Maternal Health Care Seeking Behaviour in Rwanda

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Abstract

We model the proximate determinants of maternal health care seeking behavior (place of delivery). We find that visits for ante natal care is a key determinant of whether the woman seeks either institutional care or professional assistance at home as compared to delivering at home without any help. Women from richer households are less likely to deliver a child at home without any professional help. In order to understand the changes in Rwanda since the beginning of nineties, we pool three rounds of DHS data. The survey year dummies (2000, 2005) are statistically significant indicating that children born after 1995 were more likely to be born at home without professional assistance. This suggests a worsening of access to professional help at child birth.

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1. Introduction

With a per capita income of $ 220 per year, Rwanda is ranked 159 of 177 in the United Nations Development Programme's 2004 Human Development Index. From the point of view of demographic processes and economic well being, Rwanda is different from other countries in Africa because of the civil war which began in 1990. Over a million people died in the genocide in 1994. The composition of the population changed with the return of over a million former refugees who were living in exile till the end of the war and genocide (Rwanda Demographic Health Survey 2005). Ghobarah, Huth and Russett (2003) argue that health care systems suffer long term damage on account of civil wars. Based on an analysis of a cross national World Health Organization data set, they also find that women and children suffer disproportionately from the long term effects of civil war. To this end, we focus on maternal health care seeking behavior. We pool Rwanda DHS data for the years 1992, 2000 and 2005 and estimate a multinomial logit model to model the place of delivery, viz. at home without any professional assistance, in an institution, and at home with professional assistance.

2. In Relation to Literature

Various studies have consistently shown that maternal education has a statistically significant positive effect on the likelihood that a woman uses reproductive health services. Education makes a difference through a multitude of mechanisms in order to influence service use, including increasing female decision-making power, awareness of health services, changing marriage patterns, greater self-confidence and creating shifts in household dynamics. Better educated women are more aware of health problems, know more about the availability of health care services, and use this information more effectively to maintain or achieve good health status. Mother's education may also act as a proxy variable of a number of background variables representing women's higher socioeconomic status, thus enabling her to seek proper medical care whenever she perceives it necessary. The evidence on the impact of women's employment outside the home on demand for health care has been mixed. The benefits of antenatal visits may be most significant in developing countries where morbidity and mortality levels among reproductive-age women are high. There is evidence of a strong association between birth order and use of health care services. Because of perceived risk associated with first pregnancy, a woman is more likely to seek maternal health care services for first order than higher-order births. Having more children may also cause resource constraints, which have a negative effect on health care utilization. Women with a large number of children underutilize available health services because too many demands on their time force them to forgo health care. It is well known that increased income has a positive effect on the utilization of modern health care services. Measures of income and wealth have also been shown to be important predictors of use of pregnancy care. Furthermore, the utilization of maternal health services is influenced by the characteristics of the

health care delivery system, among other things, including physical availability of services, distance and/or time to a facility, economic and other costs associated with use of services, cultural and social factors that may impede access, and quality of services.

3. Data and Methods

3.1 Data

We use the nationally representative 1992, 2000 and 2005 Rwanda Demographic and Health Survey data. We pool the three rounds of data for the analysis on place of delivery. The unit of analysis for place of delivery is the most recent birth in the five years preceding the survey. The 1992, 2000 and 2005 data sets cover a total of 6,551, 10,421 and 11,321 women in the age group 15-49 years respectively. Details on the survey procedures and sampling design are available in individual survey reports (Rwanda Demographic Health Survey 1992, 2000, 2005).

3.2 Increasing Inequality in Access to Institutional Delivery

Women from richer households might be better positioned to seek access to institutional care at the time of delivery. This is reflected by drawing a Lorenz Curve where on the X-axis we have cumulative percentage of births arranged by standard of living index and on the Y-axis we have the cumulative percentage of institutional deliveries. The Lorenz Curve will be drawn for the year 1992, 2000 and 2005 and it will show that there is an increase in the extent of inequality in terms of access to health care at the time of child birth. As is well known the 45 degree line reflects perfect equality or the absence of inequality.

