Impact of Health Insurance on the Use of Family Planning and Maternal Health Services

Bill Winfrey
Leanne Dougherty
Sarah Alkenbrack

Table of Contents

Tables in the report

I. Introduction

Health insurance and prepayment schemes are becoming increasingly popular in developing countries. Parallel to this trend are attempts to integrate reproductive health (RH) including family planning (FP) and maternal health (MH) into the mainstream of health financing. There are many reasons why governments and donors are interested in insurance plans adopting reproductive health (RH) benefits. Including family planning and other reproductive health services in health insurance plans would help ease the fiscal burden of reproductive health services by shifting the financing of some primary health services from central government entities to communities, private individuals and/or their employers. A secondary and less certain proposition is whether utilization of these health services will increase as a result of insurance coverage. This report contributes to the effort to understand whether people who belong to an insurance scheme that includes FP or MH services are more likely to use those services than people who do not belong to such insurance schemes.

I.A. Motivation for and purpose of this report

The United States Agency for International Development (USAID) has a long history of promoting the inclusion of family planning within private health insurance, social insurance and employer provided health plans. The TIPPS Project and the Enterprise Project promoted the inclusion of family planning in these programs based on prospective analyses of the costs and benefits of family planning to the plan administrators. The POLICY Project has promoted inclusion of FP in insurance plans as a mechanism for promoting the commercial sector for family planning, cost sharing and improved sustainability of reproductive health programs. The Commercial Markets Strategies (CMS) Project has promoted the inclusion of FP in insurance plans as a mechanism for promoting increased commercial sector and community participation in reproductive health financing as well as increasing access to reproductive health services.

These efforts have not seen much success. The TIPPS Project and the Enterprise Projects could point to examples where they convinced enterprises to expand insurance coverage to include family planning (e.g., Foreit et al., 1991). However, reading through the project documents, one is struck by the lack of generalized success in convincing employers and insurance companies to include family planning benefits in the health insurance schemes[1]. Although the prospective analyses showed great benefit cost ratios; insurance companies and employers proved to be very difficult to convince.

In September of 2000, the CMS Project convened a technical advisory group meeting to discuss the issue of reproductive health in the context of insurance. The consensus of the expert panel was that insurance for reproductive health is a tough sell in a developing country context. In essence insurance companies see reproductive health services as being uninsurable. Quoting the report:

"Life and casualty insurers have traditionally opposed including reproductive health and family planning benefits, alleging they are subject to 'moral hazard' and not to chance events beyond the

[1] It was also expected in these projects that if one company adopted the policy of including family planning, that others would follow through a demonstration effect. None of these projects ever saw widespread adoption of family planning services by companies as a result of one company adopting family planning services.

control of the insured. These companies are unwilling to cover any benefit that appears to be subject to beneficiary choice, rather than the result of accident or disease. Their target market has sufficient discretionary income to buy these services, and is probably doing so already. Executives coming from a background of liability, casualty and life insurance see costs escalating if a policy offers benefits that customers already purchase. Rather than thinking of comprehensive health coverage, these executives analogize the situation to using automobile insurance to pay for an oil change, or new tires." (Feeley 2000)

The panel was also very skeptical about the possibility of insurance affecting utilization patterns.

"Panelists were even more skeptical that insurance mechanisms will lead to rapid changes in contraceptive acceptance. Use of contraceptives is determined by a complex mix of historical, cultural, and economic factors. Prepayment or insurance have little effect on these factors. In countries where contraceptive prevalence is high, the non-users have strong religious or cultural objections, or are concentrated in disadvantaged groups which are hardest to reach through insurance schemes. Where prevalence is low, social marketing and education must first change attitudes towards contraception, and plan enrollees may then seek such services." (Feeley 2000)

So the question remains open, does working toward including RH into health insurance schemes move government and donors toward their goals of increased use of FP and MH services? To date, there is little empirical evidence one way or another. The aim of this report is to use data in three Demographic and Health Surveys to examine whether there is at least a correlation[2] between coverage and use of the services after controlling for confounding factors such as socio-economic status. This paper will inform policymakers on the potential effect of health insurance coverage on the use of FP and MH services. The results are based on cross-country comparative analyses of insurance content, service utilization and multivariate regression.

I.B. Analytical approach

This report will examine whether health insurance coverage correlates with increased FP and MH service utilization. More specifically, the analyses in this report will describe the types of incentives that are provided by the various insurance mechanisms (e.g., private sector access), examine the types of insurance mechanisms that are most effective at increasing utilization of FP and MH services, and whether selected types of FP methods are differentially used dependent on the insurance mechanism.

Our analyses address the issue from a couple of complementary directions. First we examine the basic question of whether women with insurance are more likely to use reproductive health services or if the modality of reproductive health services use (method and service delivery point) is different. However, there are many other factors known to influence the use of family planning and maternal health services. These factors are likely to confound the interpretation of any simple analysis of the correlation between reproductive health service utilization and insurance. For example, women from high socio-economic status (SES) households are likely to use family planning services, but at the same time women from high socio-economic status household are more likely to have insurance. In other words, when we look at a simple table of family planning use versus insurance status, we may be observing a spurious relationship based on a correlation

[2] We use the term "correlation" because we will not be able to establish causality in this paper.

between SES and insurance. To partially correct for this problem, we perform multivariate regressions that correct for the possibility that the decision to obtain insurance coverage may be made at the same time as the decision to use family planning or maternal health services.

I.C. Organization of the report

This paper is organized into five sections. First is this introductory section of the report. Following this introductory section a second section describing the reasons we might expect to see an increase in family planning use if family planning services are included in an insurance plan. Section three is a description of the data and methods used in the analysis. Sections four, five and six discuss the cases of Colombia, The Dominican Republic and Turkey respectively. Each of these sections will contain detailed descriptions of the available insurance plans, service utilization amongst the women covered by the plans and a multivariate analysis that corrects for confounding factors. Finally, in section seven, a summary of the results and policy implications are discussed.

II. Relationship between FP/RH and insurance

II.A. Previous findings

There are several reasons to expect a relationship between membership in a health insurance scheme and the use of FP and MH services. First, health insurance has the potential to decrease financial barriers to seeking FP and MH services. Long term family planning methods such as sterilization, implants and intra-uterine devices (IUDs) often have high up-front costs but relatively small recurrent costs (pp. 34-43, Stover and Heaton, 1999). Insurance has the potential for smoothing the costs associated with these methods. Experiments have also shown that people are more inclined to use health services that are pre-paid as opposed to those that are paid at the time of care (Bachmann 1994, Eklund 1990, Schneider 2000, Schneider 2001). Insurance may also reduce financial barriers for other methods since their cost will be spread across both users and non-users.

Second, government provided and community health insurance plans have the potential to assist governments and donors in their provision of FP and MH services and products by raising revenue. The increased revenue can be used to increase quality and access which in turn create higher demand (Bachmann 1994, Normand 1999). Finally, individuals may choose to access higher quality, more reliable FP and MH services in the private sector if they are made available by private or government[3] health insurance schemes.

On the other hand, USAID assisted countries have developed large public sector family planning programs. These programs often offer free or almost free family planning commodities that rival in quality and access the commodities that the private sector might provide[4]. To the extent that the private sector has higher quality services or better amenities this effect may be counterbalanced.

[3] E.g., government may contract out of services to private providers.

[4] Often commodities are provided via donors who provide very high quality products. For instance USAID purchases its product for donation via a tender offered to US companies. The product descriptions in the procurement have very stringent quality standards.

Although there are many reasons to expect a relationship between FP services and health insurance scheme membership, a literature review found that very little had been written about the effect of insurance coverage on the use of family planning services (Alkenbrack 2002). Our further review of the literature did not find any empirical study of nationally representative data concerning this issue.

Despite the lack of evidence on the effects of health insurance on FP services, there have been numerous pilot projects that have been implemented throughout the world where FP services have been included in insurance schemes and evaluations have been conducted. In the TIPPS and Enterprise projects, programmatic goals included the promotion of private sector participation of family planning and/or maternal and child health programs for private companies and employees in less developed countries.

Through cost-benefit analyses, the projects tried to convince private companies to adopt FP and MH services in their employee benefits. There is however very little evidence showing an overall increase in the use of services (JSA Healthcare Corporation 1991 and Skibiak 1988). In Peru, a USAID funded project called Apoyo a Programas de Poblacion (APROPO) was implemented in order to expand family planning programs in the private sector, and increase the number of insurance companies and employers who offer family planning services. The project was unsuccessful in attracting new users primarily due to poor information dissemination and therefore it was not possible to determine the effect of health insurance coverage on family planning use (Lambert 1994).

Studies on the effects of health insurance and MH services have produced inconsistent results. A study in Turkey found that having health insurance coverage increased the probability of a woman to choose a modern delivery over a traditional delivery and to access prenatal services while controlling for independent variables that affect the utilization of services including education, geography and household wealth (Celik, et al. 2000). However, results from an analysis of prenatal care use among privately insured, uninsured and Medicaid-Enrolled women in the United States found that use of services is highly correlated with the type of insurance. In fact, the study found that in some instances Medicaid recipients actually receive prenatal coverage later in pregnancy and receive fewer visits than uninsured women (Oberg 1990) – even though limits to prenatal care is not a feature of the plan. These results suggest that when stratifying a sample by type of insurance, some unobservable characteristics of the woman may be influencing their decision to seek MH services.

In addition to individual characteristics of a woman which may impact demand for MH services, the design of health insurance coverage may also influence the use of MH services. Studies in China and Taiwan discovered that with the changes in the design of their health insurance programs, there has been an increase in the incidence of c-sections, use of obstetric ultrasounds and complicated lab tests because fee for service payments provide physicians with an incentive to provide more costly care (Cai 1998, Chen 2001).

II.B. Hypotheses

Our examination of insurance requires some discussion of the types of insurance we encounter. The content of the benefits packages, the quality of services reimbursed or provided by the plan, the people served by the plan and the services replaced by the plan are all important features that may play a role in whether an insurance plan influences women to use FP or MH services.

First, we expect that if an insurance plan covers family planning it may encourage women to use family planning. Family planning benefits reduce the marginal cost to the consumer to either free or a required co-payment. However, there is a strong literature that shows that price (at least within the ranges in developing countries) is not a significant deterrent to family planning use – especially in the SES range of women likely to afford health insurance[5].

Second, health insurance most often provides women with access to services that are higher quality or provide better amenities than normal government services. If family planning services are offered within the benefits packages, then the better services may be an inducement to women who would not otherwise accept family planning services – especially clinical methods. Also, these better services may in general be better at giving women counseling that would lead to be family planning acceptors or be more likely to use prenatal care.

A third consideration is that many health insurance plans that we will encounter are actually social security plans. The social security plans are often a mechanism for providing universal health coverage. So, any insurance mechanism examined is relative to the services provided by the public health system of the government. Also, these plans are often devices for extracting contributions from employers to fund a government health plan that is otherwise free to the population. There is little expectation that such plans will be an inducement to use family planning or maternal health services. However, there may still be an "entitlement" effect. If a woman is aware that she is paying for access to facilities she may be more likely to use the entire gamut of services available. Also, sometimes these government plans offer different tiers of services. For example in Turkey there is a government plan called SSK that operates its own health facilities, which are nominally higher quality.

Finally, in most developing countries the government is a large provider of health services -- especially family planning via assistance from donors including USAID and UNFPA. To the extent that they are offering free or almost free, good quality family planning and maternal health services, one might suppose that the marginal inducement offered by a health insurance plan would be relatively small.

