Use of Maternal Health Care in Tajikistan:

A Bargaining Framework

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DRAFT

ABSTRACT

Post-socialist economic declines have included declines in women's use of maternal health care. This paper examines the use of maternal health care in Tajikistan, where such declines have occurred. The findings support previous evidence that women's use of services depends on women's education, household income, and proximity of services. Previous models have not specified who makes the care decision. Using education as a proxy for preferences, the findings show that women share decision-making with their spouse and the eldest female in the household. However, the data provides limited evidence that traditional proxies for bargaining power affect outcomes. The authors conclude that measures of bargaining power require tailoring to local conditions. Surveys evaluating the value of women's assets and their services in the home, as well as questions about decision-making, will allow researchers to more effectively measure bargaining power across contexts. The paper concludes with policy recommendations.

Introduction

The collapse of socialism in Central and Eastern Europe and the former Soviet Union was followed by a radical decline in GDP and related decline in health indicators (Meurs and Ranasinghe, 2002). Many countries experienced an increase in infant and maternal mortality rates. In most cases, these mortality rates fell again over time, but in some of the poorer former Soviet countries, the mortality rates have remained stubbornly high (UNICEF, 2007; 2008).

Underlying the rise in mortality has been a decline in women's use of prenatal care and professional assistance during birth. Previous models of women's use of these health services have focused on factors including women's education, household income, and proximity of services. This approach does not specify whether the decision was made by the woman herself, the household as unit, or some other actor, but appears to assume a unified household as decision-maker. Recently, researchers have begun including measures of women's bargaining power (in marriage) in modeling maternal health care use, suggesting women may share decision-making with their spouse (Beegle, Frankenberg and Thomas, 2001; Furuta and Salway, 2006; Bloom, Wypij, and das Gupta, 2001).

In this paper, we explicitly address an issue of importance to feminist economists—the problem of how to adequately model household bargaining in widely differing cultural and economic contexts. We examine the use of maternal health care in one poor post-socialist country, Tajikistan, where use of prenatal care and medical assistance at birth has declined substantially. Using data from the 2003 and 2007 Tajikistan Living Standards Surveys (TLSS), we build on previous work by Falkingham (2003), Habibov and Fan (2008), and Fan and Habibov (2009) documenting recent trends in the use of these services. Extending previous research, we explicitly examine the role of household members other than the women herself in the decision to use maternal health care and, finding that others do seem to play a role, examine the impact of possible sources of women's bargaining power regarding the use of care.

Tajikistan provides a particularly interesting case for such a study, because of the substantial decline in the use of maternal health care during the post-socialist period. In addition, as will be discussed further below, most women live in extended families, where a number of different people may influence decisions about care. Labor force participation rates for women are low, and exit from marriage and formation of female headed households is quite unusual (Harris, 2004). In this context, it is unclear whether commonly used measures of women's household bargaining power will be related to care use.

Consistent with the previous work on the use of maternal health care in Tajijkistan, we find that higher household income and education of the woman have a consistent, positive impact on use of both prenatal care and the presence of professional assistance at birth. Living in a more remote or socially conservative location with poor health quality also has a significant negative impact. Examining the question of who makes decisions about care, we consider the role of both the spouse and the oldest female in the household, taking into account the patrilocal and multigenerational nature of households in Tajikistan. We find evidence that both the women's spouse and the oldest woman in the household play a role in decision about care, using education as a proxy for preferences. We use the regression results to predict the likelihood of getting care for individuals with different characteristics, examining particularly the impact of variations in the relative education of the woman and her spouse. We show that increases in women's education have a greater positive impact than increases in spousal education, suggesting that women may have a relatively larger role in the decisions than do their spouses.

We find that standard measures of bargaining power (relative earnings potential, for example) do not have an impact on the use of maternal health care. We find this result to be consistent with gender relations and other conditions in Tajikistan, where female labor force participation is low and women's ability to exit her spouse's household is limited by a variety of social factors. We discuss, in conclusion,

the need to tailor measures of bargaining power more carefully to local conditions, and the need to collect data to support more diverse and refined measures of bargaining power. One important advance, we argue, would be more theoretical development and data collection (perhaps starting with interviews) for estimating women's sources of bargaining power *within* a relationship, for use in contexts where exit options are limited. In concluding, we also highlight other policy recommendations.

Understanding Use of Maternal Health Care

The literature on maternal and infant outcomes in developed and developing countries identifies a number of factors consistently correlated with mortality rates, including the use of prenatal care and the presence of trained assistance during birth (Flegg, 1982; Shiffman, 2000; Celik and Hotchkiss, 2000).[1] Pre-natal care is important in identifying underlying conditions which contribute to poor maternal and infant outcomes, and also in informing women about nutrition and hygiene (Shiffman, 2000; Sundari, 1992). The presence of professional assistance at birth is particularly important to both mother and infant in the case of high-risk births.

Researchers have thus focused on the factors contributing to women's use of prenatal care and medical assistance at birth. The majority of studies focus on demand-side issues—factors which contribute to women's use of care. In cross-country research using data from both developed and developing countries, researchers find that more educated women are more likely to seek quality medical care (Flegg, 1982: 443; Shiffman, 2000:281). The authors suggest that the relationship may be due to better educated women being better informed about the benefits of care (a change in their preferences) or in them being more highly valued by their family, leaving uncertain whom is the hypothesized decision-maker. Wealth and better infrastructure are also found to increase women's use of prenatal and delivery care in developing countries (Sundari, 1992).

Social norms also influence the choices about care. Studying changing birthing practices in Tatarstan and Russia in the 19th and 20th centuries, Ransel found a "generational chain of knowledge, norms and assistance that strongly reinforced traditional practices." Even when medical services became available, practices changed slowly. It took time for medical assistance to be incorporated into the norms passed down to, and expected of, young women (2001: 3). .

The demand-side factors described above include women's education and norms (which may affect preferences of decision-makers), household financial resources, and infrastructure (particularly transportation infrastructure), which affects households' ability to *express* a demand for services. A simple version of this model, which does not specify a decision-maker, might look like Figure 1.

Figure 1: Determinants of Demand for Maternal Health Care Services
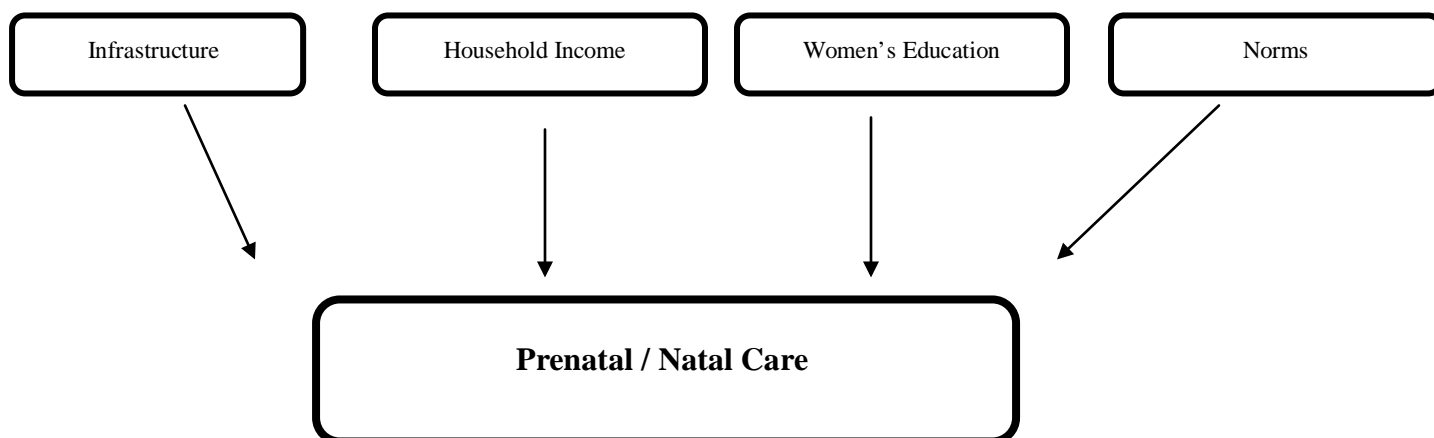
Increasingly, however, explanations of demand for care have considered the impact of women's decision-making power and autonomy on the use of care (Beegle, Frankenberg and Thomas, 2001; Bloom, Wypij and das Gupta, 2001; Furuta and Salway, 2006). Social scientists have characterized women's influence differently, considering women's "autonomy," "position," and "bargaining power" (or just "power"). These concepts encompass similar characteristics and have similar predictive

implications. For example, Bloom, Wypij and das Gupta (2001) examine women's "control over finances, decision-making power, and freedom of movement" as elements of *autonomy*. In looking at the role of women's *position* in care use in Nepal, Furuta and Salway (2006) consider women's employment, participation in household decision making and ability to discuss family planning with their husband. The autonomy and position approaches focus on the characteristics of the woman herself, but they do not state explicitly whether the women or the household is thought to make care decisions, or how decisions might be shared by household members.

