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Private Delivery Care in Developing Countries: Trends and Determinants

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ABSTRACT

Over the past two decades, multilateral organizations have encouraged increased engagement with private health care providers in developing countries. As these efforts progress, there are concerns that private delivery care may have adverse effects on maternal health. Currently available data do not allow for an in-depth study of the direct effect of privatization on maternal health. However, as a first step, we can use Demographic and Health Surveys (DHS) data to examine a) **trends in growth of delivery care provided by private facilities,** and b) **determinants of private sector use within the health care system**. To construct trends, this study uses DHS from 16 sub-Saharan African, Asian, and Latin American countries, selecting those countries with one DHS in phase 4 (1997–2003) and one in phase 5 (2003–present).

For a subset of eight countries, we examine determinants of a mother‟s choice to deliver in a health facility and then, among women delivering in a facility, their decision to use a private provider. Determinants of use are grouped by socioeconomic characteristics, economic and physical access and by actual/perceived need.

Results show a significant trend toward privatization of delivery care over the 13 years covered in the study but there is considerable variation in the characteristics driving this increased use across countries. In three African countries, socio-demographic characteristics are associated with use of private delivery care, while in Bolivia and four Asian countries, economic indicators are more relevant. In the former this may suggest complementarity to public facilities (e.g. private delivery services cover populations that may not be reached by public services), while in the latter it may mean competition. These results warn against making generalizations on the effects of privatization on maternal health use.

INTRODUCTION

Over the past two decades, multilateral organizations have encouraged increased engagement with private health care providers in low- and middle-income countries (Ferrinho, Bugalho, & Van Lerberghe 2001, Zwi et al. 2001). As these efforts progress, there are concerns that private delivery care may have adverse effects on maternal health.

The most vocal critics of privatization have stated that private providers do not have the same incentive to provide services with public health benefits and may be more likely to provide low- quality treatment while overprescribing diagnostics, procedures, and pharmaceuticals (Hanson et al. 2008, Marriott 2009). It is not clear, however, that the private sector functions the same way in every health system (Brugha & Pritze-Aliassime 2003, Hanson & Berman 1998, Parkhurst et al. 2005, Shaikh & Hatcher 2005). In some cases, the private sector may cater to subgroups of patients for whom the public sector underprovides, acting as a complement (Brugha & Pritze-Aliassime 2003). In other countries, public and private health facilities may act as substitutes for each other, and patients can choose between them for care based on quality and cost (Hanson & Berman, 1998). In the case where it complements public services, the private sector can contribute to greater coverage of maternal care. In the case where it substitutes, the direction of the effect on care is less clear.

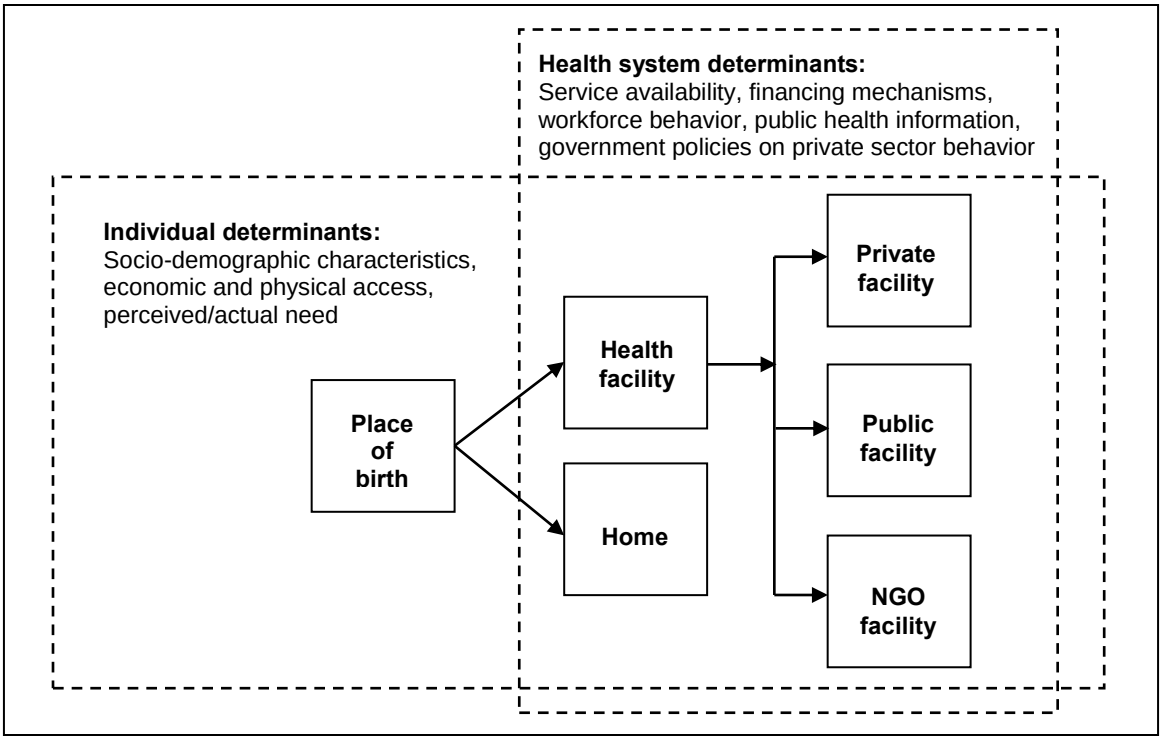
Currently available data do not allow for an in-depth study of the direct effect of privatization on maternal health across countries. As a first step, however we can use Demographic and Health Surveys (DHS) data to examine a) **trends in growth of delivery care provided by private facilities,** and b) **determinants of private sector use within the health care system**. We expect that in health systems where the public sector functions at all socio-economic levels, the private sector competes for clients based on perceived quality. In health systems where the public sector fails to provide for all subgroups of the population, the private sector may substitute for the public sector. We test this hypothesis on a subset of our 16 countries by modeling two related care-seeking decision points: a mother‟s choice to deliver in a health facility, and then among women delivering in a facility, her decision to use a private provider.

