Household Bargaining and Excess Fertility: An Experimental Study in Zambia

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Abstract

This paper tests the role of spousal discordance in fertility preferences in explaining low rates of contraceptive use and high rates of unwanted births through a field experiment in Zambia. We randomly assigned married women to receive, either alone ("Individual" treatment) or in the presence of their husbands ("Couples" treatment), a voucher that guaranteed ease of access to modern contraceptives. Women in the Individual treatment were 23% more likely to visit a family planning nurse and 38% more likely to receive a concealable form of contraception, leading to a 57% reduction in unwanted births. Meanwhile, providing cheaper and more convenient forms of birth control led to a reduction in unwanted births *only* when women were also given full autonomy over accessing these new methods: although use of modern methods increased by a substantial amount among women in the Couples treatment relative to a control group who received no voucher, they experienced no corresponding reduction in unwanted births. These findings indicate that asymmetric information about use of contraceptives has a strong influence on outcomes in household bargaining over fertility. Furthermore, increasing the supply of contraceptives will have little impact on excess fertility in Africa as long as de facto spousal consent requirements for birth control access remain in place.

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1 Introduction

The ability to control fertility through modern contraception is one of the most important technological developments of the 20th century, with potentially broad social and economic consequences for women and society. Recent evidence from the United States and Colombia suggests that the ability to optimally time births with modern birth control methods results in large increases in female schooling and labor force participation at childbearing ages (Goldin and Katz, 2002; Bailey, 2006; Miller, 2005) and improved outcomes for children (Do and Phung, 2010).

Despite the value to individuals and society of fertility control, there are significant and poorly understood barriers to the adoption of contraceptives in the developing world. Although modern methods of birth control have been around for almost half a century, many countries still report substantial unmet need for contraceptives and high rates of unwanted births.[1] For instance, the overall rate of unmet need in Sub-Saharan Africa was estimated to be 25% in 2001 (Westoff, 2001).

Unmet need and excess fertility are generally attributed to barriers to access to modern contraceptive methods such as cost, distance to providers, and limited numbers of methods available due to stockouts at clinics, and misinformation about the efficacy or risks of available methods.[2] Yet high rates of unwanted births are reported in many settings where birth control is readily and cheaply available. Furthermore, since the cost of preventing births using any method must be small relative to the cost of raising a child, others have gone so far as to argue that survey data on unintended pregnancy must reflect systematic mismeasurement of fertility desires (Becker, 1991).

An alternative hypothesis is that birth rates exceeding women's reported ideals reflect the outcome of bargaining between partners with differing demand for fertility control. In

[1]Unmet need is defined by demographers as the difference between the share of women at risk of pregnancy who report wishing to discontinue childbearing or space and the share of women who report currently using a contraceptive method. Unwanted births are defined either, using panel data, as births to women who reported within the past two years that they did not wish to become pregnant within the next two years, or, using cross-section data, as births to women who report ex post that the birth was undesired.
[2]Excess fertility is defined as residual live births above and beyond a woman's reported ideal family size.

particular, data from surveys such as the Demographic and Health Surveys (DHS) indicate that, in many countries, men tend to report larger ideal family sizes and lower demand for contraception than their wives (Becker, 1999).[3] Furthermore, qualitative studies and survey data from Zambia and elsewhere indicate that women frequently hide contraceptive use from their partners (Biddlecom and Fapohunda, 1998; Castle et al., 1999; McCarraher et al., 2005), suggesting strategic behavior within the household in response to spousal disagreement over fertility. The desire for concealability in the face of spousal control has been shown to be strong in intra-household financial decision-making (Ashraf, 2009) and has potentially even greater societal implications for child-bearing.

This paper tests the role of spousal discordance in explaining unmet need for contraception and excess fertility through a field experiment with a large family planning clinic in Lusaka, Zambia. In our study, 1031 married women were randomly chosen to receive a voucher guaranteeing free and immediate access to a range of modern contraceptives through a private appointment with a family planning nurse. This amounted to a sudden and unexpected improvement in access to long-term and relatively concealable forms of contraception, including injectables and contraceptive implants. A control group of 768 women received nothing. To isolate the role of discordance, our experiment involved randomizing women in the treatment group to either receive information about this opportunity in private ("Individual" treatment) or in the presence of their husbands ("Couples" treatment). This gave a randomly selected set of women the choice to withhold information about the opportunity to access new methods of contraception from their husbands.

By introducing random variation in the degree of asymmetric information between spouses on contraceptive availability, our experiment isolates the role of private information about contraception in fertility decisions and quantifies its influence on fertility. Providing information in private increases a woman's autonomy in the decision to use and conceal contraception but would only alter outcomes in the face of spousal discordance.

[3]Although the first implies the second, (Biddlecom and Fapohunda, 1998) note that men may have greater willingness to exceed their ideal family size simply because of a stronger aversion to contraception.

Thus, by comparing rates of take-up of contraceptives and birth across women with different levels of opportunity to act in private, we can determine whether intra-household disagreement over family planning lowers take-up of modern contraceptive methods and increases unwanted births. Meanwhile, differences in contraceptive use and birth outcomes in the control group relative to each of the two treatment arms estimate the impact of improving access to contraception in settings with and without full female autonomy over family planning services.

Our results suggest that intra-household discordance over family planning plays a significant role in contraceptive use and fertility outcomes. When women were given greater opportunity to make decisions alone, they were 23% more likely to respond to changes in contraceptive access by visiting a family planning nurse and 38% more likely to ask for a relatively concealable form of contraception (injectable contraceptives or contraceptive implants), leading to a 57% reduction in unwanted births.

Results from our experiment shed light on whether intra-household decision-making leads to efficient outcomes in a particularly important type of household production – reproduction. Standard unitary or collective models of the household imply that fertility should not respond to who in the household is given nominal control over access to contraceptives. The fact that, according to our results, varying the degree of asymmetric information characterizing the bargaining process has significant effects on outcomes implies that standard bargaining models that ignore asymmetric information are poor approximations of household decision-making over fertility. Our findings suggest that, instead, decision-making over fertility is characterized by incomplete contracts with sunk investments.[4] Previous empirical evidence in support of this framework comes from Rangel (2005), Rasul (2004) and Field (2003). For instance, Field (2003) finds that the partial inclusion of women on formal land titles in Peru lead to significantly fewer pregnancies in

[4]Furthermore, fertility possesses features which make an incomplete contracts approach, such as Rasul (2004), a particularly attractive way to model bargaining over this outcome: fertility investments are sunk in the sense that children are not liquid, investments in fertility are relationship-specific, and it is difficult for couples to write contracts that condition division of marital surplus on number of children.

the year following the titling program, consistent with a bargaining model in which threat points influence fertility outcomes. Our experimental approach improves on this literature by circumventing the endogeneity concerns inherent in non-experimental studies.

In addition to contributing rigorous evidence to our understanding of household decision-making over fertility, our findings have a number of implications for family planning policy. First, the results indicate that rates of contraceptive use would increase in response to simple changes in institutional or technological features that increase women's autonomy over birth control. The results also help explain why improvements in contraceptive availability have failed to bring about significant reductions in unwanted births in many parts of the world: Women in our experiment who were given access to significantly cheaper and more convenient forms of birth control *only* experienced a reduction in unwanted births relative to a control group when they were also given full autonomy over accessing these new methods. Although usage rates increased among women in the Couples treatment relative to women who received no voucher, the rate of unintended births one year later was identical, indicating that those on the margin of taking up new methods spousal consent is required re women who already have reasonable control over fertility with existing methods. This suggests that increasing the supply of contraceptives while maintaining formal or informal spousal consent requirements for accessing hormonal contraception, as has been the case in much of Africa, will make birth control more convenient for existing users but have little influence on preventing unwanted births.

2 Context

Our study took place in Lusaka, Zambia, a setting in which contraceptives are readily available from public and private providers, but reported unmet need for contraception is nonetheless high. According to the 2001/2002 Zambia DHS, 51% of currently pregnant women in the sample report that the pregnancy was not wanted at the time of conception. While 99% of women reporting unwanted pregnancies were familiar with at least one

method of modern contraception, only 26.8% reported ever having used any modern contraception.[5] Maternal mortality is also relatively high: According to the 2007 Zambian DHS, a woman's lifetime risk of maternal death is 1 in 27.[6]

In Lusaka, contraceptives can be obtained through public clinics, private clinics, or pharmacies. Contraceptive pills and condoms are sold in most pharmacies and injectable contraceptives are sold in a handful. In principle, all three methods, along with contraceptive implants and intra-uterine devices (IUDs), are available for free through public clinics, although severe public resource constraints result in long waiting times for appointments and frequent stockouts of many methods. For instance, prior to the inception of this study, our partner clinic – one of the largest in Lusaka – had been out of stock of contraceptive implants for over a year. According to a comprehensive assessment of stockouts conducted by USAID, between October and December 2007, 53% of hospitals and health clinics in Zambia were stocked out of injectables for an average of 54 days and 28% were stocked out of contraceptive pills for an average of 35 days (**?**).

In addition, for certain methods such as contraceptive implants, women are required to supply some of the materials necessary for the procedure such as surgical gloves and disinfectant. Though spousal consent was required by law until 2005, women are no longer officially required to have their husband's approval in order to obtain contraceptives through public clinics in Zambia. Anecdotally, however, health care providers in rural Zambia, as in other parts of rural Africa, still commonly refuse to give contraceptives to women without the explicit consent of their husbands. For long-term methods such as implants and IUDs, this practice has been reported in urban areas as well.

Finally, baseline survey data indicate that a high fraction of women hide contraceptive use from their husbands: among the 23% of men in our sample who claim they are currently "not doing anything to prevent pregnancy", 59% have wives who separately report using some method of birth control, including 18% who are on the pill and 12% who are using injectables.

[5]Authors' tabulations.
[6]Calculated using the Zambian total fertility rate (TFR) of 6.1.

3 Experimental Design

3.1 Sample recruitment

The timeline in Figure 1 illustrates the stages of our experiment. We recruited subjects from the catchment area of Chipata Clinic, a large government clinic that serves low- and middle-income peri-urban neighborhoods of Lusaka. Community health workers (CHWs) from the clinic were hired to recruit subjects through home visits. Married women of childbearing age (18-40) were invited to participate in the study if they: (1) currently lived with their husband; (2) had last given birth between January 2004 and December 2006; (3) were not currently pregnant; (4) had neither been sterilized nor had a hysterectomy; (5) were not known to have health conditions for which hormonal contraceptives are contraindicated; and (6) agreed to participate in a survey and information session about family planning together with their husband.[7] Although the intervention only required the husband's presence in the "Couples" treatment, criteria (6) was imposed on all subjects in order to prevent higher rates of attrition among those assigned to the "Couples" or control arms relative to those in the "Individual" arm.