II.C. Other factors influencing the use of FP and MH services

There is a large literature examining the determinants of FP and MH service utilization. Age, education, household income or wealth, occupation, characteristics of her husband, parity, fecundity and community characteristics have all been shown to be important influences on use of these health services. We will not discuss the theoretical reasons for their impact here.

However, we note that many of these factors also influence the decision to purchase coverage or eligibility through an insurance plan. Participation in the formal employment sector may permit access to money and employer organized insurance plans. Household wealth and income provides the means to purchase insurance. Education may provide the skills to understand and evaluate the benefits offered by an insurance plan. Parity and fecundity may influence women to selectively purchase insurance plans that cover family planning and maternity services. Provider quality and access are also important determinants of family planning and maternal health service

[5] See, for example, Akin and Schwartz, 1988 or Jensen et al. 1996 for price elasticity estimates. See also, Murray et al.,2001 which documents that in none of the 29 countries examined did more than 10 percent of the population say that they did not use FP because of cost.

utilization. In our data we are not able to directly observe quality and access except to the extent that regional and locational variables proxy for these factors[6].

There are also factors that are impossible or difficult to measure that influence both the use of FP/MH services and coverage by health insurance. One example might be the rationality (epitomized by the household economic theories of Gary Becker) that pushes families to both use FP/MH services and obtain insurance coverage. Although many aspects of this rationality are captured via proxies like income and education other aspects are unmeasured either because they are not in our data sets or because they are not measurable with current techniques. Fortunately, econometrics has developed some techniques that can partially control for this that we discuss in the next section.

III. Data and Methods

III.A. Data

Our analysis requires nationally representative and comparable data that contain information on use of family planning and maternal health services, as well as information on whether individuals, families or households have health insurance. We limited our search to the collection of countries that have conducted Demographic and Health Surveys (DHS) in the last ten years[7]. We located four countries that met our needs: Colombia (2000), the Dominican Republic (1996), Turkey (1998) and the Philippines (1998). However, we do not present results from the Philippines because there has been considerable change in the private sector policy environment in the last five years. The surveys vary in terms of sample size (Colombia n=11585, Turkey n=8576, and Dominican Republic n=4004). However, each provides a statistically representative sample at the national level for married women between the ages of 15 and 49.

Table 1 shows that all three countries are middle income countries. The range of contraceptive prevalence is from 46.6 percent to 73.4 percent. Facility based births range from 72.5 percent in Turkey to more than 95 percent in the DR. In Colombia and the Dominican Republic the average number of prenatal care visits exceeded six, whereas in Turkey four is the average. Our small sample of countries will not allow significant generalization. As we will see below, none of the countries have significant numbers of women covered by community health insurance schemes – meaning that our results will be impossible to generalize to sub-Saharan Africa where those schemes play an increasingly important role.

[6] However, we will see below that some insurance policies offer access to better quality services.

[7] The worldwide DHS program asks a standardized set of questions that are recoded into variables that are comparable across countries and across time. We needed recent surveys because we needed to be able to determine the content of the insurance plans – a difficult task when key informants are asked to recall situations more than a decade in the past.

Table 1: Summary description of study countries

Country	Population in Millions	GDI per capita in (USD)	Contraceptive Prevalence Rate (among married, fecund, non-pregnant women)	Mean number of prenatal visits for births in last five years	% of births in last five years delivered in a facility	% of Population with Health Insurance
Colombia	43.0	$1,930	73.4%	6.1	87.5%	57.0%
Dominican Republic	8.5	$2,230	70.1%	6.6	95.3%	NA
Turkey	66.2	$2,540	46.6%	4.2	72.5%	74.6%

Source: Columns 1 and 2 (World Bank 2002), Columns 3, 4, and 5 DHS, Column 6 Colombia (Plaza 2001), Turkey (Tatar 1997).

Defining insurance coverage can be handled several ways. The Demographic and Health Surveys do not ask detailed questions about the content of insurance coverage or who might be collaterally covered by a policy. Therefore, we defined a woman as being covered by an insurance policy if and only if she or the household head indicated that she was specifically covered[8]. An implication of this is that we may have lost some cases where a household head is misinformed or uninformed about her insurance coverage and cases where a woman is covered by a husband's policy, but is unaware because he handles payment of health services in the household[9].

Another important issue is how to define the outcome variables of family planning use and maternal health service use. We have defined four:

- Use of modern family planning versus not using a modern family planning method (including folkloric methods, traditional methods and nothing at all).

- Use of clinical methods of modern family planning versus using a resupply method (among those using a modern method of family planning)[10]. We believe that this is an important outcome variable because insurance often offers improved access to clinical services and can help smooth over a longer period of time the costs associated with a method that has high up front costs.

- Use of adequate prenatal care versus not using adequate prenatal care. We define this variable in a pragmatic way. Although it would be nice to have an objective definition of adequate prenatal care, it is beyond the scope of our paper to make such a definition. Instead for each country we define a standard of prenatal care that allows for significant variation across the women in the sample. For Colombia and the DR where maternal

[8] Coverage by health insurance is not a standardized question of the DHS series of surveys, therefore each country survey poses the question in its own idiosyncratic way. Appendix 1 reproduces the questions we referenced for defining whether a woman was covered by insurance.

[9] There are also cases where a woman is entitled to insurance coverage, is unaware and does not take advantage of its benefits. We are less concerned about these cases because if she is unaware of her coverage, the existence of coverage is presumably not influencing her decision to use FP or MH services.

[10] Clinical methods include: sterilization, IUDs and Norplant. Resupply methods include oral contraceptives, injectables, condoms and vaginal methods.

health services are widely used, we chose six visits as the cut-off. For Turkey we chose four visits.

- Birth delivery in a medical facility versus home delivery.

In the next section we present summary tables showing how family planning and maternal health service use vary across women who are covered by the various insurance plans in Colombia, the Dominican Republic and Turkey. As mentioned above, many insurance plans offer access to nominally higher quality services than women would have if they were dependent upon government services. Therefore, in the summary tables, we also present the service delivery points where women obtain their services disaggregated by insurance coverage.

III.B. Regression models

The relationship between use of family planning or maternal health services and insurance coverage is potentially complicated. At the end of the previous section, we presented some theoretical considerations for why insurance coverage might influence use of family planning and maternal health services. For every reason that insurance coverage might positively influence the use of family planning and maternal health services, there was another factor that would potentially mediate that influence.

Also, the use of family planning and maternal health services is actually influenced by a host of factors, many of which are also correlated with insurance coverage. This complicated set of factors implies that we need to analyze the influence or correlation of insurance coverage with RH service using a multivariate statistical framework. Regression analysis is a popular method for disentangling and controlling for the multiple partial correlations encountered in the real world.

We estimated equations for each of the four outcomes above with a probit regression model – a recommended procedure for regression equations where only two outcomes are observed and a certain set of assumptions about the outcome and predictor variables are met (Maddala 1983). Each probit equation controls for other factors that affect health care utilization. See Appendix 1 for the statistical description of the model.

The regression coefficients generated by a probit estimation are not immediately interpretable. Therefore, we estimated the marginal effect of having an insurance plan by estimating the probabilities of a positive outcome if no one were to have the insurance plan and the probability if everyone were to have the insurance (while holding the values of the other independent variables at their sample means). The difference between the two predicted probabilities is the marginal effect presented in the section containing the regression results. This simulates the impact of all people having the particular insurance plan relative to none of them having the plan.

Potentially two of the key assumptions of the probit equation are violated with our analysis. First, a problem not addressed in this paper, is sample selectivity bias for use of maternal health services and usage of clinical methods versus resupply methods (Heckman 1978, Maddala 1983). The characteristics that influence a woman to use FP or become pregnant may be correlated with the unexplained variance in the outcomes of interest (i.e., use of clinical methods or use of MH services). Practically speaking this means that unexplained factors that “cause” a woman to become pregnant may be correlated with the unexplained factors that “cause” a woman to use

MH services. This in turn can bias the regression coefficients to be higher or lower than their "real" values.

A second concern that we do address, is that having insurance coverage and use of these services are potentially determined simultaneously. Unobservable characteristics of women, the availability of insurance or family planning services as well as the decisions to use health services and opt into a health insurance scheme may be correlated as described in the previous section. One resolution to this problem is to simultaneously estimate the use of the health services and coverage by the insurance plan. This strategy was used to analyze the effect of health insurance coverage on health service utilization in Ecuador (Waters 1999). However, in each of our selected countries several insurance plans are available. To simultaneously estimate the decision to obtain or participate in each of the insurance plans and to use the health services is a theoretically and computationally difficult task that we do not attempt[11].

Instead we estimate bivariate probit models one at a time for each type of insurance plan. The first equation is coverage by the health insurance plan and the second is use of the health service (i.e., use of modern FP, use of a clinical method, use of prenatal care and birth delivery in a health facility). In the health service utilization equations we include the insurance variable under consideration as well as simple instrumental variables for the other insurance variables[12]. See part 2 of Appendix 1 for a more detailed statistical description of the model.

The downside of the bivariate probit method is that it produces relatively large standard errors meaning it often shows statistically insignificant results when a simple probit regression shows significance. However, a feature of the bivariate regression results is that there is an estimation of the degree of simultaneity between the equation estimating being covered by insurance and the equation estimating the use of the health service. When the degree of simultaneity is significant we report the results of the bivariate estimation. When the degree of simultaneity is not significant, we report the simple probit results[13].

To ease the task of interpretation for the reader we present only the portions of the regression results that are pertinent to insurance. The complete regression results, including the values of the likelihood functions and the regression coefficients of the control variables are available from the authors, but are not presented here.

In the regression results tables in the results section, we present the relevant regression coefficients, the average probability that a woman has used the service evaluated at the observed values of the variables used in the regressions, the average probability evaluated at the observed values of the variables but with no woman having insurance and the average probability evaluated

---

[11] Possibilities include, among others:

- Estimation of several simultaneous equations, one for each of the insurance possibilities and one for the decision to use modern family planning.
- Estimation of two simultaneous equations, one multinomial probit for the decision to use one of the insurance plans (or none at all) and one probit equation for the decision to use modern family planning.

[12] The instrumental variables are used for the other insurance plans to eliminate any correlation between their use and the error terms of the insurance coverage being examined and the use of the health services.

[13] Neither model is always best, a better interpretation is that they are alternative ways of viewing the world. One could use a visual metaphor. The bivariate probit estimation makes sure that you do not mistake a mirage for an oasis. However, because the technique dims your vision, you may not see the water at all. The simple probit model is more likely to find water, however the water you see might be a mirage. Finally, the factor estimating the degree of simultaneity lets you know the probability of the existence of a mirage.

at the observed values of the variables but with every woman having insurance. Finally there is a line called the difference, which can be interpreted as the marginal effect of having the particular insurance type on using the health service.

Appendix 3 presents the means of all of the independent variables used in the regression equations.

IV. Colombia

IV.A. Colombian insurance plans

In 1993, Colombia enacted 'Law 100' which transformed its system for providing health care for the poor from a traditional supply-based model to a new model in which the government purchases managed care insurance for the poor from competing insurers in an effort to provide universal health care to all Colombians. Prior to the reforms, the general Social Security System (ISS) guaranteed universal emergency care and general health services including family planning, prenatal and delivery care services for workers, their spouses and children under the age of one year. Since the reforms, two systems have been established: the contributory and the subsidized. At the time of the survey the ISS was being folded into the contributory system (Plaza 2001, Jack 2001, Maceira 2000). Therefore at the time of the survey, ISS was still quite common.

