it is 14 in the sample for this study. For the purposes of the current study, Equation 1 refers to the probability that a woman of age a dies within n years. This kind of definition of mortality rate, also referred to as mortality risk, allows for the computation of annual mortality rates of a given age range of a population. Maternal mortality rates were computed for rural/urban women in this study.

Even though mortality rate is a good measure of health status, because it is observable and measured with accuracy, it is not a complete measure. Death

represents a deterioration of health stock below a minimum level (Grossman, 2000) and so a fall in the mortality rate of a population represents an improvement in health. However, mortality rate does not capture a deterioration of health stock to a level that is still above minimum. This kind of health deterioration is captured by morbidity rate. Hence morbidity rates are also measured to derive a more complete picture of the health status of the cohort than what mortality rate alone would capture.

The main indicators of morbidity are prevalence and incidence of diseases. Prevalence refers to the number of cases with the particular disease or complication while incidence here refers to the number of new cases of the disease in a year. Since the data are hospital data on patients' records, the analysis uses information on patients' diagnostics to measure morbidity. Hence the morbidity rates measured are observed or objective morbidity rate. It must be mentioned that the use of patients' diagnostics has its own weakness in that patients' records do not provide detailed information on the variation of severity or effect of diagnostics on the functional capacity of patients. Being inpatient data however implies that the disease must be severe enough to affect the patients' functional capacity and require retention in the hospital. Also, since the observations of the data are already patients, it is likely for morbidity rates to be higher than that of the national population. The analysis of morbidity then focuses on the difference between morbidity of rural and urban women and the changes over time.

The second part of the analysis uses the statistical software, Statistical Package for Social Sciences (SPSS), to run a multivariate logistic regression of mortality on the patient's characteristics. This second part is important in shedding light on the factors or characteristics of the women which significantly affect mortality. The delineation of these factors can guide policy makers on the factors on which to focus to reduce mortality and hence improve the health of women. In addition, logistic regression analysis is an appropriate method of estimation when the dependent variable is binary given the characteristics of the data used in this study.[1] The regression equation is outlined in Equation 2 below:

$$y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \beta_4 X_{4i} + \beta_5 X_{5i} + \beta_6 X_{6i} + \beta_7 X_{7i} + e_i$$

Equation 2

where y_i is a binary variable which equals 1 if a patient died during childbirth and 0 otherwise. X_1 is patient's age in years, X_2 is a dummy variable which equals one if the patients lived in a rural area and zero otherwise, X_3 equals one if the patient had caesarean section and zero otherwise, X_4 also equals one if the patient had a normal delivery and zero otherwise and X_5 equals one if the patient had complications. Complications here include, among others, anaemia, haemorrhage, eclampsia, and retained placenta. The selection of diagnostics, that were ranked as complications, was done with the help of a nurse-midwife.

Income and education of patients are likely to affect mortality but were not included in the model simply because the information was not available. When patients' income is not available, the median income of the patients' community is often used in the literature as a proxy for income. The local communities of the patients in the data can be grouped into three: villages, towns and cities. In general, villages have the lowest and the cities have the highest median income. Thus, X_6 represents the median income of the patients' communities. A similar reasoning is used in the literature to create proxy for education (see for example, Amporfu, 2008). In this case patient's communities could be ranked according to the education level of the population. However, this proxy is not used in the current study because there is already a dummy indicating whether or not the patient lives in a rural community. Patients (women) who live in rural areas are likely to be uneducated and so a proxy for education might be highly correlated with the rural dummy variable which may cause a significant multicollinearity problem and weaken hypothesis testing.

Finally, X_7 is a dummy variable which equals one if the patient was registered under the National Health Insurance Scheme (NHIS) and zero otherwise. This dummy was included to find out the extent to which the presence of health insurance affect mortality rate of maternity patients. With the exception of age, all the independent variables are dummy variables.

3. DATA ANALYSIS

The main data used for this study were a three year (2005-2007) maternity in-patient data from a mission hospital in the Kuntenase district of the Ashanti Region, about 30 kilometres from Kumasi, the capital city of the Ashanti Region. For the purposes of this study, the data had information on patients' age, address, outcome (mortality and readmission), diagnostics and procedure. The sample size was 4,847 but reduced to 4,525 after the removal of the

observations with some missing data. Table 1 below summarises information from the data. As shown in Table 1 about half the patients lived in rural areas. This is consistent with information from the United Nations population database (United Nations, 2007). The major cause of death, anaemia is preventable and treatable.