The bargaining power approach is somewhat more specific in its description of decision-making, having emerged as critique of models in which "unitary households" are specifically posited as decision-makers. The bargaining models highlight the need to consider how decision-making might be shared, with women's influence varying with bargaining power (Ghysles, 2004: Ch. 1). To the extent that the woman's preferences are not given full weight, the preferences of other household members also impact the decision. In this case, the education of the other household members, as well as social norms, may play an important role in determining what kind of care women get. However, bargaining power models have generally not tested directly for the influence of other household members in decision-making.

Women's bargaining power is thought to derive, at least in part, from women's relative ability (compared to her bargaining partner) to walk away from a relationship, or to withhold valuable services within it (Lundberg and Pollack, 1994). Attempts to measure this power have frequently relied on indirect methods--measuring characteristics which are thought to convey power. Characteristics such as education and employment might allow a woman to survive economically outside the relationship (Ross, 1987; Bittman, et. al, 2003; Acharya and Bennet, 1983), so may enhance a threat to walk away. Ownership of assets, especially those brought into the marriage, is also thought to convey bargaining power in fertility and other decisions (Ransul, 2007; Doss, 1996), possibly also because these may allow

women to leave the relationship. Although less often used in empirical work, social norms have also been argued to increase the weight of women's preferences in certain decisions (Folbre, 1994).

Economists studying maternal health care use within a bargaining power framework have relied less on the direct measures of power used by researchers studying "autonomy" or "empowerment"--like self-reported influence on decisions. Such measures have been begun to be used in models of other household outcomes, such as savings among households in the Philippines (Malapit, 2009).

Examining the impact of women's autonomy, power, and bargaining power on decisions about reproductive care, researchers have generally found a positive effect, when controlling for subsets of the demand-side variables included in Figure 1 (Beegle, Frankenberg, and Thomas, 2001; Furuta and Salway, 2006). Authors emphasize, however, that the impact of women's status, empowerment, or bargaining power is complex (Woldemicael, 2007). The specific factors which convey decision-making influence in one context may not convey it in others. For example, studying use of maternal health care in Uttar Pradesh, Bloom, Wypij and das Gupta (2001) found that freedom of movement affected the use of prenatal care and delivery care, but control over finances and general decision-making power did not. In Nepal, Furuta and Salway (2006) found that participation in decisions about large household purchases positively affected the likelihood of receiving prenatal care, but not the likelihood of skilled assistance at birth. Conversely, women's ability to discuss family planning with their spouse positively affected the likelihood of skilled assistance at birth, but not that of getting prenatal care.

Further, resources such as education, income and assets which enhance women's ability to survive economically outside the relationship may not convey bargaining power where legal rights and social norms limit women's ability to leave (Malapit, 2009; Folbre, 1997; Frankenberg and Thomas, 2003). Looking at fertility decisions among Chinese and Malay communities in Malaysia, Rasul (2008) concludes that differing divorce norms across communities contribute to differences in the impact of

asset-holding plays on fertility decisions. Where divorce is rare, assets do not appear to impact bargaining. When strict social norms prevent divorce, women's bargaining power may depend more on the value of their role *inside* the relationship, especially the services they provide to their spouse or head of household (Lundberg and Pollack, 1994). Data suitable for measuring this source of bargaining power have been less available. In this paper, we follow the majority of economists, examining whether factors which may convey decision-making power affect the use of maternal health care. However, we also directly examine the role of household members other than the woman herself in the decision.

Our approach is a modification of the model depicted in Figure 1, which we present in Figure 2. This model includes household income and infrastructure, as before. In the modified model, we include household structure (which determines who might co-participate in decisions and their position relative to the woman), culture (which may influence the preferences of household members, as well as social norms regarding the weight of women's preferences in specific decisions, in addition to the norms about birthing practices included in Figure 1), and the education (a proxy for preferences) of household members with whom the women may share decision-making power (her spouse and the oldest female in the household, usually her spouse's mother). Women's education *relative* to other household members contributes to her bargaining power in this model, although we continue to recognize and discuss her own *level* of education as a proxy for her preferences. As noted above, women's education may also contribute to also contribute to the way other household decision-makers value her health.

Figure 2: Determinants of Demand for Maternal Healthcare, Including Bargaining Power
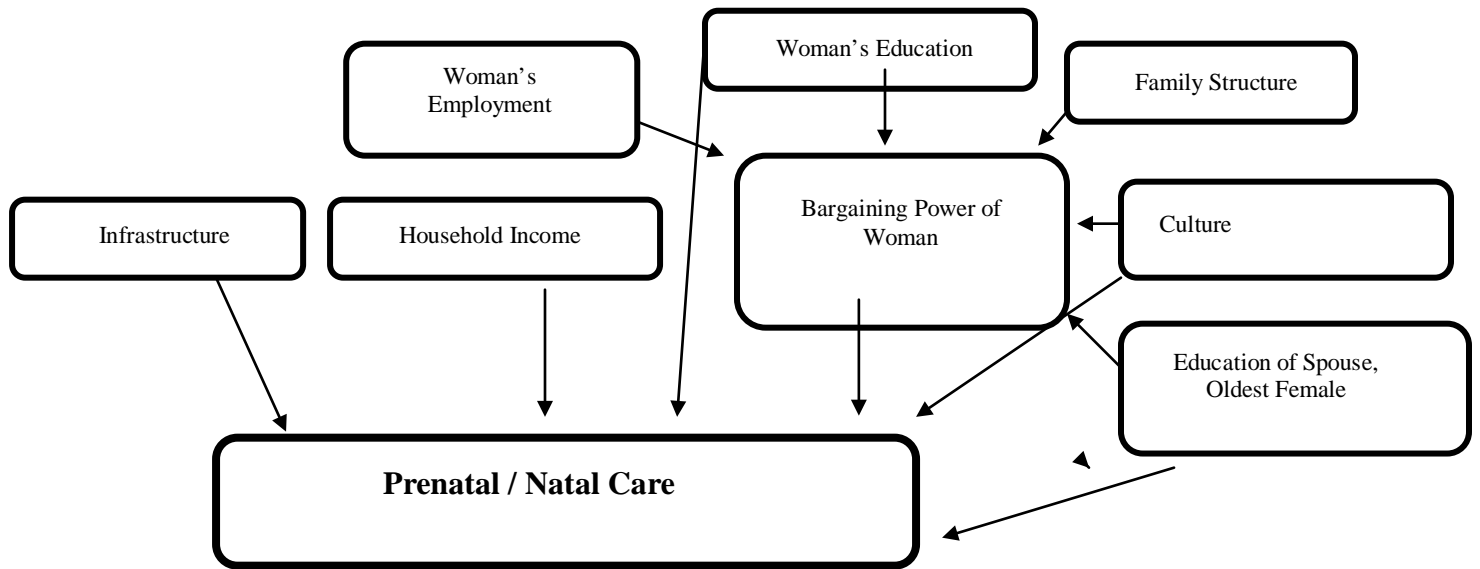
Supply side factors—availability and quality of maternal health services—have also been also been found to play an important role in use. Reviewing literature on maternal health care in developing countries, Gupta (1989) finds that access and quality of services play a bigger role than user characteristics in explaining use. Distance, as well as inadequate supplies and poor service provision, are also important in explaining use of care in developing countries (Sundari, 1992; Hotchkiss, 2001).

Tajikistan: Background

In this section, we draw on both secondary sources and our own analysis of the 2003 and 2007 Living Standards Survey in the Republic of Tajikistan (TLSS, 2003; 2007) to review of trends in the use of maternal health services and changes in factors considered as independent variables in the model. We provide a further discussion of the survey data below.

Use of Maternal Health Services

During the early Soviet period, maternal health care services expanded through the use of feldshers (physician's assistants or paramedics). By the 1950s, access to medical care improved substantially (Harris, 2006:28), but then started to deteriorate in the 1960s (Ransel, 2000:146). By the 1980s, a widespread crisis in health care (Becker, 1998: 2057) forced people to bring their own bedding and food to maternity hospitals. Some avoided hospitals for births (Ransel, 2000).

According to official data, the share of births attended by skilled personnel fell from 93% in 1989 to 75% in 2003, before recovering very slightly (UNICEF, 2007). Using the 1999 TLSS, Jane Falkingham (2003) documented a similar significant decline in use both of prenatal care and medical assistance at birth from 1989-1999. In Tables 1a and 1b, we report the percentage of sample women using both types of care by year of their most recent birth, based on the 2003 and 2007 TLSS surveys. As can be seen, the downward trend in care use care, reported by Falkingham based on the 1999 data (2003), continued through the early late 1990s, and then improved slightly (unsteadily, on some indicators) in the 2000s. Although the share of women recalling use of care is consistently higher in the 2007 data than in the 2003 data, the trends are fairly consistent across the surveys (Tables 1a and 1b).[2]

The rates of use of medical assistance are still reasonable by comparison with other countries at a similar level of development. For comparison, in Turkey, where GDP per capita is substantially higher than in Tajikistan (UNESCO, 2008), 1993 only 63% of births were to mothers who had received prenatal care, and 76% of births were attended by skilled personnel (Celik and Hotchkiss, 2000:1798). However, the decline is likely to undermine efforts to improve infant and maternal outcomes and to achieve Millennium Development Goals.