Recruitment was conducted in two stages using two different sampling frames. In the first stage, which took place in July and August of 2006, subjects were recruited from the roster of women who, according to clinic obstetric records, met inclusion criteria (2) and (5), and who resided at the address listed in the records. Only around 50% of those women could be located, largely because of false or missing addresses and high rates of mobility within the city.[8] Therefore, women were also invited to participate in the study if they resided at the house number listed for the intended respondent and met all six

[7]Each of these inclusion criteria was screened by the CHW during recruitment visits. In addition, women were thoroughly screened for health conditions in criteria 3 and 5 if and when they visited the family planning nurse at Chipata clinic. Disqualifying health conditions included diabetes, heart disease and high blood pressure.

[8]The clinic staff reported that false addresses were often given by women who resided outside of the official catchment area in order to obtain obstetric services at Chipata clinic, which is larger and much better equipped than other clinics in Lusaka. To the extent that this is true, women who were found are a representative sample from the catchment area.

inclusion criteria.[9] To expand the sample, from August 2006 to April 2007, women were recruited by randomly sampling house numbers in the neighborhoods that comprise the catchment area of the clinic.[10] Women residing at sampled house numbers were invited to participate if they met all six inclusion criteria.

3.2 Baseline Survey

Our baseline survey and intervention took place between March and June 2007. Among all those recruited for the study, a baseline survey visit ("First Visit", Figure 1) was made by a team of one survey enumerator and one CHW. During this visit, CHWs first re-screened women to ensure that they continued to meet all of the inclusion criteria and still agreed to participate. In total, 1799 eligible women gave consent to participate in the study were administered a one-hour survey in their homes that collected detailed information about marriage and childbearing, school enrollment of children, fertility preferences, decision-making in the household, and contraceptive use.

Immediately following the survey, CHWs were responsible for delivering health information about the prevention of sexually transmitted diseases (STDs) and condom use and distributing a three-pack of condoms.[11] In addition, CHWs gave participants information about the benefits of family planning, the range of family planning methods available at Chipata clinic, specific information about injectable contraceptives and contraceptive implants including contraindications and side effects, and counseling about dual protection. Husbands were not present during either the survey or the information session of the first visit.

[9] Of the women recruited in the first stage, 74% were taken from obstetrics records and 26% were alternates residing at the addresses listed in the records. At both stages, if more than one eligible woman resided at a sampled address, only the one whose first name came first in alphabetical order was invited to participate.

[10] The catchment area is approximately 8 square kilometers and densely populated, encompassing an estimated 107,107 people.

[11] CHWs all had previous relevant experience working with the clinic to implement information campaigns and homecare programs. The script and talking points for the information covered in this visit are detailed in Appendix A.

3.3 Experimental Intervention

Prior to the first visit, recruited women were randomized into treatment (N=1031) and control (N=768) groups.[12] The key experimental manipulation took place during a second visit made to those assigned to the treatment group in which women and their husband were visited concurrently. On that occasion, all women assigned to the treatment group – either with their husbands or in private – received a voucher that could be redeemed for free and immediate access to a menu of modern contraceptives through an appointment with a dedicated family planning nurse at Chipata clinic. This voucher guaranteed a maximum wait time of one hour and guaranteed access to two methods - injectable contraceptives and contraceptive implants - that had been regularly out of stock at the clinic prior to our study. According to clinic personnel, in 2006 injectable contraceptives were out of stock more than half of the time and contraceptive implants were almost never available.[13] Although patients could purchase these outside of the clinic and bring them in to be administered, according to nurses at Chipata, average wait times for family planning visits were typically more than two hours.

In order to provide wait-free appointments with guaranteed access, we hired a dedicated nurse for the study and purchased sufficient stocks of injectable contraceptives (Depo-Provera) and contraceptive implants (Jadelle) to treat all women in the sample for at least one year.[14] These stocks and the nurse were reserved exclusively for women in our study. Hence, the voucher significantly reduced barriers to accessing long-term methods of contraception. The voucher, a copy of which appears in Appendix B, was valid for one month from the day it was issued.[15] To ensure that vouchers were not used by individuals

[12] Randomization was done using the minmax t statistics method (Bruhn and Mckenzie, Bruhn and Mckenzie), with treatment assignment balanced on the following variables collected at the time of recruitment: compound, community health worker, number of children, whether currently using any family planning method, whether currently using the pill, whether currently using injectables, and months since last birth.

[13] Interview, Nurse Grace Daka, Chipata Clinic, July 2009.

[14] To keep waiting lines short we spaced the intervention over 4 months, distributing approximately 50 vouchers per week.

[15] To minimize confusion over the offer period, the expiration date was written clearly on each voucher by the CHW on the day of the second visit.

outside of our sample, the wife's name and national ID numbers were written on the voucher by enumerators, and women were instructed to bring their ID cards to the clinic at the time of the visit for the nurse to verify. Responses to the debriefing survey were also used to verify the identities of women using the voucher.

Our experimental manipulation involved varying the manner in which the voucher was distributed. Prior to the second visit, all women in the treatment sample were randomly assigned to either Individual or Couples treatment arms, which determined whether they were given the voucher alone (Individual) or in the presence of their husband (Couples). Treatment group was assigned dynamically within batches of surveys collected from enumerators approximately each day and balanced on the following variables collected in the baseline: wife's age, wife's education, current number of living children, reported desired number of children, reported differential in fertility desires between the woman and her husband, whether the woman was currently using injectables, and whether the woman was currently using the pill.[16]

The experimental protocol was as follows: When the field team arrived at the participants' home for the second visit, the couple was told that the team would be conducting short surveys of both the husband and wife. To ensure confidentiality, they were surveyed separately and in private. The husband's survey, which was kept very short to minimize refusals, gathered information on fertility preferences and income. The wife's survey during this visit was also extremely brief given that a large amount of information from the wife had been collected during the first visit, and contained only questions about whether she had visited a clinic since the previous visit and whether she had seen or heard about the voucher.[17] Compensation for participation was given to the husband and wife separately, i.e. after their respective interviews.[18]

[16] As with assignment to treatment versus control groups, randomization was done using the minmax t-statistics method.

[17] The primary purpose of re-surveying wives in this visit was to get women alone so that those assigned to the Individual treatment could be given the information session and voucher while away from their husbands.

[18] Initially, women were given a choice between two compensations of similar value: cash and a piece of printed cloth known as a chitenge that can be used as a skirt or a wrap. Later in the study, women were

Treatment assignment was revealed to the survey team when they removed the survey instrument from the pre-labeled envelope at the start of the interview.[19] In the case of women assigned to the Individual treatment, first the husband was surveyed alone, then the voucher and information session were administered to the wife in private, and then a brief survey was administered to the wife in private. In the case of women assigned to the Couples treatment, first the husband was surveyed alone, then the husband and wife were brought back together to receive the information session and voucher, and then the wife was given the short survey.[20] Appendix C describes the protocol in depth. Based on responses to debriefing surveys conducted among 48% of women in our study, we estimated a 1.1% rate of non-compliance with treatment assignment.[21] Throughout the paper we consider only treatment assignment rather than treatment received.

In total, 503 women in our study were assigned to the Couples treatment arm and 528 women were assigned to the Individual treatment arm.[22] Table 1a presents summary statistics on a wide range of variables available in the baseline broken down by treatment assignment. Variables 2 through 9 in the table were those used to balance assignment across the two treatment arms, hence, means of these variables are predictably very similar across the two treatment groups. Out of 43 variables not used to balance the sample, there are no differences in means that are statistically significant at the 10% level (column 10),

only offered chitenges as compensation, due to concerns over enumerators carrying too much cash and the fact that most women chose cloth over cash. Men were given the choice of compensation in cash or in cell phone minutes of equal value. Compensation was described to participants as an "appreciation of their time".

[19] This was done by prior stapling of the voucher to either the husband (indicating Couples assignment) or the wife (indicating Individual assignment) survey sheet).

[20] CHWs and surveyors were responsible for ensuring adherence to the experimental protocol, monitored daily by supervisors.

[21] Mistakes were caught through debriefing surveys conducted at the clinic in which supervisors asked women to describe their protocol. If it did not match the treatment assignment, they would probe, and report the non-compliance to the project manager. In each reported case of non-compliance, the project manager then spoke to the CHW/enumerator team to confirm it was noncompliance. In a few instances, the project manager also visited respondents in the field to probe further and confirm whether they were given a faulty treatment. In total, 9 cases were discovered this way.

[22] The Individuals arm is slightly bigger than the Couples arm due to the fact that random assignment was done in more than 100 small batches, and the computer program automatically assigned Individual treatment status to more than half of the observations when the batch size was odd.

indicating that treatment assignment is balanced. The last column of Table 1a shows that the sample is also balanced across control and treatment groups: None of the mean differences between the control and Couples arms are significant at the 5% level, although three out of 45 variables not used to balance the sample are significantly different at a 10% level.[23] To account for potential imbalance, we present all results with and without the full set of controls.

3.4 Sample attrition

Not all 1031 treatment women who were administered a baseline survey participated in the experiment.[24] In total, 282 women attrited from the study between the first (baseline survey) and second visit (treatment) for two reasons: First, 24% either chose to drop out or became ineligible.[25] Second, since fieldwork had to be completed by a set date (May 24, 2007) due to personnel and resource constraints, 76% of these could not be located to complete the second visit by the deadline.[26] Hence, our sample of final participants includes 749 treatment women, 378 assigned to the Individual treatment and 371 assigned to the Couples treatment.

Given that attrition occurred before treatment assignment was revealed to subjects, it is safe to assume that factors determining attrition were orthogonal to treatment assignment.[27] Although enumerators were potentially aware of treatment assignment, there is

[23] Although the sample sizes are larger, differences in mean characteristics are greater across treatment versus control groups compared to differences across the two treatment arms since fewer baseline characteristics – in particular, only those available in the recruitment survey – were used to balance experimental assignment to treatment versus control groups.

