Understanding the Association between Wealth, Long-Acting Contraception, and the For-Profit Sector

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Abstract

Use of long-acting and permanent methods of contraception (LAPMs) is critical to obtaining sustained reductions in fertility and ensuring that women achieve their ideal family size, yet anecdotal evidence suggests that cost may be a barrier to using these methods, especially from the for-profit sector. Thus, we systematically explored the relationship between household wealth, use of LAPMs, and the source where women obtain these methods. We conducted multivariate analyses using Demographic Health Survey data from 14 countries. Findings include: Wealthier women are more likely than poorer women to use LAPMs, except for South Asian countries; wealthier women are more likely than poorer women to get their LAPMs from the for-profit sector; and the extent to which the poorest women use the for-profit sector for LAPMs varies widely across countries. These findings can help improve programs so they respond better to women's needs for family planning, especially lower- and middle-income women.

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1. INTRODUCTION

Greater access to and usage of long-acting and permanent methods (LAPMs, which typically include implants, IUDs, and male and female sterilization[2]) of family planning has the potential to help women and couples achieve their reproductive goals, while also helping countries achieve development objectives by reducing fertility rates and unmet need for family planning. Compared to modern short-acting methods of contraception (SAMs, which typically include pills, injectables, and condoms), LAPMs have higher continuation rates and are generally more effective at preventing unintended pregnancies. In addition, research shows that the cost per couple-year of protection (CYP)[3] is generally much lower for LAPMs than for most SAMs (Wickstrom and Jacobstein 2011).

Despite the efforts of governments, donors, and family planning organizations, the uptake of LAPMs is still relatively low in many developing countries compared to the uptake of SAM but also relative to the uptake of LAPMs in developed countries. Research indicates that several reasons might explain this situation, including provider and consumer biases, limited access to clinical providers who offer these methods, lack of financing mechanisms to support the expansion of LAPM services, and persistent negative myths about the side effects of these methods (Wickstrom and Jacobstein, 2011; Babalola and John, 2012). Anecdotal evidence also suggests that price is a major barrier that limits use of LAPMs by poor women. If that is the case, then we would expect to see very little use of these methods among poorer women, and an increase in their odds of use as household wealth increases. Furthermore, we expect that use of the private for-profit sector as the source for LAPMs to increase as household wealth increases.

[2] LAPMs can be divided into two groups: long-acting reversible methods or LARC (IUDs and implants), and permanent methods (male and female sterilization).

[3] CYP refers to the estimated protection provided by contraceptive methods during a one-year period. This estimate is based on the volume of all contraceptives sold or distributed for free to clients during that period. CYP basically indicates the amount of time a couple will be protected against unwanted pregnancies depending on the contraceptive method used.

Since the inception of family planning programs, the private sector—both the for-profit and NGO sectors—has played an important role in making contraception accessible to women and couples. While the role of the private for-profit sector[4] has increased in most developing countries over time, with pharmacies and other private for-profit actors playing a key role in providing SAMs to all women, its role in providing LAPMs has been less clear (Janowitz, 2006).

Understanding the relationship between household wealth, type of family planning method used, and source can play an important role in redesigning programs to better align the market for family planning services and commodities, especially regarding the use of LAPMs among lower and middle income women in developing countries. Previous studies have examined factors that are associated with the uptake of LAPMs in a specific country (e.g., Alemayehu et al. 2012, Crede et al., 2012, Takele et al, 2012), but we found no studies that systematically explored the role of wealth or women's ability to pay[5] on the use of LAPMs in developing countries. Similarly, we found no studies that examine the effect of household wealth or ability to pay on women's use of the private sector to obtain the family planning method they choose.

Our research explores this evidence gap and provides a better understanding of the relationship between wealth, use of modern family planning, and reliance on the private for-profit sector as the source of modern methods. Specifically, it addresses three main research questions:

Question 1. What is the relationship between household wealth and a woman's decision to use a modern family planning method?

[4] The private for-profit sector is defined in this study as the commercial private sector and includes private physicians and clinics, pharmacies, or other private outlets. It does not include not-for profit or NGOs

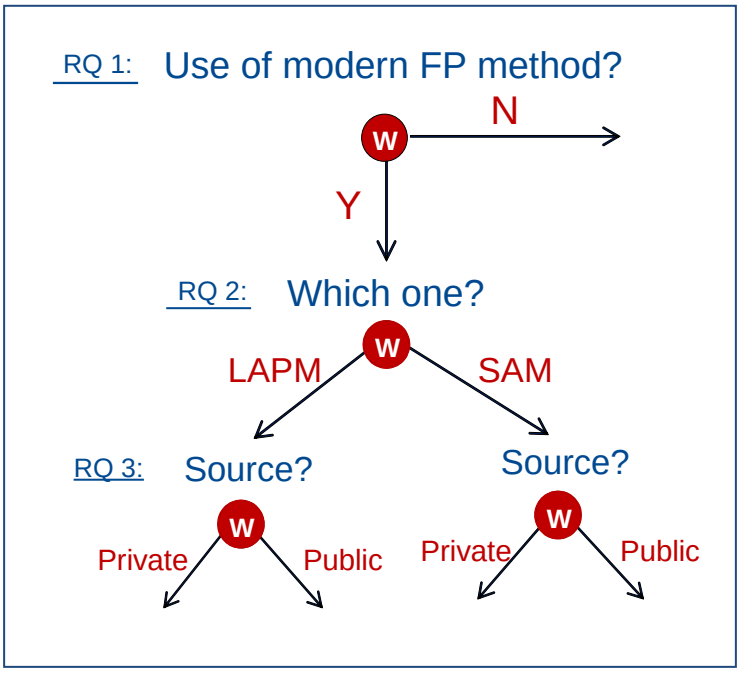
[5] Ideally, to assess the extent to which price is a barrier for use of FP methods and their source, one would have to rely on the overall structure of prices paid for FP services and commodities in several countries, which can severely restrict the scope of quantitative analysis. At the same time, measures of ability to pay are harder to define in a consistent manner, especially across countries and regions. Thus, in this study we will use a wealth variable as a proxy for ability to pay. As will be explained in the Data section, that wealth variable is measured in the same manner across all countries in our sample and comprises information mainly on household assets.

Question 2. In particular, what is the relationship between household wealth and a woman's decision to use LAPM instead of SAM?

Question 3. Among LAPM users, is there an association between household wealth and a woman's decision to obtain her LAPM from the private for-profit or the public sector? What can we say about that association among SAM users?