Table 1a: Percent Using Maternal Health Services, By Date of Last Birth, 2003 Survey

	Date Last Birth					
	Prior to 1989	1989-1994	1994-1997	1997-1998	1998-1999	1999-2003
Prenatal Consult	94.74	92.02	88.98	87.40	85.43	82.35
Place of Delivery						
Medical Facility	92.11	81.19	77.12	73.58	68.02	61.49
Home,with Medical Professional	2.63	6.95	6.95	11.79	16.19	12.99
Home, No Medical Professional	5.26	11.86	15.93	14.63	15.79	25.52
Medical Professional, regardless of location of delivery	94.74	88.14	84.07	85.37	84.21	74.48
N = 3,694						

Table 1b: Percent Using Maternal Health Services, By Date of Last Birth, 2007 Survey

	Date Last Birth						
	Prior to 1989	1989-1994	1994-1997	1997-1998	1998-1999	1999-2003	2003-2007
Prenatal Consult	89.47	89.69	85.31	83.57	89.37	87.65	86.07
Place of Delivery							
Medical Facility	84.21	83.84	67.50	62.14	71.25	63.42	70.82
Home, Medical Professional	2.11	3.90	7.81	10.71	9.38	9.84	7.58
Home, No Medical Professional	13.68	12.26	24.69	27.14	19.38	26.74	21.60
Medical Professional, regardless of location of delivery	86.32	87.74	75.31	72.86	80.63	73.26	78.40
N = 4,420							

Underlying Factors

Household Income

At the end of the Soviet period, Tajikistan was among the poorest of the Soviet Republics. Economic conditions worsened after 1991. The post-socialist economic downturn was exacerbated by a civil war, from October 1992 to May 1993 and skirmishes which continued into 1996 and even 200l (Gomart, 2003; Jeffries, 2003: 269-272). GDP per capita collapsed, falling more dramatically than in any other Central Asian country, from $501 in 1989 to $139 in 1996, before recovering somewhat, to $234 in 2005 (in constant 2000 USD) (UNICEF, 2008).

Ability to pay for medical services has also become increasingly uneven, with the Gini coefficient for per capita household income rising from around 0.308 in 1988 to 0.47 in the late 1990s

(Falkingham, 2000). Poverty rates are highest in the regions of Gorno-Badakhshan and Khatlon, less developed areas affected by war and de-industrialization (State Statistical Committee Tajikistan, 2008).

Female Education and Employment

Despite relatively severe repression of Islamic practices during the Soviet period, and the general replacement of the veil with a headscarf, researchers reported continued preferences for female seclusion and early marriage for girls (Harris, 2004). Still, during the Soviet period girls got almost as much education as boys. In 1986, about nine adult women had completed college for every ten men who had done so, and the same was true for high school (USSR Central Statistical Office, 1986: 28). Since 1999, however, girls' enrollment rates have declined. Over the period 1999-2005, girls' secondary school enrollment hovered around 84% of boys' enrollment (UNESCO, 2008). Overall enrollment in tertiary education is low. Among the limited number of post-secondary students, boys far outnumber girls, with young women making up only about 34% of students in 1998/99 and 2002/03 (UNESCO, 2005:102).

Despite the declines in enrollment, TLSS data suggest that the pre-1989 trend of increasing education continued to raise the average level of education for women of childbearing age through 2007. From 2003 to 2007, the average number of years of education for women in our sample (see below) rose from approximately 10 to 10.5, a small but statistically significant increase. Education levels of spouses in our sample increased slightly as well (Table 2).

During the Soviet period, women in Tajikistan had low labor force participation rates by Soviet standards, around 52% in 1990 (UNDP, 2007/8: 340). Since the collapse of the Soviet Union, the *overall* employment ratio has fallen, from 72% of the working age population in 1991 to 59% in 1999 and 52% in 2003 (UNICEF, 2007). Women's employment rate may have risen during the economic collapse, but by 2005, reported female economic participation rates were only 47% (Falkingham and Bashieri, 2004; UNDP, 2007/8:340). In our sample, participation is even lower, 36% (Table 2).

Household Structure:

Traditionally, women in Tajikistan join the household of their spouse when they marry. The position of daughter-in-law has been traditionally associated with submission to, and direction by, her spouse's mother (Harris, 2006).   Women's choices about care may need to be discussed (bargained) with her mother-in-law, as well as her spouse.

Since 1999, civil war and the migration of men for work have contributed to a decline in the prevalence of the traditional patri-local family. The majority of women of childbearing age continue to live with their spouse or extended family, however. Among all women who answered the female survey (given to women of childbearing age), 93% lived with their spouse in 2003 and 85% did in 2007. Of the women not living with their spouse, about 79% lived with their in-laws in 2003 and 70% did so in 2007. Among women in our sample (see below), the share who were the head of household fell slightly, from 3.7% in 2003 to 2.9% in 2007 (Table 2).

Culture:

One factor which may affect women's bargaining power and use of medical care in Tajikistan is the "reassessment of the role of Islam" (Tett, 1994). Soviet efforts did not eliminate Islamic culture in Tajikistan[3] during the Soviet period, and the 1992 civil war was partly driven by the resurgence of Islam in some areas, and conflicts between secular and Islamic visions for the new state. Even in the more "pro-communist" areas, Islamic symbols and practices have become much more predominant since 1989 (Tett, 1994:146-7; Harris, 2004). The vast majority of Tajikistanis now identify as Muslim, most belonging to the Sunni branch of Islam (Curtis, 1996).

Just as in the 1920s and 1930s when ideological battles in Central Asia centered on the role of women (whether women should unveil, whether to end seclusion) (Northrop, 2004), current ideological battles emphasize the need for Tajikistani women to distinguish themselves culturally from "Russian"

("colonialist") women (Tett, 1994) by becoming more visibly "Muslim." These changes may influence women's own preferences about medical care (by reducing women's willingness to be examined by a male doctor, for example), as well as their ability and desire to assert their preferences if these are in conflict with those of elders or spouses.

Access to Care:

State spending on health care in Tajikistan during the Soviet period was low by Soviet standards (Curtis, 1996). The number of hospital beds per 1000 population was well below the average for the Soviet Union as a whole, and rural areas had about half the number per population as the capital, Dushanbe. There were reports of a lack of hot water and inadequate plumbing in hospitals (Komsomol'skaia Pravda, 1988, cited in Olcott, 1991: 252; Curtis, 1996).

Still, health care was universally accessible and free. While hospital beds were in short supply, urban centers offered polyclinics for prenatal care and more centralized hospitals or maternity centers for giving birth. Rural areas were more likely to receive periodic visits by ambulatory polyclinics and offer midwives or feldshers for birthing (Rivkin-Fish, 2005).

As GDP collapsed, the share of GDP spent on health care also fell dramatically, from 3.4% in 1993 to 0.9 from 2000-2004, and 1.1% in 2005-2006.   The number of available hospital beds per 10,000 population fell 32% from 1991-2004 (to under 41 per 10,000), while the capacity of polyclinics remained about the same (State Statistical Committee Tajikistan, 2008). As the Soviet Union disintegrated and civil war broke out, many doctors (many of whom were non-indigenous nationalities) left the country (Curtis, 1996), reducing the number of doctors per 10,000 population from 26 to 19 over the period 1991-2004. The number of paramedical personnel fell even more dramatically, from 77 per 10,000 to 42 (State Statistical Committee Tajikistan, 2008).   Conditions in health care facilities, which had been poor, deteriorated further. The civil war also damaged important infrastructure necessary to

both access and run medical facilities, while continuing skirmishes and road blocks perpetuated fear and limited population movement (Gomart, 2003; Jeffries, 2003: 269-272).

The changes since 1991 negatively affected many of the determinants of maternal health case use outlined in Figure 2, although some factors have subsequently improved somewhat. Household incomes have fallen, roads and other transportation infrastructure have been damaged, women have less access to employment and secondary education and, although men's employment and school enrollment has also declined, less relative to their spouses. Other conservative cultural changes have occurred in some areas. Below, we evaluate the relative role of these factors in women's use of the medical services.

Data and Methodology

In her analysis of the 1999 Tajikistan Living Standards Survey (TLSS), Jane Falkingham (2003) showed that significant differences existed in care, depending on education, location, wealth, and year of last birth. More educated women were more likely to get prenatal care, and poorer women were much less likely to have skilled assistance at birth. Using the 2003 TLSS data, Habibov and Fan (2008) confirm that that education increased use of prenatal care, while poverty, poor quality of care, and remoteness reduced the probability of use.

We develop a model similar to that used by Falkingham (2003) and Habibov and Fan (2008), incorporating data from 2007 TLSS. We extend their work by specifically examining women's role in the decisions about care and the impact of bargaining power on outcomes.