[24] On-the-spot randomization at the time of the second visit would have circumvented this problem, but our choice to balance treatment assignment on baseline characteristics prevented us from randomizing on the spot. The control group faced no analogous attrition since they were visited only once.

[25] Although these two visits were usually close together (on average, 9.6 days), in a few cases husbands and wives could not be reached together for several weeks after the baseline survey.

[26] These cases were disproportionately women recruited near the end of the study. In the majority of cases, although women could be located for a second visit, enumerators were unable to carry out the intervention after multiple attempts because husbands' work schedules made it extremely difficult for the enumerator to schedule and keep appointments with men.

[27] Importantly, no subjects dropped out of the study mid-way through the intervention, which was when treatment assignment was revealed

no reason to anticipate attrition to be correlated with treatment assignment on account of enumerator behavior since recruitment procedures were identical across study arms.[28] It is also worth noting that rates of attrition were almost identical across treatment arms: attrition was 26.8% in the Couples treatment arm and 27.6% in the Individual treatment arm. Table 1b, which reveals that treatment arms in the final sample (post attrition) remained balanced on all observables, provides further evidence that attrition was independent of treatment assignment.

In terms of external validity, it is worth keeping in mind that some amount of attrition may reflect subjects' tacit unwillingness to participate in the study. However, the direction of bias due to this type of sample selection is unclear. Wives with husbands who are most unwilling to participate in a family planning survey may be the most likely to hide contraception when given the opportunity, in which case our experimental results underestimate the average effect of the intervention on the population of eligible women. Alternatively, attrition may be driven by women with no interest in family planning who would be little influenced by treatment assignment, in which case our estimates overstate the average population effect.

Comparing observables in our sample with those of married women in Lusaka from the 2007 Demographic Health Survey (ZDHS) sheds some light on the representativeness of our sample (Appendix Table 1). In many respects, such as education, our sample is very similar to the random sample from the ZDHS. However, the means indicate that our sample is composed of a disproportionate number of couples with discordant fertility preferences and relatively frequent intercourse. These differences suggest that our experimental sample is at greater risk of an unwanted birth than the average woman in urban Zambia. Furthermore, women in our sample also have significantly more experience using modern contraceptives than the average woman in urban Zambia, likely sue to their proximity to the clinic. Both differences are consistent with the case in which the most important source of selection is interest in modern family planning methods. Although

[28] In particular, enumerators were required to locate and interview both the husband and wife in all cases, a protocol feature added intentionally to minimize this concern.

this suggests that our expected treatment effect may be larger than what we would anticipate were the experiment conducted on a random sample of women from the same population (although not definitively), we are arguably still capturing the estimate of interest for policy purposes by implicitly restricting the sample to women with a demand for family planning services since this is the group that would be influenced by policy measure such as increasing access to injectable contraceptives.

4 Empirical Analysis

4.1 Experimental Outcomes

To study the role of spousal discordance in family planning, we examine differences between the two treatment arms in four main outcomes of interest: use of the voucher, choice of contraception, use of contraception, and pregnancy. Outcomes come from two sources: administrative data from clinic records on family planning visits and contraceptive use ("nurse's logs") during the period in which vouchers were redeemed (short-run outcomes), and data from a follow-up survey of women conducted two years after the intervention.

4.1.1 Short-run Outcomes

To keep track of visits women made to the family planning clinic to redeem their voucher, the nurse hired for the study, who oversaw the daily management of the experiment with the assistance of medical interns, kept daily visit logs. For each woman who came to the clinic to redeem a voucher, the nurse checked that their identity corresponded to the information written on the voucher, discussed family planning alternatives with the women and prescribed her desired method after thoroughly screening for contraindications. Detailed logs of each visit recorded the date and time of visit, the name and NRC number of the woman, the ID number of the voucher, and the desired, prescribed and received family planning method (result of the visit). In cases in which women could not be prescribed a certain family planning method on account of a temporary condition such as

menstruation, current use of a contraceptive method, or illness, their prescribed method was recorded along with their reason for not receiving it, and a follow-up appointment was set. Subsequent visits by women in treatment arms were also recorded in the nurse's log for approximately one month after the last participant's voucher expired in order to capture contraceptive choices for women who required follow-up appointments. Official expiry date of the last voucher was June 23, 2007.[29]

From these data, we construct a variable indicating whether a woman redeemed her voucher according to whether her name appears in the nurse's logs.[30] As an alternative measure of voucher redemption, we augment the subsample of vouchers redeemed according to the nurse's logs with 38 follow-up survey respondents who claimed to have used the voucher but did not appear in our records. While the majority of these cases are likely to reflect misreporting given that the follow-up survey was conducted two years later, it is possible that some are women who tried to redeem the voucher at the wrong clinic, or after the expiration period.

Based on values recorded in the nurses' logs, we also construct two variables for the analysis related to an individual's take-up of concealable contraceptives at the time of the clinic visit. The first is the contraceptive method the woman requested from the study nurse at the start of the family planning appointment. We construct an indicator variable equal to one if the woman asked for either injectable contraceptives, a contraceptive implant, or an IUD at the time of her family planning visit, all of which are considered concealable methods because they are administered only in the clinic in the privacy of the

[29] According to clinic staff, a handful of women with expired vouchers continued to come into the clinic until August 2007 but did not redeem their voucher with the study nurse, who was no longer available at the clinic.

[30] These data were also cross-checked with two additional sources: First, all of the vouchers that were redeemed were physically collected from the clinic by the investigators to verify that all women who redeemed a voucher were reported in the nurse's logs. In addition, enumerators conducted a short debriefing survey with each woman in the study as she exited the clinic after her family planning visit. These data were used to verify that we collected vouchers from all women who went to the clinic, and to capture information on contraceptive choices for women who were missing from the nurse's logs. We found no vouchers nor women who completed debriefing surveys who were not recorded in the nurse's log.

nurse's office.[31] She then screened the woman for contraindications and either prescribed her chosen method or offered a list of alternative methods if she was not eligible. Hence, our second variable is whether the woman received a concealable method of contraception.

4.1.2 Long-run outcomes

To study the long-run impact of birth control access provided through our study - particularly, the effects on fertility -, we conducted a follow-up survey approximately two years after the baseline. Women who moved were tracked to other parts of the country, and only 1% of study subjects were not located at follow up. In total we re-interviewed 94% of individuals in the final study phase, leaving a final sample of 789.[32] The follow-up survey contained questions analogous to the baseline, in addition to extensive qualitative data on factors influencing a respondent's decision to redeem the voucher and choose a particular contraceptive method, intended to shed light on mechanisms underlying differences in use of the voucher across treatment arms.

From these data we construct four measures of family planning behavior between baseline and follow-up: whether the respondent gave birth 9-13 months after she received a voucher, whether she gave birth 14-24 months after the intervention, whether she tried a new form of contraception between baseline and follow-up, and whether she was using a concealable contraceptive method at the time of follow-up (on average, 24 months after the intervention).[33]

4.2 Regression Estimates

We test the following null hypotheses:

[31] To elicit this information, the study nurse was instructed to, after describing the range of available contraceptives at the clinic, ask each woman her preferred method of contraception based on the available choices.

[32] Of those that could not be interviewed, 3% had passed away, 2% refused, and 1% could not be found.

[33] We choose to look at births 9-13 months in order to capture all possible births prevented by one shot of injectable contraception taken by women in our study. Injectables prevent births for three months and reduce fertility for four months. Furthermore, women could have redeemed the voucher, and hence received a shot, up to one month after receiving the voucher.

1. Voucher redemption is no different for women who receive the voucher alone than for those who receive it with their husband. If this is not true, it implies that couples have discordant preferences over number of children and are unable to bargain efficiently over fertility outcomes.

2. Women who receive the voucher alone are no more likely to prefer or to use "concealable" contraceptives such as injectables and implants than women who receive the voucher with their husbands.

with the following ordinary least squares (OLS) regression model:

$$Y_i = a + \beta I_{individual} + vX_i + e \tag{1}$$

where Y_i is the binary outcome variable of interest; $I_{individual}$ is an indicator for assignment to the Individual treatment, in which women received the voucher in private; and X_i is a vector of controls from both the husband's and wife's baseline surveys, including: husband's and wife's age, husband's and wife's education, husband's and wife's income, husband's and wife's existing and ideal number of children, whether wife was using contraception at baseline, whether wife over 40, whether wife desires to become pregnant within the next two years, and whether wife was aware of most fertile period of the month.

As described above, there should be no differential effect of being given the voucher alone or with one's husband for women who have the same preferences over children as their husbands. To check this, we split our sample according to whether the husband wants more children than his wife, whether the husband and wife want the same number of children, and whether the wife wants more children than her husband. To more precisely gauge the impact on unmet need for contraception and unwanted births, we also look separately at treatment effects among the subsample of women who report at baseline that they wish to avoid pregnancy over the next two years.

5 Results

5.1 Voucher Redemption

In total, 48% of women who were given a voucher for family planning services redeemed the voucher and had an appointment with a family planning nurse and the opportunity to receive a prescription for free contraceptives. The first two columns of Figure 2 show the difference in take-up rates by treatment arm. While only 43% of women in the Couples treatment redeemed the voucher, the rate was 53% in the Individual treatment arm. To gauge the significance of this difference, Table 2 presents regression estimates of the effect of private information on voucher redemption. The basic experimental estimate in Column 1 indicates that giving women the opportunity to hide information about the reduced price of contraceptive services from their husbands increased the rate of voucher redemption by ten percentage points, or by 23 percent, and the estimate is significant at the 5% level. The estimate changes little when control variables are added (column 2). When we use the alternative definition of voucher redemption (columns 3-4), which also considers reported use from the follow-up survey, the point estimate falls slightly but remains significant.