THEORETICAL FRAMEWORK AND RESEARCH QUESTIONS

As figure 1 shows, from the woman‟s perspective, two key sets of factors should influence her decision on where to give birth:

1. Her individual determinants, such as socio-demographic characteristics, economic and physical access based on household wealth and proximity to birth facilities, and actual/perceived need for health care based on risks associated with childbirth and the use of antenatal care (ANC) and other health care services
2. The structure of the health system in her country, including availability of public and private providers, financing mechanisms for the demand and supply side, the supply and location of the health workforce as well as their decisions on care provision, health information available to the public, and government policies influencing private/public sector behavior as well as patient choice

Figure 1: Factors Affecting a Woman's Choice of Birth Facility



As data on system-level determinants at the individual or even community level over time are not now available, our analysis is drawn from the Demographic and Health Surveys, which provide nationally representative individual-level survey data on the individual determinants of choice of facility for birth. With this in mind, we address the following questions:

- **Has private sector delivery care increased over the last decade?**
- **What role does the private sector play in overall growth of facility delivery care?**
- **Who is using private sector delivery care?**

LITERATURE REVIEW

Use of Facility Births

A vast body of literature has examined facility use for childbirth in low- and middle-income countries. As a follow-up to a review by Thaddeus and Maine (1994), a comprehensive literature review by Gabrysch and Campbell (2009) noted that across studies, socio-demographic factors such as higher maternal age (Bell et al. 2003, Magadi et al. 2007) and education of the mother and her husband (Thaddeus & Maine 1994, Elo 1992, Raghupathy 1996) increase use of birth facilities among women.

Perceived benefit of/need for facility delivery care, as indicated by facility use for the previous delivery and antenatal care (ANC) use for the index pregnancy, are also significantly related to delivery in a facility (Stephenson et al. 2006, Mishra & Retherford 2006). However, these indicators may be picking up unmeasured factors such as availability and ready access of services and familiarity/comfort of mother with health services (Bell et al. 2003, Stephenson et al. 2006). Facility use is also higher among first and low-order births (Bell et al. 2003, Stephenson et al. 2006). Self-reported obstetric complications are also relevant although data availability limits their inclusion (Hotchkiss et al. 2003, Anwar et al. 2008). Perceived quality of care is judged to be essential in influencing facility use in qualitative studies, but it is not easily measured in household surveys and hence lacking for most countries (Amooti-Kaguna & Nuwaha 2000, Hodnett 2000).

Economic and physical accessibility are key factors that contribute to choice of facility. Households with a greater ability to pay are more likely to access delivery services outside the home (Thaddeus & Maine 1994, Mayhew et al. 2008, Say & Raine 2007). Physical access is often difficult to determine. Where data are available, greater distance to health facilities does decrease facility use (Yanagisawa et al. 2006, Gage et al. 2006, Chowdhury et al. 2006, Rahman et al. 2007). Where data are not available, proxies such as lack of transport and/or poor roads in conjunction with distance can be used (Gage & Calixte 2006). Rural residence also captures some of aspects of physical accessibility and is often negatively related to facility use, though this measure also picks up other unobservable household characteristics (Say & Raine 2007, Bell et al. 2003, Mekonnen & Mekonnen 2003).