Table 2: **Means and Standard Deviations (in parentheses)**[a,b]

	2003	2007	Both Years
Number of Women aged 15-50	1,932	2,519	4,451
Number of Women aged 15-50 with identifiable spouses	1,812	2,116	3,928
At least one Prenatal Consult	0.810 (0.393)	0.871 (0.335)	0.843 (0.363)
Medical Professional at Birth	0.731 (0.443)	0.794 (0.404)	0.765 (0.424)
Number of Prenatal Visits	3.325 (2.631)	4.643 (4.193)	4.035 (3.618)
More than 4 Prenatal Visits	0.473 (0.499)	0.526 (0.499)	0.502 (0.500)
Survey Year is 2007	0	1	0.542 (0.498)
Woman's Education (years)	10.154 (1.592)	10.496 (2.290)	10.339 (2.008)
Spouse's Education (years)	11.416 (2.312)	11.686 (2.426)	11.568 (2.380)
Eldest Female's Education (years)	8.388 (2.599)	7.906 (4.364)	8.086 (3.809)
Respondent is in the Labor Force	0.449 (0.498)	0.286 (0.452)	0.361 (0.480)
Log of Per Capital Household Consumption in 2007 Dollars	4.145 (0.604)	4.874 (0.448)	4.540 (0.638)
Number of Births[c]	3.578 (1.973)	3.263 (1.933)	3.408 (1.957)
Year of Reported Birth	2000.967 (1.226)	2005.578 (1.316)	2003.467 (2.628)
Population of Population Point	4,727.242 (69933.293)	84753.829 (10924.290)	6909.859 (9544.104)
Distance to Closest Clinic	5.425 (11.892)	8.597 (12.344)	7.050 (12.227)
Bad Health Care Quality	0.090 (0.285)	0.046 (0.210)	0.066 (0.249)
Observed Woman is Household Head[d]	0.037 (0.190)	0.029 (0.168)	0.033 (0.178)

Spouse Opposes Contraceptives	0.120 (0.325)	0.0644 (0.245)	0.090 (0.286)
Respondent has more education than her spouse	0.078 (0.269)	0.082 (0.275)	0.080 (0.271)
Respondent has more education than the oldest female in the household	0.245 (0.430)	0.279 (0.449)	0.264 (0.441)
Region			
Gornobadakhshian	0.021 (0.144)	0.016 (0.127)	0.019 (0.135)
Sughdian	0.306 (0.461)	0.239 (0.427)	0.270 (0.444)
Khatlon	0.348 (0.476)	0.244 (0.430)	0.292 (0.454)
Dushanbe	0.088 (0.283)	0.090 (0.287)	0.089 (0.285)
RRS	0.237 (0.425)	0.410 (0.492)	0.330 (0.470)
Source: TLSS,2003, 2007.			

a) The sample includes women who answered the female questionnaire in each year, including only women whose year of last birth was within five years of the survey year (starting in 1998 and 2002 for the two surveys, respectively) and who had identifiable spouses. The sample weights are used in the calculation of the means.

b)) Means and Standard Deviations are based on the weighted data.

c) The question reads "How many children have you given birth to? Please include births where the child only lived a few short hours or died later."

d) Note, for those questions and regressions involving this variable (respondent is the head), we include households whose husband is not identifiable as well as those for whom husbands are identifiable. This sample is n = 4,451.

The 2003 and 2007 TLSS were designed and conducted jointly by the Tajikistan National Committee for Statistics (Goskomstat), UNICEF, and the World Bank. Both of the cross-sectional surveys are multi-topic, nationally representative household surveys. The sampling frames were both based on a two-stage sample stratified by region (oblast) and urban/rural settlements, with the share of each stratum in the overall sample being in proportion to its share in the total number of households as recorded in the 1989 and 2000 Censuses. After stratification, the 2003 survey consists of 208 population points chosen as primary sampling units while the 2007 survey consists of 270 population points. The

2003 and 2007 samples included an oversampling of the capital Dushanbe, and the province of Gorno Badakhshian, which we account for using the weights provided by the World Bank.[4]

The 2003 survey was based on a sample of 4,156 households for a total of over 26,000 individuals. The 2007 survey sampled 4,860 households for a total of nearly 31,000 individuals. Our analysis relies on a subsample of women between the ages of 15 and 50 who report having been pregnant at least once, and who answered a series of questions regarding the medical attention that they sought and received *for their last (most recent) pregnancy*. Because we are interested in the way household and community characteristics may affect maternal health care, and those characteristics are measured only for the survey year itself, we restricted our sample to women who had given birth within five years of the survey. While this does not assure that the household and community characteristics measured in the survey capture those prevalent at the time of the decision, this choice is necessary to maintain a reasonable sample size. The most important changes to most households' situation (loss of formal employment due to economic restructuring or displacement due to the civil war) would probably have occurred earlier than 1999, the most recent birth year included in our survey, rather than after it.[5]

Because we are particularly interested in who makes the care decision in households and whether women's characteristics affect their role in decision-making (bargaining power), for most of the analysis we further restricted our sample to women with an identifiable spouse. This results in an additional small loss of cases (Table 2). These subsamples consisted of 1,812 women in the 2003 survey and 2,116 women in the 2007 survey. Not all women answered the questions regarding use of prenatal care or presence of skilled assistance at birth, however, and some data was missing for other variables, particularly education. For the regression analysis below, we have a total of 3,146 usable cases.[6]

However, for one set of regressions we used a slightly different sample. We examine the use of care when the respondent herself is the reported head of household and thus the presumed decision-

maker. In these regressions, we included all women who had given birth during the relevant period and who had answered the questions about seeking medical assistance, regardless of whether they reported having a spouse. For these regressions we had a sample size of 4451.

Lacking time series data to explain the change in use of maternal medical services over time, we use a cross-sectional approach and examine factors correlated with two outcomes: use of prenatal care and birthing with professional assistance.[7] To measure use of prenatal care, we consider two binomial outcomes: whether the woman receives any medical exam prior to the birth, and a dummy for whether she attends more than 4 prenatal visits. In using a dummy variable to measure of level of attendance of prenatal visits, we follow Hotchkiss (2001).[8] This allows us to examine factors behind the repeated use of care—more than one visit per trimester—while overcoming some apparent inconsistencies between the two survey years in the top-coding of visits.   We chose 4 as the cutoff for the dummy variable because it represented a break in the data: in both 2003 and 2007 the number of women reporting a given number of visits dropped off markedly after 4. We define professional assistance as the presence of a doctor or nurse at the birth and measure use of professional care as a dummy variable.

Following previous work, we examine the role of the respondent's education, as a proxy for her preferences. We include household income per capita (measured as expenditure per capita, in log form, in constant 2007 US dollars) as a measure of households' ability to pay for care. After multiple births, women may be less likely to seek care (Celik and Hotchkiss, 2000). To control for this, we include the total number of children born to this woman.

We include two measure of access to medical care: population of the locality (population point) as defined in the World Bank survey and distance (in kilometers) to the closest clinic.[9] More populous localities are expected to provide easier access to services due to the availability of better transport infrastructure. Distance to the closest clinic provides the most direct measure of access. A third measure

of the supply is the perceived quality of health care in the population point. We use a dummy for poor quality if the respondent chose "bad" on a 4 point scale (excellent, good, satisfactory, bad).

To better understand the woman's relative role in the decision about care, we examine correlations between care use and the education of the woman's spouse and the eldest female in the household. We assume that better educated spouses and eldest females will, like more educated women, prefer more care. We are able to measure separate effects of the education of different household members on the outcomes because of relatively low levels of assortative mating in our sample.[10]

We examine the role of spouses and eldest females (usually the spouse's mother) separately. In many cases the respondent is herself the eldest female. In these cases, there is no other "eldest female" household member who participates in the decision, and her education cannot be included in the regression. For the regression examining the role of the eldest female in decision making, therefore, the number of cases falls substantially, to 1570. We examine the link between spouse education and outcomes in the full sample.

In a further set of regressions, we consider the impact of several measures of the woman's bargaining power on use of care. As noted above, most attempts to examine the impact of a woman's bargaining power on household outcomes have relied on measures *potential* power, especially their relative education, income or assets. Some studies have also attempted to include direct measures of women's participation in household decisions, such as self-reported evaluations of their role, or evaluations by both the woman and her spouse (Malapit, 2009).

The TLSS provides no data on assets brought to the marriage or currently held by the individual spouses, however, and data on income were very incomplete. As a measure of relative education, we included a dummy for whether the woman had more education than her spouse or the eldest female in her household.[11] As a measure of relative access to income, we included a dummy for whether or not the

woman reported working for pay at all in the past year.[12] We also included two direct measures of bargaining power. Partially following Furutu and Salway (2006), who included a dummy for whether the woman had discussed family planning with their husbands, we included a dummy for whether the reason for not using contraceptives was the husband's opposition. Non-use due to spousal opposition would suggest a lack of bargaining power on reproductive health issues. As a second direct measure of bargaining power, we include a dummy for whether the respondent is identified as the head of household.[13] As can be seen in Table 2, the level of variation in the bargaining power variables is mixed. Relatively few childbearing women are heads of household (about 3% of the sample); more are employed (over a third). The share of women with more education than their spouse, or not using contraceptives due to spousal opposition is under 10%. Between a quarter and a third of respondents living with an elder female had more education than the elder female (Table 2).