Diagram 1 presents a decision framework for using a modern method of family planning. The first decision (and research question 1) considers the factors—especially household wealth—that determine whether a woman decides to space or limit future pregnancies through use of a modern family planning method (instead of a traditional method or no method at all). The second decision is which modern method to use—either a SAM or an LAPM. The third question is where to obtain that particular method. Our study explores the extent to which wealth (symbolized as the little red circles with a W inside) plays a role in determining those decision nodes.

Diagram 1: Multiple decision framework for family planning



We expect wealth to be a significant part of the response for these research questions. In general, wealthier women are more likely to use modern family planning methods (Schultz, 1997; Becker, 1991). At the same time, we expect wealthier women to be more likely to use LAPMs than poorer women because wealthier women tend to have greater familiarity with clinical providers who offer LAPMs. They may also be more certain about wanting to space or limit future pregnancies. Financial barriers may also affect the decision because wealthier women may be better able to cover the out-of-pocket expenses and opportunity costs associated with LAPMs.

Finally, we expect wealthier women to rely more on the private sector for all family planning methods. On one hand, the majority of family planning methods provided through the public sector are heavily subsidized, which makes them more accessible to women regardless of their income or ability to pay. However, greater access and demand through the private sector may contribute to greater inconvenience, more frequent stock-outs, and longer waiting times—all of which wealthier women may be able to avoid by using the private sector. In addition, the private sector tends to concentrate in urban and more densely populated areas, where revenues and profits may be greater.

This paper includes the following sections: Section 2 presents the data from 14 countries used in the analysis, including an overview of the family planning method mix (i.e., SAMs and LAPMs) and the private for-profit sector's role in their provision. Section 3 presents the methodology and empirical strategy used to answer the three research questions. Section 4 presents the findings. Section 5 discusses the meaning of the findings, especially in light of country-specific programs that may drive family planning decision-making at the individual level.

2. DATA

This study uses nationally representative and comparable data from 14 developing countries: Egypt, Kenya, and Malawi in Africa; Bangladesh, India, Indonesia, Jordan, Nepal, Pakistan and Philippines

in Asia; and Bolivia, Colombia, Honduras and Peru in Latin America. The data come from the most recent Demographic and Health Surveys (DHS) for these countries, all of which were fielded between 2006 and 2012. DHS are household surveys that focus largely on reproductive health, fertility, and maternal and child health, and their main unit of observation is women of reproductive age, i.e., between 15 and 49 years of age.

While DHS surveys have collected data in more than 80 countries worldwide, this report considers only 14 of them. In order to be included in the study, at least 5 percent of women in the survey must have reported using a LAPM, and we required that there be at least 150 women responding to the relevant questions about modern method use and source so that estimates from models were stable.[6] Box 1 presents the countries included in the analysis and the years in which the surveys were conducted.

Box 1. List of Countries

Country	Year
Bangladesh (BGD)	2011
Bolivia (BOL)	2008
Colombia (COL)	2010
Egypt (EGY)	2008
Honduras (HND)	2012
India (IND)	2006
Indonesia (IDN)	2007
Jordan (JOR)	2009
Kenya (KEN)	2009
Malawi (MWI)	2010
Nepal (NPL)	2011
Pakistan (PAK)	2007
Peru (PER)	2008
Philippines (PHL)	2008

Source: MEASURE DHS

3. METHODOLOGY

The analysis examines the country-specific relationships between (1) wealth and use of a modern family planning method; (2) wealth and method of choice (LAPMs or SAMs); and (3) wealth and source of the method used (private for-profit sector and public sector).

In DHS datasets, information on asset ownership and quality of housing is used to create a proxy for wealth, and then households are ranked and assigned a wealth quintile. Categorizing households based on wealth quintiles has been shown to be consistent with wealth rankings based on consumption

[6] As a result large countries, like Nigeria and Senegal for example, which have low LAPM prevalence rates (1.1 percent and 1.5 percent respectively), are not included in the analysis.

expenditure aggregates, especially when other socioeconomic characteristics are taken into account (see Howe, et al., 2009; Montgomery et al., 2000).[7]

In the analysis, we first use descriptive statistics to examine the unadjusted relationships between the variables of interest—wealth quintile, use of modern family planning, use of LAPM instead of SAM, and source used for modern methods for each of the 14 countries. Then we estimate multivariate regression models for each country, controlling for age, parity, education, marital status, employment or occupation, and residence--factors that can confound the relationships of interest.[8] In the multivariate analyses, wealth is represented by a vector of five dummy variables, with the poorest quintile (quintile 1) serving as the reference group.[9,10]

The research question drives the subsample used in each analysis. For the first question – the relationship between wealth and use of modern family planning – the samples include all ever-sexually active women between ages 15 and 49.[11] The outcome variable is dichotomous: 1 if the woman is using a modern method and 0 if she is not (which includes women using traditional methods or no method at all). For the second research question – considering whether wealth affects the decision of choosing LAPMs instead of SAMs -- the samples for each country include only women who reported using a modern method at the time of the interview. In this analysis, the outcome variable is also dichotomous: 1 if using a LAPM and 0 if using a SAM. For the third research question – the relationship between

[7] Although wealth quintile may not be a perfect proxy for ability to pay, the DHS surveys collect limited expenditure data, so wealth quintile is the best available option.

[8] Age is included as a vector of dummies for age groups. Number of children already born is included in linear and quadratic forms. Education is included as a vector of dummies for levels completed. Marital status is a dummy equal to one if "married and/or living together" and zero otherwise. Employment and type of occupation is measured at the household level. Residence is the usual urban/rural variable.

[9] For a comprehensive explanation and discussion of the DHS wealth index, please see Rutstein and Johnson (2004).

[10] Alternatively, we also ran the same set of regressions using a quintile variable with values from 1 to 5, along with its quadratic, in order to capture non-linear relationships. The results were quite similar and are available upon request.

[11] Questions about sexual activity before marriage are not included in the DHS in Bangladesh, Egypt, Indonesia, Jordan, and Pakistan. Therefore, only married women from these countries are included in the analysis for this question. For other countries, we include all women who reported ever having been sexually active, regardless of their marital status.

wealth and source of the method chosen – we conduct separate analyses for users of LAPMs and SAM in each country because we expect household wealth to be associated in different ways with where women go to get these methods. With respect to the third question on source of the method, our interest is on how wealth influences use of the private for-profit sector compared to the public sector only. As a result, we have excluded women who used NGOs from the analysis because these organizations follow a variety of service delivery models—from free to full-cost services that subsidize the cost of other services--and the DHS does not provide enough information on whether those services were priced similar to the ones offered by the public sector or by the private for-profit sector.[12] Similarly, we exclude women who use "other sources"—typically churches, friends or family, and shops--from the analysis because of the lack of specificity of where the commodities were obtained in the first place.[13] In the analyses related to source, the outcome variable is also dichotomous: 1 if the woman reports a private for-profit source and 0 for a public-sector source.