In Table 3 we explore heterogeneity in the treatment effect according to the husband's and wife's demand for children by dividing the sample according to whether the husband desires more or fewer children than his wife (according to the wife).[34] The ability to conceal should have a larger effect on the wife's take-up of family planning services when her husband desires more children than she does because spousal disagreement creates an incentive for the wife to conceal contraceptive use and thereby capture more of the bargaining surplus. Indeed, the estimates in Table 3 indicate that voucher redemption is only significantly higher for women who are given private information when the husband desires more children than his wife (columns 1-2). In this subsample, which encompasses

[34] Since we are interested in how the wife responds to private information, we use her beliefs about her husband's preferences rather than his stated preferences (from the husband's survey) since the former would dictate her behavior.

a mere 26% of the sample, women are 46% more likely to use the voucher when they are not required to share information about the opportunity with their husbands. Meanwhile, there is no significant effect of private information when the couple has concordant fertility preferences or when the wife desires more children than her husband, although the means across columns are not significantly different from each other at conventional levels.[35]

The last four columns of Table 2 divide the sample according to the wife's fertility desires as a means of isolating the effect of our intervention on unmet need for contraception. According to the standard definition used by demographers, a woman is considered to have an unmet need for contraception if she: (1) is married or in a consensual union; (2) is of reproductive age; (3) is capable of becoming pregnant; and (4) wants to have no more children or to postpone childbearing by at least two years. Based on the sampling frame, all women in our study meet the first three criteria. To identify women who meet the fourth criteria, we use baseline survey data to categorize women as desiring to space or limit fertility at the time of the intervention if they do not claim to want to give birth within the next two years.[36] For obvious reasons, we should see little impact of reducing the cost of contraceptives among women who desire to conceive, and therefore little difference between two treatment arms among such women. Indeed, as the estimates reveal, there is no measurable effect of the intervention among the 27% of the sample who desire to have another child in the immediate future. Reassuringly, the effect is concentrated among the 73% of women in our sample with some demand for birth control, among whom we see a 27% increase in voucher redemption.

[35] While one might expect voucher redemption to be *lower* in the private information treatment when women demand *more* children than their husbands, given that husbands are always excluded from family planning appointments, a man who wishes to avoid pregnancy has little to gain by pushing his wife to go to the clinic when he has no control over the outcome of the visit. That is, the predictions are not symmetric since men can ensure that their wives don't take advantage of the opportunity (for instance, by destroying the voucher), but can not ensure that they take advantage of the opportunity just by going to the clinic.

[36] We use two questions to identify this subsample: "If it were completely up to you, would you like to have another child within the next two years, after two years or not at all?" and "If it were completely up to you, how long would you like to wait until the birth of another child?" A respondent is reported as desiring to conceive if she reports wanting to give birth within two years according to either of these questions.

5.2 Take-up of Concealable Contraceptives

We next turn to the effect of private information on take-up of concealable contraceptives. As described earlier, since women were not always able to receive their desired method due to contraindications, as outcome variables we look at both the method of contraception that a woman initially requested during her visit and the method that was ultimately prescribed by the nurse.

While our voucher results in Table 2 indicate that husbands' disapproval is a significant barrier to the utilization of family planning services, there are two important reasons for examining the direct effect of the intervention on take-up of concealable contraceptives. First, doing so provides a consistency check on our interpretation of the difference across treatment arms. According to our theoretical framework, the higher rate of voucher redemption among women in the private information treatment derives from greater ability to conceal use of contraceptives. Hence, we should expect to see disproportionate take-up of relatively concealable methods among women in the Individual treatment accompanying their higher rate of voucher redemption. Second, the effect on contraceptive use is important for drawing policy conclusions from our intervention. In particular, while the results on voucher redemption indicate that husbands discourage women from using family planning services, it is possible that differences in family planning visits do not translate into differences in the prevention of unwanted births. For instance, it could be the case that women are willing to meet in secret with a family planning nurse but are hesitant to carry through with a new method of contraception without their husband's approval. In this case, while discordance is a real and identifiable friction in household fertility decisions, the ability to conceal birth control with access to standard modern contraceptives is not sufficient to reduce excess fertility.

Results from these regressions are presented in Table 4. Here we see that the difference in take-up rates of concealable contraceptives between women in the Couples and Individual treatment arms almost perfectly matches the difference in rates of voucher redemption, indicating that women on the margin of influence for redeeming the voucher

were indeed those who sought relatively concealable methods. While only half (49%) of women redeeming the voucher in the Couples arm received injectables, implants, or IUDs, the ratio of treatment effect estimates in Tables 2 and 5 indicate that 79% of women on the margin of influence received long-term concealable methods.[37] Among the subsample at risk of an unwanted birth, 85% of those encouraged by the opportunity to hide went home with concealable methods.[38] There is little difference in the estimated effect of the intervention on method requested and method received, consistent with the fact that women who knew they had contraindications to hormonal contraception were screened out of our study.

The magnitude of the effect rules out competing stories for why voucher use might have been higher when information was given to women alone. In particular, it is possible that women were more likely to redeem the voucher when it was given to them alone simply because of different sources of disagreement in the household other than discordance in demand for children. The Table 4 results are inconsistent with this explanation since, in this case, women on the margin of influence would not be disproportionately those seeking concealable methods of birth control.

5.3 Fertility

We next turn to the effect of our intervention on fertility and the prevention of unwanted births. Since we know that our intervention increased take-up of long-term contraceptive methods in the short run, but do not have reliable data on continuation rates (which were reportedly low), we first look at birth rates 9-13 months after an individual woman received a voucher. Since the largest difference in birth control patterns between treatment

[37] In total, in the Individual treatment who redeemed the voucher received a concealable method. Using Couples' rate of redemption as the counterfactual (49%), this implies that, among the additional 23% of women who were encouraged by the Individuals treatment to redeem, the rate of concealables is 79%

[38] A comparison of observable characteristics between women in the Individual and Couples treatments who redeemed the voucher provides some suggestive evidence of the reasons behind their higher demand for concealables: women who redeem in the Individuals treatment are more likely to have been physically threatened by their husbands or been pressured to have sex (unreported), although the differences are not statistically significant.

arms is use of injectables, this time period reflects the period over which most women were protected by the birth control they received as a direct result of treatment. Hence, as long as there was little substitution towards contraceptives outside of the clinic among women in the Individual treatment who did not redeem their vouchers, the difference in the likelihood of giving birth 9 to 13 months after receiving a voucher measures the increased efficacy of concealable methods relative to whatever contraceptive methods those women would otherwise have used.

Table 6 presents these results. We first look at the total sample of treatment women with follow-up data. In total, 36% of women gave birth in the two years following our intervention, and 6.5% of women gave birth 9-13 months after they received a voucher. Although the point estimates in columns 1-2 indicate that this rate was slightly lower among women who were offered access to family planning services in private, the difference is not statistically significant. However, when we restrict our sample to the 73% of women who desire to limit fertility, we observe a large and significant effect of our intervention on the rate of unwanted births. Consistent with Table 4 and the standard definition of unmet need for contraception, we define a birth as unwanted if, at the time of the baseline survey, a woman stated that she did not want to have another child for at least two years. According to this definition, a remarkable 75% of births in this interval were unwanted.[39]

Results from these regressions are presented in columns 3 and 4 of Table 6. Here we see a significant decrease in unwanted births among women assigned to the private information treatment. The point estimates indicate that excess fertility falls by 57% when women are told about free family planning services in private, and thereby given greater opportunity to hide their use of these services from their husbands. These results imply that concealability of contraception has a major impact on women's ability to meet their own fertility desires.

The fact that the reduction in unwanted births (57%) is slightly larger than the increase

[39] While this is higher than the DHS estimate (52%) of excess fertility in Zambia, the discrepancy is consistent with the fact that, due to ex-post rationalization, ex-post measures of birth "wantedness" are generally much higher than ex-ante measures.

in modern contraception among the same sub-group (47%) suggests that women who were encouraged to seek treatment by the ability to conceal were at higher underlying risk of an unwanted pregnancy. Indeed, this is exactly what one would expect: Women most concerned about becoming pregnant against their will (for instance, because their husbands are trying harder to have a baby, insist on frequent intercourse, or are for other reasons unwilling to use any form of fertility regulation) should be the most willing to risk hiding contraception when given the opportunity.

The fact that birth rates are substantially different between treatment groups also confirms that substitution among the Couples group towards other, equally effective sources of birth control was limited. In particular, one shortcoming of our measure of contraceptive use from administrative data is that we do not observe use of contraceptive methods that were obtained outside of the clinic during the study period. Hence, while Table 5 confirms that take-up of family planning methods at the clinic was lower among women assigned to the Couples treatment, it could be the case that overall use of concealable contraception was not significantly different across the two treatment arms if there was sufficient substitution towards family planning services outside of the clinic among women who were prevented from using the voucher by their husbands.

Unfortunately, follow-up survey data do not help us address this problem since recall of contraceptive use two years prior is unlikely to be reliable. In general, the rate of access to concealable methods outside of public clinics is low: According to data in the baseline survey, approximately 10% of women who had ever used injectables had *ever* obtained them outside of the clinic. The majority (68%) report that their reason for going somewhere else was related to stock-outs or waiting times at the clinic. Hence, this rate is unlikely to reflect the rate at which women in our study obtained injectables outside of the clinic when the clinic was fully stocked and there was a guarantee of no waiting time, but is a reasonable upper bound on the rate at which women who could not use the voucher sought injectables in other locations.[40] Given that, substitution is

[40] If study women came to the clinic without their voucher, they would receive the standard clinic treatment by the regular family planning nurse.

unlikely to explain away all of our estimated treatment effect.

Nonetheless, we cannot completely rule out substitution among women who did not use the clinic services with available data on contraceptive use. Hence, the fertility results are useful for validating our previous findings since they serve as a proxy for total contraceptive use.

5.4 Long-term Effects

Our intervention increased overall use of injectable contraception in the month following the intervention by 12 percentage points, the rate of use rising from 23% at baseline to 35% after vouchers were redeemed.[41] However, it appears that our intervention did not have a lasting impact on birth control: at follow-up only 13% of women reported that they were still using injectables, well below the levels observed even before our study. We first test for effects of treatment assignment on long-term use of concealable contraceptives in a regression analysis in which the outcome variable is an indicator of whether the woman is still using a method at follow-up. These results are presented in Table 7. Not surprisingly given the overall trend away from these methods, the differential use of concealable contraceptives across treatment arms has disappeared by Year 2.

While these discontinuation rates are striking, the primary reason for the sharp decline in use of injectables to levels below baseline was not a generalizable phenomenon but rather the result of a large unanticipated shock to contraceptive availability that occurred several months after our intervention. In particular, for several weeks between December 2007 and March 2008, people in Zambia were led to believe that injectable contraceptives contained HIV. This situation was triggered when a box of Depo-Provera tested positive for HIV at Lusaka international airport. Although the test conducted was invalid, the news was quickly and broadly broadcasted in the media, and on January 27, 2008, the Ministry of Health imposed a national ban on the distribution of injectable contraceptives until further

[41] This is assuming that those who were using at baseline and did not redeem vouchers continued to use, and that the number of subjects obtaining injectables outside of the clinic was negligible.

tests could be conducted. After local and international investigations, and international pressure to remove the ban, Depo-Provera was proven to be perfectly safe for use and, as expected, no evidence of it being contaminated with HIV, human blood products, or HIV antibodies was found.[42] Although on March 16, the Zambian government officially instructed its healthcare providers to resume distribution of injectable contraceptives, as of mid-April, the message had yet to reach most health district facilities, the product was still unavailable in several areas, and trust of injectables among both health providers and community members remained low. However, by mid-July, injectables had returned to clinics and demand appeared to rebound gradually.