As a very rough measure of differences in culture, we include a set of regional dummies for the five administrative regions. The survey does not ask questions about religious affiliation or other cultural values, and the vast majority of Tajikistanis identify as Muslims, so that a basic variable on religious affiliation would provide little additional information. Ethnic identity is asked only in the 2007 survey, but not the 2003 survey. Since regional differences in development and infrastructure should be largely controlled for by measures of remoteness and household income per capita in the regression, we expect our regional controls to partially reflect differences in ethnic makeup and culture. Dushanbe, as the capital, was most affected by Soviet culture and Western influence that other areas. Dushanbe is the reference category for the regional dummies. Khatlon is among the most socially conservative regions, and has a large Uzbek population. Data from the 1980s and the current period show that the region had lower female labor force participation rates and lower rates of enrollment of six year olds in school than other regions (Falkingham and Baschieri, 2004; USSR Central Statistical Office, 1986). Strong

conservative values may have contributed to a heavy impact of the Civil War in this region. Like Khatlon, the RRS administrative district also has a large, conservative, Uzbek population. Gorno-Badakhshan has the highest share of Russian population in the country (4%), and is home to the Pamir ethnic minority, creating a distinct cultural mix. Sughdian, in the north of the country has a large Kyrgyz population, but was also the home to many Soviet elites in the pre-1989 period and may have been exposed to more secular influences.

To control for effects of economic cycle and other changes in context across years of birth, we include a complete set of year dummies (not reported in the tables). The birth year 2007 is the excluded category. Table 2 reports the means and standard deviations for the included variables.

To examine the relationship of household demand characteristics and service availability to use of services we develop a probit model:

$$\Pr(Y=1|X) = \Phi(X\beta)$$

where Y is the binary outcome (use of the service=1), X is a matrix of explanatory variables discussed above, Φ is the cumulative distribution function of the standard normal distribution, and β is a vector of parameters. We estimate this using *Stata Statistical Software: Release 11.* We run the regressions as svy probit followed by the mfx command in Stata. The mfx command presents the coefficients as marginal effects—the impact on the probability of care of a one unit change in the given independent variable, for someone who is at the mean on all independent variables. Because no such person actually exists (and an individual with mean values sometimes lacks intuitive sense, as in the case of dummy variables), we also present results for a set of contrasting ("representative") individuals, who have been selected to have very different predicted probabilities of care.

Because the data were collected using a two-staged random stratification based on urban and rural regions as well as population points, we rely on the "svy" commands in STATA to account for the

stratified, cluster sampling design with weights (UCLA Statistical Consulting Group, 2011). We estimate separate models of use of prenatal care and medical assistance at birth. Results of the estimations can be found in Tables 3, 4a and 4b.

 What Affects Receipt of Care?

In Table 3, we begin with the baseline model of prenatal care use which incorporates standard variables explaining the use of maternal health care. Here we model choice as in Figure 1. In the second model, we include spouse's education and that of the eldest female in the household, as proxies for the preferences of these household members, to measure their possible role in the care decision.

We find that, as predicted by the model in Figure 1, education of the mother and log per capita household expenditure have a significant positive impact on getting prenatal care (Column 1), while being in a remote location with poor health quality has a significant negative impact (all three measures of access have the expected sign and are significant). Having had more previous births also has the expected negative impact. There are also significant differences between regions, with residence in the regions of Khatlon and the RRS resulting in generally lower levels of care compared to Dushanbe, and residence in Sughd resulting in a greater likelihood of prenatal care.

We use the same baseline model to examine factors related to having more than four prenatal visits (Column 3) and the use of professional medical assistance at birth (Column 5). Mother's education and household income positively affect attending more than four prenatal visits, as is living in Sughd, while living farther from a clinic, and living in Khatlon and the RRS provinces had a negative impact. Survey year 2007 had a positive impact. The other factors related to seeking care at least once (number of births and bad health quality) were not related to the likelihood of having at least four visits, suggesting possible distinct dynamics for the decision to go at all and the decision to go for multiple visits. Factors related to use of professional assistance at birth are identical to those for having at least

one prenatal visit, with the exception the later survey year was correlated with lower use of professional care, and residence in Sughd did not have a positive effect on receiving medical assistance. In terms of magnitude, bad health care quality and income have a larger impact on the likelihood of prenatal care, while mother's education and household income have more impact on professional assistance at birth. These findings largely confirm that the results of previous work hold for a more recent period, adding information on the impact of previous births.

In columns 2, 4 and 6, we include the education of the spouse as a proxy for his preferences. As can be seen in Table 3a, we find that spouse education is significantly (positively) correlated with both the use of prenatal care and the use of professional medical care at birth. The impact of spouse education is significantly smaller than that of the education of the woman herself. While spousal preferences appear to influence the decision to get prenatal care, they are not significantly related to the decision about number of prenatal visits.

The model including the education of the eldest female (other than the respondent herself) is presented in Table 3b. As noted above, these versions of the models rely on many fewer cases than the previous models. The main variables—respondent education, household income, bad health quality and distance to clinic retain their sign and remain significant. However, perhaps due to the fact that we include here only cases where the respondent lives with an older woman (often her mother-in-law, so possibly these are more traditional households), the level of education of the respondent herself is not significant in the predicting use of medical care at birth. Spouse education remains significant in determining use of medical care at birth, and is a significant factor in the women attending more than 4 prenatal visits, but the education of the elder female is not significant. However, in the use of prenatal care, the education of the eldest female is significant and has a magnitude larger than that of the respondent herself. In this case, spouse education is not significant.

Based on the regressions in columns 2, 4, and 6 of Table 3a and in those in Table 3b, we conclude that the woman does not make the decisions about care alone. In the larger sample of all married couples, both the woman's preferences and those of her spouse play a role, although the women's impact on the decision is more important. However, in the smaller sample of respondents living with an elder female, the respondent's education is less strongly associated with care use and in the case of using prenatal care the eldest female replaces the spouse as the other significant influence.

In Tables 4a and 4b, we consider a number of factors which may influence the relative impact of the woman's preferences on the use of prenatal care and professional medical assistance at birth, building on previous work. As there was no evidence that household members other than the respondent participated in the decision whether to receive more than four prenatal visits, we do not add bargaining power measures to that model. We include the bargaining power variables individually, and all together.

Table 4a presents the results for use of prenatal care. As can be seen, the results remain highly consistent with those of the baseline model. Education of the spouse and eldest female remain significant in all versions of the model. We find, however, that factors which might enhance women's ability to survive economically on their own, relative to their spouse (relative education and employment), do not have a significant impact on the receipt of care. While we present here only one measure for ability to earn income, other measures produced the same results (see footnote 13). In a socially conservative country such as Tajikistan, where overall levels of female employment are low, and households headed by women of reproductive age are very rare, a threat to leave the relationship may not be credible, and education and labor force attachment may not affect bargaining power.

One direct measure of women's bargaining power on reproductive issues may be her ability to influence the decision to use contraceptives. However, as see in Table 4a, opposition by the husband to the use of contraceptives does not have the expected negative relationship with use of prenatal care.

Perhaps women's bargaining position on the two issues is governed by distinct norms (as suggested Furuta and Salway (2007)), or perhaps men's preferences about contraceptives differ from their preferences about prenatal care. The data does not allow us to distinguish between these two possible explanations. A second direct measure of women's bargaining power, where the respondent is head of household, also has no impact on the use of prenatal care. Including all of the sources of potential bargaining power in a single regression does not increase their significance, and an F-test does not find the bargaining power variables to have a significant impact when the effect of all four is measured together.

Where women may need to bargain with an elder female when seeking prenatal care (Table 4b), we consider two measures of bargaining power: the respondent's relative education and whether she participates in the labor force. Controlling for these, the education of the eldest female has a significant impact on care use; neither measure of potential bargaining power is significantly related to the outcome.

Table 5 presents the spouse bargaining models for use of professional assistance at birth. As with prenatal care, the models including bargaining power measures are highly consistent with the previous model. Spouse education is remains significantly correlated with the outcome. Also as in the prenatal care model, we find no impact of measures of potential bargaining power—relative income and earning capacity. Lack of bargaining power in the decision to use contraceptives is also unrelated, as is being the reported head of household. This is true whether we include the variable alone, or with other bargaining power variables, and an F-test reveals no joint impact. Relative education and participation in the labor force also have no effect when bargaining with an elder female (table not shown).

Table 3a: Factors Associated with Maternal Care, Probit Model Using Pooled 2003 and 2007: Who Decides, Spouse?