The contributory system or Health Promotion Company (EPS) covers the population with the ability to pay and is financed through employer and employee contributions via a tax of 12% upon income. One twelfth of the resources collected from the system go to a subsidized system known as the Subsidized System Administrator or ARS. The remaining resources for the ARS are provided by the decentralized political entities, such as departments (responsible for the hospital services) and municipalities (responsible for primary care) as well as the Ministry of Health. Members of the subsidized system also contribute financial resources. However, these contributions to the ARS are means tested and some beneficiaries contribute nothing.

In general, members of the ARS are less well off than members of the EPS. Any individual may choose to participate in the EPS plan whereby the individual can contribute to the plan and become eligible to access a wider range of services at notionally higher quality (Jack 2000). EPS contracts with the successful NGO Profamilia for family planning services. The ARS system covers a more limited package of benefits that emphasizes prevention and primary care (including FP and MH services).

Since the new policy was adopted, the number of Colombians covered by the social security system has increased to approximately 57% (Plaza 2001). In addition to the public social security systems (i.e., ARS, ISS and EPS), a small percentage of Colombians have chosen to participate in private health insurance mechanisms, primarily as a means for obtaining services unavailable in the EPS system. FP and MH services may or may not be covered by the private insurance plans depending upon the plan. The private insurance reimburses services in the private sector where the quality of services is presumably better than in government facilities. Private insurance plans vary greatly—sometimes they include FP and MH benefits and sometimes they do not.

Table 2: Summary description of insurance in Colombia

Insurance Plan	Eligible Population	Family Planning Benefits Covered	Maternal Health Benefits Covered
ISS	People in formal employment situations or with an ability to pay	Yes, Receive services in better government facilities	Yes, Receive services in better government facilities
EPS	People in formal employment situations or with an ability to pay	Yes, Receive services in better government facilities	Yes, Receive services in better government facilities
ARS	All people	Yes, Receive government services	Yes, Receive government services
Private	Anyone who pays	Sometimes, private sector	Sometimes, private sector

IV.B. Use of FP and MH services by insurance plan

In the Colombia Demographic and Health Survey the head of household indicated for each person in the household whether she or he was covered by health insurance, and if so what type of insurance. In Colombia we define insurance coverage by whether or not the head of household responded that the woman had insurance coverage. Appendix 2 reproduces the exact question. ISS, EPS and ARS were the response categories in addition to "other" and "Don't know". Although private health insurance is available in Colombia, the DHS didn't code private insurance as a separate category.

Table 3 shows a summary of service utilization among women who are covered by the various insurance types. The first row of the table shows the distribution of women across the types of insurance. More than 40 percent of the women are not covered by insurance. About 35 percent belong to either EPS or ISS. Twenty-two percent are covered by ARS.

The next section of the table shows the percents of women who use family planning services (among non-pregnant, fecund women). In general there is not large variation in the proportions of women who use modern family planning across the insurance types. The women with ISS and EPS use a modern method of family planning more often than those without insurance, but the difference is not large. Below the row on total modern use, the use is disaggregated into use of supply methods and clinical methods. Once again, there is little difference across the different insurance types.

The final section of the table shows where the women obtain their family planning services. The women with the ARS coverage are more likely to use the public sector than women covered by the other insurance plans (and even the women with no insurance at all). The women with EPS and ISS coverage are most likely to use the private sector. Recall that EPS and ISS coverage entitles women to health services that are better than that which they would normally get in the public sector if they had ARS or no insurance at all. We also note that many Colombians access high quality and inexpensive family services from the NGO Profamilia.

Table 3: Use of Family Planning versus insurance coverage in Colombia, among married women who are fecund and not pregnant

	No Insurance	EPS	ISS	ARS	Other system
% with each type of insurance	37.9	20.9	14.6	22.7	3.8
Family Planning Use					
Not using	12.9	10.2	8.6	10.7	13.6
Traditional	16.1	12.8	11.9	18.0	20.2
Total Modern	71.1	77.0	79.6	71.3	66.2
N=	1899	1049	732	1138	190
Supply (as % of modern use)	42.5	41.4	36.3	31.8	36.8
Clinical (as % of modern use)	57.5	58.6	63.8	68.2	63.2
Source of family planning services (%)					
Govt Hospital	23.94	15.07	19.81	30.57	29
Govt Health Center	8.39	3.06	4.06	10.64	5.66
Mobile Clinic	0.06	0	0	0.33	0
Field Worker	0	0.18	0.13	0	0
Total Public	*32.39*	*18.31*	*24*	*41.54*	*34.66*
Private Hospital	5.26	13.97	7.82	2.99	12.16
EPS/ARS/Cajas	1.38	5.65	6.96	2.49	0.81
Private Doctor	3.35	4.64	2.72	0.85	2.48
Profamilia	21.29	24.31	27.87	23.21	20.3
Pharmacy	34.12	28.51	28.35	27.88	28.67
Other Private	*1.43*	*4.26*	*2.12*	*0.77*	*0.92*
Total Non-Public	66.83	81.34	75.84	58.19	65.34
Don't Know	0.77	0.34	0.17	0.28	0
N=	1323	803	577	791	126

Table 4 describes the use of maternal health services in Colombia. The women with ISS and EPS insurance are more likely to receive prenatal care and to give birth at a health facility. There is a small difference between women with ARS and those who have no insurance at all. Recall that ARS is a subsidized plan that permits use of public services only. The women covered by EPS and ISS are more likely to use private sector services for their prenatal care. The women with EPS coverage are more likely to use private facilities for deliveries. Interestingly however, the women with ISS deliver babies in public sector facilities in about the same rates as the women with ARS insurance.

Table 4: Use of maternal health services at last birth and insurance coverage in Colombia, among married women who have given birth in the last five years

	No Insurance	EPS	ISS	ARS	Other system
Percent with Insurance	39.8	18.3	10.9	27.9	3.2
Number of Prenatal Visits					
Less than 6	44.9	21.3	21.3	47.9	41.4
6 or more	55.1	78.7	78.8	52.1	58.6
Place where last child delivered					
At home	15.5	2.4	2.2	18.0	14.1
In a health facility	*84.5*	*97.6*	*97.9*	*82.0*	*86.0*
Govt Hospital	61.2	42.7	65.9	65.9	55.1
Govt Health Center	8.2	2.6	2.0	7.8	1.7
Total Public	*69.5*	*45.4*	*68.0*	*73.6*	*56.9*
Private Hospital	12.9	48.2	25.0	7.2	28.0
EPS/ARS/Cajas	1.5	3.9	4.9	1.1	1.1
Private Doctor	0.5	0.2	0.0	0.0	0.0
Other	0.1	0.0	0.0	0.2	0.0
Total Non-Public	*15.0*	*52.3*	*29.9*	*8.4*	*29.1*
N=	1436	659	393	1006	117

IV.C. Regression results

Table 5 is the first of six regression results tables that we present (others are Tables 6, 10, 11, 15 and 16). The tables are organized into sections by health coverage type and insurance coverage type. For example, the upper left hand corner of Table 5 is the impact of the EPS/ISS insurance on the use of modern family planning services.

We present the regression results in each section as follows. The first line is the probit regression coefficient of a particular insurance coverage on the use of the indicated health services. The level of statistical significance is indicated by the asterisks. No asterisk indicates that the level of significance did not reach $p<.10$. The second line indicates which of the two estimation techniques we chose to present[14]. The third line is the probability of using the health service for an average person[15]. The fourth line is the probability of using the health service for a person

[14] Please refer to the Data and Methods section of the report for more information on the regression techniques and criteria for choice between them. Appendix Table 4 presents the coefficients of both the simple probit and the simultaneous estimations. The results of the entire set of regressions, including the coefficients on the other independent variables are available from the authors.

[15] I.e., evaluating the regression equation at the mean of the variables that were included in the regression estimate.

who is average in every way except that the person does not have insurance coverage for the indicated insurance type. The fifth line is the probability of using the health service for a person who is average in every way except that the person has coverage for the indicated insurance type. Finally the sixth line is the difference between the probabilities of the average person with insurance and the average person without insurance. We interpret this as the marginal increase in probability in utilization that comes with being covered by the insurance type.

In the top half of Table 5 we look at the effect of EPS or ISS insurance on the use of family planning in Colombia. The first column shows the results of the regression on use of modern FP services. The marginal effect of being covered by the EPS or ISS insurance is a reduction in the probability of using a modern method of family planning by .24. This is counter to expectations. We would have expected either an increased probability of using family planning or no impact at all. In the summary section we speculate on the cause for this result.

In the second column of the upper half of the table is an estimation of the effect of EPS or ISS insurance on the use of a clinical method of family planning versus the use of a resupply method of family planning. After correcting for a significant level of simultaneity, coverage with the EPS or ISS insurance reduces the probability of using the clinical method, coincidentally by .24 again.

The bottom half of this table contains results relative to the ARS insurance plan. The ARS plan is a subsidized plan targeted to low income families. Looking at the second column, we see that being covered by ARS has no effect on modern family planning use. In the second column we see that being covered by ARS significantly increases the probability of using a clinical method versus a resupply method by .21.

Table 5: Effect of insurance on modern family planning use: Married, fecund, non-pregnant women in Colombia

		Use of modern method among fecund, non-pregnant women	Use of clinical method among women using a modern method of family planning
		Simple probit Simultaneous estimation	Simultaneous estimation
EPS or ISS	Regression coefficient	-.761***	-.807**
	Result presented	Simultaneous	Simultaneous
	Mean	0.69	0.60
	mean (ins=0)	0.77	0.69
	mean (ins=1)	0.53	0.45
Difference or marginal increase in probability due to coverage		**-0.24**	**-0.24**
ARS	Regression coefficient	.043	.789***
	Result presented	Simple Probit	Simultaneous
	mean	0.71	0.61
	mean (ins=0)	0.71	0.56
	mean (ins=1)	0.72	0.77
Difference or marginal increase in probability due to coverage		**0.01**	**0.21**

*indicates significance at p<.10
**indicates significance at p<.05
***indicates significance at p<.01

Coefficients and simulations for both simultaneous estimations and simple probit in Appendix Table 4.

Table 6 shows the results of our regressions of insurance coverage on use of maternal health services in Colombia. The simple probit equations estimate that having the EPS or ISS insurance increases the probability of using prenatal care or delivering in a medical facility by .14 and .09 respectively. These results are significant at p<.01.

The ARS insurance appears to have no effect on use of prenatal care in our equations. However it has a very strong effect on the probability of delivering in a medical facility – increasing by .28 in the preferred equation.

Table 6: Effect of insurance on use of maternal health services: Married women who gave birth in the last five years, Colombia

		Use of prenatal care for the most recent birth among women who have been pregnant in the last five years	Gave birth in a medical facility at the last birth among women who have had a birth in the last five years
EPS or ISS	Regression coefficient	.414***	.663***
	Result presented	Simple Probit	Simultaneous
	mean	0.63	0.87
	mean (ins=0)	0.59	0.85
	mean (ins=1)	0.73	0.94
Difference or marginal increase in probability due to coverage		**0.14**	**0.09**
ARS	Regression coefficient	.065	1.490***
	Result presented	Simple Probit	Simultaneous
	mean	0.63	0.77
	mean (ins=0)	0.62	0.66
	mean (ins=1)	0.64	0.95
Difference or marginal increase in probability due to coverage		**0.02**	**0.28**

*indicates significance at p<.10
**indicates significance at p<.05
***indicates significance at p<.01
Coefficients and simulations for both simultaneous estimations and simple probit in Appendix Table 5.

V. Dominican Republic

IV.A. Dominican Republic insurance plans

Prior to 2001, "social insurance" in the Dominican Republic was a fragmented practice. There were the basic government services which provided prenatal care and deliveries, newborn care, family planning, gynecological services and prevention and treatment of STDs. However, in addition to these basic government provided services, other types of coverage were available with varying types of coverage.