3.3 Empirical Model

The unit of analysis for place of delivery is the most recent birth in the five years preceding the survey. We estimate a multinomial logit model where dependent variable is one of the three outcomes: deliver at home without assistance, institutional delivery, deliver at home with professional assistance. Data were collected on the place of delivery and the person who assisted with delivery. Institutional delivery included delivery at both private sector and public sector health facility. Delivery at home with professional assistance included help from doctors, nurse and trained birth attendants. The base category is delivering at home without assistance.

Independent variables in the analysis include number of antenatal visits (none, one, two or three, four or more), age of the women at the time of birth, birth order (one, two or three, four or five, six or seven, seven or more), education (no education, primary level, secondary or higher), work status (working, not working), wealth index (lowest, second, middle, fourth, highest), and province (City of Kigali, South, West, North, East). In addition to the standard

regressors that have been used in the literature we include the province-level shock dummies, community-level average education of the women, community-level mean number of women who have had institutional delivery in the past, and year dummy (1992, 2000, 2005). We include community-level variables to capture the effect on community or society on individual decision making.

We pool the three cross section data for the years 1992, 2000 and 2005. One advantage of pooling is that it increases the sample size. In order to be able to pool it is necessary that the relationship between dependent variable and some of the independent variables need to be constant over time. In the analysis we include a time dummy for each cross section. The reference category is the year 1992. We estimate two separate models, first with all the women in the sample and then separately for women aged 15 – 30 years. We tested for the IIA assumption and find that the null hypothesis of IIA cannot be rejected. This allows us to estimate multinomial logit model. Instead of reporting the coefficients of the multinomial logit model, we provide estimates of the relative risk ratios (RRR) or odds ratios. The odds ratio does not depend on other choices and this follows from the assumption of independence of disturbances. The RRRs show the effects of the regressors on the probability of institutional delivery, delivery at home with professional assistance relative to the likelihood of delivering child at home with no assistance. If a parameter estimate is greater (less) than one it indicates that the regressor is associated with a probability of the outcome that is greater (smaller) than the probability of the base case.

We also estimate a multi level model: a two level model where two levels are place of birth and the cluster (results not reported here). This allows us to control for the cluster level effects.

4. Results

The results of the multinomial model on place of delivery are presented in Tables 1 and 2. While Table 1 presents the results for the pooled data for women of all ages, Table 2 presents results for the pooled data for women aged 15 – 30 years. Here we discuss the key findings based on the estimates of the multinomial logit model.

In line with the existing literature, we find that number of visits for antenatal care is a key determinant of whether the woman seeks institutional care or professional assistance at home as compared to delivering at home without any help. This result comes out clearly when we estimate the model with all women in the age group 15 – 49 years. We get a slightly different result for the restricted sample, i.e. women in the age group 15 – 30. We find that compared to a woman who does not go for antenatal check up, a woman who goes for antenatal check is more likely to deliver in a health facility instead of at home without assistance.

We find that birth order matters, i.e. older children are more likely to be born at home without assistance rather than at health facility or at home with professional assistance. We should point out that this effect is not observable for women with more than seven children. We also find that women who are educated are more likely to seek assistance or deliver at home with

professional assistance rather than delivering at home without assistance. We do not find that women who are working are more likely not to deliver at home without assistance. Wealth matters in the sense that children from households in the fourth and fifth quantiles are less likely to be born in at home without assistance.

We now turn to a discussion of the year or the dummy for the survey year. We find that children born in the five years preceding the 2000 survey are less likely to be born in health facility and more likely to be born at home without assistance. We also find that children born in the five years preceding the 2005 survey are less likely to be born in health facility and more likely to be born at home without assistance. However there is a difference.

Consider the following two outcomes, viz. delivery in a hospital versus delivery at home without assistance. The RRR for the year dummy for 2000 is 0.62 and the RRR for the year dummy for 2005 is 0.87. This implies that in 2000 the ratio of probability of delivering at hospital and probability of delivering at home without assistance is smaller than the ratio of probability of delivering at hospital and probability of delivering at home without assistance in 2005. We find a similar result when we focus only on women in the age group 15 – 30 years.