The data have several advantages for the current study. First, the proportion of rural women in the sample is consistent with that of the whole Ghanaian population hence making the data a close representation of the national population. Hence the results of the analysis could exhibit at least some of the variations in the health status of rural and urban women in Ghana. Second, since all observations are from the same hospital, the selection bias that could result from hospital choice is minimised. Both the rural and urban patients had access to public hospitals. The mission hospital used in the study is located a few kilometres from the district hospital and so the rural as well as urban patients chose the mission hospital over the public hospitals. Thus the data are a self selection of women who are likely to expect higher quality and/or less expensive care from a mission hospital and so are likely to be homogeneous at least in their expectation. Since the patients might still differ as a result of their life experience, education, income or cultural background, unobserved heterogeneity may still exist among them. However, any existence of unobserved heterogeneity is not likely to bias the results because the method of estimation is not affected by unobserved heterogeneity (Kennedy, 1998).

Table 1: Summary data description of the sample

ITEM	NUMBER
Sample size	4,525
Percent rural (%)	51
Average age (years)	26.85
Age range	14-45
Number of deaths	14
Patients with NHIS	241
Major cause of death,	Anaemia

Third, the use of hospital data allows the measurement of morbidity to be observed morbidity which is more objective than unobserved morbidity. Fourth, since hospitals are able to attract people from far and near, hospital data are an affordable means of obtaining information on a cross section of the population. The people in the data come from different parts of the Ashanti Region and so form a good cross section of the national population since the health characteristics of the residents may not differ significantly from the rest of the nation. An alternative would be to travel to villages, towns and cities to interview over four thousand subjects or patients; needless to say, this would be very costly.

4. RESULTS

4.1. Maternal mortality rates

The maternal mortality rates are reported in Table 2. These rates are close to the death rates (per 1000 population) reported in the United Nation's database on population for the period under study for Ghana. For example, the database reported an annual average of 0.093 for the period. This is close to the 0.091 reported in this study in Table 2. Such results increase confidence in the reliability of the results. The mortality rates in Table 2 are the annual mortality rates of women currently alive and within ages 14 and 49. The rates then represent the probability that a woman at age 14 will die within 35 years from maternal problems.

As expected the results show that the mortality rates of rural women were significantly higher than those of urban women throughout the three years under study. The rates are expressed per 100,000 individuals. This implies that, for example, in 2005, 394 out of 100,000 rural women were likely to die compared to 16 for their urban counterparts. Similarly, the annual averages mean that, during the study period, 213 out of 100,000 rural women were likely to die annually compared to 6 for urban women. The age range used (14 – 49 years) falls within the productive years of women (retirement age in the formal public sector is 60).

The fall in mortality implies improvement in health status over time. However, the fall is greater for urban women than for the rural women. For the urban women, mortality rate fell by 93.8 percent in 2006 and remained at the low level the following year. In the case of rural women, the drop was 56.9 percent in 2006 followed by another 54.7 percent in 2007. The women received care from the same

health facility and, from Table 1, the cause of mortality was mainly anaemia, which is treatable at the facility. Anaemia can be detected during prenatal consultations and treated so that it does not cause complications during delivery. The difference in the drop of mortality rate then could be because urban women increased their prenatal consultations more than their rural counterparts.

Table 2: Mortality rates for rural and urban women

Year	All women	Rural	Urban
2005	0.166	0.394	0.016
2006	0.073	0.170	0.001
2007	0.035	0.077	0.001
Annual average	0.091	0.213	0.006

The results from the regression showed a high correlation between the rural dummy variable and the proxy for income. The dummy variable for registration for the NHIS was also found to be highly correlated with the rural dummy variable. Hence the two dummy variables for income and registration in the NHIS were removed from the regression. The removal of the NHIS dummy variable is important because people with NHIS may be systemically different from those without NHIS in terms of attitudes towards risk. Thus, including a NHIS dummy in the model without purging it from attitude towards risk could result in biased estimation. Complication was also found to be highly correlated with caesarean section. Hence the dummy for caesarean section was also dropped from the analysis.

The results from the regression analysis, reported in Table 3, show a negative relationship between age and mortality. Such results are consistent with the age range and the nature of the data used for the study. The result then implies that teenage maternity patients, whether urban or rural, are likely to die from child birth but such likelihood falls with age. After controlling for age, complications and area of residence (rural or urban) the results also show that the reduction in mortality rates over time is not statistically significant at the 5% significance level. The regression results also show that the coefficients of the rural and complication dummies are positive indicating that mortality rates of rural women are significantly higher than those of urban women and women with complications are more likely to die than those without complications.