The Instituto Dominicano de Seguros Sociales (IDSS) plan was a narrow and exclusive mechanism serving workers earning less than the equivalent of $80 a month. The plan was funded by an employer payroll tax and received some funding from the government of the DR. The plan was initially designed for low-wage rural workers in the sugar industry. Later, the plan included workers in the off-shore manufacturing industry and low level service workers. The IDSS plan's coverage never exceeded a significant percentage of the Dominican population and quality was not very good. There were long waiting times, stock outs of drugs and other supplies, and questionable professional practices. This is why many firms purchased private insurance to bypass IDSS (mandatory) services to make sure workers were back at work as soon as possible. This represents a double expenditure to firms, as they must pay into IDSS (mandatory) and private insurance.

A second plan available to military personnel and their families is ISSFAPOL. This plan was funded directly by the government of the DR.

In addition to the basic government plan, insurance through employers is available. As mentioned above, although employers are required to contribute through to a payroll tax, the employers still consider it efficient to develop plans with a private insurance company. The benefits package is the result of a negotiation between the employer and the insurance company. The private insurance plans and clinics are open to anyone willing and able to pay the premium. These plans usually cover deliveries and prenatal care, but not family planning.

Table 7: Summary description of insurance in The Dominican Republic

Insurance Plan	Eligible Population	Family Planning Benefits Covered	Maternal Health Benefits Covered
IDSS	Everyone	Services are the same as MOH but there is better infrastructure and trained staff. However there are long waiting times.	Services are the same as MOH but there is better infrastructure and trained staff. However there are long waiting times.
ISSFAPOL[16]	Military and their dependents	Same as MOH however the staff and infrastructure is better.	Same as MOH however the staff and infrastructure is better.
Employee & Professional insurance	People in formal economy	Same as MOH but specific benefits are negotiated in the package with the insurers. Drugs are often excluded but there is a shorter waiting time, freedom of choice for providers and personalized care.	Same as MOH but specific benefits are negotiated in the package with the insurers. Drugs are often excluded but there is a shorter waiting time, freedom of choice for providers and personalized care.
Private insurance	Anyone who can pay	Negotiated package to package, however services are private when offered. Drugs are often excluded but there is a shorter waiting time, freedom of choice for providers and personalized care.	Negotiated package to package, however services are private when offered. Drugs are often excluded but there is a shorter waiting time, freedom of choice for providers and personalized care.

[16] ISSFAPOL split up two years ago into ISSFA and ISSPOL. That is a plan for the Armed Forces and a separate one for the police forces. Each now operates separately now with different sources of funding, different facilities, different coverage, but essentially the same mix of services. In both cases, RH services are offered to both female service personnel and their dependents which make up the majority of beneficiaries and active users.

V.B. Use of FP and MH services by insurance plan

For the Dominican Republic, a sub sample of the total DHS sample was queried about their health status, heath care seeking behavior and health expenditures. In the household expenditures section, the household head identified all household members who were covered by an insurance plan, as well as the plan that covered them. We assigned insurance coverage status to the women by merging the household level question on insurance into the woman's data file. Although several women were identified as being covered by private insurance, the sample size was considered too small for analysis. The women with private insurance coverage have therefore been lumped together with those who have employer provided or professional insurance.

Table 8 presents use of family planning disaggregated by the insurance coverage of the women. Women with private insurance, professional insurance or employer provided insurance use a modern method of family planning most often. The women with ISSFAPOL and IDSS are a little less likely than the women without insurance coverage to use family planning. Amongst modern family planning users, the women with ISSFAPOL are the least likely to use a clinical method. This may be due to the relatively young age of people in the military.

The women covered by the employer provided or professional insurance are more likely to use the private sector, in particular private physicians and pharmacists, for their family planning services. Recall that women covered by the employee and professional plans may have access to better private services. The women covered by ISSFAPOL are also quite likely to go to pharmacies.

Table 8: Use of Family Planning versus insurance coverage in the Dominican Republic, married fecund women who are not pregnant

	No Insurance	**IDSS**	**ISSFAPOL**	**Private, Employer provided or professional Insurance**
% with each type of insurance	61.9	10.8	3.2	24.1
Family Planning Use				
Not using	22.4	27.6	23.2	20.0
Traditional	6.6	7.9	13.5	5.5
Total Modern	71.0	64.5	63.3	74.5
N=	1218	212	63	474
Re-Supply (as % of modern use)	22.7	27.5	40.8	25.9
Clinical (as % of modern use)	77.3	72.5	59.2	74.1
Source of family planning services				
(SESPAS): Hosp /clin/dis	35.82	30.69	23.8	19.83
(IDSS): hosp /clin/disp	1.77	9.5	2.39	1.76

(CEA) :Clinic /disp cea	0	0.24	5.13	0
FFAA:Hosp /clin/disp	0.47	1.51	0.8	0
SESPAS: comm worker	0.47	0	0.8	0.12
CEA: comm worker	0.07	0	0	0
Total Public	*38.6*	*41.94*	*32.92*	*21.71*
Clinic Profamilia	3.98	3.67	4.06	3.89
Clinic Assoc Profiami	8.66	6.27	5.34	5.33
Consult. Adoplafam	0.3	0.48	0	0
Clin /Office Priv doc	31.23	25.68	20.47	43.5
Profamil Comm worker	1.58	0.54	4.29	2.91
Comm worker adoplafa	0.31	0	0	0
Supermarket, shop	0.04	0	0	0
Pharmacy	14.04	18.71	32.93	20.8
Barber shop /beauty p	0.46	0	0	0.58
Other	0.75	2.71	0	1.28
Total Non-public	*61.35*	*58.06*	*67.09*	*78.29*
Dk	0.04	0	0	0
N=	869	136	40	357

- Public Health & Social Assistance Council (SESPAS); Institute of Social Insurance (IDSS); State Sugar Council (CEA); Armed Forces (FFAA); Profamilia and Adoplafa are family planning NGOs.

Table 9 shows the use of maternal health services disaggregated by the insurance coverage. Virtually everyone, even those without insurance, in the Dominican Republic delivers their baby in a health facility. However, the women with the employer based or professional insurance coverage are more likely to delivery their babies in a private hospital. Women with IDSS or one of the private funded insurances receive more prenatal care than either the women with no insurance or those covered by ISSFAPOL.

Table 9: Use of maternal health services at last birth versus insurance coverage in the Dominican Republic, married women who have given birth in the last five years

	No Insurance	**IDSS**	**ISSFAPOL**	**Private, Employer provided or professional Insurance**
Percent with Insurance	63.2	13.0	3.0	20.8
Number of Prenatal Visits				
Less than 6	30.8	23.1	32.1	15.6
6 or more	69.3	76.9	67.9	84.4
Place where last child delivered				
At home	3.7	2.1	0.0	1.7
In a health facility				
Govt. hospital	72.8	68.4	67.4	44.6

Govt. health center	2.7	6.1	5.8	0.8
Govt. health post	0.3	0.0	4.4	0.0
Govt. rural clinic	0.4	0.0	2.8	0.1
Total Public facility	*79.8*	*76.6*	*80.4*	*47.2*
Private hosp /clinic	19.9	22.1	19.6	52.2
other	0.3	1.3	0.0	0.6
N=	959	197	46	315

V.C. Regression results

Table 10 shows the regression results of insurance coverage on family planning use in the Dominican Republic. As a quick reminder, the IDSS system "offers" access to public services that the population is entitled to in any case. The employer based and professional insurances offer access to services that are nominally better. A quick look at the table shows that none of the relevant regression coefficients were statistically significant and the predicted marginal changes in probabilities of use are correspondingly small.

Table 10: Effect of insurance on modern family planning use: Married, fecund, non-pregnant women in the Dominican Republic

		Use of modern method among fecund, non-pregnant women	Use of clinical method among women using a modern method of family planning
IDSS	Regression coefficient	-.030	-.260
	Result presented	Simple Probit	Simple Probit
	mean	0.71	0.77
	mean (ins=0)	0.71	0.78
	mean (ins=1)	0.70	0.73
Difference or marginal increase in probability due to coverage		**-0.01**	**-0.04**
Employer Provided or Professional	Regression coefficient	.089	.174
	Result presented	Simple Probit	Simple Probit
	mean	0.71	0.77
	mean (ins=0)	0.71	0.77
	mean (ins=1)	0.73	0.79
Difference or marginal increase in probability due to coverage		**0.02**	**0.03**

*indicates significance at p<.10
**indicates significance at p<.05
***indicates significance at p<.01
Coefficients and simulations for both simultaneous estimations and simple probit in Appendix Table 6.

Table 11 shows the effect of coverage by insurance in the Dominican Republic on the use of prenatal care. Since there is near universal delivery at health facilities we did not run regressions on birth delivery services. None of the estimations yielded a significant regression coefficient on the insurance coverage variables.

Table 11: Effect of insurance on use of maternal health services: Married women who gave birth within the last five years, Dominican Republic

		Use of prenatal care for the most recent birth among women who have been pregnant in the last five years
IDSS	Regression coefficient	.000
	Result presented	Simple Probit
	mean	0.69
	mean (ins=0)	0.69
	mean (ins=1)	0.69
Difference or marginal increase in probability due to coverage		**0.00**
Employer provided or professional	Regression coefficient	-.102
	Result presented	Simple Probit
	mean	0.69
	mean (ins=0)	0.69
	mean (ins=1)	0.66
Difference or marginal increase in probability due to coverage		**-0.03**
*indicates significance at p<.10 **indicates significance at p<.05 ***indicates significance at p<.01 Coefficients and simulations for both simultaneous estimations and simple probit in Appendix Table 7.		

VI. Turkey

VI.A. Turkish insurance plans

Turkey has five main institutions responsible for the provision of health services. These institutions are the Ministry of Health (MOH), the Social Insurance Organization (SIO), the University system, the Ministry of Defense, and private sector facilities. Although the majority of Turkish people (74.6%) are covered by social security schemes, out of pocket payments still form a significant share (30%) of health care expenditures (Kisa 2001).

The constitution of Turkey provides for universal and free basic health care for all. Basic health care is defined to include FP and MH services among other services. Therefore, any insurance plan described below that allows for access to government health services, also allows access to basic FP and MH services.

In general, there are five major branches to the Turkish health insurance system. The first branch is the Emekly sandigi scheme which was introduced to provide civil servants and their dependents with free health services mainly via the MOH and the university facilities. Expenses are covered through their department's budgetary allowances (Tatar 1997).

A second major branch of the health insurance system is the SIO. The SIO (known as SSK in Turkey) is a social security organization for private sector employees and white-collar public

workers. It functions as both an insurer and health care provider for its beneficiaries (Kisa 2001) The SSK provides mainly curative services through the operation of its own facilities. Its main sources of finance are health insurance premia collected from employers and employees (Tatar 1997). The SSK provides adequate maternal health care but family planning services are limited (Sine 2003).

A third major branch of the Turkish health insurance system is the Social Security Institution of Craftsmen, and Other Tradesmen and other Self-Employed Private Funds also referred to as Bag-Kur. The Bag-Kur was established in 1972 to provide social security to the self-employed. In theory, the scheme was developed to provide coverage to any person not covered by the other major health insurance mechanisms (Tatar 1997). The Bag-Kur essentially provides members with access to public sector facilities and is financed by a premium charged to the user.

The fourth major branch of the health care system in Turkey is the Green Card scheme. The Green Card system covers the indigent and otherwise uninsured population -- primarily the rural and urban poor. People covered under this system have to pay their premia directly out of their pockets unless they can produce proof of their inability to pay, in which case the services are provided free of charge. This system provides access to public sector facilities free of charge.