Given the eight-month ban on injectables and general contraceptive scare that interrupted our study, it is unsurprising that the influence of the intervention was short-lived. These unfortunate events led to an immediate convergence in use of contraceptives among women in the two treatments arms as soon as four months into our study when usage rates in both groups first fell to zero while stocks were withheld from clinics and then appear to have rebounded in limited proportions in response to the subsequent local and national awareness campaigns and increase in stocks available to all women at Chipata clinic. Likewise, we see no long-term effect of the intervention on childbearing 14-24 months after the intervention (Table 7). This result holds when the sample is restricted to discordant couples and when we focus on unmet need and excess fertility among the sample of women who do not want children. Unfortunately, due to the policy shock, our long-term results are inconclusive. While our treatment may not have lead to differences in completed fertility, we cannot rule out the possibility that our intervention would have generated long-term differences in birth control use and completed fertility in the absence of the injectables scare.

Fertility patterns over the entire 24 months following the intervention are presented

[42] HIV DNA PCR tests, which look for the presence of HIV, were performed in Zambia at the MoH's request on samples from the suspicious lot and were negative. The manufacturer, Family Health International, also proved that Depo-Provera was not contaminated with HIV virus and that the false positive reaction was caused by a substance used to make chemicals soluble called Polysobed.

in Figure 3. Here we see the divergence in birth rates between the two treatment arms beginning at month 8 (the first possible month that births could be influenced by the treatment), that lasts for about 5 months. Between months 14 and 18, the pattern switches, and births in the Couples treatment arm are significantly lower. This pattern indicates that our intervention essentially postponed births in the Individual arm by 3-5 months (or on average slightly more than the duration of one shot of injectable contraceptives).

This degree of postponement is a significant welfare benefit for women and children in a setting in which the average pregnancy interval is 26 months and an estimated 20% of birth intervals are under 15 months (**?**). Maternal mortality, risk of bleeding in the third trimester or premature rupture of membranes, and risk of high blood pressure, pre-eclampsia and labor dystocia are considerably higher for women with who conceive less than 15 months after a birth relative to those with pregnancy intervals of 18-21 months even after conditioning on a wide range of observable characteristics (**?**). In terms of child health, a number of studies document that neonatal and infant mortality as well as chronic and general undernutrition are decreasing functions of birth interval until 36 months (**?**). Hence, even though we see fertility catching up among those in the Individual treatment soon after injectables were banned, Individual treatment is also likely to be associated with improvements in maternal and child health that are unobservable in our data [43].

6 Channels of Influence

Thus far we have attributed higher take-up of family planning services when women are given private information about reductions in the cost of contraception to an increase in the ability of women who desire to limit fertility against husbands' wishes to conceal birth control. Here we consider a number of alternative explanations for our findings and present direct and indirect evidence in support of this interpretation.

[43] Because infant and maternal mortality are low frequency events, our sample is too small to pick up a difference between treatment arms. For instance, there were only 3 maternal deaths in our sample between baseline and follow-up. Unfortunately, we did not collect detailed follow-up data on maternal or child morbidity that would allow us to measure more subtle improvements in reproductive health.

6.1 Effect of the Intervention on Spousal Communication

It is possible that our intervention encouraged couples to discuss family planning issues, and - by bringing husbands and wives together to receive the voucher - that the Couples treatment had a greater effect on communication than the Individual treatment. In this case, women in the Couples treatment may have been less likely to use the voucher because they updated on their husband's preferences over contraception or fertility.

While, in the baseline survey, 86% of women in our sample report that they have discussed family planning with their partner in the past year (33% more than five times) and 77% have discussed desired family size (30% more than five times), the baseline data indicate that there is room for spousal communication to improve. In particular, there is a great deal of misinformation among women as to their husband's fertility preferences: More than half (54%) incorrectly predict their husband's fertility desires, although only 25% are off by more than one. The discrepancy is relatively symmetric with a slightly higher fraction of women overestimating (28% versus 23%) their husband's desired number of children.

To gauge whether this mechanism may be at work, we divide the sample according to whether the wife overestimates or underestimates her husband's desired number of children and test whether the effect of the Couples treatment is concentrated among women who underestimate their husband's preferences. These results are presented in Appendix D. Here we see no evidence that the effect of Couples treatment is higher in the subgroup of women who underestimated their husbands' demand for children.

To study more directly the possible effect of the treatment on spousal communication, we next look at a number of outcome variables related to spousal dialogue available in both the baseline and the follow-up survey, including: Whether the couple disagrees about number of children or contraception, whether they discuss contraception, and the accuracy of the wife's perception of her husband's desired fertility.[44] We then exam-

[44] Unfortunately due to space constraints the follow-up survey did not ask whether the couple had discussed desired family size as was asked in the baseline.

ine whether Couples treatment led to improved communication relative to Individuals treatment. These estimates, presented in Table 8, show no evidence of a disproportionate change in the degree of communication or information-sharing about family planning among couples assigned to the Couples treatment. In fact, on average, women appear at follow-up to be no better able, or willing, to accurately report their husband's fertility preferences.

6.2 Direct Evidence of Concealment

We next look for *direct* evidence that our results operated through changing women's ability to hide contraceptive use from their husbands. A major objective of the follow-up survey was to obtain detailed information from women about what they did with the voucher after receiving it, including whether and why or why not they spoke to their husbands about the voucher, why they did or did not use the voucher, and whether their husbands encouraged or discouraged them from using it. To collect this information, at the end of the follow-up survey we asked a series of qualitative questions about their experiences with the intervention two years ago.[45]

We use these responses to identify individually-treated respondents who used the voucher without their husband's knowledge because they believed he would otherwise not have let them use it. Identifying these respondents allows us to directly estimate the fraction of the treatment effect of private information on voucher redemption that can be accounted for by greater reported ability to conceal. That is, according to our analytical framework, the difference in rate of voucher redemption between the two treatment arms is equal to the number of individually-treated women who used the voucher but whose

[45] Specific questions included: "What did you do with the voucher just after you received it?", "At any point in time, did you talk about the voucher with your husband?", "What did you tell him (relating to the voucher, FP, contraceptives, ...)?", "How did he react to what you said? What did he say or do?", "Did you show the voucher to your husband?", "How did your husband react when you showed him the voucher? What did he say or do?", "What did you and/or your husband do with the voucher just after you received it?", and "Did you tell your husband beforehand that you were going for a family planning visit at Chipata clinic?".

husbands would not have let them go had they been made aware of the opportunity (or, symmetrically, the number of Couples-treated women who did not use the voucher because their husband did not permit them to - but who would have hidden the voucher from their husbands and used it had they received it alone, which is harder to identify). We hand-code each observation making use of all responses to questions in this section, and classify respondents' motives conservatively such that we only report a woman as hiding from her husband when she makes explicit reference to hiding.

To give an example, the following woman who was in the Individual treatment and used the voucher described her experience as follows: "I put [the voucher] in the bag for my children's clothes to hide it from my husband. I did not show him the voucher because he does not know that I am using contraceptives." In addition, the enumerator made the following comments on this respondent: "The respondent did not tell the husband about the survey or the voucher because the husband does not allow her to use any contraceptives. ... It seems the husband wants the wife to get pregnant that is why he's not allowing the wife to use contraceptives." In another instance, the respondent gave the following description: "I kept [the voucher] in the house and hid it because I didn't want my husband to see it. He didn't know I [went] to the clinic for family planning." In this case, the enumerator commented that, "Her partner doesn't allow her to use family planning so she does it without his consent." Both of these women were classified as an Individually-treated woman who would not have been able to use the voucher had they been assigned to the Couples treatment.[46]

Since it is also possible that, in addition to these unambiguous cases of hiding, giving the woman private information allowed her to more easily persuade her husband to let her use the voucher by either presenting partial information about the services available or framing the opportunity in a misleading way, we also look through the detailed de-

[46] In contrast, although ambiguous, the following Individually-treated woman who used the voucher but did not tell her husband was not considered to be hiding. According to this woman, "I kept the voucher in my handbag. I did not talk about the voucher with my husband." Meanwhile, the enumerator noted that, "Respondent could not recall most information because it has been long, although we probed."

scriptions for this type of scenario. In particular, we attempt to identify women in the Individual treatment who used the voucher but appear to have partially hidden or misrepresented information about the voucher when discussing it with their husbands so that they would be able to redeem it.

For example, in one case a woman initially tells her husband about the voucher and seeks his permission to switch from the pill to injectables, but does not mention the opportunity to get contraceptive implants: "When I went home [from the clinic], my husband asked me how it went and if they gave me injections and I told him it went well but I didn't get injections, I got implants instead, they last longer, they last for 5 years. My husband became angry, asking me how I could do something so long term without talking to him." In this case, it is possible that, had the husband known that implants were being offered for free at the clinic, he would not have allowed his wife to use the voucher. In another instance, the respondent reports that her husband "asked what would happen during my visit to the clinic. I told him I did not know but would tell him more afterwards". The enumerator notes of this respondent that, "The only secret she has ever kept from her husband is the injectables contraceptives she is using," suggesting that the husband would not have approved had he known that the clinic was suddenly offering free injectables. Since injectables were not available before the intervention, it is reasonable to assume the husband did not expect his wife to have the opportunity to get a free injection, which he would have learned in the Couples treatment. Hence, being in the Individual treatment helped the woman to keep this secret from her husband.