To find the difference in the mortality rates of rural and urban women with complications, the regression was rerun after including interactions of the rural and complication dummy variables. Interactions between the rural and year dummies were also included to find changes in the mortality rates for rural and urban women over the years under study. The results are reported in the last column of Table 3 and they show that rural women are more likely to die from their complications than urban women. The negative coefficient for complications implies that urban women were not likely to die from complications. The coefficients for the rural dummy variable for the base year was positive but the differential coefficients for the interactions of rural with 2006 and 2007 were negative, but less in magnitude than that of the base year, and positive respectively. Such results imply that the gap between the mortality rates of rural and urban women dropped in 2006 but increased again in 2007 at the 10% significance level. Consistent with the results in Table 2, the results also imply that mortality rates of rural women remained higher than urban women over the years. The year dummies had negative coefficients at the 5% significance level, implying significant reduction in mortality rates for urban women over the years. This again is consistent with the large drop in mortality rates for urban women in 2006 shown in Table 2.

Thus, the results implied that the rural population lost considerable labour annually due to maternal health problems, 13 times more than the urban population. The table also shows that mortality rates of both rural and urban women fell over the years.

Table 3: Regression analysis results

Dependent Variable Independent Variables	Mortality	Mortality
Age	-0.017 (0.08)	-0.584 (0.019)
Complication	1.138 (0.016)	-14.323 (0.037)
Rural	2.159 (0.005)	1.279 (0.006)
2006	-0.593 (0.257)	-0.584 (0.027)
2007	-1.358 (0.174)	-0.584 (0.027)
Rural *Complication		-1.337 (0.055)
Rural *2006		15.802 (0.052)
Rural *2007		-0.864 (0.096)
Constant		12.615 (0.101)
	-6.708 (0.000)	-6.004 (0.000)

Notes
*With the exception of age all the independent variables are dummy variables.
The p-values are in brackets.

4.2. Maternal Morbidity

A close examination of the data showed that a different group of patients had complications each year. This could eithermean that the patients died from their complications or were cured or those who were not cured sought care from some other hospital and so did not show up in the hospital of the study anymore. Thus, only incidence was measured for each year. Table 4 shows that for rural women, the incidence of all complications increased in 2006 but fell in 2007. In the case of urban women, incidence dropped over time. The data for 2007 were only up to August and so the proportion of the sample with the disease, rather than the number of cases, is a better tool for examining the changes in morbidity over time. The proportion of cases with complication or particular diagnostics, referred to in the study as morbidity rates and computed as a percentage of the relevant group, are also reported in Table 4. The morbidity rates computed for anaemia, haemorrhage, and malaria indicate the probability that a patient's health is deteriorated by those diseases.

Table 4: Women's Morbidity Rates

	Rural Women			Urban Women		
	2005	2006	2007	2005	2006	2007
All complications (%)	0.41	0.37	0.36	0.38	0.33	0.35
All complications (incidence)	257	284	130	367	340	149
Anaemia (%)	1.4	1.7	1.2	0.5	0.8	0.5
Haemorrhage (%)	3.4	4.0	3.8	1.6	1.4	4.0
Malaria in Pregnancy (%)	8.0	7.9	5.8	9.6	6.9	7.0

With the exception of malaria in 2005 and 2007, and haemorrhage in 2007, the morbidity rates are in general higher for rural women than urban women. When all complications are combined, morbidity rates fell slightly (9.5 percent in 2006 and 2.7 percent in 2007) over the years for rural women. For urban women, however, there was a larger drop (13 percent) in 2006 but this was followed by a slight increase (6 percent) in 2007. As expected, malaria was the main cause of morbidity among the women especially urban women. The morbidity rates from malaria dropped significantly (28 percent) in 2006 for urban women but for rural women, it was not until 2007 that a similar drop (26.5 percent) occurred. Haemorrhage was the next dominant cause of morbidity, affecting rural women more than urban women. There was an increase in morbidity (17 percent), due to haemorrhage, for rural women and remained high through 2007. For urban women however, there was a sharp increase (71 percent) in 2007. Anaemia, though the major cause of death, was the least cause of morbidity and was more prevalent among rural than urban women. The morbidity rates due to anaemia rose for both groups of women in 2006 but fell in 2007.