The fifth major branch of the health care system in Turkey is the private commercial insurance sector. This sector covers less than 2% of the population -- primarily elite Turks. Eligible family planning and maternal health services vary by plan, but do not usually cover family planning (Sine 2003).

Government health services in Turkey are not adequately funded. Therefore all individuals accessing the public sector are asked to make a voluntary donation to ensure continuity of services. The donations are managed by the Health and Social Aid Foundation which is chaired by Ministry Officials. The donations are requested regardless of the type of insurance a person holds.

Table 12: Summary description of insurance in Turkey

Insurance Plan	Eligible Population	Family Planning Benefits Covered	Maternal Health Benefits Covered
Emekly sandigi	Civil Servants	Yes, through the government facilities	Yes, through the government facilities
SSK	Private sector employees	Yes, through special facilities	Yes, through special facilities
Bag Kur	Craftsment and artisans	Yes, through the government facilities	Yes, through the government facilities
Green Card	Indigent	Yes, through the government facilities	Yes, through the government facilities
Private	Whoever can pay	Depends on the policy and benefits package	Depends on the policy and benefits package

VI.B. Use of FP and MH services by insurance type

Table 13 presents the use of family planning disaggregated by insurance coverage for Turkey. First we note that only about 57 percent of women cited an insurance plan under which they are covered. This contrasts with the figure of 74 percent that we cite above. We can only speculate,

but we believe that there are many women who are either covered by their husbands' plans and are unaware; or that they are eligible and have not availed of the coverage. The SSK insurance is the most common insurance policy followed by the Emekly Sandigi and Bag Kur. Private insurance and the green card system cover only about five percent of women.

Women with no insurance or the Green Card are the least likely to use modern family planning. However, we note that these are also the women most likely to be poor and uneducated. The women with private insurance are the most likely to use family planning – in spite of the fact that the insurance is not likely to cover family planning. The modern method users with private insurance are also the most likely to use a clinical method of family planning.

The modern family planning users covered by private insurance are the most likely to use the private sector, while those without insurance are the least likely. Although the women covered by the SSK plan are most likely to use the SSK service, only about fourteen percent of the women use those facilities for family planning.

Table 13: Use of Family Planning versus insurance coverage in Turkey, fecund married women who are not currently pregnant

	No Insurance	SSK	EMEKLY SANDIGI	Bag Kur	Private Insurance	Green Card
% with each type of insurance	43.1	30.9	11.3	8.5	1.2	3.8
Family Planning Use						
Not using	28.9	15.3	13.1	15.0	6.1	25.9
Traditional	31.8	34.0	31.2	30.1	23.2	37.4
Total Modern	39.4	50.8	55.8	55.0	70.8	36.6
N=	2018	1448	529	397	54	177
Supply (as % of modern use)	35.3	36.1	38.4	33.8	50.8	33.5
Clinical (as % of modern use)	64.7	63.9	61.6	66.3	49.2	66.5
Source of family planning services						
Government /sample ho	12.6	9.13	14.96	13.14	5.78	16.03
Maternity house	5.78	5.61	6.78	7.22	3.48	10.08
MCH/FP centre	7.64	8.03	7.68	6.2	0	12.17
Health centre	30.51	19.04	16.66	23.87	12.53	33.28
Health house	0.13	0.04	0	0	0	0.5
SSK hospital /dispens	2.88	13.51	1.52	1.22	0	1.67
University hospital	0.23	0.92	3.67	0	3.48	0
Other public	0.25	0.31	0	0	0	0
Total Public	*60.02*	*56.59*	*51.27*	*51.65*	*25.27*	*73.73*
Private hospital	3.21	4.37	2.42	4.21	1.07	0
Private polyclinic	2.3	0.96	0	1.29	2.55	0
Private doctor	11.23	9.77	13.51	18.66	23.78	3.84
Private nurse /midwif	0.2	0.55	0.21	1.87	0	1.5
Pharmacy	21.76	26.77	31.41	21.95	33.21	20.92

Other private	0.12	0	0	0	0	0
Market /shop	0	0.28	0.69	0	10.64	0
Friend /relative/neig	0.21	0.18	0	0	0	0
Trad. Midwife	0.16	0.23	0	0	0	0
Community volunteers	0	0.08	0	0	0	0
Total Non Public	*39.19*	*43.19*	*48.24*	*47.98*	*71.25*	*26.26*
Other	0.8	0.21	0.5	0.38	3.48	0
N=	783	731	294	215	38	64

Table 14 presents maternal health services utilization disaggregated by the insurance coverage. The women covered by insurance (except the Green Card) are much more likely to have four or more prenatal care visits and to delivery their child in a health facility. The women with the private insurance are most likely to deliver their baby in a private facility. In contrast with the results for the family planning services, the women covered by SSK are quite likely to deliver their babies in the special services offered by SSK.

Table 14: Use of maternal health services at last birth versus insurance coverage in Turkey, married women who have given birth in the last five years

	No Insurance	**SSK**	**EMEKLY SANDIGI**	**Bag Kur**	**Private Insurance**	**Green Card**
Percent with Insurance	50.5	27.3	8.5	6.4	0.7	5.4
Number of Prenatal Visits						
Less than 4	67.4	39.4	26.0	30.3	13.5	67.6
4 or more	32.6	60.6	74.0	69.7	86.5	32.4
Place where last child delivered						
At home	33.3	10.2	6.7	17.5	3.5	26.9
In a health facility						
Govt. hospital	36.0	25.8	50.9	38.6	44.2	38.3
Health center	2.9	1.1	2.0	1.1	7.1	3.1
Health house	0.0	0.0	0.0	0.0	0.0	0.7
Maternity house	12.4	10.6	22.7	20.8	0.0	22.5
MCH/FP center	0.1	0.0	0.0	0.0	0.0	1.0
SSK hospital /dispens	4.6	40.0	0.8	5.3	0.0	1.4
University hospital	0.7	2.2	9.8	2.4	3.2	2.1
Other public sector	0.1	0.1	0.7	0.0	0.0	0.0
Total Public Facility	*56.8*	*79.8*	*87.0*	*68.2*	*54.5*	*69.1*
Private hospital	6.4	8.7	4.6	12.2	22.2	0.4
Private polyclinic	1.7	0.4	0.0	0.4	10.9	0.5

Private doctor	1.0	0.5	1.4	0.5	3.8	2.6
Private nurse /midwif	0.5	0.3	0.0	0.8	0.0	0.0
Other private medica	0.1	0.0	0.0	0.0	5.2	0.0
Other	0.4	0.0	0.3	0.3	0.0	0.4
Total non-public	*10.0*	*10.0*	*6.3*	*14.3*	*42.1*	*4.0*
N=	1346	725	228	170	19	145

VI.C. Regression results

Table 15 shows the results of the family planning regressions run on the data for Turkey. For women covered by Emekly Sandigi, SSK or a private insurance there is a statistically significant impact of insurance on the use of a modern family planning method. For Emekly Sandigi and SSK the impact is numerically relatively small. For the private insurance, the marginal impact is estimated at more than 20 percent. Only the Emekly Sandigi insurance plan had a statistically significant impact on the use of a clinical method versus a resupply method of family planning.

Table 15: Effect of insurance on modern family planning use: Married, fecund, non-pregnant women in Turkey

		Use of modern method among fecund, non-pregnant women	Use of clinical method among women using a modern method of family planning
Emekly sandigi	Regression coefficient	0.144*	.650**
	Rho	Simple Probit	Simultaneous
	Mean	0.459	0.641
	Mean (ins=0)	0.452	0.608
	Mean (ins=1)	0.503	0.807
Difference or marginal increase in probability due to coverage		**0.051**	**0.199**
SSK	Regression coefficient	0.150***	0.049
	Rho	Simple Probit	Simple Probit
	Mean	0.459	0.643
	Mean (ins=0)	0.442	0.637
	Mean (ins=1)	0.496	0.655
Difference or marginal increase in probability due to coverage		**0.053**	**0.017**
Bag Kur or Green Card	Regression coefficient	0.110	0.049
	Rho	Simple Probit	Simple Probit
	Mean	0.459	0.643
	Mean (ins=0)	0.454	0.641
	Mean (ins=1)	0.492	0.658
Difference or marginal increase in probability due to coverage		**0.039**	**0.017**
Private Insurance	Regression coefficient	0.583***	-0.218
	Rho	Simple Probit	Simple Probit
	Mean	0.459	0.643
	Mean (ins=0)	0.456	0.644
	Mean (ins=1)	0.657	0.564
Difference or marginal increase in probability due to coverage		**0.201**	**-0.080**

*indicates significance at p<.10
**indicates significance at p<.05
***indicates significance at p<.01
Coefficients and simulations for both simultaneous estimations and simple probit in Appendix Table 8.

Table 16 shows the effect of having insurance coverage on the use of maternal health services in Turkey. All four of the insurance types have a significant effect on the use of prenatal care. Quantitatively the marginal impacts range from a little more than 8 percent to more than 26 percent for the private insurance. Each of the insurance coverage types has a significant influence on giving birth in a medical facility. The estimated marginal impacts range from a relatively small amount for the Bag Kur/Green card to more than 17 percent for Emekly Sandigi and private insurance.

Table 16: Effect of insurance on use of maternal health services: Married women who gave birth in the last five years, Turkey

		Use of prenatal care for the most recent birth among women who have been pregnant in the last five years	Gave birth in a medical facility at the last birth among women who have had a birth in the last five years
Emekly sandigi	Regression coefficient	.282**	.888***
	Rho	Simple Probit	Simultaneous
	Mean	0.439	0.747
	Mean (ins=0)	0.432	0.736
	Mean (ins=1)	0.516	0.912
Difference or marginal increase in probability due to coverage		**0.084**	**0.176**
SSK	Regression coefficient	.283***	.446***
	Rho	Simple Probit	Simple Probit
	Mean	0.439	0.752
	Mean (ins=0)	0.415	0.728
	Mean (ins=1)	0.499	0.833
Difference or marginal increase in probability due to coverage		**0.084**	**0.105**
Bag Kur or Green Card	Regression coefficient	.442***	.177*
	Rho	Simple Probit	Simple Probit
	mean	0.439	0.752
	mean (ins=0)	0.422	0.747
	mean (ins=1)	0.553	0.789
Difference or marginal increase in probability due to coverage		**0.131**	**0.042**
Private Insurance	Regression coefficient	.918***	.950**
	Rho	Simple Probit	Simple Probit
	mean	0.439	0.752
	mean (ins=0)	0.437	0.751
	mean (ins=1)	0.703	0.924
Difference or marginal increase in probability due to coverage		**0.265**	**0.172**

*indicates significance at p<.10
**indicates significance at p<.05
***indicates significance at p<.01
Coefficients and simulations for both simultaneous estimations and simple probit in Appendix Table 9.

VI. Summary and Conclusions

Table 17 quickly summarizes the results presented in this report. The first three columns present results relative to family planning. The second three columns present results relative to prenatal care. We do not present results relative to delivery services to keep the table small enough for easy comparisons. Furthermore, in Colombia and the Dominican Republic the vast majority of women give births in facilities. Within each of the two sets of three columns are the following:

- A quick summary of the services covered by the insurance;
- An assessment of whether the women with insurance use the services more often than those without insurance;
- A summary of whether the regression results predicts greater use of the services with insurance or not. Please note that when we say "no impact", it would probably be better to say: "we found no statistically significant positive or negative result in our sample".

The first thing that we note is that in general women with insurance use family planning services more often than women who do not have insurance. A potential exception to this is in the Dominican Republic where women with employer provided or professional insurance use clinical family planning services less than those without insurance.