All the outcomes of interest in our study are dichotomous. We use multivariate logistic regression models and present results as odds ratios. Data are weighted using the weights provided by DHS; standard errors are adjusted accordingly.

4. RESULTS

Summary descriptive results

Table 1 (displayed on page 26) presents country-specific summary information on the subsamples of women included in the analysis of family planning use. The middle of the table displays family planning use and method mix, breaking LAPM methods in two groups: Long-acting reversible methods (also known as LARC), and permanent methods (or PM methods). SAMs dominate the method

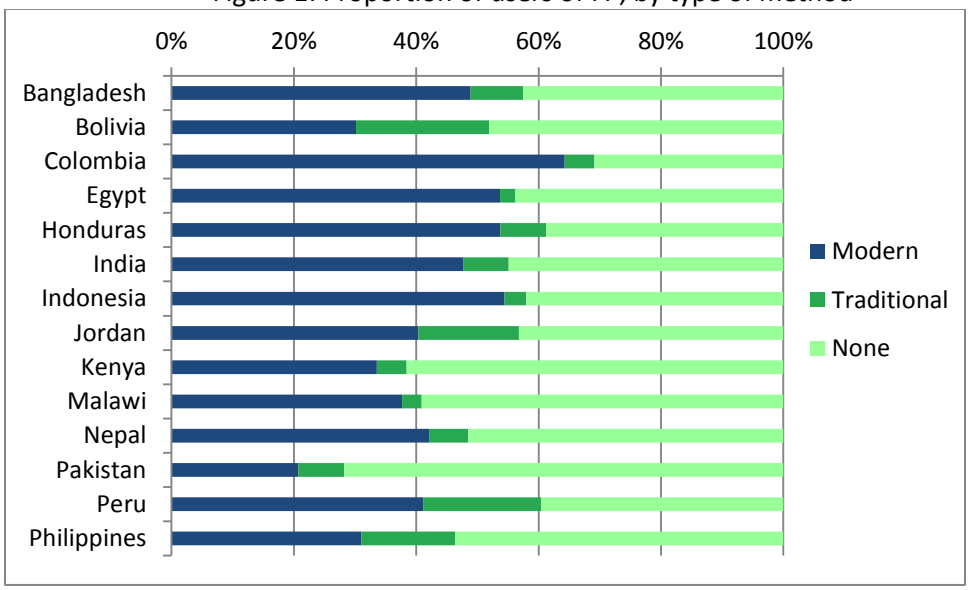
[12] The use of NGOs for modern family planning methods range between 0 percent (Colombia) to 18 percent (Malawi).
[13] "Other sources" represent 0 percent of the source mix in Jordan and up to 20 percent in Pakistan.

mix in nine countries, ranging from as low as 8.0 percent in India to as high as 43.9 percent in Indonesia. LARCs are the leading type of method in two countries (Egypt and Jordan) with usage rates of 34.0 percent and 21.6 percent respectively. In Colombia, India, and Nepal, permanent methods lead the mix, with rates of 29.5 percent, 38.1 percent, and 22.7 percent respectively).

Use and sources for modern contraceptive methods

There is a great deal of variance on modern contraceptive prevalence rates among the countries in our sample, from 64 percent in Colombia to 21 percent in Pakistan. At the same time, the proportion of women relying on traditional method of contraception should not be overlooked, with Bolivia, Peru, Jordan and the Philippines displaying usage rates of traditional methods between 30 and 50 percent.

Figure 1: Proportion of users of FP, by type of method

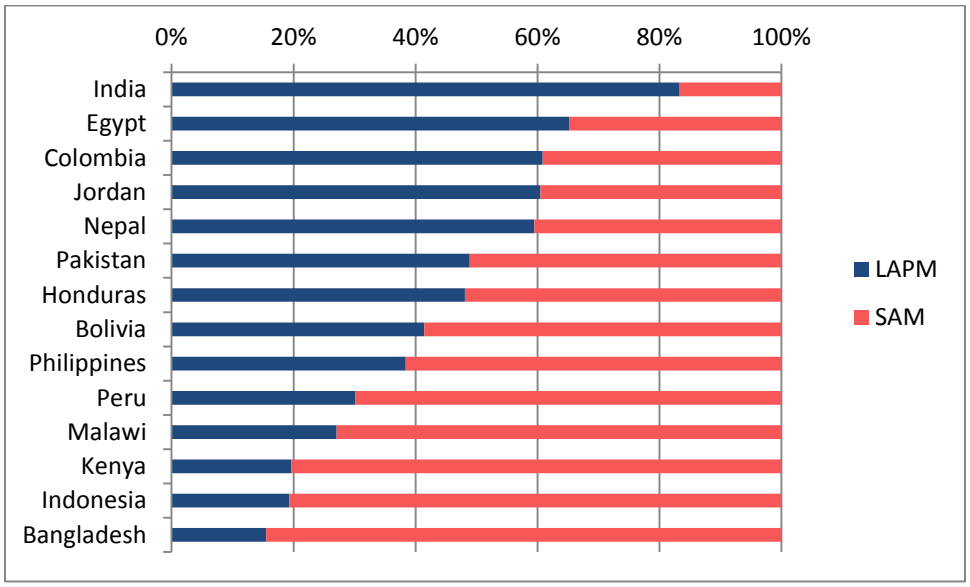


Note: Based on data obtained from the surveys for these countries.

When it comes to use of modern contraception, the method mix varies widely across our sample of countries. In five of the 14 countries (India, Egypt, Colombia, Jordan, and Nepal), more than 50 percent women rely on LAPMs (ie., LARC and PM) than on SAMs (figure 2). Yet, as observed in Table 1, within these countries, the mix of LAPMs used varies. In India, for example, 96 percent of LAPM users

are actually using permanent methods; but in Egypt, 97 percent of LAPM users are actually using LARCs. In the remaining nine countries, SAMs are the leading type of modern methods. For example, In Bangladesh, SAMs dominate the method mix, representing 85 percent of modern method use.