Dependent Variable:	Prenatal Consult (Yes/No)				Prenatal Consult (Greater than 4 Times)				Professional Care at Birth			
Control:	Female Education (1)		Spouse Education (2)		Female Education (3)		Spouse Education (4)		Female Education (5)		Spouse Education (6)	
	n=3,146		n=3,052		n=3,146		n=3,052		n=3,146		n=3,052	
F(19, 306) Prob > F	12.13 0.0000		11.49 0.0000		19.04 0.0000		18.14 0.0000		17.58 0.0000		16.16 0.0000	
Independent Variables												
	dF/dx	Robust SE	dF/dx	Robust SE	dF/dx	Robust SE	dF/dx	Robust SE	dF/dx	Robust SE	dF/dx	Robust SE
Edu of Mother (years)	0.011***	0.0034	0.009**	0.004	0.022***	0.006	0.020***	0.006	0.017***	0.004	0.015***	0.004
Number of Births	-0.009***	0.003	-0.012***	0.003	0.007	0.005	0.007	0.005	-0.023***	0.004	-0.025***	0.004
Log Per Cap Household Consumption 2007 USD	0.054***	0.014	0.055***	0.015	0.050***	0.022	0.056***	0.023	0.044***	0.016	0.041***	0.016
Survey Year 2007	0.003	0.049	-0.014	0.041	0.124**	0.062	0.113*	0.062	-0.096*	0.057	-0.102*	0.056
Bad Health Quality	-0.112***	0.042	-0.122***	0.041	-0.032	0.053	-0.030	0.054	-0.069*	0.037	-0.081**	0.036
Population	0.000*	0.000	0.000*	0.000	0.000	0.000	0.000	0.000	0.000**	0.000	-0.000***	0.000
Distance to Closest Clinic	-0.003***	0.001	-0.003***	0.001	-0.004***	0.000	0.004***	0.001	-0.005***	0.010	-0.005***	0.001
Region Gorno	-0.002	0.037	-0.010	0.035	-0.025	0.045	-0.022	0.050	-0.068	0.052	-0.059	0.054
Region Sughd	0.046*	0.032	0.052*	0.032	0.147***	0.053	0.154***	0.056	0.052	0.047	0.059	0.041
Region Khatlon	-0.172***	0.040	-0.153***	0.039	-0.267***	0.033	-0.263***	0.036	-0.240***	0.045	-0.223***	0.045
Region RRS^	-0.102***	0.034	-0.082***	0.032	-0.303***	0.032	-0.393***	0.034	-0.147***	0.036	-0.132***	0.036
Spouse Education (yrs)			0.006*	0.003			-0.006	0.005			0.009***	0.004

*** , ** , and * denote statistical significance at the 1%, 5% and 10% levels.

^ Dushanbe is the excluded regional dummy.

Notes: Sample includes only women with identifiable spouses whose last birth was within five years of the survey, except in Respondent is Head regression . Robust standard errors correct for impact of cluster sampling on standard errors. The regressions include individual year dummies for all birth years. 2007 is the excluded year. There are no significant birth years.

Table 3b: Factors Associated with Maternal Care, Probit Model Using Pooled 2003 and 2007: Who Decides, Elder Female?

Dependent Variable:	Prenatal Consult (Yes/No)		Prenatal Consult (Greater than 4 Times)		Professional Care at Birth	
Control:	Spouse and Eldest Female Education (2)		Spouse and Eldest Female Education (4)		Spouse and Oldest Female Education (6)	
	n=1,565		n=1,565		n=1,565	
F(21,260) Prob > F	8.30 0.0000		11.91 0.0000		8.65 0.0000	
Independent Variables						
	dF/dx	Robust SE	dF/dx	Robust SE	dF/dx	Robust SE
Edu of Mother (years)	0.006*	0.004	0.016*	0.009	0.007	0.005
Number of Births	-0.008*	0.005	0.022**	0.011	-0.031***	0.006
Log Per Cap Household Consumption 2007 USD	0.051***	0.021	0.058*	0.034	0.055***	0.024
Survey Year 2007	0.056	0.073	0.065	0.095	-0.036	0.072
Bad Health Quality	-0.153***	0.050	-0.056	0.055	-0.116***	0.049
Population	0.000	0.000	0.000	0.000	0.000*	0.000
Distance to Closest Clinic	-0.002***	0.001	-0.002	0.001	-0.004***	0.001
Region Gorno	0.032	0.045	-0.002	0.082	-0.125*	0.073
Region Sughd	0.067	0.043	0.163*	0.085	0.056	0.052
Region Khatlon	-0.118*	0.066	-0.267***	0.057	-0.246***	0.061
Region RRS^	-0.060	0.052	-0.327***	0.050	-0.174***	0.047
Spouse Education (yrs)	0.004	0.003	0.015**	0.007	0.012***	0.005
Eldest Female Edu(yrs)	0.008***	0.002	-0.006	0.004	0.003	0.003

***, **, and * denote statistical significance at the 1%, 5% and 10% levels.
^ Dushanbe is the excluded regional dummy.
Notes: Sample includes only women with identifiable spouses whose last birth was within five years of the survey. Robust standard errors correct for impact the complex stratified and clustered design. The regressions includes individual year dummies for all birth years. 2007 is the excluded year. There are no significant birth years in any regressions.

Overall, we find evidence that the woman shares decision-making about maternal health care with her spouse and also, in the decision to get prenatal care, with the eldest female in her household. However, we find no evidence that traditional measures of women's potential bargaining power are related to her use of care. Again, this result holds for the measures presented here, as well as a number

of other measures. We also do not find that a woman's bargaining with her spouse over the use of contraceptives is related to her use of maternal health care. Recognition as head of household, a possible direct measure of bargaining power, also did not have a positive impact.

These results highlight our currently limited capacity to measure bargaining power and to separate its impact from that of other variables (like preferences, for which education may be an imperfect proxy), and particularly our capacity to develop measures applicable across cultural contexts. Relative education and access to employment may make credible a bargaining threat where women can reliably form households of their own and seek employment to support these households. But, as also noted by Ransul (2008), where social norms strongly discourage divorce (or female-headed households or even female employment), education and labor market attachment may not convey bargaining power.

We find no evidence that a woman identified as head of household is more likely to get care. In the context of the extended family networks and small, rural communities, perhaps even female heads of household do not make their own choices about care (which might involve travel in public transport and even fairly long absences from the household), but must bargain with other relatives or family members, so that even headship conveys limited bargaining power.

Our results regarding the impact of (a lack of) bargaining power in contraceptive decisions about maternal health care provide further evidence that bargaining power varies across apparently similar contexts. Social norms or other factors may provide bargaining power on some aspects of care but not on others, as found by Furuta and Salway (2006) and Bloom, Wypij and das Gupta (2001).

Because of the small sample size in households where respondents had to bargain with elder females, we are less confident about the results of those tests. However, they provide preliminary evidence that elder females do participate in care decisions, and that relative education and income earning capacity do not affect the outcome of bargaining.

A question that we were not able to investigate with the Tajikistan data is whether the assets that women bring into the household convey power in this context, where a woman might threaten to return to the parental household, resulting in the loss of assets by the husband's household. Another important question which we were also not able to answer with available data is the way that women's services within the household might impact on bargaining power in the context where a threat to leave is not credible.

Finally, the type of survey data currently available also do not allow us to adequately distinguish between women's bargaining power and their underlying preferences. Education is often used as a proxy for preferences, assuming that more educated people prefer more care. But this may not always be true. Perhaps highly religious but relatively well-educated women do not prefer more care, at least in a context when the majority of doctors are male.[xiv] When asked about the reasons for not getting prenatal care, about 23% of non-recipients in both years responded that they were "ashamed,"[xv] and the rate of this response did not differ significantly by education. Malapit (2009) also notes that observable measures of the unobservable characteristic "bargaining power" may be instead capturing other unobservable characteristics. Without a direct measure of preferences on the issue of care, we cannot be sure whether, for example, relatively educated women who do not receive care lack bargaining power in the decision they share with their spouse, or whether they do not prefer care.

Table 4a: Bargaining Power Variables Associated with Prenatal Care, Probit Model Using Pooled 2003 and 2007 Data, Spouse Model

Dependent Variable:	Prenatal Consult									
	Woman is in the Labor Force		Woman's Education ExceedsSpouse'sEducation		Husband Opposed Contraceptives		All Bargaining Power Variables		Respondent is Head	
	n=3,052		n=3,052		n=3,052		n=3,052		n=3,549	
F(21, 302) **Prob > F**	11.22 0.0000		10.87 0.0000		11.16 0.0000		10.42 0.0000		11.60 0.0000	
Independent Variables										
	dF/dx	**SE**	**dF/dx**	**SE**	**dF/dx**	**SE**	**dF/dx**	**SE**	**dF/dx**	**SE**
Edu of Mother	0.009**	0.004	0.008*	0.004	0.009**	0.004	0.008**	0.004	0.011***	0.003
Number of Births	-0.011***	0.003	-0.011***	0.003	-0.011***	0.003	-0.011***	0.003	-0.010***	0.003
Log Per Cap Expenditure	0.056***	0.015	0.055***	0.014	0.056***	0.015	0.056***	0.014	0.050***	0.013
Year Dummy 2007	-0.015	0.049	-0.015	0.049	-0.018	0.050	-0.019	0.050	-0.004	0.046
Bad Health Quality	-0.122***	0.041	-0.122***	0.041	-0.122***	0.041	-0.122***	0.041	-0.103***	0.039
Population	0.000*	0.000	0.000*	0.000	0.000*	0.000	0.000*	0.000	0.000*	0.000
Distance to Closest Clinic	-0.003***	0.001	-0.002***	0.001	-0.003***	0.001	-0.003***	0.001	-0.002***	0.001
Region Gorno	0.011	0.035	0.009	0.035	0.008	0.035	0.010	0.035	-0.008	0.035
Region Sughd	0.052*	0.032	0.052*	0.032	0.051	0.031	0.052*	0.031	0.048	0.030
Region Khatlon	-0.152***	0.039	-0.152***	0.039	-0.153***	0.039	-0.151***	0.039	-0.174***	0.039
Region RRS^	-0.080***	0.032	-0.081***	0.031	-0.081***	0.032	-0.079***	0.031	-0.107***	0.031
Spouse Education	0.005*	0.003	0.006*	0.003	0.005*	0.003	0.006*	0.003		
Woman in Labor Force	-0.004	0.015					-0.003	0.015		
Woman's Education Exceeds Spouse's			0.022	0.027			0.023	0.026		
Husband Opposed Contraceptives					-0.016	0.023	-0.016	0.024		
Respondent Head									0.009	0.029

***, **, and * denote statistical significance at the 1%, 5% and 10% levels.

^ Dushanbe is the excluded regional dummy.