In total, among individually-treated women who used the voucher, 11% admit that they did so behind their husband's back because he would not have let them redeem it (N=24), and another 5% appear to have misrepresented the voucher offer in order to convince their husbands to let them use it. Cases in the first category alone imply a 6 percentage point difference in voucher redemption across treatment arms. If we also include cases of misrepresentation, this accounts for a 7.5 percentage point difference in voucher use. Given our estimated treatment effect of 10 percentage points, these numbers

imply that confessions of hiding from disapproving husbands can alone explain 60-75% of our estimated treatment effect. It is important to note that, not only have we likely underestimated such cases by classifying responses conservatively (e.g. not counting cases in which the women hides the voucher from her husband but gives no reason, or gives a different reason), but we are also underestimating if women were reluctant to admit concealing the voucher, which our survey data indicate is the case.[47] Moreover, only 92% of women were administered this section of the survey so it is also the case that in expectation we will not observe two relevant cases.[48]

7 Treatment versus Control group

In our study, women in both the Couples and Individuals arms of the study received access to cheaper and more convenient forms of contraception than were previously available, along with detailed information on how to use those new methods. In this sense, we simultaneously reduced several commonly cited barriers to access even among women in the Couples treatment, including direct and indirect costs, limited mix of methods, and misinformation on side effects or efficacy of existing methods. The difference between the two treatment arms presented in the previous sections isolates the effect of greater female autonomy when other barriers to access are relatively low. We next estimate the impact of lowering barriers to access to contraceptives through our intervention by comparing unwanted births 9-14 months after the intervention among women in the Couples treatment arm relative to women in the control arm of the study who were not given a voucher and did not have access to the family planning services provided through our study. This comparison approximates the impact of lowering barriers to accessing modern contraceptives while maintaining family planning policies that limit women's autonomy

[47] That is, while at least 8% of women are using modern contraceptives without their husbands' knowledge (based on differences between husbands' and wives' surveys, only 2% admit to doing so when asked directly.

[48] Of these, 6% did not participate in the follow-up survey, and an additional 2% of respondents did not answer this section.

over these methods, such as de facto spousal consent requirements that are still in place in much of the continent.

Because there was no attrition between visits among women assigned to the control group (who were visited only once at baseline), rather than limiting our treatment group sample to those who received a voucher as in the previous estimates, our Couples versus Control estimates include *all* subjects who completed the baseline survey in an intent-to-treat analysis. Columns 5 and 6 of Table 6 replicate the Table 5 results among the intent-to-treat sample. As expected, the point estimates fall slightly but remain statistically significant.

We first show that lowering barriers to access, including cost, convenience and information, had a visible impact on utilization of new contraception methods even when women were not given full autonomy. As shown in columns 7 and 8 of Appendix D, among women who sought to avoid pregnancy, improving access to injectable contraceptives increased the likelihood that a woman tries a new form of contraception between baseline and follow-up by 18 percentage points. Strikingly, only one woman in the control group tried any new form of contraception within this two-year interval, whereas 18% of women assigned to the Couples treatment experimented with a new birth control method, almost half of which was injectable contraception and about half oral contraceptives. In sum, lowering the cost of contraceptives through our voucher intervention succeeded in improving rates of utilization of both short- and long-acting methods.

However, although women in this group reported significantly higher rates of utilization, the large change in use of modern methods was *not* associated with a reduction in unwanted births. This implies that women positioned to take advantage of the more convenient and affordable method were those who were already fairly successful in preventing unwanted births. In contrast, women at risk of an unwanted birth appear to have responded little to the change in contraceptive access offered through our voucher.

This contrasts sharply with the estimated effect on unwanted births of increasing women's control over birth control, shown in columns 2 to 5 of Table 6. As already

discussed, simply increasing women's ability to keep contraceptive use private, holding price and availability of contraception constant, had a large and significant effect on preventing unwanted pregnancies. Yet, as shown in columns 1-6 of Appendix D, privacy had no effect on women's likelihood of trying injectables for the first time between baseline and follow-up. This implies that the individuals who responded to an increase in privacy were by and large those who had already used injectables in the past. Since injectables are arguably the easiest available contraceptive method to conceal, it makes sense that women who responded to the privacy intervention were those with a strong enough demand for this particular method that they had tried to access it before through the clinic, which kept injectables on hand an estimated 50% of the time. Meanwhile, since women in the Couples treatment who responded to the price change were necessarily those with little interest in concealing contraception, they were likely to be those for whom oral contraceptives and condoms are closer substitutes for injectables, and hence they are less likely to have tried injectables in the past.

The policy implications of this comparison are straightforward. Increasing access while requiring spousal consent will not reduce excess fertility in settings like urban Zambia where modern contraceptives are already reasonably though by no means freely available. Though doing so is likely to change patterns of utilization towards more convenient and reliable long-acting methods, those positioned to take advantage of better access will be couples already in control of fertility through existing - and perhaps even traditional - methods. In sum, excess fertility in these settings is *not* driven by the high cost of birth control or misinformation about birth control methods since improving these two barriers had no impact on unwanted births. In contrast, technologies or policies that shift control of fertility from men to women are likely to reduce fertility and unwanted births, though with a welfare cost to men that is difficult to measure or predict.

8 Conclusions

This paper uses a novel experimental design to understand the nature of household bargaining over fertility and the role that it plays in accounting for excess fertility. Our experimental manipulation changed the concealability of contraceptive use by varying whether a woman received information about new family planning opportunities alone or in the presence of her spouse. In the simplest household bargaining models, couples with discordant preferences should be able to bargain efficiently and, therefore, should have no incentive to hide contraceptive use. In contrast, we find that when women are provided with greater opportunity to hide birth control from their husbands, they are 23% more likely to visit a family planning nurse and 38% more likely to use a relatively concealable form of contraception, suggesting that in a significant fraction of households, women do have incentives to hide contraception. Further evidence for our interpretation of concealment comes from the concentration of our treatment effect in households in which women want fewer children than their husbands, and from in-depth interviews with women after the intervention, in which a significant fraction admitted to hiding their visits from disapproving husbands. Our study shows that this strategic behavior has major consequences for female economic wellbeing: the opportunity to conceal leads to a 57% reduction in unwanted births in our sample.

The results suggest significant inefficiencies in intra-household bargaining over fertility, which contribute to excess fertility. With respect to family planning policy, our results suggest that some fraction of women can be made better off by increasing their opportunities to make private choices over birth control, such as by promoting access to relatively concealable longer-term methods (implants, IUDs and injectables), conducting family planning outreach efforts among women in private, or by eliminating spousal consent requirements at many clinics in the developing world. However, before drawing any general welfare conclusions, and especially because some fraction of men may be made worse off with such opportunities, more needs to be understood about the channels through which bargaining inefficiencies arise: for instance, credit constraints may prevent fully transfer-

able utilities, or a weak contracting environment may limit households' ability to bargain over long-range fertility plans.

Our results also help explain why results from previous quantitative studies on male involvement in family planning have been mixed, and why concealable contraceptives such as injectables have proven to be so popular in cultural contexts in which men dominate family planning decisions.[49] Our results reveal a potential negative effect of male involvement among couples with conflicting fertility preferences that may offset any positive influence of providing family planning education to men. In a policy environment with increasing emphasis on male involvement in family planning, our results suggest caution: male involvement that is simply making men aware of family planning opportunities may actually decrease opportunities for women, depending on the distribution of discordant households in the population. Involving males in a way that influences their preferences over number of children or helps them to better internalize the costs to women of childbearing and child-raising are likely to be more promising strategies.