Figure 2: Percentage of women using SAMs, LARCs or PMs by country (among users of modern FP)



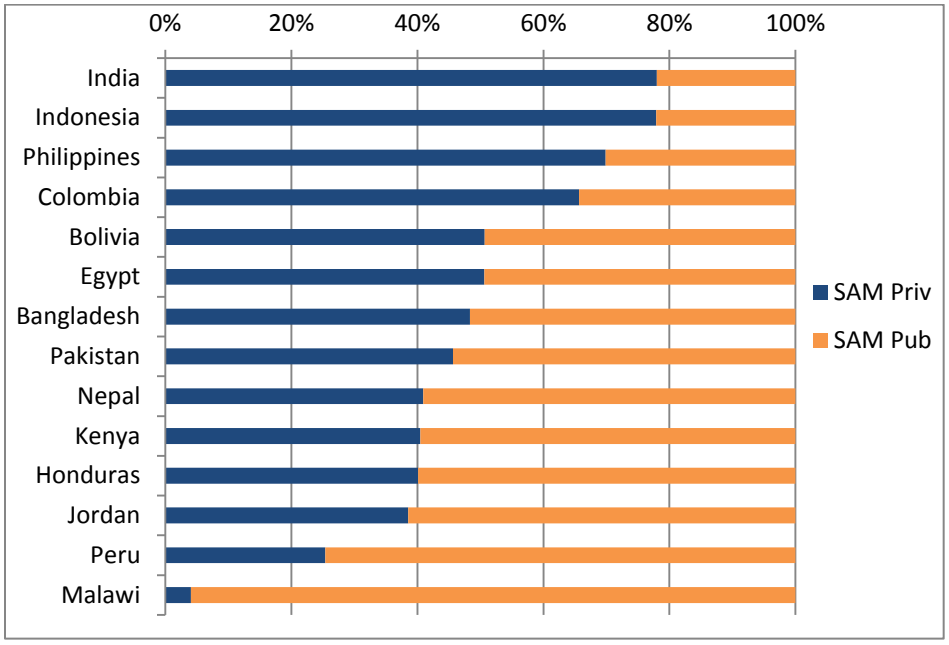
Note: Based on data obtained from the surveys for these countries.

With regard to source of method, in general, the public sector is the leading source in most countries, with the exceptions of Indonesia, Jordan, and the Philippines, as displayed in Table 1. However, it is interesting to note how large the difference is between the public and private sources per country. In Bolivia, the public sector leads by only 8 percentage points, while in Nepal, the public leads the private sector by 49 percentage points.

Figure 3 presents the sources for obtaining SAMs only. The private sector serves as the source for 50 percent or more of users in six of the 14 countries, refuting the common misperception that only a small and privileged minority of women can afford the family planning services provided by that sector.

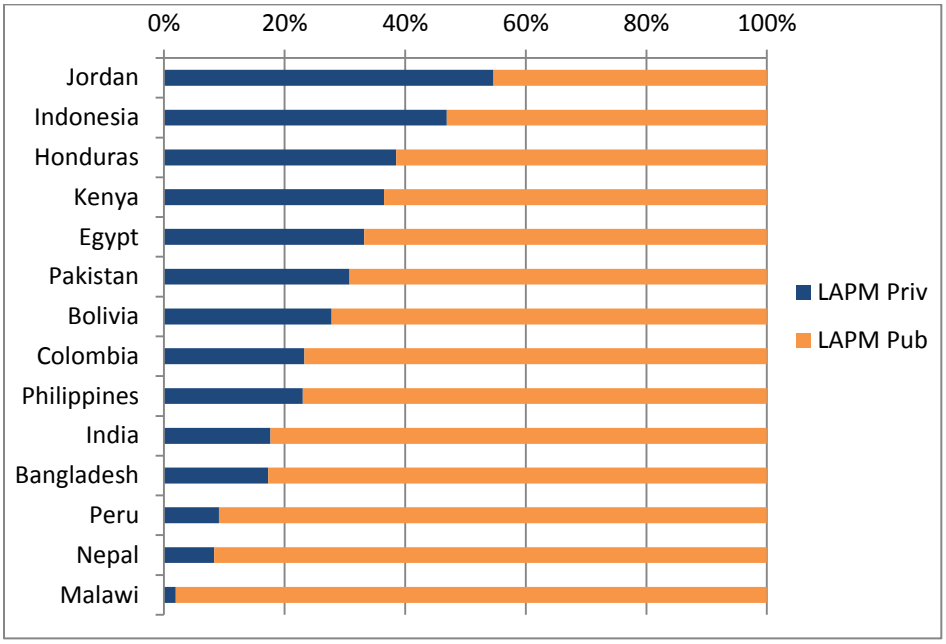
On the other hand, the public sector largely dominates the source mix for LAPMs (see Figure 4); only in Jordan does a majority of women rely on the private sector to obtain these methods.

Figure 3: Source for Short-Acting Methods (SAMs) of family planning (among SAM users)



Note: Based on data obtained from the surveys for these countries.

Figure 4: Source for Long-Acting and Permanent Methods (LAPMs) of family planning (among LAPM users)



Note: Based on data obtained from the surveys for these countries.

Analysis of wealth and use of family planning

a. Bivariate analysis.

The results shown in Table 2 indicate that, in general, use of modern methods of family planning increases as household wealth increases (and use of traditional methods or no method at all decreases). Most countries show an increase of 10 percentage points or more between the poorest and wealthiest quintiles. In Colombia, Honduras, Indonesia, and the Philippines, we note a smaller increase of 4 to 8 percentage points between these two quintiles. In Bangladesh, we see virtually no difference between poorest and wealthiest quintiles.

Table 2: Use of modern FP method by women from each wealth quintile (among all women ever-sexually active of reproductive age using any type of FP method)

	Q1 (poorest)	Q2	Q3	Q4	Q5 (wealthiest)
Bangladesh	48%	50%	49%	48%	48%
Bolivia	20%	24%	29%	35%	39%
Colombia	61%	65%	64%	65%	65%
Egypt	47%	51%	55%	55%	59%
Honduras	48%	53%	56%	55%	55%
India	34%	43%	49%	54%	57%
Indonesia	47%	57%	56%	57%	55%
Jordan	35%	41%	39%	40%	47%
Kenya	16%	28%	37%	42%	40%
Malawi	30%	36%	38%	41%	42%
Nepal	35%	40%	42%	45%	48%
Pakistan	12%	15%	21%	25%	31%
Peru	29%	35%	43%	46%	44%
Philippines	25%	33%	33%	35%	29%

Note: Based on data obtained from the surveys for these countries.

Among users of modern methods, the relationship between wealth and use of LAPMs versus SAMs varies across countries. Table 3 presents the proportion of LAPM users per quintile (among all women using modern methods); thus, the complement of each number is the proportion of women using SAM (for example, among women in the poorest quintile (Q1) in Bolivia, 26% use LAPMs, which means that the other 74% use SAMs). As Table 3 demonstrates, in the majority of countries (9 out of 14), wealthier

women are more likely than poorer women to use LAPMs. However, three countries (Bangladesh, India, and Pakistan) clearly exhibit the opposite relationship, with LAPMs being far more common among poorer women than among wealthier women, and SAMs being more common among wealthier women than poorer ones. In Colombia, the use of LAPMs and SAMs is fairly constant regardless of wealth quintile.