From this it is not immediately clearly whether the difference in the two RRR's is because of a worsening in availability and access to health care services following the genocide and then a gradual improvement in availability and access to such services. Unfortunately, the survey data does not have information on access to health services.

However it is not an unreasonable conjecture that there could have been a disruption in availability and access to health services. Households could have relied more on the traditional birth attendants. The Rwanda Service Provision Survey 2001 states that the Ministry of Health in Rwanda, has instituted a program for training the traditional birth attendants and also for developing and strengthening the links between the health system and the traditional birth attendants. Such an initiative can improve health outcomes and improve delivery care. In 2003, a new national population policy was formulated in Rwanda emphasizing the need to improve the quality of life and also affecting the demographic (fertility, mortality) processes.

It is possible that the combined effect of these measures could explain the difference in RRR's.

When we consider the following two outcomes, viz. delivery at home without professional assistance versus delivery at home without assistance we find that only the year 2000 dummy is significant and less than one. The dummy for the year 2005 is insignificant. This is true for both models, i.e. the sample with women aged 15 – 49 years and sample with women aged 15 – 30 years. The Rwanda Service Provision Survey 2001 noted that on account of a varied set of reasons, many women preferred to seek the help of the traditional birth attendant.

Finally we find that there are large differences across the provinces. This is not surprising for the following reasons. First, the impact of genocide across the provinces was not uniform. Second, there are differences in the poverty levels across the provinces in both 1990 and 2000. Third, there are substantial differences in the change in poverty levels over 1990-2000 across the provinces (Justino and Verwimp 2006).

5. Preliminary Findings

We find that visits for ante natal care is a key determinant of whether the woman seeks either institutional care or professional assistance at home as compared to delivering at home without any help. Women from richer households are less likely to deliver a child at home without any professional help. In order to understand the changes in Rwanda since the beginning of nineties, we pool three rounds of DHS data. The survey year dummies (2000, 2005) are statistically significant indicating that children born after 1995 were more likely to be born at home without professional assistance. This suggests a worsening of access to professional help at child birth.

Selected References

Ghobarah, H.A., P. Huth, and B. Russett. 2003. "Civil Wars Kill and Maim People– Long after the Shooting Stops." *American Political Science Review* 97(2): 189-202.

Justino, P. and P. Verwimp. 2006. "Poverty Dynamics, Violent Conflict and Convergence in Rwanda." HiCN WP16.

Rwanda Demographic Health Survey 2005. Institut National de la Statistique du Rwanda (INSR) and ORC Macro. 2006. Rwanda Demographic and Health Survey 2005. Calverton, Maryland, U.S.A.: INSR and ORC Macro.

Rwanda Demographic Health Survey 2000. Office National de la Population (ONAPO) [Rwanda] et ORC Macro. 2001. Enquête Démographique et de Santé, Rwanda 2000. Kigali, Rwanda et Calverton, Maryland, USA : Ministère de la Santé, Office National de la Population et ORC Macro.

Rwanda Demographic Health Survey 1992. Barrère, Bernard, Juan Schoemaker, Monique Barrère, Tite Habiyakare, Athanasie Kabagwira, and Mathias Ngendakumana. 1994. Enquête Démographique et de Santé, Rwanda 1992. Calverton, MD: Macro International.

Table 1: Multinomial Logit: Place of Delivery (Pooled Cross Section Women Aged 15 – 49 Years)