Notes: Sample includes only women with identifiable spouses whose last birth was within five years of the survey, except in Respondent is Head regression.
Robust standard errors correct for impact the complex stratified and clustered design. The regressions includes individual year dummies for all birth years. 2007 is the excluded year. There are no significant birth years.

Table 4b: Bargaining Power Variables Associated with Prenatal Care, Probit Model Using Pooled 2003 and 2007 Data, Elder Female Model

Dependent Variable:	Prenatal Consult					
	Woman is in the Labor Force		Women's Education Exceeds Education of Eldest Female's		All Bargaining Power Variables	
	n=1,565		n=1,565		n=1,565	
F(22, 259) Prob > F	7.81 0.000		7.94 0.000		7.49 0.000	
Independent Variables						
	dF/dx	SE	dF/dx	SE	dF/dx	SE
Edu of Mother	0.006*	0.004	0.005	0.004	0.005	0.004
Number of Births	-0.008*	0.005	-0.008*	0.005	-0.008*	0.005
Log Per Cap Expenditure	0.052***	0.021	0.051***	0.021	0.051***	0.021
Year Dummy 2007	0.051	0.072	0.063	0.073	0.059	0.072
Bad Health Quality	-0.153***	0.051	-0.154***	0.051	-0.154***	0.051
Population	0.000	0.000	0.000	0.000	0.000	0.000
Distance to Closest Clinic	-0.002***	0.001	-0.002***	0.001	-0.002***	0.001
Region Gorno	0.036	0.045	0.031	0.047	0.035	0.045
Region Sughd	0.068	0.043	0.068	0.043	0.068	0.043
Region Khatlon	-0.115*	0.066	-0.119*	0.067	-0.115*	0.066
Region RRS^	-0.056	0.051	-0.061	0.052	-0.057	0.052
Spouse Education	0.004	0.003	0.004	0.003	0.004	0.003
Education of Eldest Female in Household	0.008***	0.002	0.010***	0.003	0.010***	0.003
Woman in Labor Force	-0.010	0.018			-0.010	0.018
Woman's Education Exceeds Education of Eldest Female in the Household			0.019	0.025	0.018	0.025

***, **, and * denote statistical significance at the 1%, 5% and 10% levels.

^ Dushanbe is the excluded regional dummy.

Notes: Sample includes only women with identifiable spouses whose last birth was within five years of the survey. Robust standard errors correct for impact the complex stratified and clustered design. The regressions includes individual year dummies for all birth years. 2007 is the excluded year. There are no significant birth years.

Table 5: Factors Associated with Professional Care at Birth, Probit Model Using Pooled 2003 and 2007 Data, Spouse Model

Dependent Variable:	Professional Care at Birth									
	Woman is in the Labor Force		Woman's Education Exceeds Spouse's Education		Husband Opposes Contraceptives		All Bargaining Power Variables		Respondent is Head of Household	
	n=3,052		n=3,052		n=3,052		n=3,052		n=3,549	
F(21, 302)	15.44		16.08		15.36		14.67		18.45	
Prob > F	0.0000		0.00000		0.0000		0.0000		0.0000	
Independent Variables										
	dF/dx	**SE**	**dF/dx**	**SE**	**dF/dx**	**SE**	**dF/dx**	**SE**	**dF/dx**	**SE**
Edu of Mother (years)	0.015***	0.004	0.013***	0.004	0.015***	0.004	0.013***	0.004	0.015***	0.004
Number of Births	-0.025***	0.004	-0.025***	0.004	-0.025***	0.004	-0.025***	0.004	-0.023***	0.004
Log PerCap Expenditure	0.041***	0.016	0.040***	0.016	0.041***	0.016	0.041***	0.016	0.033**	0.015
Year Dummy 2007	-0.104*	0.056	-0.102*	0.056	-0.109*	0.056	-0.111**	0.056	-0.082	0.054
Bad Health Quality	-0.080**	0.036	-0.080**	0.036	-0.080**	0.036	-0.080**	0.037	-0.093***	0.034
Population	0.000***	0.000	0.000***	0.000	0.000***	0.000	0.000***	0.000	0.000***	0.000
Distance to Closest Clinic	-0.005***	0.001	-0.005***	0.001	-0.004***	0.001	-0.005***	0.001	-0.005***	0.001
Region Gorno	-0.053	0.053	-0.059	0.053	-0.061	0.053	-0.056	0.053	-0.074	0.051
Region Sughd	0.060	0.041	0.060	0.041	0.058	0.042	0.061	0.041	0.052	0.039
Region Khatlon	-0.221***	0.045	0.222***	0.045	0.224***	0.045	-0.221***	0.045	-0.236***	0.044
Region RRS	-0.126***	0.036	-0.129***	0.036	-0.128***	0.036	-0.123***	0.036	-0.144***	0.034
Spouse Education (yrs)	0.010***	0.004	0.012***	0.004	0.010***	0.003	0.012***	0.004		
Woman in Labor Force	-0.010	0.017					-0.009	0.016		
Woman's Education Exceeds Spouse's			0.032	0.032			0.034	0.032		
Spouse Opposes Contraceptives					-0.034	0.025	-0.034	0.026		
Respondent Head									0.054	0.036

***, **, and * denote statistical significance at the 1%, 5% and 10% levels.

^ Dushanbe is the excluded regional dummy. Notes: Sample includes only women with identifiable spouses whose last birth was within five years of the survey. Robust standard errors correct for impact the complex stratified and clustered design. The regressions includes individual year dummies for all birth years. 2007 is the excluded year. There are no significant birth years.

Who Gets Care?

To provide a clearer sense of the impact of the variables considered here on women's use of care, we create six "representative people" using the results from the full bargaining power regression to predict their probability of care.[xvi] We examine two contrasting types of women. One has the deck stacked against her on the significant variables, while the other is advantaged in the terms of these variables. To highlight the relative role of the proxies for woman's preferences and those of her spouse, we compare three possible situations for each of the two types of women. We estimate the probability of using care for the situation where the respondent and her spouse have equal education (eight years for the disadvantaged woman and 14 for the advantaged woman), and then contrast this outcome with that predicted when the respondent's education changes versus that when her spouse's education changes.

To estimate the probability of getting prenatal care, we initially assign the disadvantaged woman and her spouse an 8th grade education. Her household has income at the 25th percentile, she lives in a remote population point in socially conservative Khatlon province, where health care quality is bad, and the distance to the closest clinic is at the 75th percentile. She has given birth four times. We compare her predicted outcome with that of a relatively advantaged woman. This woman has per capita household has income at the 75% percentile. She does not live in Khatlon province. Her population point is at the 75th percentile of population and the distance she travels to the closest clinic is at the 25th percentile. Her population point does not have bad health care quality. In the initial estimate, the spouses both have 14 years of education. Like her disadvantaged counterpart, she has also given birth four times, and the eldest female in her household has nine years of education.

The results of this comparison are presented in Table 6. They show very significant differences between the advantaged and disadvantaged women in the probability of getting care. While the disadvantaged woman has only a very low probability of getting prenatal care, her advantaged

counterpart has a probability of nearly 100%. The difference in probability of receiving professional care at birth is even greater. The large differences confirm the central importance of household income, education, and region of residence in the use of care shown by Falkingham (2003) and Habibov and Fan (2008).

Comparing the predicted outcomes when varying the education of the respondent and her spouse illustrates women's relative role in choosing care. For the disadvantaged woman, an increase in her education to 14 years (holding her spouse's education constant at eight years) increases her probability of getting prenatal care by about 9 percentage points. Increasing her spouse's education (while holding hers constant at eight years) increases her probability of receiving care less. In the case of the advantaged woman (where both spouses are assumed to have 14 years of education), a reduction in her education to eight years reduces her likelihood of getting care slightly, while a reduction in her spouse's education has *more* impact. Comparing the impact of the educational levels of spouses on the likelihood of receiving professional care at birth similarly illustrates the greater impact of women's education.