Table 3: Proportion of users of LAPM by wealth quintile (among all users of modern FP methods)

	Q1 (poorest)	Q2	Q3	Q4	Q5 (wealthiest)
Bangladesh	21%	18%	15%	13%	11%
Bolivia	26%	33%	39%	45%	51%
Colombia	57%	59%	58%	61%	58%
Egypt	51%	58%	62%	69%	72%
Honduras	35%	43%	48%	51%	56%
India	89%	87%	85%	80%	68%
Indonesia	12%	16%	17%	19%	29%
Jordan	51%	57%	59%	64%	64%
Kenya	14%	18%	20%	21%	22%
Malawi	22%	23%	24%	31%	36%
Nepal	50%	59%	60%	59%	51%
Pakistan	64%	49%	50%	43%	44%
Peru	16%	25%	27%	33%	37%
Philippines	33%	37%	40%	40%	41%

Note: Based on data obtained from the surveys for these countries.

Multivariate analysis

In order to capture a more accurate diagnosis of the relationship between household wealth and both use and source of FP methods, we conducted multivariate analysis to control for important covariates that could potentially confound the relationship, like age, number of children, marital status, levels of education, employment status, urban/rural location, among others.. In Table 4, we present the adjusted odds ratios from running multivariate logistic regressions of woman's use of modern family planning method on a vector of household wealth quintiles, with women in the lowest wealth quintile (Q1) as the reference category.

The adjusted odds ratios in Table 4 reveal a strong and positive relationship between modern family planning use and household wealth in 13 of 14 countries—as wealth increases, so do the odds of using a modern method of family planning.[14] These findings answer our first research question: after controlling for important individual and household characteristics, the likelihood of using any family planning method increases as wealth increases. The only country for which this pattern does not hold across all quintiles is Bangladesh, where women in lower-middle income households (quintile 2) are more likely to use modern family planning than are wealthier women.

Table 4: Use of modern FP methods by wealth quintile, 2006-2012

	Adjusted odds ratio				
Country	Q2	Q3	Q4	Q5	Obs.
Bangladesh	1.15*	1.1	1.01	0.9	17,808
Bolivia	1.26*	1.69*	2.02*	2.83*	13,623
Colombia	1.77*	2.27*	2.46*	2.86*	44,249
Egypt	1.23*	1.48*	1.65*	1.93*	16,527
Honduras	1.48*	1.65*	1.69*	1.82*	18,250
India	1.43*	1.78*	2.27*	2.62*	93,993
Indonesia	1.62*	1.69*	1.80*	1.90*	32,881
Jordan	1.30*	1.31*	1.32*	1.92*	10,105
Kenya	1.86*	2.71*	3.04*	3.43*	7,037
Malawi	1.21*	1.24*	1.39*	1.54*	19,880
Nepal	1.42*	1.84*	1.84*	2.10*	9,843
Pakistan	1.47*	2.02*	2.60*	3.34*	10,023
Peru	1.49*	1.99*	2.33*	2.51*	33,125
Philippines	1.55*	1.73*	1.89*	1.65*	9,625

+ $p<0.05$, * $p<0.01$

In Table 5 we explore the relationship between wealth and the likelihood that a woman uses an LAPM compared to a SAM controlling for the covariates. When examining the adjusted odds ratios for use of LAPMs by wealth quintile, we observe a more varied picture across countries. In most of the 14

[14] Odds ratios coefficients larger than one imply a positive association relative to the reference group; odds ratios smaller than one represent a negative association.

countries, the adjusted odds ratios confirm an overall positive relationship between household wealth quintile and likelihood of using a LAPM method: in those countries, wealthier women are more likely to use LAPMs and less likely to use SAMs compared to poorer women, and poorer women are more likely to use SAMs than are wealthier women. Three findings emerge: First, in some countries, the increase in the odds of using a LAPM statistically increases for all wealth quintiles. Second, in other countries, the increase in the odds is statistically significant only for the wealthiest quintiles (quintiles 4 or 5). And third, interestingly, South Asian countries of Bangladesh, India and Pakistan show a negative relationship that is both large and significant: compared to wealthier women, poorer women are more likely to use LAPMs than SAMs. Only in the Philippines is the relationship is not statistically significant, indicating that increased wealth is not associated with use of either LAPMs or SAMs.

Table 5: Use of LAPM (instead of SAM) across wealth quintiles. Adjusted odds ratios

	Adjusted odds ratio				
Country	Q2	Q3	Q4	Q5	Obs.
Bangladesh	0.83+	0.71*	0.63*	0.59*	8,716
Bolivia	1.71*	2.52*	3.43*	4.29*	4,375
Colombia	1.47*	1.61*	2.03*	2.01*	27,555
Egypt	1.22*	1.41*	1.89*	1.97*	8,516
Honduras	1.46*	1.87*	2.18*	2.61*	9,530
India	0.88	0.85+	0.80*	0.58*	45,213
Indonesia	1.18+	1.20+	1.24*	1.73*	16,963
Jordan	1.28+	1.36*	1.61*	1.54*	3,815
Kenya	1.27	1.44	1.80+	2.73*	2,225
Malawi	1.17	1.29+	1.67*	2.27*	7,449
Nepal	1.50*	1.70*	2.17*	2.02*	4,193
Pakistan	0.61+	0.77	0.63+	0.81	2,031
Peru	1.63*	2.18*	3.20*	3.60*	13,765
Philippines	1.18	1.17	1.17	1.29	3,024

+ p<0.05, * p<0.01

b. Analysis of wealth and obtaining methods through the private for-profit sector

Bivariate analysis

In this section, we explore whether household wealth is associated with a woman's decision of obtaining her method of choice through the private or the public sector. especially for LAPMs since they tend to be more expensive than SAMs. As was observed in figures 3 and 4, in seven of the 14 countries included in this study, the majority of women obtained their SAMs through the private sector; for LAPMs, in 13 of the 14 countries, at least 50 percent of women obtained their methods through the public sector. Our bivariate and multivariate analysis reveals two key findings: (1) Wealthier women are more likely than poorer women to obtain their methods through the for-profit sector, both among LAPM and SAM users; and (2) the extent to which the poorest women use the for-profit sector for LAPMs varies widely across countries.