However, as we noted above, the simple cross-tabulations can be misleading. We note in the regression results that insurance coverage has a mixed effect on the use of modern family planning services after controlling for confounding variables. In Colombia and the DR, insurance coverage either has no impact or a counterintuitive negative effect (in the case of the EPS/ISS insurance). In Turkey, the insurances targeted toward formal sector employees have a positive effect on the use of modern family planning. The Bag Kur and Green Card insurances, which offer little more than access to public facilities, do not have an effect.

Although it may sound counterintuitive, decreased use of family planning may logically follow from a plan that includes comprehensive reproductive health services. Improved family planning services probably go hand in hand with improved services in other areas including maternal health. If women are self-selecting into insurance plans based on their immediate medical needs, the prenatal care and birth delivery services may be a bigger immediate attraction than the family planning services. For example, if a woman is pregnant or planning to become pregnant soon, the insurance plan will look good for its maternal health policy (relative to family planning). To the extent that maternal health services are more expensive than family planning services, the insurance type could differentially attract the women seeking maternal health services. In fact, looking at the sixth column, we see that the regression equation for the EPS/ISS insurance shows a greater likelihood of using adequate prenatal care.

In two cases, insurance seems to effect an increased use of clinical family planning services relative to resupply methods. In one case, it appears to cause a decrease. As mentioned above, coverage of family planning by an insurance plan may not be sufficient to cause an increase in family planning use and that in fact it may go hand in hand with improvements in maternal health services. One area where "improved" maternal health services may lead directly to greater use of

clinical family planning methods is the practice of tubal ligation following a potentially unnecessary caesarian section.

Finally looking at the prenatal care columns of the table, we see that the regression equations predict an increase in use of adequate prenatal care in five of eight cases. In the other three there is a prediction of no impact.

Another way of looking at Table 17 is across the rows instead down the columns. In the DR the regression equations never yielded a statistically significant effect. For a middle income country, the government-run public health system delivers services relatively well (e.g., most all births are in health facilities) and most women receive many prenatal care visits. Also, the various insurance schemes, especially the social security, seem to offer little more than access to government health facilities that are otherwise freely available.

Again, looking across the rows, two publicly organized insurance plans offer better RH services than are normally available through the government[17]: EPS/ISS in Colombia and SSK in Turkey. In both of these insurances, there is a statistically significant effect on use of prenatal care. There are also statistically significant effects on the use of modern FP (albeit negative in the case of EPS/ISS, about which we speculated above).

In Turkey, we noted above that quality of services in public facilities is often spotty and that donations are encouraged. Even though belonging to an insurance plan may entitle the covered women to little more than access to the usual government services, it may still be an inducement to insisting upon more comprehensive services.

Table 17: Summary of results: services covered, service utilization and regression results

	Family Planning Services			Prenatal Care		
	Services covered	Use of service (relative to those without insurance)	Regression Prediction	Services covered	More use (relative to those without insurance)	Regression Prediction
Colombia						
EPS/ISS	Yes	Clinical more	FP: negative Clinical: negative	Yes	Yes	Positive
ARS	Yes	Clinical more, supply less	FP: No Impact Clinical: positive	Yes	No	No Impact
Dominican Republic						
Social Security	Yes	Supply more, clinical less	No Impact	Yes	No	No Impact
Employer, Professional	Yes	Supply more, clinical less	No Impact	Yes	Yes	No Impact
Turkey						
SSK	Yes but limited	Supply more, clinical more	FP: positive Clinical: positive	Yes, special facilities	Yes	Positive
Emekly sandigi	Yes	Supply more, clinical more	FP: positive Clinical: No Impact	Yes	Yes	Positive
Bag Kur, Green Card	Yes	Supply more, clinical more	FP: No Impact Clinical No Impact	Yes	Yes	Positive

[17] Note that the facilities are run by the government through a two-tier system where those covered by the specified insurance get better services.

Private	No	Supply more, clinical more	FP: Positive Clinical: No Impact	Yes	Yes	Positive

Although not covered in the summary table above, we saw that people with special insurance plans often use the private sector more often than the public sector. In Colombia, the women with EPS insurance were more likely to use private facilities. In the DR women with the employer/professional insurances were more likely to use private facilities. And again in Turkey, the women with private insurance were more likely to use private facilities.

In studies of this kind -- cross national with individually complicated health system environments -- it is difficult to draw general conclusions. In addition to the thorny econometric issues, which are not completely resolved here, there is also the issue that we did not travel to the countries involved to observe first hand how the insurance plans are implemented. Also, we were limited primarily to insurance schemes offered through the governments at the national level. We did not know the content of individual private insurance plans and we did not examine any community insurance plans. Given these caveats we think a couple of provisional conclusions can be made:

In our set of countries, having insurance or not, yields mixed results concerning the use of modern family planning services. We found positive results for the insurance plans offered to formal sector employees in Turkey. All other insurance plans showed either counterintuitive results or no result at all. On the other hand, promoting insurance is probably a good way to encourage expanded use of prenatal care. In five of eight cases we found a significant increase in the probability of prenatal care use for people who had insurance. Finally, insurance plans that offer access to improved services seem to have more effect than those that do not.

References

Akin, John S. and J. Brad Schwartz. 1988. “The Effect of Economic Factors on Contraceptive Choice in Jamaica and Thailand: A Comparison of Mixed Multinomial Logit Results”. Economic Development and Cultural Change, pp. 503-527.

Alkenbrack, Sarah. March 2002. “The Effects of Health Insurance on Patterns of Reproductive Health Service Utilization.” Commercial Market Strategies Project. Washington, DC.

Bachmann, Max. “Would national health insurance improve equity and efficiency of health care in South Africa? Lessons from Asia and Latin America.” South African Medical Journal 84 (1994): 153-7.

Bollen, Kenneth, David Guilkey and Thomas Mroz. 1995. "Binary outcomes and endogenous explanatory variables: tests and solutions with an application to the demand for contraceptive use in Tunisia." Demography, Vol 32, No. 1, pp. 111-131.

Bound, John, David Jaeger and Regina Baker. 1995. "Problems with instrumental variables estimation when the correlation between the instruments and the endogenous variable is weak." Journal of the American Statistical Association, Vol. 90, No. 430. pp. 443-450.

Cai, Wen-Wei et al. ”Increased Cesarean Section Rates and Emerging Patterns of Health Insurance in Shanghai, China.” American Journal of Public Health 88, 5 (1998): 777-80.

Celik, Y. Hotchkiss, DR. 2000. “The socio-economic determinants of maternal health care utilization in Turkey.” Social Science and Medicine50: 1797-1806.

Chen LM, Wen SW, Li CY. 2001. “The impact of National Health Insurance on the utilization of health care services by pregnant women: the case of Taiwan. Maternal and Child Health Journal. 5(1):35-42.

Cheng,Shou-Hsia, Tung-Liang Chiang. “The effect of Universal Health Insurance on Health Care Utilization in Taiwan: Results from a Natural Experiment.” Journal of the American Medical Association 278, 2 (1997): 89-93.

Dominican Republic. Centro de Estudios Sociales y Demograficos [CESDEM]; Asociacion Dominicana Pro Bienestar de la Familia [PROFAMILIA]; Dominican Republic. Oficina Nacional de Planificacion [ONAPLAN]; Macro International. Demographic and Health Surveys [DHS]. [Demographic and Health Survey, 1996] Encuesta Demografica y de Salud, 1996. Santo Domingo, Dominican Republic, Centro de Estudios Sociales y Demograficos [CESDEM], 1997

Eichler, Rena. “The Emergence of Managed Competition: Early Evidence from Colombia.” Agency for Health Care Policy and Research. October 1996.

Eklund, Per, Knut Stavem. August 1990. “Prepaid financing of primary health care in Guinea-Bissau: An assessment of 18 village health posts.” The World Bank.

Even, Williams E. 1988. "Testing endogeneity in a probit model." Economic Letters, Vol. 26, pp. 125-128.

Feeley Richard. The role for insurance mechanisms in improving access to private sector primary and reproductive health care. Technical advisory group meeting, September 12, 2000. Washington, D.C., Deloitte Touche Tohmatsu, Commercial Market Strategies, 2000 Nov 22.

Foreit, Karen G., Delia Haustein, Max Winterhalter and Ernesto La Mata. 1991. “Costs and benefits of implementing family planning services at a private mining company in Peru” International Family Planning Persectives, Volume 17, Number 3, pp. 91-95.

Gertler, Paul, Luis Locay, Warren Sanderson, Avi Dor, and Jacques van der Gaag. 1988. Health Care Financing and the Demand for Medical Care. Living Standards Measurement Study Working Paper No. 37. Washington, D.C.: The World Bank.

Gonalez Rosetti, Alejandra. 2002. “Social Health Insurance in Latin America.” Department for International Development, United Kingdom. Health Insurance Literature Review.

Hacettepe Universitesi. Nufus Etutleri Enstitusu; Macro International. MEASURE DHS+. Turkish Demographic and Health Survey, 1998. Ankara, Turkey, Hacettepe Universitesi, Nufus Etutleri Enstitusu, 1999

Heckman, James. 1978. "Dummy Endogenous variables in a simultaneous equation system." Econometrica, Vol. 46, No. 6.

Heckman, James. 1979. "Sample selection bias as a specification error." Econometrica, Vol. 47, pp. 153-161.

Hotchkiss, David R., et al. DATE? “The influence of MCH service utilization and access to private sector family planning services on subsequent contraceptive use: A multi-country study.” Commercial Market Strategies Project. Washington, D.C.

Jack, William. February 2000. “The evolution of health insurance institutions: Theory and Four Examples from Latin America.” The World Bank.

Jensen, Eric, Neeraj Kak, Kusnadi Satjawinata, Dewa Nyoman Wirawan, Nelly Nangoy and Suproyoko. 1994. "Contraceptive pricing and prevalence: family planning self-sufficiency in Indonesia". International Journal of Health Planning and Management 9, no. 4 (1994), 349-359.

JSA Healthcare Corporation. March 1991. Facilitating corporate investments in family planning and maternal child health services: the TIPPS experience. USAID contract NO. DPE-3035-C-00-5047-00.

Kisa, Adnan. “The Turkish Commercial Health Insurance Industry” Journal of Medical Systems. 25, 4 (2001):233-9.

Kutzin, Joseph, and Howard Barnum. “How health insurance affects the delivery of health care in developing countries.” February 1992. The World Bank.

Lambert A, Favin MN, Jaramillo VM, Zavala J. 1994. Evaluation of USAID/Peru Project: Private commercial family planning project. .

Maceira, Daniel. January 2000. “Financing of the Expanded Program on Immunization in Colombia: Impact of Reform and Decentralization.” Partnerships for Health Reform Project: Washington, D.C.

Maddala GS. Limited-dependent and qualitative variables in econometrics. Cambridge, England, Cambridge University Press, 1983.

Manning, Willard G., Joseph P. Newhouse, Naihua Duan, Emmett Keeler, Arleen Leibowitz and Susan Marquis. “Health Insurance and the Demand for Medical Care: Evidence from a Randomized Experiment.” The American Economic Review, Spring (1987): 251-73.

Muguetio, Patricio. January 2004. Personal communication.

Murray, Nancy, William Winfrey, Charlotte Colvin and Christine Stevens. 2001. “Will Youth Be Negatively Affected by User Fees for Reproductive Health Products or Services”. Focus on Young Adults Project, USAID.

Mwabu, Germano, Joseph Wang’ombe, Gerishon K. Ikiara. “Financing Health Services through Insurance: A case study from Kenya.” October 1993. Health Financing and Sustainability Project.