Discussion

Our examination of the use of maternal health care services in Tajikistan reveals a continuation of the decline in service use documented by Jane Falkingham (2003) on the basis of the 1999 TLSS, followed by a partial and inconsistent recovery. This trend undermines improvement in maternal and infant outcomes in Tajikistan and the attainment of Tajikistan's Millennium Development Goals.

Table 6: Representative Women

	Probability of Prenatal Care	Probability of Professional Care at Birth
CASE		
Disadvantaged* Income at 25th percentile Remote location Khatlon province Poor health care quality		
Both eight years education	0.338	0.197
Respondent eight years, spouse 14	0.396	0.267
Respondent 14 years, spouse eight	0.434	0.302
Advantaged* Income at 75th percentile Not Remote location Not Khatlon province Not poor health quality		
Both 14 years education	0.973	0.968
Respondent 14 years, spouse eight	0.952	0.936
Respondent eight years, spouse 14	0.961	0.948

*Both sets of examples have four previous births.

Our work confirms previous findings (Falkingham, 2003; Habibov and Fan, 2008) in showing that income, mother's education, and access to quality care influence the use of care. Region of residence also plays a role, even after controlling for income and access—living in the more socially conservative regions of Khatlon and the RRS has a consistent negative impact on using care. Further, we show that women are less likely to seek professional assistance at birth if they have previously had more children, confirming a similar finding for Turkey (Celik and Hotchkiss, 2000).

To date, research on the use of maternal health care has not specifically addressed the question of who decides whether to get such care. A well-established correlation between women's education and

their care use has been used to suggest that more educated women prefer more care, but also that more educated women are more valued by other household decision-makers. Our results suggest that women share the decision-making with other household members, as the education of both spouse and eldest female in the household are significantly correlated with outcomes, controlling for the respondent's education (and in the context of reasonably low correlations between spouses' education levels). Our presentation of probabilities of care for women with different characteristics illustrates the impact of variations in male and female education on outcomes, highlighting that female education has a stronger impact. This may be because women's preferences are more important in the decision to get care, or because an increase in women's education not only changes women's preferences, but also the way they are valued by other household members involved in the decision.

Our attempts to identify factors which might increase women's bargaining power produced mixed results, however. Measures of power derived from women's relative ability to survive economically on their own (their relative education and labor market participation) were not related to care use. Nor was a direct measure of bargaining power in a related context—the husband's opposition the use of contraceptives. Women who were identified as head of household (another direct measure of power) were more likely to get professional care at birth—by a large margin in the case of disadvantaged women.

Following other recent work (Rasul, 2007; Bloom, Wypij and das Gupta, 2001), we conclude that effective measures of bargaining power require careful tailoring to local conditions. We extend the idea of Rasul (2007) that social norms against divorce may limit the impact of education on bargaining power, noting that limited female labor force participation may have the same effect. Where women cannot threaten to set up independent households, women's power to withhold services within the household, or to return to their parents' home (with their assets), may be more important sources of

power. Future surveys which provide strong proxies for the value of women's assets and their services in the home, as well as direct questions decision-making on a variety of issues, will allow researchers to more effectively measure bargaining power in diverse contexts. Direct questions about preferences will also help distinguish between the impact of preferences and that of bargaining power.

Returning to the immediate problem of increasing care use in Tajikistan, our results suggest that a mix of policies is important. One obvious issue is the relative cost of services, given low incomes. Costs include not only direct costs, but also bribes and gifts to poorly-paid health care providers (Dabalen and Wane, 2008), supplies which must be brought by patients, and transportation. In 2004, the government passed a pilot program in 2 rayons (counties) which guarantees free primary health care consultations and free prenatal care and hospital care for birthing (UNDP, 2005). Broader programs like this may be important in increasing use of maternal health care. Habibov (2009) discusses in detail some alternative ways to deal with cost, including community-based health insurance and careful targeting of programs.

Lack of access to quality care is also a shown be a contributing factor to low levels of maternal care use. The *Safe Maternity* program (2000-2010), supported by the Tajikistan Ministry of Health and the World Health Organization includes measures to increase the presence of qualified gynecologists in the provinces (Hasanova, 2008). A 2007 study by Mirzoev, Green and Newell (2007), however, finds slow progress in implementing reforms.

Education (of both men and women) also plays an important role. This suggests that declining enrollment rates are an issue for maternal health policy which has not yet been incorporated into efforts to address low levels of maternal health care use (an gap also noted by Mavjouda Hasanova, writing on health policy in 2008). This creates opportunities for the government to realize synergies in spending across sectors. Given the important differences in use of care in social conservative provinces and the

role of modesty in the choice to use care, policies to increase outreach to women in the home, and to

address the shortage of female doctors may also be important.

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[1] This positive relationship with prenatal care has not been found universally, however. Shiffman (2000) finds that while assistance in childbirth does have a positive impact, the same cannot be shown for use of prenatal care using cross-country aggregate data.

[2] We include as "Medical Professional" a doctor or nurse.

[3] Russian Orthodox and other Christians probably make up less than 5% of the population (Curtis, 1996; TLSS, 1999; 2003).

[4] The use of sample weights has been the subject of much debate. If the parameter one seeks to estimate is heterogeneous across people, then neither the weighted nor the unweighted results will yield a consistent estimate of the population mean of that parameter. On the other hand, if the parameter is in fact the same for all people, then the unweighted results are to be preferred, as they are more efficient. Thus, the weights distort the collected data but do not result in an efficient estimate (Deaton, 1997). We choose to use the weights to keep our work as comparable as possible with the other research. We have also performed the analysis without weights, however, and the results are comparable in both their implications and significance.

[5] Other work on this issue (Falkingham, 2003, Habibov and Fan, 2008) appears to have included all births reported in the sample.

[6] As our sample includes only women with identifiable spouses, the results are valid only for this group. However, as we note, the results are very similar to those found by Habibov and Fan (2008) and Falkingham (2003), who included all women who answered the questions regarding their last pregnancy. All researchers using this data must exclude the women who did not respond to questions about their last pregnancy. These might be women who are very conservative, or who had very

negative experiences in pregnancy. That might result in an under-sampling of such women, but it is not clear why such exclusion would bias the results in any predictable way.

[7] We also examined a third outcome, birthing in a medical facility. The results were not significantly different from the results regarding the more general question of the presence of skilled assistance at birth, so we present the results for only two outcomes.

[8] Habibov and Fan (2009) use a two-stage ZINB regression method to model number of visits given a decision to seek prenatal care at all using just the 2003 data. Due to the apparently inconsistent way that the data on number of prenatal visits was collected in 2003 and 2007, we chose to instead to follow Hotchkiss (2001) in presenting svy probit results for a dummy for multiple visits. In 2003, the number of visits varies between 1 and 9. In 2007, the number of visits varies between 1and 36, with 5% of the sample reporting over 13 visits. It appears that the question was not asked, or coded, the same way in both years, and as a result we were disinclined to use all the data on number of visits. However, we performed two robustness tests for our modeling choice. First, to check for sensitivity to our choice of 4 visits for our dummy variable, we re-ran the regressions using a dummy for more than 3 visits and also for more than 5 visits. The results are identical, except that in the case of more than 5 visits the number of previous births has a significant positive impact. Second, we followed Habibov and Fan (2009) in running a ZINB. The results for the second stage (the number of visits, given that at least one visit would occur) were identical to those resulting from the svy probit regressions presented here for the dummy variable Greater than 4 Visits in sign and significance, with one exception. Number of Births is significant in the ZINB but significant in the probit version only in the robustness test where we used a dummy for greater than 5 visits. The ZINB results are available from the authors.

[9] Both the 2003 and 2007 surveys include information on the existence of and distance to both the closest polyclinic and women's clinic. We use the shorter of these two distances.

[10] The correlation between a woman's education and that of her spouse is 0.35; correlation between the woman and the eldest female interactive variable is 0.16.

[11] The regressions control for the education of both the woman and her spouse, and continuous measures of relative education are co-linear with those variables.

[12] Labor force participation is low and data on employment was very incomplete. Among women who provided full answers to the work questions, the vast majority those who worked were employed full time. There was little variation across different possible measures of access to income (hours worked, weeks worked) and the choice of measure did not affect the outcome.

[13] There is very little correlation between these bargaining power variables. Correlation coefficients range from -0.0027 (between the dummy for employed and female head) to 0.0945 (between the education of the eldest female and that of the spouse).

[xiv] Only about a third of doctors in Tajikistan are female, which may contribute to these feelings of being "ashamed," especially in the context of a resurgence of more strict interpretations of Islam. Gorno-Badakhshian, which has significantly higher levels of use of maternal health services, also has the highest share of female doctors, 67% (Dabalen and Wane, 2008).

[xv] This was a closed question, and most options reflected an underlying model as in Figure 1. No options were offered regarding the woman's role in the choice.

[xvi] The care probabilities reported are calculated using Stata's "adjust" command, which calculates the predicted values for a person with the specified characteristics, derived from the probit regression equation.