Privatization of Birth Facilities

Mothers who go to a facility for delivery care make a choice on the type of facility to attend. In many countries, public facilities are the most common option, but for various reasons a woman may choose to seek a private facility. Literature on facility choice has found a wide range of determinants, and across countries the same determinants have been found to have opposing affects, hindering consensus on what influences mothers to seek private care.

For the purposes of this study we assume that facility type does not play a significant role in the mother‟s initial decision to go to a facility or stay home for delivery. We also assume that she chooses the type of facility after making the decision to go to any facility. Socio-demographic factors are a key determinant of the choice of a private birth facility. Higher education is often significant in facility choice, though whether it predicts public or private facility use varies by setting (Osubor et al. 2005, Thind et al. 2008, Berman & Rose 1996 –- positive effect; Do et al. 2009 – negative effect). Other relevant factors are ethnicity and caste/tribe status, both of which are negatively associated with use of private facilities in India and Nairobi (Bazant et al. 2009; Thind et al. 2008).

A woman‟s real or perceived need for care is also influential. Women who attend more ANC visits are more likely to use a private facility for delivery (Thind et al. 2008). More than half (54.3 percent) of those who went to a private hospital had received five or more ANC visits compared with 28.8 percent in a public hospital in Jordan (Obermeyer & Potter 1991). An ANC visit at a public rather than a private facility is also associated with public facility delivery (Bazant et al. 2009). Perceived obstetric complications can act as a catalyst for private facility use due to the general perception that they provide better quality of care (Amooti-Kaguna & Nuwaha 2000, World Bank 2005, Ferrinho, Bugalho, & Van Lerberghe 2001, Hodnett 2000). However, research on this issue is contradictory. For instance, having perceived suffering with an obstetric complication actually encourages use of public facilities instead of private facilities in Nairobi (Bazant et al. 2009).

Regarding economic and physical accessibility indicators, a higher standard of living is associated with use of private facilities, as is urban residence (Thind, et al. 2008, Obermeyer & Potter 1991, Berman & Rose 1996).

DATA AND METHODS

Sixteen countries with multiple rounds of data were examined for trends in delivery care over time as well as trends in privatization of delivery care. Data from two time points were used, with four to seven years separating the two rounds of data. The year for the first time point was chosen from the fourth round of DHS survey collection (1997–2003) while the second time point was chosen from the fifth phase (2003–present). The details of the surveys chosen are listed in table 1.

Table 1: Details of Demographic and Health Surveys

Country	Year	N (Women)	N (Children)
Africa			
Ethiopia	2000	15,367	10,873
Ethiopia	2005	14,070	9,861
Kenya	2003	8,195	5,949
Kenya	2008	8,444	6,079
Malawi	2000	13,220	11,926
Malawi	2004	11,698	10,914
Mali	2001	12,849	13,097
Mali	2006	14,583	14,238
Rwanda	2000	10,421	7,922
Rwanda	2005	11,321	8,649
Tanzania	1999	4,029	3,215
Tanzania	2004	10,329	8,564
Uganda	2000	7,246	7,113
Uganda	2006	8,531	8,369
Zambia	2001	7,658	6,877
Zambia	2007	7,146	6,401
Asia			
Bangladesh	1999	10,544	6,832
Bangladesh	2007	10,996	6,150
Cambodia	2000	15,351	8,834
Cambodia	2005	16,823	8,290
India	1998	89,199	33,026
India	2005	124,385	51,555
Indonesia	2002	29,483	16,206
Indonesia	2007	32,895	18,645
Nepal	2001	8,726	6,931
Nepal	2006	10,793	5,783
Philippines	2003	13,633	7,145
Philippines	2008	13,594	6,572
Latin America			
Bolivia	2003	17,654	10,448
Bolivia	2008	16,939	8,605
Haiti	2000	10,159	6,685
Haiti	2006	10,757	6,015

A subset of eight countries (Mali, Zambia, Rwanda, Bangladesh, the Philippines, Indonesia, Nepal, and Bolivia) were analyzed in depth on the drivers of facility usage, in particular private facility usage. They were chosen to represent the three regions listed above, and the upper and lower ends of the privatization trend as described later in this paper (see figure 2). For each country, both years of data were pooled to increase statistical power and to allow for a limited examination of trend over time.