Newhouse, Joseph P., Charles Phelps and M. Susan Marquis. 1980. "On having your cake and eating it too: Econometric problems in estimating the demand for health services." Journal of Econometrics, Vol. 13, pp. 365-90.

Normand, Charles. “Using social health insurance to meet policy goals.” *Social Science and Medicine* 48(1999) 865-869.

Oberg, C.N., Lia-Hoagberg, B. Hodkinson, E. Skovholt, C. and R. Vanman. 1990. "Prenatal Care Comparisons among privately insured, uninsured, and medicaid-enrolled women." Public Health Reports, Vol. 105, No. 5, pp. 533-5.

O'Higgins N. YTS. Employment, and sample selection bias. Oxford economic papers 1994; 46: 605-628.

Ojeda G; Ordonez M; Ochoa LH. [Sexual and reproductive health. Findings of the Colombia National Demographic and Health Survey, 2000] Salud sexual y reproductiva. Resultados: [Colombia] Encuesta Nacional de Demografia y Salud, 2000. Calverton, Maryland, Macro International, MEASURE DHS+, 2000

Phelps, C.E. 1975. "Effects of Insurance on Demand for Medical Care." In Ronald Anderson, Joanna Kravits and Odin W. Anderson, eds., Equity in Health Services. Cambridge, Mass.: Ballinger.

Plaza, Beatriz, Ana Beatriz Barona, Norman Hearst. “Managed competition for the poor or poorly managed competition? Lessons from the Colombian Health Reform Experience.” Health Policy and Planning 16, Supplement 2 (2001): 44-51.

Schneider, P, Diop, FP, Bucyana S. March 2000. “Development and implementation of prepayment schemes in Rwanda.” Partnerships for Health Reform: Washington, D.C.

Schneider, P. March 2001. Increasing access to maternal and child health care in Rwanda. Partnerships for Health Reform Powerpoint presentation.

Schneider, Pia, Francois Diop. October 2001. “Impact of Prepayment Pilot on Health Care Utilization and Financing in Rwanda: Findings from Final Household Survey.” Partners for Health Reform Plus.

Sine, Jeff. February 2003. personal communication on Turkey’s health insurance mechanisms.

Skibiak JP. 1988. Employer-provided family planning in the private sector: the lessons of Enterprise. John Snow Inc. USAID document. Contract No. AID/DPE-3034-C-00-5072-00.

StataCorp. 2001. *Reference Manual. Stata Statistical Software: Release 7.0.* College Station, TX: Stata Corporation.

Stover, John and Laura Heaton. 1999. Famplan Version 4. A computer program for projecting future family planning requirements. The Futures Group International.

Tatar, Mehtap et al. “Primary Health care in Turkey: A passing fashion?” Health Policy and Planning 12, 3 (1997): 224-33.

Van den Heever, Alex, Anthony Kinghorn, Allison Beattie. April 1995. “Paying for Health Care: A comprehensive primary health care approach-An alternative to national health insurance.” University of the Witswatersrand.

Waters, Hugh. "Measuring the impact of health insurance with a correction for selection bias: A case study of Ecuador" Health Economics 8, 5 (1999): 473-83.

Wolfe, Kelly. February 2003. email correspondence on Dominican Republic health insurance mechanisms.

World Bank. 2003. World Development Indicators Online. http://devdata.worldbank.org/dataonline/.

Appendix 1: Technical details of regression equations

Simple Probit Estimation

The following is the statistical model used for the simple probit.

$$Y_t^* = x_i\beta + \varepsilon_i$$

$$\varepsilon \sim N(0, \sigma^2)$$

$$Y_t = 0 \ \ if\ Y_i^* \le A$$

$$Y_t = 1 \ \ if\ Y_i^* > A$$

where Y_t^* is a latent variable with an observed outcome Y_t . Next X_i is a set of explanatory variables. The set of coefficients β are estimated by maximizing the log likelihood function of the equation.

Bivariate Probit Estimation

The bivariate estimation is done by maximizing the log likelihood function of the bivariate normal distribution:

$$L = \sum_{i=1}^{n} w_i \ln \Phi_2(q_{1i}\xi_i^{\beta}, q_{2i}\xi_i^{\gamma}, \rho_i^*)$$

$$q_{1i} = \begin{cases} 1 \ if\ y_{1i} \neq 0 \\ -1 \ otherwise \end{cases}$$

$$q_{2i} = \begin{cases} 1 \ if\ y_{2i} \neq 0 \\ -1 \ otherwise \end{cases}$$

$$\rho_i^* = q_{1i} q_{2i} \rho$$

$$\xi_i^{\beta} = x_i\beta$$

$$\xi_i^{\gamma} = z_i\gamma + v_i\delta$$

$$y_{1i}^* = \xi_i^{\beta} + \varepsilon_{1i}$$

$$y_{2i}^* = \xi_i^{\gamma} + \varepsilon_{2i}$$

$$E(\varepsilon_1) = E(\varepsilon_2) = 0$$

$$Var(\varepsilon_1) = Var(\varepsilon_2) = 1$$

$$Cov(\varepsilon_1, \varepsilon_2) = \rho$$

y_{1i}^{*} and y_{2i}^{*} are unobserved latent variables representing coverage by the insurance plan being examined and the use of a modern method of family planning respectively. When y_{1i}^{*} and y_{2i}^{*} are greater than zero, we observe that their actual values to be one, otherwise the observed value is equal to zero[18].

x_i= exogenous factors that influence the decision to purchase or participate in an insurance plan

z_i=exogenous factors that influence the decision to use modern family planning

v_i= instrumental variables for the probabilities that a woman holds one of the other insurance policies (each estimated with a probit model equation)[19].

ρ is the covariance of the error terms of the insurance equation and the equation estimating the use of the health service. If ρ is significantly different than zero then unexplained variation in the use of modern family planning is correlated with unexplained variation in obtaining or availing of the particular insurance plan.

Although the simultaneous equations can be identified by the non-linearity of the normal probability function, we identified the equations by using different sets of variables on the right hand side of each equation. In the use of modern family planning equation and the equation on type of family planning (i.e., clinical versus resupply) the parity, fecundability and fertility preference variables were used to identify the equation. The insurance equation is identified by the occupation of the husband[20]. In the prenatal care and the delivery services equation, the occupation of the husband identified the insurance equation. No variables were used to independently identify the maternal health services equations[21].

[18] This technical description is adapted from Stata (2001).

[19] This two-stage process is meant to partially correct for the endogeneity of the other insurance variables. As discussed above, a more correct and complete estimation would require theoretical and computational techniques beyond the scope of this paper.

[20] Our justification for this is that in developing countries, where women's participation in the labor force is low, eligibility for insurance plans and purchasing power to obtain the policies are principally contingent upon the husband's occupation. Also, in the simple probit equations the husband's occupation was rarely a significant predictor of FP or MH services use.

[21] A close examination of the variables in the various data sets did not yield any variables that would plausibly influence maternal health service utilization, but not the probability of being covered by an insurance policy.

Appendix 2: Health insurance questions

Colombia

Asked of the household head concerning every member of the household:

(Nombre) está afiliado o es beneficiario de una entidad del Sistema de Seguridad Social en salud?

SI, Si, a cuál entidad pertenece?

The Dominican Republic

Asked of the household head concerning every member of the household (as part of health seeking and expenditure module administered to half of the households):

Esta (NOMBRE) cubierto por algún seguro de salud como :

(LEA OPCIONES Y ANOTE TODOS LOS QUE MENCIONE)

Turkey

Asked of all women aged 15 to 49 :

Are you covered by any health insurance?

IF YES: According to which schedule?

Appendix 3: Means of the explanatory variables used in regressions

Appendix Table 1: Means of Explanatory Variables used in Regressions for Colombia

Description	Mean value in Use of Modern Family Planning equations	Mean value in the use of Clinical Family Planning equations	Mean value in the use of maternal health services equations
Insurance plan			
ARS	0.227	0.210	0.270
EPS or ISS	0.356	0.383	0.311
Other	0.038	0.033	0.038
No Insurance	0.379	0.374	0.380
Women's occupation:			
Professional	0.073	0.085	0.059
Clerical or sales	0.190	0.218	0.166
Services	0.163	0.185	0.137
Manual	0.091	0.101	0.073
All other occupations	0.483	0.411	0.565
Husband's occupation:			
Professional	0.089	0.084	0.073
Clerical or sales	0.180	0.174	0.177
Services	0.082	0.075	0.091
Manual	0.386	0.355	0.374
All other occupations	0.263	0.311	0.284
Household wealth index:			
Very low wealth	0.178	0.126	0.224
Low wealth	0.213	0.187	0.241
Middle wealth	0.227	0.236	0.228
High wealth	0.219	0.239	0.181
Very high wealth	0.163	0.211	0.125
Husband's education			
No education	0.046	0.151	0.039
Primary	0.407	0.349	0.400
Secondary or more	0.547	0.500	0.561
Husband's age			
40 or more	0.387	0.314	0.180
30 to 39	0.377	0.279	0.431
29 or less	0.236	0.407	0.389

Appendix Table: Means of Explanatory Variables used in Regressions for Colombia, continued

Description	Mean value in Use of Modern Family Planning equations	Mean value in the use of Clinical Family Planning equations	Mean value in the use of maternal health services equations
Women's education			
No education or primary	0.435	0.383	0.427
Secondary or more	0.565	0.617	0.573
Women's age			
35-49	0.435	0.442	0.195
25-34	0.380	0.359	0.476
15-24	0.185	0.199	0.329
Urban	0.724	0.786	0.686
Region			
Atlantica	0.227	0.191	0.243
Oriental	0.204	0.194	0.201
Central	0.254	0.270	0.251
Pacifica	0.164	0.174	0.158
Bogota	0.152	0.171	0.148
Woman is amenorheic	0.066	0.066	0.066
Fertility intentions			
Would like to space births	0.152	0.184	
Would like to limit births	0.735	0.738	
Neither space nor limit	0.113	0.078	
Parity			
No kids	0.047	0.094	
1-2 kids	0.515	0.479	
3-4 kids	0.331	0.335	
5 or more kids	0.108	0.093	

Appendix Table 2: Means of Explanatory Variables used in Regressions for The Dominican Republic

Description	Mean value in Use of Modern Family Planning equations	Mean value in the use of Clinical Family Planning equations	Mean value in the use of maternal health services equations
Insurance plan			
Social Security	0.200	0.186	0.213
ISSFAPOL	0.037	0.033	0.040
Employer, professional or private	0.249	0.246	0.210
No Insurance	0.513	0.534	0.538
Women's occupation:			
Professional	0.090	0.084	0.079
Clerical or sales	0.171	0.182	0.132
Services	0.154	0.169	0.123
Manual	0.068	0.082	0.073
All other occupations	0.516	0.483	0.594
Husband's occupation:			
Professional	0.125	0.127	0.115
Clerical or sales	0.180	0.181	0.177
Services	0.097	0.096	0.100
Manual	0.402	0.385	0.412
All other occupations	0.197	0.212	0.196
Household wealth index:			
Very low wealth	0.189	0.162	0.246
Low wealth	0.197	0.201	0.205
Middle wealth	0.206	0.198	0.214
High wealth	0.204	0.212	0.190
Very high wealth	0.204	0.227	0.145
Husband's education			
No education	0.170	0.179	0.191
Primary	0.453	0.453	0.410
Secondary or more	0.377	0.368	0.399
Husband's age			
40 or more	0.358	0.367	0.179
30 to 39	0.367	0.307	0.413
29 or less	0.275	0.325	0.408
Women's education			
No education or primary	0.383	0.373	0.395
Secondary or more	0.617	0.627	0.605

Appendix Table: Means of Explanatory Variables used in Regressions for The Dominican Republic, continued