Base Category	Health Facility		Home with Professional Assistance	
Delivered at Home	RRR	SE	RRR	SE
Antenatal Visits (None)				
Between 1 - 2 Visits	3.19*	0.46	1.38^{+}	0.21
3 Visits	5.73*	0.83	1.58*	0.24
Over 3 Visits	8.84*	1.35	1.49^{+}	0.26
Age at Birth of Child				
Age	1.02*	0.01	0.99	0.01
Birth Order (First Child)				
Second or Third Child	0.25*	0.02	0.59*	0.06
Fourth or Fifth Child	0.19*	0.02	0.55*	0.07
Sixth or Seventh Child	0.14*	0.02	0.57*	0.1
Eighth Child and Above	0.16*	0.02	0.52*	0.11
Education (None)				
Primary	1.38*	0.08	1.13$^{\wedge}$	0.08
Above Primary	5.23*	0.49	1.94*	0.3
Work Status (Not Working)				
Working	0.75*	0.05	1.11	0.11
Wealth Index (Bottom 20 %)				
Wealth Index 2nd Quintile	1.03	0.08	1.02	0.11
Wealth Index 3rd Quintile	1.17^{+}	0.09	1.2 $^{\wedge}$	0.12
Wealth Index 4th Quintile	1.46*	0.11	1.26^{+}	0.13
Wealth Index 5th Quintile	3.78*	0.31	1.47*	0.18
Year Dummy (1992 Survey)				
2000 Survey	0.62*	0.04	0.39*	0.04
2005 Survey	0.87^{+}	0.06	0.88^{+}	0.07
Province Dummies (Butare)				
Byumba	0.76*	0.08	0.58*	0.08
Cyangugu	1.32*	0.15	1.28$^{\wedge}$	0.18
Gikongoro	0.41*	0.05	0.35*	0.06
Gisenyi	0.70*	0.08	0.52*	0.08
Gitarama	1.08	0.12	0.64*	0.09
Kibungo	0.59*	0.07	1.12	0.15
Kibuye	0.77^{+}	0.09	0.25*	0.05
Kigali Ville (Pvk)	1.67*	0.19	0.67^{+}	0.12
Kigali Rurale	0.74*	0.08	0.39*	0.06
Ruhengeri	0.69*	0.08	0.31*	0.05

N= 12506

Table 2: Multinomial Logit: Place of Delivery (Pooled Cross Section Women Aged 15 – 30 Years)

Base Category	Health Facility		Home with Professional Assistance	
Delivered at Home	RRR	SE	RRR	SE
Antenatal Visits (None)				
Between 1 - 2 Visits	2.48*	0.45	1.26	0.27
3 Visits	4.74*	0.87	1.4	0.31
Over 3 Visits	7.14*	1.39	1.47	0.36
Age at Birth of Child				
Age	1.02	0.01	0.98	0.02
Birth Order (First Child)				
Second or Third Child	0.27*	0.02	0.62*	0.07
Fourth or Fifth Child	0.2*	0.02	0.54*	0.09
Sixth or Seventh Child	0.19*	0.05	0.78	0.25
Eighth Child and Above	1.16	0.92	1.92	2.2
Education (None)				
Primary	1.48*	0.12	1.13	0.12
Above Primary	5.45*	0.71	1.9*	0.4
Work Status (Not Working)				
Working	0.73*	0.06	1.18	0.16
Wealth Index (Bottom 20 %)				
Wealth Index 2nd Quintile	0.97	0.1	0.92	0.13
Wealth Index 3rd Quintile	1.16	0.12	1.05	0.15
Wealth Index 4th Quintile	1.34*	0.14	1.24	0.17
Wealth Index 5th Quintile	3.38*	0.38	1.4+	0.24
Year Dummy (1992 Survey)				
2000 Survey	0.55*	0.05	0.43*	0.06
2005 Survey	0.82+	0.07	1	0.12
Province Dummies (Butare)				
Byumba	0.64*	0.09	0.57*	0.1
Cyangugu	1.09	0.18	1.04	0.21
Gikongoro	0.33*	0.06	0.28*	0.07
Gisenyi	0.55*	0.08	0.45*	0.09
Gitarama	1.07	0.16	0.48*	0.11
Kibungo	0.5*	0.08	0.97	0.18
Kibuye	0.69+	0.11	0.2*	0.06
Kigali Ville (Pvk)	1.27	0.2	0.52+	0.13
Kigali Rurale	0.59*	0.09	0.25*	0.06
Ruhengeri	0.55*	0.08	0.27*	0.06

N = 6461