In the pooled analysis, we estimate two related probit equations with a Heckman selection model (Heckman 1979, Dubin & Rivers 1989) to determine a) who is more likely to deliver in a facility than at home, and b) conditional on choosing a facility, who is more likely to use a private facility than a public facility. This model is meant to correct for the fact that we can only observe a woman‟s choice of a public or private facility if she chooses to go to a facility for birth. This self-selection means that if the equations are estimated separately, the results for drivers of choice between public and private facilities may be biased (for a more in-depth discussion of the Heckman selection model, see Heckman 1979, Dubin & Rivers 1989). All regressions included the built-in survey data corrections available in Stata 10 (Stata Corp., College Station TX 2009).

Our outcome variables are constructed from the DHS question "Where did you give birth to (child)?" Respondents‟ answers are broken down by various facility and home options, which are then grouped by DHS. These data are collected for births in the last five years, with the exception of India, where they are for the last three years. This process produces two outcome variables, one that identifies home births versus facility births and another that identifies public or private facility births among those who go to a facility.

Facilities of nongovernmental organizations (NGOs) are excluded in this analysis. In most of our countries, few if any births occurred in the NGO sector. In the remaining countries where NGO births were non-negligible, there were difficulties defining precisely what facilities were a part of the NGO sector.

Our key variables of interest were chosen from the categories of socio-demographics (mother‟s age, education of mother and father, household size[1]), perceived/actual need (birth order, previous child death, mean ANC visits for mother, delivery complications), and economic and physical access (perceived distance to health facility, residence, wealth index, unmet need for family planning as a proxy for access to care) as those that had the strongest theoretical relationships with choice of facility.

Because data were pooled over two separate years, we include a dummy indicating whether the observation was recorded in the first or second year of data. With this we can observe if a woman is more likely to deliver in a private facility in the second year versus the first year, controlling for other factors.

[1] Ethnicity and religion may also be significant, but are not included because they were not measured consistently across our sample of countries and years.

RESULTS

Table 2 shows simple weighted tabulations for all 16 countries and all years to describe the share of births that took place in a facility and the share of births delivered in each type of facility.

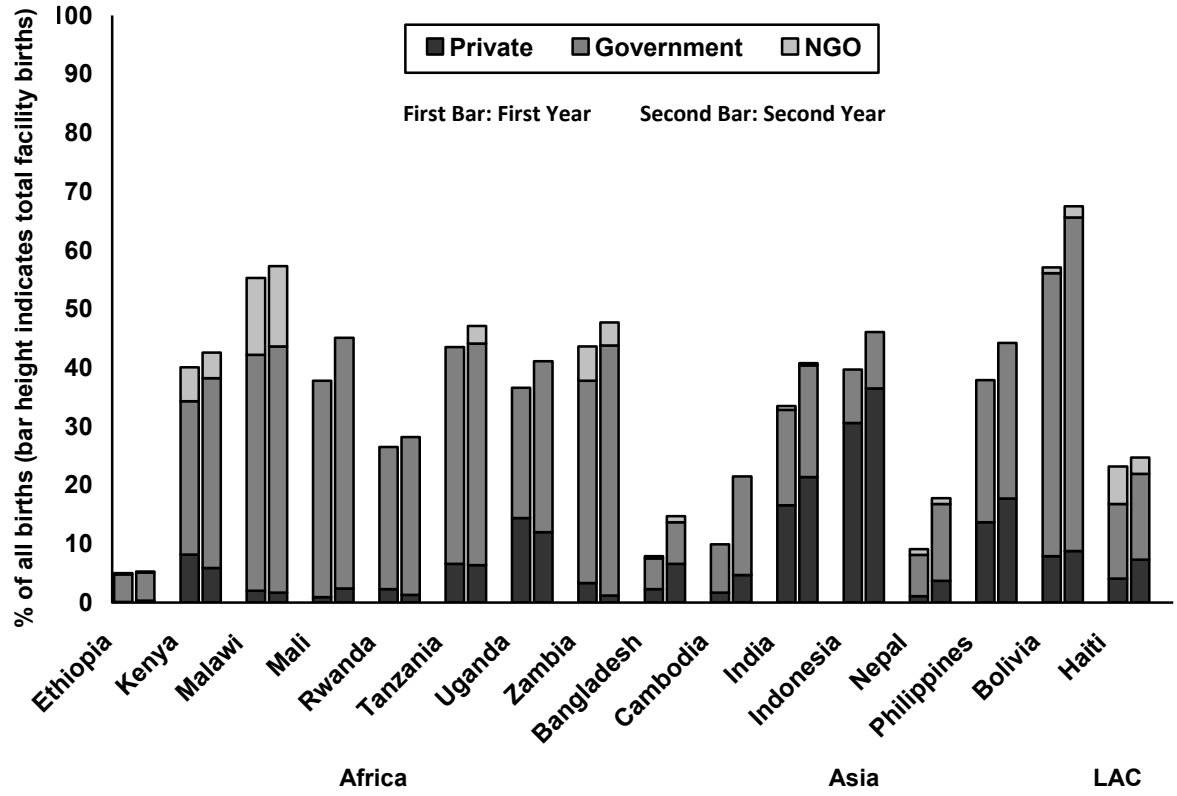
Table 2: Facility Births by Facility Type