Description	Mean value in Use of Modern Family Planning equations	Mean value in the use of Clinical Family Planning equations	Mean value in the use of maternal health services equations
Women's age			
35-49	0.335	0.450	0.120
25-34	0.427	0.405	0.508
15-24	0.238	0.146	0.372
Urban	0.636	0.662	0.596
Region			
0- Distrito Nacional	0.323	0.322	0.309
I- Perav,S Cris,M Pl	0.139	0.135	0.150
II- Cibao Central	0.188	0.210	0.183
III- Cibao Oriental	0.093	0.095	0.086
IV- Enriquillo	0.046	0.046	0.052
V- Yuma	0.107	0.092	0.117
VI- El Valle	0.050	0.045	0.054
VII-Cibao Occidental	0.054	0.057	0.048
Woman is amenorheic	0.085		
Fertility intentions			
Would like to space births	0.177	0.123	
Would like to limit births	0.670	0.814	
Neither space nor limit	0.153	0.064	
Parity			
No kids	0.063	0.026	
1-2 kids	0.396	0.326	
3-4 kids	0.384	0.466	
5 or more kids	0.157	0.182	

Appendix Table 3: Means of Explanatory Variables used in Regressions for Turkey

Description	Mean value in Use of Modern Family Planning equations	Mean value in the use of Clinical Family Planning equations	Mean value in the use of maternal health services equations
Insurance plan			
Emekly Sandigi	0.113	0.136	0.085
SSK	0.309	0.335	0.274
Bag Kur or Green Card	0.154	0.163	0.148
Private Insurance	0.011	0.017	0.007
Other insurance	0.014	0.017	0.011
No Insurance	0.399	0.331	0.474
Women's occupation:			
Professional	0.053	0.074	0.037
Clerical or sales	0.023	0.023	0.012
Services	0.022	0.024	0.009
Manual	0.074	0.081	0.062
All other occupations	0.828	0.799	0.880
Husband's occupation:			
Professional	0.213	0.252	0.198
Clerical or sales	0.087	0.096	0.086
Services	0.103	0.100	0.113
Manual	0.434	0.427	0.427
All other occupations	0.163	0.125	0.175
Household wealth index:			
Very low wealth	0.154	0.109	0.212
Low wealth	0.188	0.165	0.217
Middle wealth	0.195	0.195	0.198
High wealth	0.224	0.237	0.198
Very high wealth	0.240	0.294	0.175
Husband's education			
No education	0.051	0.027	0.062
Primary	0.500	0.485	0.507
Secondary or more	0.448	0.487	0.431
Husband's age			
40 or more	0.355	0.361	0.138
30 to 39	0.396	0.455	0.468
29 or less	0.249	0.184	0.394

Appendix Table: Means of Explanatory Variables used in Regressions for Turkey, continued

Description	Mean value in Use of Modern Family Planning equations	Mean value in the use of Clinical Family Planning equations	Mean value in the use of maternal health services equations
Women's education			
No education or primary	0.759	0.711	0.769
Secondary or more	0.241	0.289	0.231
Women's age			
35-49	0.380	0.393	0.143
25-34	0.420	0.461	0.538
15-24	0.200	0.146	0.318
Urban	0.681	0.727	0.654
Region			
South	0.140	0.134	0.144
Central	0.244	0.273	0.231
North	0.079	0.075	0.077
East	0.140	0.108	0.218
West	0.397	0.410	0.330
Woman is amenorheic	0.063	0.017	
Fertility intentions			
Would like to space births	0.137	0.122	
Would like to limit births	0.725	0.810	
Neither space nor limit	0.138	0.068	
Parity			
No kids	0.069	0.025	
1-2 kids	0.532	0.565	
3-4 kids	0.293	0.320	
5 or more kids	0.105	0.090	

Appendix 4: Summary regression results for both simple probit and bivariate probit

Appendix Table 4: Effect of insurance on modern family planning use: Married, fecund, non-pregnant women in Colombia

		Use of modern method among fecund, non-pregnant women		Use of clinical method among women using a modern method of family planning	
		Simple probit	Simultaneous estimation	Simple probit	Simultaneous estimation
EPS or ISS	Regression coefficient	.125**	-.761***	.045	-.807**
	Rho		.524***		.519**
	Mean	0.71	0.69	0.61	0.60
	mean (ins=0)	0.70	0.77	0.61	0.69
	mean (ins=1)	0.74	0.53	0.62	0.45
	Difference	**0.04**	**-0.24**	**0.01**	**-0.24**
ARS	Regression coefficient	.043	-.506	.200	.789***
	Rho		.300		-.364**
	mean	0.71	0.71	0.61	0.61
	mean (ins=0)	0.71	0.75	0.60	0.56
	mean (ins=1)	0.72	0.58	0.66	0.77
	Difference	**0.01**	**-0.17**	**0.06**	**0.21**

*indicates significance at p<.10
**indicates significance at p<.05
***indicates significance at p<.01

Appendix Table 5: Effect of insurance on use of maternal health services: Married women who gave birth in the last five years, Colombia

		Use of prenatal care for the most recent birth among women who have been pregnant in the last five years		Gave birth in a medical facility at the last birth among women who have had a birth in the last five years	
		Simple probit	Simultaneous estimation	Simple probit	Simultaneous estimation
EPS or ISS	Regression coefficient	.414***	.875**	.663***	.751
	Rho		-.285		-.078
	mean	0.63	0.62	0.87	0.86
	mean (ins=0)	0.59	0.54	0.85	0.85
	mean (ins=1)	0.73	0.82	0.94	0.95
	Difference	**0.14**	**0.29**	**0.09**	**0.10**
ARS	Regression coefficient	.065	-.031	.102	1.490***
	Rho		-.008		-.988***
	mean	0.63	0.63	0.87	0.77
	mean (ins=0)	0.62	0.63	0.86	0.66
	mean (ins=1)	0.64	0.62	0.88	0.95
	Difference	**0.02**	**-0.01**	**0.02**	**0.28**

*indicates significance at p<.10
**indicates significance at p<.05
***indicates significance at p<.01

Appendix Table 6 Effect of insurance on modern family planning use: Married, fecund, non-pregnant women in the Dominican Republic

		Use of modern method among fecund, non-pregnant women		Use of clinical method among women using a modern method of family planning	
		Simple probit	Simultaneous estimation	Simple probit	Simultaneous estimation
IDSS	Regression coefficient	-.030	.655	-.260	-.209
	Rho		-.409		-.035
	mean	0.71	0.71	0.77	0.76
	mean (ins=0)	0.71	0.69	0.78	0.77
	mean (ins=1)	0.70	0.83	0.73	0.74
	Difference	**-0.01**	**0.14**	**-0.04**	**-0.03**
Employer Provided or Professional	Regression coefficient	.089	-.253	.174	-.591
	Rho		.205		.430
	mean	0.71	0.72	0.77	0.76
	mean (ins=0)	0.71	0.73	0.77	0.78
	mean (ins=1)	0.73	0.67	0.79	0.67
	Difference	**0.02**	**-0.06**	**0.03**	**-0.11**

*indicates significance at p<.10
**indicates significance at p<.05
***indicates significance at p<.01

Appendix Table 7: Effect of insurance on use of maternal health services: Married women who gave birth within the last five years, Dominican Republic

		Use of prenatal care for the most recent birth among women who have been pregnant in the last five years	
		Simple probit	Simultaneous estimation
IDSS	Regression coefficient	.000	.425
	Rho		-.235
	mean	0.69	0.70
	mean (ins=0)	0.69	0.69
	mean (ins=1)	0.69	0.81
	Difference	**0.00**	**0.12**
Employer provided or professional	Regression coefficient	-.102	-.340
	Rho		.136
	mean	0.69	0.71
	mean (ins=0)	0.69	0.72
	mean (ins=1)	0.66	0.61
	Difference	**-0.03**	**-0.11**

*indicates significance at p<.10
**indicates significance at p<.05
***indicates significance at p<.01

Appendix Table 8: Effect of insurance on modern family planning use: Married, fecund, non-pregnant women in Turkey

		Use of modern method among fecund, non-pregnant women		Use of clinical method among women using a modern method of family planning	
		Simple probit	Simultaneous estimation	Simple probit	Simultaneous estimation
Emekly sandigi	Regression coefficient	0.144*	0.278	0.071	.650**
	Rho		-0.158		-.402**
	Mean	0.459	0.459	0.643	0.641
	mean (ins=0)	0.452	0.446	0.639	0.608
	mean (ins=1)	0.503	0.545	0.664	0.807
	Difference	**0.051**	**0.099**	**0.025**	**0.199**
SSK	Regression coefficient	0.150***	0.336	0.049	0.083
	Rho		-0.159		-0.025
	mean	0.459	0.458	0.643	0.644
	mean (ins=0)	0.442	0.422	0.637	0.635
	mean (ins=1)	0.496	0.541	0.655	0.664
	Difference	**0.053**	**0.119**	**0.017**	**0.029**
Bag Kur or Green Card	Regression coefficient	0.110	0.418	0.049	1.194
	Rho		-0.204		-0.676
	mean	0.459	0.459	0.643	0.621
	mean (ins=0)	0.454	0.440	0.641	0.577
	mean (ins=1)	0.492	0.587	0.658	0.901
	Difference	**0.039**	**0.147**	**0.017**	**0.324**
Private Insurance	Regression coefficient	0.583***	-0.192	-0.218	-0.341
	Rho		0.263		0.112
	mean	0.459	0.458	0.643	0.644
	mean (ins=0)	0.456	0.459	0.644	0.646
	mean (ins=1)	0.657	0.392	0.564	0.522
	Difference	**0.201**	**-0.067**	**-0.080**	**-0.124**

*indicates significance at p<.10
**indicates significance at p<.05
***indicates significance at p<.01

Appendix Table 9: Effect of insurance on use of maternal health services: Married women who gave birth in the last five years, Turkey

		Use of prenatal care for the most recent birth among women who have been pregnant in the last five years		Gave birth in a medical facility at the last birth among women who have had a birth in the last five years	
		Simple probit	Simultaneous estimation	Simple probit	Simultaneous estimation
Emekly sandigi	Regression coefficient	.282**	.568*	.528***	.888***
	Rho		-0.289		-.332*
	mean	0.439	0.438	0.752	0.747
	mean (ins=0)	0.432	0.424	0.744	0.736
	mean (ins=1)	0.516	0.598	0.859	0.912
	Difference	**0.084**	**0.175**	**0.115**	**0.176**
SSK	Regression coefficient	.283***	0.029	.446***	.594*
	Rho		0.070		-0.154
	mean	0.439	0.440	0.752	0.748
	mean (ins=0)	0.415	0.437	0.728	0.718
	mean (ins=1)	0.499	0.446	0.833	0.857
	Difference	**0.084**	**0.009**	**0.105**	**0.138**
Bag Kur or Green Card	Regression coefficient	.442***	0.324	.177*	0.225
	Rho		0.008		-0.091
	mean	0.439	0.439	0.752	0.751
	mean (ins=0)	0.422	0.427	0.747	0.744
	mean (ins=1)	0.553	0.524	0.789	0.798
	Difference	**0.131**	**0.097**	**0.042**	**0.054**
Private Insurance	Regression coefficient	.918***	0.100	.950**	1.068
	Rho		0.212		-0.127
	mean	0.439	0.439	0.752	0.751
	mean (ins=0)	0.437	0.439	0.751	0.751
	mean (ins=1)	0.703	0.469	0.924	0.937
	Difference	**0.265**	**0.030**	**0.172**	**0.187**

*indicates significance at p<.10
**indicates significance at p<.05
***indicates significance at p<.01