To begin our exploration of the relationship between household wealth and source (public or private for-profit sector) by method used (SAMs and LAPMs), we first present country-specific graphs, all grouped in figure 5. Each of those graphs presents the proportion of women who obtained their method through the private for-profit sector, by type of method and by wealth quintile. For example, in the first graph corresponding to Bangladesh, we observe that among the poorest women (quintile 1) using LAPMs, only 4 percent obtained their method through the private sector. (By inference, this means that the other 96 percent of LAPM users relied on the public sector). The proportion using the private for-profit sector remained low and relatively unchanged for quintiles 1 through 4, but increases sharply for the wealthiest group of women (quintile 5), among whom 32 percent rely on the private sector. A similar pattern exists for obtaining SAMs in that country, but it starts at a much higher level (31 percent) for the poorest quintile and reaches 79 percent for the wealthiest quintile. Thus, in Bangladesh, there is little difference among the first four quintiles in the use of the private sector to access LAPMs, but a

positive and significant association does exist for the wealthiest women (quintile 5) in the country for both LAPMs and SAMs.

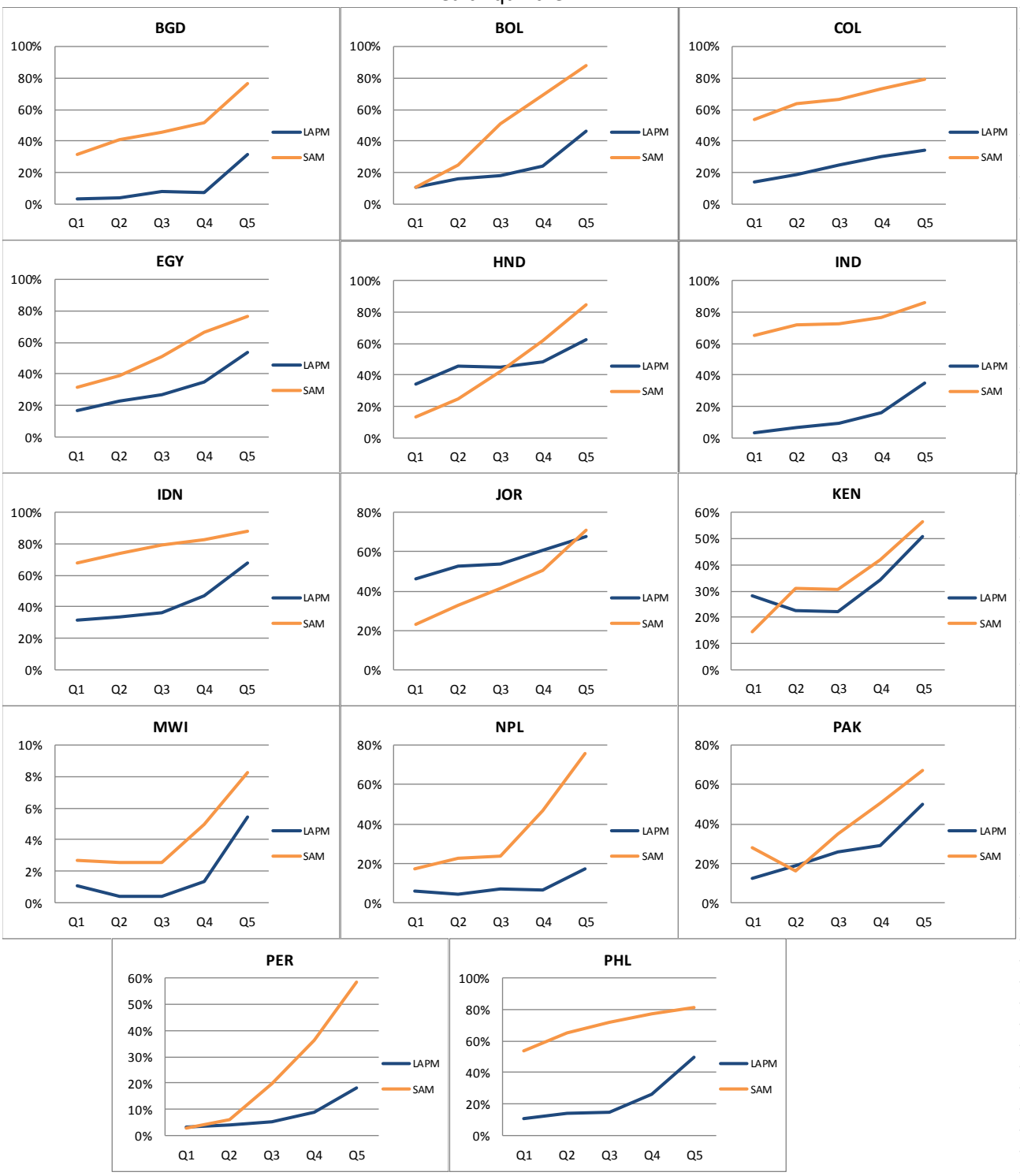
Rates of use of the private sector for SAMs increase consistently across all wealth quintiles for most countries. Only in Malawi and Nepal is the relationship flat for the lowest three quintiles before increasing among women in the wealthier quintiles. In all other countries, the proportion of women using the private sector to obtain SAMs increases by wealth quintile, sometimes by small increments (e.g., Colombia or India) but sometimes with very sharp increments (e.g., Pakistan and Peru).

Use of the private sector for LAPMs follows a similar but more complex pattern. In Bolivia, Honduras, India, Malawi, and Pakistan, there is relatively little difference in the proportion of women in lower wealth quintiles (Q1 and Q2) obtaining LAPMs from the private sector, but there is a sharp increase among women in the wealthiest quintiles. In Kenya and the Philippines, results were similar but the sharp increase included the two wealthiest quintiles. These findings suggest that, when considering wealth quintile as a proxy for ability to pay, there is very little difference among the low-income and middle-income households (quintiles 1 through 4) related to the use of the private sector for obtaining LAPMs. Only among women in the wealthiest quintiles in these countries do we see an increase in the likelihood of obtaining LAPMs through the private sector. In other countries (Colombia, Egypt, Indonesia, Jordan, Nepal, and Peru) there is a positive and consistent increase in use of the private sector as wealth increases, without the sudden increase among the wealthiest groups, as noted before. In no country do we observe a pattern of decreased use of the private sector as wealth increases.

This positive association between use of the private sector for LAPM and wealth does not mean that poor women do not rely on private sources to obtain those methods. In fact, in Honduras, Indonesia, Jordan, and Kenya, for example, between one quarter and one half of LAPM users from the poorest quintile obtained LAPMs through the private sector. The association between use of the private

sector and wealth is related to the *slope* of the curves in the graphs. However, the height of the curve indicates the frequency with which women in any quintile use the private sector for their FP methods.

Figure 5: Percentage of SAM and LAPM users who accessed their method through the private sector, by wealth quintile



Multivariate analysis

Applying our methodological approach, we ran adjusted[15] logistic regression models to explore the relationship between household wealth and source of method separately for SAM and LAPM users in each country. Tables 6 and 7 present the adjusted odds ratios among users of SAMs and LAPMs for obtaining methods from the private for-profit sector (use of the public sector is the reference category).