Country	% of all births in the last 5 years in a facility	Type of Facility (%)*		
		Government	Private	NGO
Africa				
Ethiopia (2000)	5.0	4.7	0.1	0.2
Ethiopia (2005)	5.3	4.8	0.3	0.2
Kenya (2003)	40.1	26.1	8.2	5.8
Kenya (2008)	42.6	32.3	5.9	4.4
Malawi (2000)	55.4	40.2	2.0	13.1
Malawi (2004)	57.2	41.9	1.7	13.7
Mali (2001)	37.8	36.9	0.9	0.0
Mali (2006)	45.1	42.7	2.4	0.0
Rwanda (2000)	26.5	24.2	2.3	0.0
Rwanda (2005)	28.2	26.9	1.3	0.0
Tanzania (1999)	43.5	36.9	6.6	0.0
Tanzania (2004)	47.1	37.7	6.4	3.0
Uganda (2000)	36.6	22.2	14.4	0.0
Uganda (2006)	41.1	29.1	12.0	0.0
Zambia (2001)	43.6	34.5	3.3	5.8
Zambia (2007)	47.7	42.6	1.2	3.9
Asia				
Bangladesh (1999)	7.9	5.2	2.3	0.4
Bangladesh (2007)	14.6	7.1	6.6	1.0
Cambodia (2000)	9.9	8.2	1.7	0.0
Cambodia (2005)	21.5	16.8	4.7	0.0
India (1998)	33.6	16.2	16.6	0.7
India (2005)	40.8	19.0	21.4	0.4
Indonesia (2002)	39.7	9.1	30.6	0.0
Indonesia (2007)	46.1	9.6	36.5	0.0
Nepal (2001)	9.1	7.0	1.1	1.0
Nepal (2006)	17.7	13.1	3.7	1.0
Philippines (2003)	37.9	24.2	13.7	0.0
Philippines (2008)	44.2	26.5	17.7	0.0
Latin America				
Bolivia (2003)	57.1	48.2	7.9	1.0
Bolivia (2008)	67.5	56.8	8.8	1.9
Haiti (2000)	23.2	12.7	4.1	6.4
Haiti (2006)	24.7	14.6	7.3	2.8

*Type of facility (%) may not add up exactly to the % of all births that take place in a facility due to rounding.

The share of facility births handled by private facilities increased in 10 of the 16 countries over the two time points. Figure 2 shows trends over time for each country, with each facility type displayed as a percent of all births in the country.

Figure 2: Place of Birth



In every country, use of any facility for birth increased between the first and last time points. In Asian countries such as Bangladesh, Indonesia, India, and the Philippines, that increase seems to come almost entirely from a growth in private sector care, a positive contribution to increasing maternal care. As seen in figure 2, the private sector delivers more than 10 percent of all births in Uganda, the Philippines, India, and Indonesia, while in Bolivia, Tanzania, Haiti, Bangladesh and Kenya it delivers between 5 and 10 percent of all births. In six of the eight African countries however, use of private facilities decreases between the two time points. Zambia has seen the biggest percentage drop in private facility births, but from a very low starting point of 3.3 percent of all births in 2001.

The following tables contain the results of the in-depth analysis in eight countries. Table 3 shows the results of the selection model, modeling a woman‟s choice of birth in a facility rather than at home. Table 4 displays the results for the outcome model of a woman‟s choice to go to a private facility over a public facility, which was jointly estimated with the selection model.