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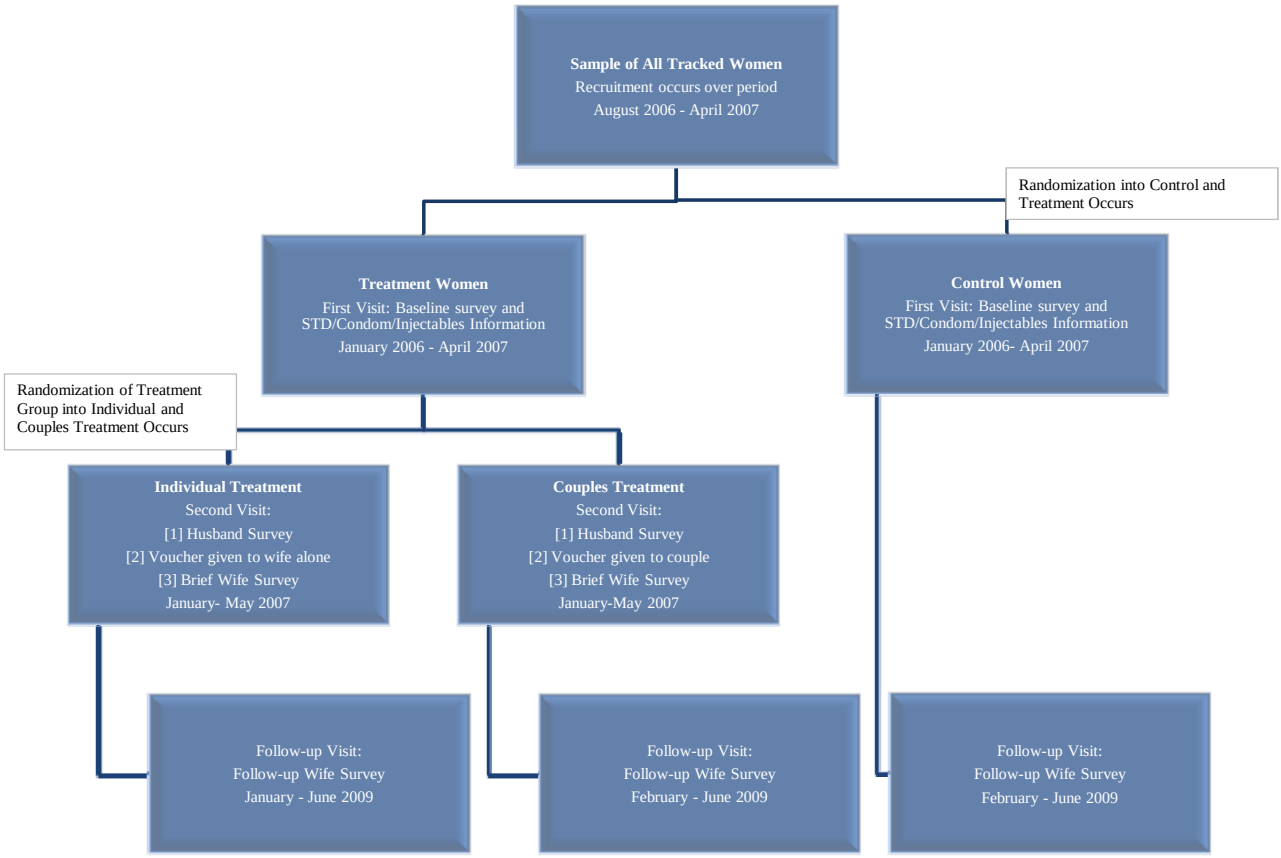
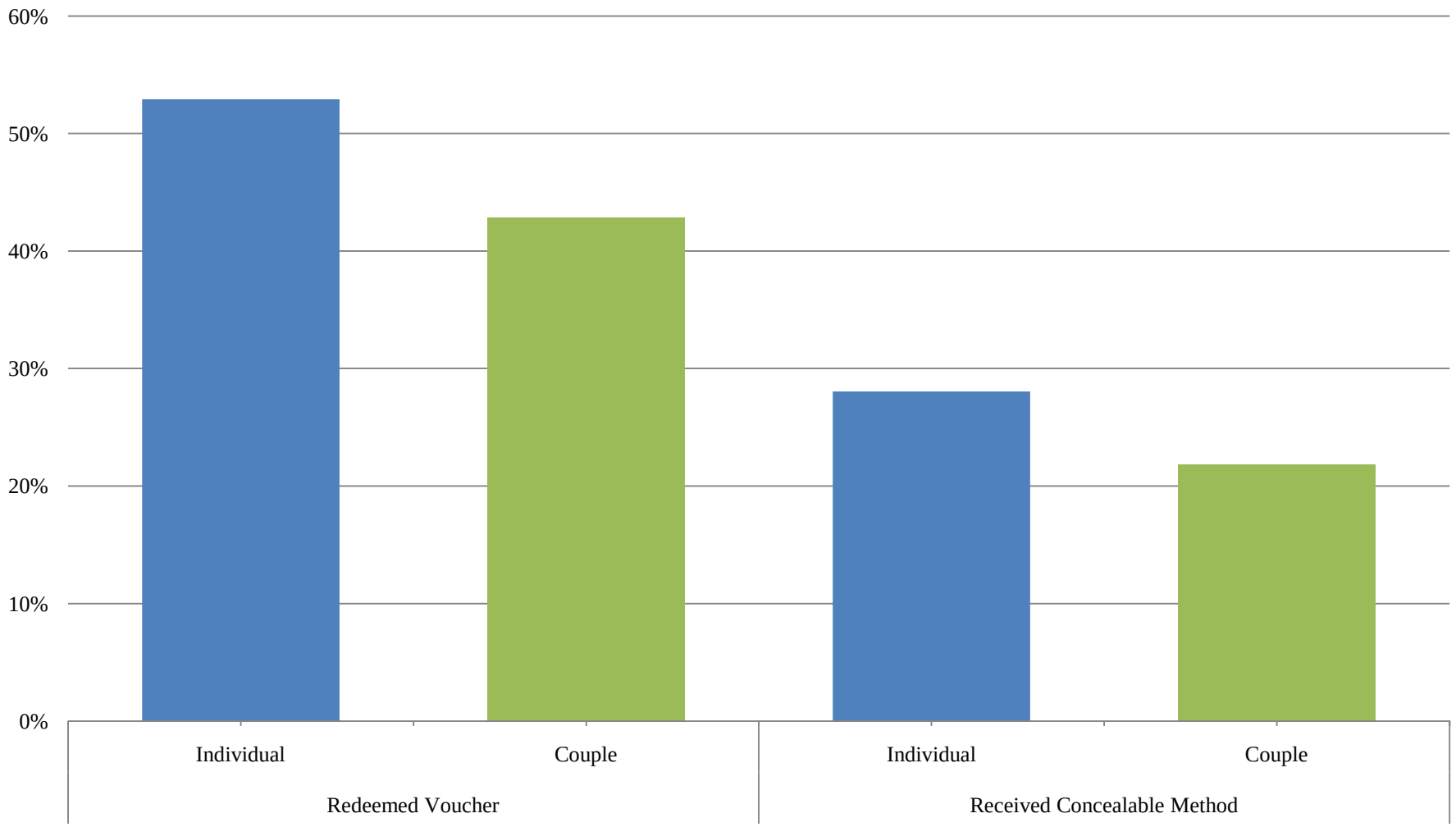
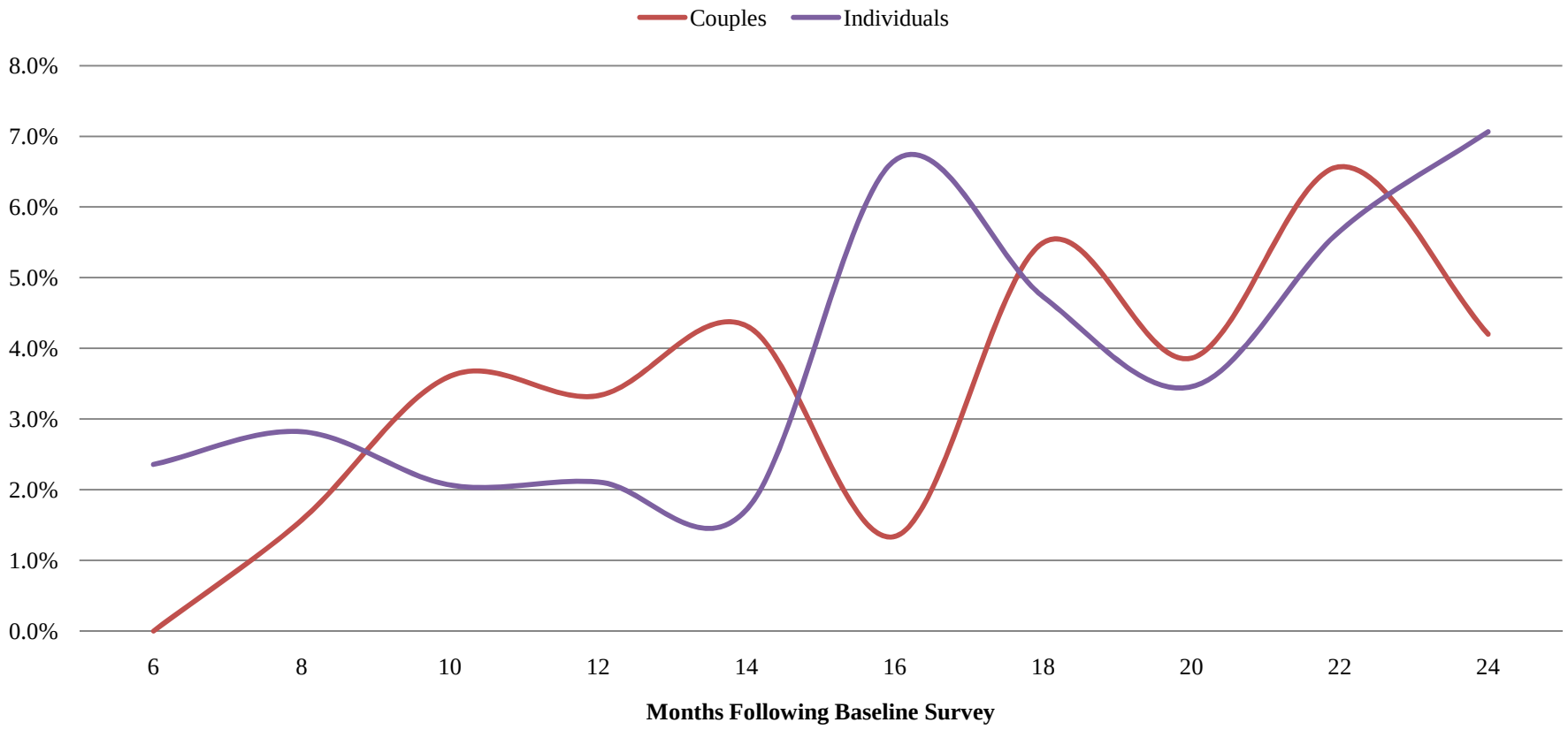

Sample of All Tracked Women
Recruitment occurs over period
August 2006 - April 2007
Randomization into Control and Treatment Occurs
Treatment Women
First Visit: Baseline survey and STD/Condom/Injectables Information
January 2006 - April 2007
Control Women
First Visit: Baseline survey and STD/Condom/Injectables Information
January 2006- April 2007
Randomization of Treatment Group into Individual and Couples Treatment Occurs
Individual Treatment
Second Visit:
[1] Husband Survey
[2] Voucher given to wife alone
[3] Brief Wife Survey
January- May 2007
Couples Treatment
Second Visit:
[1] Husband Survey
[2] Voucher given to couple
[3] Brief Wife Survey
January-May 2007
Follow-up Visit:
Follow-up Wife Survey
January - June 2009
Follow-up Visit:
Follow-up Wife Survey
February - June 2009
Follow-up Visit:
Follow-up Wife Survey
February - June 2009

Figure 2
Voucher Redemption and Use



Notes:
[1] The denominator for the Individual category is the total number of women in the individuals treatment arm. Likewise, the denominator for the Couple category is the total number fo women in the couple treatment arm. There were 409 couples treated and 427 individuals treated.
[2] A concealable method is comprised of the following contraceptives: IUD, implant and injectable.

Figure 3
Frequency of Births by Month and Treatment Arm Following Baseline Survey
Women Who Did Not Want a Child in 2 Years Following Baseline



Notes:
[1] Information was gathered from women who were in the final sample and also completed the follow-up survey information. Month and year of birth are reported by the women in the follow-up survey.
[2] Women were defined as not wanting children in next two years if they either did not want anymore children, wanted children after 24 months, or didn't know when they next wanted children. All values are normalized for number of women who were in the sample in a given month.