In Table 6, among users of SAMs, we observe a positive and significant association across all wealth quintiles for six countries (Bangladesh, Bolivia, Honduras, Indonesia, Jordan, and Kenya), which indicates that in these countries, wealthier users of SAM are more likely to obtain such methods from the private sector, and poorer users are more likely to obtain them from public facilities. In six countries (Colombia, Egypt, Malawi, Nepal, Peru, and the Philippines), the positive relationship is confined to the top two or three quintiles, i.e., mainly middle and high-income households. In India and Pakistan, wealth is not significantly associated with use of the private for-profit sector for SAMs.

Table 6: Likelihood of obtaining SAM through Private Sector and wealth, 2006-2012 (among SAM users only)

	Adjusted odds ratio				
Country	Q2	Q3	Q4	Q5	Obs.
Bangladesh	1.35*	1.61*	2.52*	5.20*	6,579
Bolivia	1.90*	3.70*	5.99*	13.06*	2,272
Colombia	1.07	1.02	1.22+	1.41*	10,463
Egypt	1.23	1.65*	2.58*	3.18*	3,181
Honduras	1.85*	4.10*	7.97*	13.57*	4,828
India	1.22	1.11	1.07	1.33	6,632
Indonesia	1.30*	1.68*	2.05*	3.09*	12,448
Jordan	1.45+	2.06*	2.95*	6.90*	1,437
Kenya	2.52*	2.33*	3.77*	5.68*	1,561
Malawi	0.94	0.92	1.80+	2.80*	4,637
Nepal	1.21	1.05	1.99*	4.83*	1,733
Pakistan	0.43	0.92	1.51	2.29	664
Peru	1.37	2.31*	3.47*	5.93*	9,510
Philippines	1.31	1.60*	1.73*	1.84*	1,766

+ p<0.05, * p<0.01

[15] The vector of covariates is the same from the previous two research questions.

The adjusted relationship between wealth and relying on the private sector among LAPM users is presented in Table 7. In five countries, the odds ratios for use of the private sector for LAPMs is significant for women belonging to the wealthiest one or two quintiles (4 and 5) (Indonesia, Jordan, Nepal, Peru, and the Philippines), indicating that wealthier women are much more likely to obtain their LAPM methods from the private for-profit sector than the poorest women. In these countries, the findings also indicate that there is no significant difference in the odds of obtaining LAPMs from the private for-profit sector among women in the poorest, lower-middle, and middle wealth groups (quintiles 1, 2 and 3). In contrast, in four countries (Colombia, Egypt, Honduras, and India), the odds ratios are significant for all wealth quintiles, indicating that as wealth increases, so is the likelihood of obtaining LAPMs from the private for-profit sector, even for the lower and middle quintiles. In two countries (Kenya and Malawi), none of the odds ratios was statistically significant, indicating that wealth is not significantly associated with use of the private for-profit sector for LAPMs.

Although the odds ratios are adjusted by potential confounders, they corroborate the country-specific averages presented in figure 5: in most cases, the relationship is not significant across the lower quintiles, but positive and significant for the wealthier quintiles only, indicating that the likelihood of using the private for-profit sector for LAPMs increases only among the wealthiest quintiles in a country. At the same time, among women in the lower wealth groups, there is no difference in the odds of using the private sector.[16]

[16] Separate regressions were run for users of LARCs and users of PMs with very similar results in terms of size of coefficients and statistical significance (not presented).

Table 7: Likelihood of obtaining LAPM method through Private Sector and wealth, 2006-2012

	Adjusted odds ratio				
Country	Q2	Q3	Q4	Q5	Obs.
Bangladesh	1.28	1.99+	3.08*	6.25*	1,255
Bolivia	1.66	2.35+	3.08*	6.96*	1,543
Colombia	1.28*	1.76*	2.24*	2.51*	16,056
Egypt	1.37+	1.59*	2.09*	3.61*	5,236
Honduras	1.37+	1.83*	2.05*	2.94*	4,031
India	1.80*	2.54*	3.85*	7.47*	35,162
Indonesia	1.15	1.24	1.80*	3.80*	2,976
Jordan	1.26	1.23	1.64*	2.27*	2,216
Kenya	0.72	0.7	0.99	1.28	441
Malawi	0.5	0.42	1.42	3.09	1,110
Nepal	0.7	1.16	0.99	2.68*	1,984
Pakistan	1.59	2.49*	2.87*	5.45*	953
Peru	1.44	2.45	4.96*	10.84*	3,909
Philippines	1.23	1.16	2.18+	5.28*	1,152

+ $p<0.05$, * $p<0.01$

5. Discussion

Understanding how wealth is associated with use of modern family planning methods, method mix, and source of supply can help focus outreach activities and services to promote greater uptake of modern methods in developing countries. The findings in this study highlight the importance of identifying and addressing the barriers that many women face in order to obtain family planning methods, especially LAPMs. Because LAPMs represent such an important component of the family planning method mix due to their longer continuation rates and lower failure rates compared to many SAMs, it is especially important to understand and address barriers that might impede access to them (Wickstrom, 2011).

Our first question, the role of wealth on the use of modern contraception reveals that, in general, modern contraceptive prevalence is higher among women in wealthier households. However,

the scale of the increase varies across countries. In some countries, the odds of women in the wealthiest quintile using a modern family planning method are more than three times higher than among women in the poorest quintile; in other countries, that difference is much smaller.

Our second question examines which types of modern method women use—LAPMs or SAMs, and how household wealth can help predict such decision. When focusing on LAPMs, the general trend of greater use by wealthier women continues to hold. It is not unusual for the odds of LAPM use to increase among women in wealthier quintiles, and to see no significant increase among women in the poorer quintiles. Although we observe an increase in the use of both SAMs and LAPMs among wealthier women, the pattern of use for LAPMs suggest that there may be a threshold effect whereby wealthier women are more likely to use an LAPM, perhaps for financial reasons, reasons of access to clinical providers, or because they are more comfortable using a non-user-directed method. However, also influencing the use of LAPMs is the policy environment, such as in Bangladesh and India, where community mobilization and supply- and demand-side incentives contribute to the high uptake of these methods, particularly among the poor.