Table 3: Selection Model – Probit Results of the Choice to Go to a Delivery Facility vs. Home Delivery, Births in the Last 5 Years

		Africa			Asia				LAC
Characteristic	**Categories**	**Mali**	**Rwanda**	**Zambia**	**Bangladesh**	**Indonesia**	**Nepal**	**Philippines**	**Bolivia**
N		**24,840**	**15,288**	**11,082**	**12,107**	**24,709**	**12,107**	**9,287**	**16,990**
Time effect (year)	year 1=0 year 2=1	0.08	0.08*	0.26**	0.41**	0.06	0.21**	0.18**	0.13**
Perceived/Actual Need									
Multiparity	1st child=0 2 or higher=1	-0.19**	-0.75**	-0.24**	-0.42**	-0.27**	-0.60**	-0.35**	-0.25**
Previous child to mother died	no=0 yes=1	0.07	-0.01	0.13	0.35**	0.20	0.15	0.14	-0.19*
Mother mean ANC visits: 1-3 visits	no visits=0	1.02**	0.67**	0.94**	0.58**	0.10	0.43**	0.10	0.79**
Mother mean ANC visits: 4 or more visits		1.42**	1.11**	1.20**	1.22**	0.59**	0.94**	0.50**	1.32**
Complication: Prolonged labor	no=0 >12 hr labor=1				0.52**	0.02		0.26**	
Complication: Convulsions	no=0 convulsions=1				0.53**	-0.05		0.31	
Economic and Physical Access									
Unmet need for family planning	no unmet need=0	0.11**	-0.03	-0.06	-0.17**	-0.12*	0.03	-0.12**	-0.19**
Distance to health facility a barrier to seeking care	not a barrier to care=0	-0.34**	-0.14**	-0.32**	0.10	-0.21**	-0.15*	-0.21**	-0.12**
Wealth status: Middle 3 wealth quintiles	bottom wealth quintile=0	0.06	0.07	0.10*	0.08	0.50**	0.31**	0.51**	0.54**
Wealth status: Top wealth quintile		0.34**	0.59**	0.86**	0.58**	1.10**	0.84**	1.08**	1.61**

Cont'd..

Table 3: Cont'd

		Africa			Asia				LAC
Characteristic	**Categories**	**Mali**	**Rwanda**	**Zambia**	**Bangladesh**	**Indonesia**	**Nepal**	**Philippines**	**Bolivia**
Socio-Demographic Characteristics									
Region of residence	rural=0 urban=1	0.76**	0.48**	0.95**	0.32**	0.62**	0.50**	0.36**	0.55**
Aged 20-34 years	<20 years=0	-0.05	0.15*	-0.01	0.28**	0.20**	0.21**	0.24**	-0.10
Aged 35 and over		0.04	0.14*	-0.13	0.34**	0.37**	0.46**	0.45**	-0.03
5 to 8 household members	less than 5 members=0	0.02	-0.02	-0.03	-0.09	0.00	-0.14**	-0.09*	-0.08*
More than 8 members		0.04	0.07	0.06	-0.06	0.02	-0.11	-0.15**	0.07
Primary education: Mother	less than primary=0	0.23**	0.18**	0.29**	0.04	0.04	0.16*	0.06	0.11
Secondary education: Mother		0.37**	0.76**	0.68**	0.31**	0.36*	0.39**	0.31	0.52**
Tertiary education: Mother		-0.05	1.26**	1.24**	0.68**	0.66**	0.71**	0.72**	1.14**
Primary education: Husband	less than primary=0	0.26**	0.18**	0.00	-0.01	-0.03	0.05	0.42*	-0.04
Secondary education: Husband		0.30**	0.42**	0.25**	0.15*	0.13	0.01	0.63**	0.03
Tertiary education: Husband		0.57**	0.58**	0.55**	0.32**	0.29*	0.30**	0.88**	0.20
Constant		-1.23**	-1.43**	-1.95**	-2.60**	-1.71**	-2.05**	-2.26**	-1.25**
F Statistic		6.45	11.59	7.24	27.30	4.70	1.92	4.97	25.28

Significance denoted by stars: ** at 99%, * at 95% confidence level.

Table 4: Outcome model – Probit Results of the Choice to Go to a Private vs. Public Delivery Facility, Births in the Last 5 Years