Several reasons could explain such difference in morbidity. Even though the labour intensive farming technology used in rural communities forces the village population to exercise and so has a positive effect on their health, this exercise could be too strenuous for pregnant women. Since women are likely to start giving birth at an early age in the rural areas such a strain could have long term repercussions on women's health. Rural pregnant women may not be exposed to information on how to care for their health because rural women are less likely than urban women to attend prenatal classes. For example, anaemia and haemorrhage can be minimized through proper diet and refraining from certain strenuous activities. Such information is made available at prenatal classes.

Table 5 reports the fraction of the patients in rural and urban areas that have NHIS. Such information shows the extent the registration to the NHIS is correlated with residence of patients. As shown in Table 5, the operation of the NHIS in the hospital did not begin till 2006 and rural women are less likely to register for the NHIS than urban women. Even though the proportion of those with NHIS increased in 2007, the increase is higher for the urban women than the rural women. The reason that is often given for failure to register for the NHIS is affordability. A lot of rural women may belong to the indigenes who qualify for fee exemption. Educating the rural population on the need to register could increase the number of rural women registered in the programme to improve access to health care.

Table 5: Registration for NHIS (%)

Year	Rural Women	Urban Women
2005	0	0
2006	4.9	6.4
2007	12.1	17.1

5. CONCLUSIONS AND DISCUSSION OF POLICY IMPLICATIONS

The study has shown that rural women are in general sicker than urban women. In addition rural women are 13 times as likely to die from maternal health problems as urban women with anaemia as the main cause of death. Mortality rates for urban women dropped about twice as much as the drop for rural women. Any improvement in morbidity that occurred during the study period was likely to be observed among urban women before extending to rural women. If the improvement in mortality and morbidity was due to allocation of resources to improve health then the share of rural women in the resources was not enough to lead to a similar improvement in health status. The study also showed that while the incidence of malaria, the main cause of morbidity, decreased slightly during the study period, the incidence of haemorrhage actually increased significantly especially for urban women.

Two likely reasons for the difference are poverty and education. As already explained women in rural areas are likely to be low income earners and so may not be able to afford some of the basic requirements for good health. For example, pregnant women are supposed to engage in less strenuous work to ensure good health. However pregnant farmers are often forced to do strenuous farm work because they are unable to afford hired labour. By engaging in strenuous activities pregnant farmers become vulnerable to haemorrhage. It is thus not a surprise that morbidity rate due to haemorrhage was higher among rural than urban women. The micro credit programme under the poverty alleviation programme was expected to provide loans to farmers to improve their business but a large percentage of rural women did not have access to such credit. The programme should give more attention to female farmers.

In addition to personal poverty, rural women live in poor communities that lack the basic infrastructure such as potable water, electricity and good road network which are crucial to good health. Thus in addition to engaging in strenuous farm work, rural women have to be exposed to water borne diseases as well. Spending more resources on research for less strenuous farming technology could improve the health of rural women. In addition more resources could be spent on feeder roads to ensure easy transportation of farming products to urban areas and hence reduce the strain on the health of rural women.

The second major reason for the poor health of rural women is lack of education. Typically rural women do not have formal education and are less likely than urban women to attend prenatal lessons. Hence, rural mothers often die from preventable diseases like anaemia. It is extremely important then that rural women be more educated. An effective tool to aid rural women could be a rural women's organisation that is ran by rural women themselves and not urban women as is often the case. Such an association could communicate effectively, the needs of rural women to the government for help.

The study also revealed that young mothers are more likely to die from childbirth than older ones. Given that the youngest mother in the data used was 14, such a result implies that teenage pregnancy can be detrimental to the health of young women. There is thus the need for a rigorous education to encourage girls to have a sense of purpose in life, apart from marriage and childbirth. Such an education is likely to induce girls to postpone childbirth to at least the post teen years. Improvement in the health status of rural women is important for the success of the poverty alleviation programme because the resulting reduction in mortality rate for example, will reduce children dropping out of school due to the loss of a parent or a guardian. Even though poverty alleviation programmes reduce financial burden of child education on parents, children are still dependent on parents and guardians for all other needs. Since child wellbeing is likely to receive a lot of weight in the spending of assets controlled by women than men (Quisumbing and Maluccio, 2003), improvement in the status of rural women could secure rural children's education.

ENDNOTE

1. More descriptions of the model are provided in the data analysis section.

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