In answering the third question – the role of wealth on the use of the private for–profit sector compared to the public sector, we observe generally that use of the private for-profit sector increases as household wealth increases. Yet there are large differences in use of the private sector based on the type of method used. For SAMs, we note that even among the poorer quintiles, use of the private sector is relatively high. This pattern likely reflects the use of private pharmacies for the purchase of oral contraceptives and condoms, and increasingly, injectable contraceptives. These methods can be purchased at a nearby pharmacy or supplier and are purchased on a regular basis—monthly or quarterly, which means that the cash outlay for purchasing the commodities is relatively low, even for many lower-middle and middle income households. Use of the public sector, on the other hand, may mean that clients have to make an appointment at a facility, wait to see a provider, and spent more time

away from home, work or other competing priorities. While commodities from the public sector may be free of charge, the opportunity costs may outweigh the out-of-pocket costs.

On the other hand, use of the private for-profit sector for LAPMs appears to be consistently low for the lower wealth quintiles (quintiles 1, 2, and 3), and does not increase until we look at the wealthier quintiles (quintiles 4 and 5). A number of factors may contribute to this finding, especially the costs associated with using the private sector for a clinical method, particularly PMs, which require higher-levels of staff and facilities than are needed for providing LARCs. Although the DHS do not provide data on the out-of-pocket and opportunity costs of obtaining these methods, the findings suggest that for many poor women, those costs serve as a barrier to using the private for-profit sector and indicate the need to develop new strategies that help remove these financial barriers so that all women can better access to this source of LAPMs.

Surprisingly, in Honduras, Indonesia, Jordan, and Kenya, we note that between one quarter and one half of women in the poorest quintiles rely on the private for-profit sector for LAPMs, and that use further increases among wealthier women. In Jordan, preferences for the IUD and female providers may lead family planning users, regardless of household wealth, to use the private sector where they know that their provider is a woman. In Kenya, voucher and social franchising programs that provide subsidized LAPMs to poor women may be driving more of them to the private sector to obtain these methods. However, understanding these unexpected findings warrants further inquiry.

The research presented here raises an important set of questions about why women use the sources they do to obtain family planning methods. In many countries, we see high use of the private sector for SAMs and low use for LAPMs regardless of wealth quintile. From a programmatic perspective, these findings call for the need to improve access to the private for-profit sector for LAPMs across all wealth quintiles.

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Table 1: Descriptive statistics for each country, for all women of reproductive age who have ever been sexually active*

	Bangladesh	Bolivia	Colombia	Egypt	Honduras	India	Indonesia	Jordan	Kenya	Malawi	Nepal	Pakistan	Peru	Philippines
Age	30.8	32.2	32.2	33.1	31.1	31.7	34.2	34.1	30.6	29.7	31.5	32.4	33.3	33.8
Number of children	2.6	3.0	1.9	2.9	2.6	2.8	2.5	3.6	3.2	3.6	2.7	3.9	2.5	2.9
Married (or living together)	93.8%	75.2%	59.5%	93.2%	70.7%	94.0%	94.1%	95.5%	70.1%	78.0%	96.3%	95.3%	71.4%	88.4%
% of women who had never had intercourse *	-	19.6%	17.3%	-	19.8%	24.4%	-	-	16.7%	13.6%	22.3%	-	20.5%	29.2%
Education														
None	27.7%	5.6%	1.9%	32.1%	4.6%	47.8%	6.9%	2.8%	10.1%	17.3%	48.2%	65.0%	4.0%	1.6%
Primary	30.0%	46.5%	24.2%	12.4%	55.7%	15.6%	47.6%	7.1%	57.0%	64.4%	19.0%	14.2%	29.1%	23.4%
High school	34.9%	30.2%	48.7%	43.8%	32.3%	31.0%	38.7%	58.3%	25.3%	16.6%	26.9%	14.4%	38.0%	44.1%
College or higher	7.3%	17.7%	25.2%	11.7%	7.3%	5.7%	6.8%	31.7%	7.6%	1.8%	5.9%	6.4%	28.8%	30.9%
Living in urban areas	26.0%	64.4%	78.9%	41.2%	53.3%	30.8%	41.8%	84.0%	25.7%	18.2%	13.3%	33.4%	70.0%	53.0%
Use of FP methods														
None	42.5%	48.1%	30.9%	43.8%	38.8%	44.9%	42.0%	43.2%	61.6%	59.1%	51.5%	71.8%	39.6%	53.6%
Traditional	8.6%	21.8%	4.8%	2.5%	7.4%	7.3%	3.6%	16.5%	4.9%	3.2%	6.3%	7.5%	19.2%	15.3%
Short-term (condoms, pills, injectables)	41.3%	17.7%	25.2%	18.7%	27.9%	8.0%	43.9%	16.0%	27.0%	27.5%	17.1%	10.6%	28.8%	19.1%
Long -acting and permanent methods (LAPM):	7.6%	12.5%	39.1%	35.0%	25.9%	39.8%	10.5%	24.4%	6.6%	10.2%	25.1%	10.1%	12.4%	11.9%
Long acting reversible (IUDs, implants)	1.8%	7.0%	9.6%	34.0%	5.8%	1.6%	7.3%	21.6%	2.8%	1.4%	2.4%	2.3%	4.0%	3.3%
Permanent (sterilization)	5.8%	5.5%	29.5%	1.0%	20.1%	38.1%	3.2%	2.8%	3.8%	8.8%	22.7%	7.9%	8.5%	8.6%
Source of access to modern FP methods														
Private-for-profit facilities	38.4%	40.6%	40.6%	39.1%	41.0%	22.8%	69.1%	54.0%	34.7%	3.5%	19.8%	30.2%	27.4%	51.1%
Public facilities	52.1%	48.8%	56.0%	59.6%	51.1%	70.6%	22.2%	46.0%	57.9%	73.8%	69.0%	49.4%	70.4%	46.3%
NGO facilities	4.3%	7.6%	0.0%	1.3%	0.1%	0.8%	0.0%	0.0%	1.2%	18.3%	8.5%	0.0%	1.1%	0.1%
Other	5.2%	3.0%	3.4%	0.1%	7.8%	5.8%	8.7%	0.0%	6.2%	4.4%	2.7%	20.3%	1.1%	2.6%
Number of observations	**17,721**	**13,623**	**44,249**	**16,527**	**18,250**	**93,993**	**32,881**	**10,109**	**7,037**	**19,880**	**9,843**	**10,023**	**33,125**	**9,625**
Using modern FP, and reported any source	8,680	4,258	27,476	8,524	9,530	45,231	16,856	3,657	2,198	7,466	4,193	2,019	13,656	3,001
- If reported source as Public or Private	7,800	3,815	26,516	8,417	8,860	41,800	15,424	3,655	2,003	5,918	3,717	1,617	13,419	2,918

* The question "At what age did you first have intercourse?" was used to determine whether a woman had ever been sexually active. In Bangladesh, Egypt, Indonesia, Jordan and Pakistan, such question was not asked at all or was asked only to women who have ever been married, in which case, we only include married women.