		Africa			Asia				LAC
Characteristic	**Categories**	**Mali**	**Rwanda**	**Zambia**	**Bangladesh**	**Indonesia**	**Nepal**	**Philippines**	**Bolivia**
N		**9,637**	**4,516**	**4,428**	**1,482**	**10,528**	**1,482**	**3,729**	**10,931**
Time effect (year)	year 1=0 year 2=1	0.46**	-0.22**	-0.56**	0.56**	0.09	0.35**	0.13**	-0.03
Perceived/Actual Need									
Multiparity	1st child=0 2 or higher=1	-0.02	-0.25	0.26*	-0.32**	0.03	-0.02	-0.05	-0.11*
Previous child to mother died	no=0 yes=1	-0.03	-0.28	-0.75*	0.02	-0.11	-0.15	-0.33	-0.41*
Mother mean ANC visits: 1-3 visits	no visits=0	0.09	-0.16	-1.07	0.75**	-0.28	0.25	0.01	-0.09
Mother mean ANC visits: 4 or more visits		0.34	-0.09	-0.48	1.30**	0.01	0.29	0.05	0.06
Delivery complication: Prolonged labor	no=0 >12 hr labor=1				0.19	-0.17**		-0.07	
Delivery complication: Convulsions	no=0 convulsions=1				0.28	-0.14		0.32	
Economic and Physical Access									
Unmet need for family planning	no unmet need=0	-0.08	-0.02	-0.14	0.00	-0.09	-0.04	0.08	0.00
Wealth Status: Middle 3 wealth quintiles	bottom wealth quintile=0	-0.34**	-0.12	0.47	0.02	0.37*	0.03	0.35*	0.53**
Wealth Status: Top wealth quintile		-0.05	0.11	1.85**	0.59**	0.76**	0.03	0.87**	1.31**

Cont'd..

Table 4: Cont'd

		Africa			Asia				LAC
Characteristic	**Categories**	**Mali**	**Rwanda**	**Zambia**	**Bangladesh**	**Indonesia**	**Nepal**	**Philippines**	**Bolivia**
Socio-Demographic Characteristics									
Region of residence	rural=0 urban=1	-0.30	0.33**	0.37	0.10	0.21	-0.21	0.23**	0.18*
Aged 20-34 years	<20 years=0	0.27*	0.04	0.27	0.24*	0.04	0.09	0.10	0.16*
Aged 35 and over		0.27*	-0.07	0.61**	0.43*	-0.07	-0.22	0.13	0.13
Primary education: Mother	less than primary=0	-0.01	0.02	0.94**	0.11	0.24	0.16	-0.24	0.18
Secondary education: Mother		0.24*	0.42**	1.07*	0.37*	0.38	0.45**	-0.20	0.41*
Tertiary education: Mother		0.96**	0.80**	1.43**	0.62**	0.39	0.44	0.01	0.51**
Primary education: Husband	less than primary=0	-0.05	0.10	-0.37	-0.06	0.10	-0.01	0.15	0.55
Secondary education: Husband		-0.02	0.11	-0.64	0.01	0.02	-0.09	0.16	0.59
Tertiary education: Husband		0.51**	0.67**	-0.72	0.16	-0.13	0.12	0.37	0.69
Constant		-2.28**	-1.89**	-3.21**	-3.25**	-0.41	-2.02*	-1.21	-3.02**
F Statistic		6.45	11.59	7.24	27.30	4.70	4.97	1.92	25.28

Significance denoted by stars: ** at 99%, * at 95% confidence level.

Note: Ns derived from post-estimation commands.

In table 3, we find generally homogenous determinants of facility usage across countries. Use trends upward over time even after inclusion of controls. Across nearly every country, women are more likely to choose to deliver at a facility instead of home if they are having a first birth; have had more ANC visits; live in urban areas, have greater wealth, and higher education; and do not report distance to a health facility as a barrier to health care**.** Husband‟s education is also positively related to facility use in some countries, as is maternal age and previous death of a child, though in fewer countries, and largely in Asia. In about half of our countries, if the woman reported an unmet need for family planning, she is less likely to go to a facility for birth. We include this measure because we believe it is an indirect measure of lack of access to health services, not because of any theoretical link between perceived need for family planning and delivery care. In two of the three countries with data on delivery complications, prolonged labor are both positively related to facility use. In Bangladesh, convulsions (a sign of eclampsia) were also positively associated with use.

In the outcome model determining private facility use (table 4), private sector use significantly changes over time, though use both increases and decreases depending on the country. We find no other universal determinants of private delivery care across all eight countries.

Within regions, however, some trends appear. In Africa, private sector use was related less to perceived/actual need or economic indicators and more to socio-demographic characteristics. Only in Zambia was perceived/actual need significant, namely multiparity (more likely) and previous death of a child (less likely). Zambia was also the only African country to see a greater likelihood of private facility use if the mother was from the top wealth quintile. Surprisingly, middle wealth status actually decreased use in Mali, while top wealth status had no effect. In all three countries, mother‟s education was associated with increased use of private facilities. In Mali and Rwanda, the role of husband‟s tertiary education was also relevant. Increased maternal age was also associated with greater use of private facilities in two of the three African countries (Mali, Zambia), as was urban residence (Rwanda, Zambia).

In Asia and Bolivia, the only qualifying LAC country, perceived/actual need variables were more statistically significant for use of a private facility for birth as compared to countries in Africa, but among these variables no distinct patterns emerged. Primiparity increases the

likelihood of using a private facility in Bangladesh and Bolivia. We would expect that mothers with a previous child death would want to go to a private facility due to perceived risk. This was not the case however. In Bolivia, a previous child death decreased the likelihood of private facility use, and was not found to be significant in any of the Asian countries.

The only labor complication that had an effect was prolonged labor in Indonesia, which was associated with a lower likelihood of private sector use. Greater mean ANC visits was positive in Bangladesh but did not seem to have an effect in any other country. Unmet need did not have a significant effect on the choice of facility in any country.

Wealth status appears to influence private facility use more in Asia and Bolivia than in Africa. Household wealth had a positive effect on private delivery care in all five countries except Nepal. Socio-demographics however played a relatively smaller role as compared to Africa. Maternal education positively influenced use of private facilities in three of the five Asian /LAC countries, while in two of the countries maternal age (Bangladesh & Bolivia) and urban residence (Philippines & Bolivia) were associated with greater use. Husband‟s education was not a factor.

DISCUSSION

This analysis provides further evidence of a trend of privatization in delivery care. It also sheds some light on what type of women choose private facilities over public facilities for birth, although no consistent results were found across the three regions. While we cannot clearly explain from our data how the public-private relationship differs by region or by country, it does beg for further analysis to better understand why it appears that in Africa, socio-demographic factors drive the decision to go to a private facility, while in Asia and possibly LAC, economic status matters more.

One source of variation may come from the wide array of facilities that are categorized as belonging to the private sector. These facilities range from large modern hospitals to simple one-bed facilities. Because the private sector often does not face the same regulations as the public sector, private providers are also of widely varying quality. (See Das and Hammer 2005 for an example of such variations among public and private providers in India).

Some staff employed by the public sector also work in the private sector, increasing the ambiguity of who exactly is providing delivery care (Ferrinho, Bugalho, & Van Lerberghe 2001). Governance of this is lacking, with some countries (many in Africa) having no specific regulations regarding the practice of working across sectors, while others (including our Asian countries) such practice is formally or informally recognized, as long as it occurs outside the main employment in the public sector (Prata et al. 2005).

Given that these market distortions occur in all the countries examined here, they would not fully explain why mothers seem to choose private delivery care for different reasons across regions. Results from Africa loosely suggest that the private sector may act as a complement to the public sector, appealing to certain socio-demographic populations that may not be able to access the public system. Anecdotally, Prata et al. (2005) notes that government spending for curative health care may target the wealthy and urban residents in many sub-Saharan African countries. Therefore the rural poor may have to choose between locally available private health care providers or no care at all.

On the other hand, our findings in Asia and Bolivia seem to suggest a more competitive relationship between the public and private sectors, given that wealth was one of the most

significant predictors. There is some evidence that private providers are competing with the public sector based on perceived quality of care and by targeting wealthier patients in developing countries, particularly as GDP per capita rises (Brugha & Pritze-Aliassime 2003, Das & Hammer 2004). Indeed, the average GDP per capita (US$) for the four Asian countries and Bolivia in 2007 was $ 1145, as compared to $613 for the three African countries (Zambia, the richest of the African countries, was the only one of that group where the positive role of household wealth was statistically significant).

The differences in how the private sector operates have a direct impact on how to interpret the impact of privatization on maternal delivery care. In theory, a more competitive market can benefit women by keeping overall prices down, and by pushing providers to see more patients. However, as has been noted widely in the literature, the market for medical care is imperfect and nontransparent, and as such the effect of this model of care on maternal health is ambiguous. In some situations, overprovision of care and overcharging may increase in the private sector in order for them to maximize their income (Brugha & Pritze-Aliassime 2003, Ferrinho, Bugalho, & Van Lerberghe 2001). There has been a significant body of work on overprovision of cesarean section in the developing world and its link to privatization of delivery care (e.g. Potter et al. 2001, Roberts et al. 2000). Few studies used randomized controlled trials, however, and as such important outside influences such as payment systems and case mix may not have been properly accounted for in the results.

Across all countries examined in this paper, there is an increase in use of facilities for birth, and in several countries a key factor driving this increase is use of private facilities. Definitions of private facilities and the drivers in their use vary by region and perhaps even within countries. In some cases, private delivery services play an important role in covering populations not covered by the public sector. In others, privatization may increase the gap in delivery care provided to the rich and poor. While more in-depth work is needed to truly understand the behavior of the private sector in these countries, these results warn against making generalizations on the effects of privatization on maternal health use.

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