TABLE Ia
Summary Statistics for Recruited Sample

	Variable	Couples Mean	Couples SD	Couples N	Individuals Mean	Individuals SD	Individuals N	Controls Mean	Controls SD	Controls N	P-value for Difference of Means Couples and	P-value for Difference of Means Couples and Controls
	Variables Used to Balance Sample											
1	Using any modern contraceptive method at baseline	0.86	0.35	498	0.84	0.36	527	0.85	0.35	756	0.622	0.560
2	Number of living children	2.90	1.84	497	2.92	1.74	527	2.77	1.67	756	0.867	0.251
3	Using injectable at baseline	0.22	0.41	498	0.19	0.40	527	0.19	0.40	756	0.317	0.144
4	Using pill at baseline	0.28	0.45	498	0.29	0.46	527	0.30	0.46	756	0.643	0.504
5	Months sine last birth (at recruitment)	15.30	6.14	498	15.46	5.94	527	15.54	6.58	756	0.653	0.399
6	Highest schooling attained	6.52	2.89	460	6.67	2.91	472	6.26	3.08	681	0.437	0.164
7	Husband's highest schooling attained (reported by wife)	9.41	2.79	455	9.62	2.56	475	9.30	2.63	694	0.228	0.492
8	Ideal number of children	3.96	1.59	503	3.94	1.56	528	3.93	1.50	766	0.800	0.616
9	Difference in husband's ideal and wife's ideal number of children (reported by wife)	0.30	1.38	464	0.29	1.31	490	0.44	1.35	708	0.874	0.076
	Other Observable Characteristics											
10	Age	27.51	6.29	499	27.47	5.88	528	27.08	5.96	763	0.918	0.301
11	Husband’s age (reported by wife)	34.26	7.04	442	34.31	6.66	461	33.49	7.17	662	0.909	0.125
12	Husband’s age (reported by husband)	34.21	8.18	375	33.89	7.22	380				0.561	
13	Husband's highest schooling attained (reported by husband)	8.70	2.89	375	8.81	2.92	382				0.584	
14	Husband’s ideal number of children (reported by wife)	4.24	1.95	464	4.23	1.83	490	4.35	1.73	708	0.929	0.332
15	Husband’s ideal number of children (reported by husband)	4.43	2.11	372	4.20	1.94	378				0.123	
16	Number of children in the household	2.85	1.51	503	2.98	1.59	528	2.85	1.47	768	0.165	0.776
17	Has ever used a modern contraceptive method	0.82	0.38	503	0.84	0.37	528	0.79	0.40	768	0.549	0.232
18	Wife's average monthly income (1,000 USD)	0.07	0.89	503	0.03	0.08	528	0.02	0.05	768	0.302	0.259
19	Husband’s average monthly income (1,000 USD) (reported by husband)	0.15	0.26	375	0.13	0.16	382				0.161	
20	Wife earned money in previous month	0.45	0.50	498	0.40	0.49	525	0.42	0.49	766	0.123	0.417
21	Husband works 40+ hours	0.55	0.50	473	0.59	0.49	505	0.62	0.49	722	0.281	0.058
22	Wife knows when she is most fertile	0.12	0.33	460	0.16	0.36	482	0.14	0.34	713	0.136	0.756
23	Wife plans on becoming pregnant in following 2 years	0.26	0.44	503	0.25	0.43	528	0.25	0.43	768	0.647	0.607
24	Formally married	0.88	0.33	503	0.87	0.34	527	0.85	0.36	764	0.583	0.135
25	Age wife married	19.15	4.21	497	19.42	4.16	521	19.04	3.72	755	0.301	0.685
26	Catholic	0.23	0.42	503	0.23	0.42	528	0.22	0.41	768	0.987	0.652
27	Comparison of happiness with other women in region (1=very unhappy, 5=very happy)	3.56	0.86	503	3.58	0.91	528	3.52	0.86	768	0.756	0.356
28	Comparison of health with other women in region (1=very poor, 5=excellent)	3.65	0.79	502	3.62	0.74	528	3.61	0.72	768	0.502	0.222
29	Number of years respondent lived in Lusaka	18.06	10.78	501	18.24	10.84	528	18.93	10.52	763	0.790	0.131
30	Couple has electricity	0.39	0.49	503	0.38	0.49	528	0.38	0.49	768	0.916	0.821
	Intimacy and Violence Measures											
31	Difference in wife's perception of husband's ideal and actual husband's ideal number of children	-0.08	1.86	347	0.00	1.91	358				0.598	
32	Wife wants more children	0.62	0.49	503	0.63	0.48	528	0.63	0.48	768	0.829	0.982
33	Number of days in past 7 days couple has sex	2.00	1.65	501	2.02	1.62	523	2.08	1.75	765	0.867	0.576
34	Number of days in past month couple has sex	7.89	5.47	496	7.93	5.29	523	8.23	5.88	752	0.910	0.515
35	Number of children husband has with other women	0.65	1.33	494	0.61	1.18	510	0.57	1.30	754	0.581	0.348
36	Frequency at which couple has talked about contraception in last year	1.68	1.07	503	1.72	1.08	528	1.70	1.06	764	0.555	0.977
37	Couple has ever disagreed on number of children	0.14	0.34	503	0.14	0.34	528	0.16	0.36	765	0.970	0.127
38	Couple has ever disagreed on contraception use	0.13	0.33	503	0.12	0.32	527	0.10	0.29	763	0.780	0.283
39	Have used contraceptive method without husband’s knowledge	0.15	0.36	501	0.16	0.37	526	0.12	0.32	758	0.724	0.201
40	Wife would hide money from husband if given 5000 kwacha	0.27	0.44	503	0.30	0.46	527	0.29	0.45	768	0.211	0.368
41	Husband would hide money from wife if given 5000 kwacha	0.32	0.47	419	0.35	0.48	448	0.30	0.46	656	0.269	0.861
42	Husband drinks at least 2 to 3 times a week	0.42	0.49	503	0.43	0.50	528	0.41	0.49	768	0.786	0.621
43	Husband has ever threatened physical violence	0.56	0.50	503	0.54	0.50	528	0.55	0.50	765	0.543	0.983
44	Husband has ever been physically violent conditional on having threatened violence	0.66	0.47	278	0.68	0.47	285	0.64	0.48	440	0.635	0.728
45	Wife ever pressured to have sex	0.54	0.50	503	0.55	0.50	527	0.58	0.49	768	0.904	0.114
46	Wife ever pressured violently to have sex	0.15	0.36	501	0.14	0.34	524	0.14	0.35	767	0.576	0.768
	Financial Decision Making Measures											
47	Husband decides savings	0.63	0.48	500	0.62	0.49	528	0.65	0.48	766	0.727	0.659
48	Husband holds the money	0.17	0.37	499	0.16	0.37	521	0.13	0.34	761	0.762	0.097
49	Husband does budgeting	0.14	0.35	502	0.14	0.35	527	0.14	0.34	763	0.890	0.815
50	Husband decides major purchases	0.65	0.48	503	0.65	0.48	525	0.61	0.49	767	0.962	0.236
										Chi2	32.74	50.80
										Probability < Chi2	0.972	0.290

Notes:

[1] Variables 1-5 come from the tracking data not the baseline survey data. The tracking data was used to balance the samples.

[2] The variable "Couple has talked about contraception in the last year" takes on the following values: 0 = never, 1 = once or twice, 2 = three or four times, 3 = five or more times.

[3] Variables 28 through 38 are all dummy variables, taking on values of 1, 0 or missing,. For variables 35 through 38, the variable took on 0 if the respondent said the wife or both of them was in charge of the respective task.

[4] Modern contraception includes use of the pill, IUD, implant, injectable, diaphragm, female and male sterilization.

[5] A concealable method is comprised of the following contraceptives: IUD, implant and injectable.

[6] All data comes from husband and wife baseline surveys. If not specified, data comes from wife's baseline survey.

TABLE Ib
Summary Statistics for Final Sample

		Couples			Individuals			P-value for Difference of Means
	Variable	Mean	SD	N	Mean	SD	N	Couples and
	Variables Used to Balance Sample							
1	Using any modern contraceptive method at baseline	0.87	0.34	366	0.84	0.37	377	0.279
2	Number of living children	2.99	1.86	366	2.95	1.74	377	0.781
3	Using injectable at baseline	0.22	0.42	366	0.20	0.40	377	0.511
4	Using pill at baseline	0.31	0.46	366	0.30	0.46	377	0.791
5	Months sine last birth (at recruitment)	15.30	6.19	366	15.57	5.93	377	0.536
6	Highest schooling attained	6.49	2.84	339	6.67	3.01	339	0.409
7	Husband's highest schooling attained (reported by wife)	9.38	2.75	337	9.54	2.59	343	0.436
8	Ideal number of children	4.00	1.59	371	3.92	1.55	378	0.476
9	Difference in husband's ideal and wife's ideal number of children (reported by wife)	0.32	1.39	346	0.26	1.26	359	0.576
	Other Observable Characteristics							
10	Age	27.65	6.37	368	27.58	6.07	378	0.873
11	Husband's age (reported by wife)	34.46	7.35	327	34.50	6.76	339	0.938
12	Husband's age (reported by husband)	34.24	8.21	371	33.80	7.16	376	0.439
13	Husband's highest schooling attained (reported by husband)	8.68	2.89	371	8.83	2.93	378	0.485
14	Husband's ideal number of children (reported by wife)	4.29	1.98	346	4.18	1.79	359	0.472
15	Husband's ideal number of children (reported by husband)	4.43	2.12	368	4.17	1.90	374	0.072
16	Number of children in the household	2.91	1.52	371	2.99	1.55	378	0.469
17	Have ever used a modern contraceptive method	0.82	0.38	371	0.84	0.37	378	0.614
18	Wife's average monthly income (1,000 USD)	0.03	0.06	371	0.03	0.08	378	0.959
19	Husband's average monthly income (1,000 USD) (reported by husband)	0.15	0.26	371	0.13	0.16	378	0.164
20	Wife earned money in previous month	0.45	0.50	369	0.40	0.49	375	0.194
21	Husband works 40+ hours	0.55	0.50	346	0.58	0.50	360	0.442
22	Wife knows when she is most fertile	0.10	0.30	339	0.14	0.35	346	0.126
23	Wife plans on becoming pregnant in following 2 years	0.27	0.45	371	0.26	0.44	378	0.688
24	Formally married	0.88	0.33	371	0.89	0.32	378	0.749
25	Age wife married	19.03	4.02	366	19.39	4.24	373	0.238
26	Catholic	0.23	0.42	371	0.22	0.41	378	0.755
27	Comparison of happiness with other women in region (1=very unhappy, 5=very happy)	3.56	0.87	371	3.58	0.92	378	0.806
28	Comparison of health with other women in region (1=very poor, 5=excellent)	3.66	0.80	370	3.62	0.74	378	0.503
29	Number of years respondent lived in Lusaka	17.88	10.70	369	18.33	10.84	378	0.562
30	Couple has electricity	0.39	0.49	371	0.41	0.49	378	0.592
	Intimacy and Violence Measures							
31	Difference in wife's perception of husband's ideal and actual husband's ideal number of children	-0.08	1.87	344	-0.01	1.91	356	0.611
32	Wife wants more children	0.60	0.49	371	0.62	0.49	378	0.467
33	Number of days in past 7 days couple has sex	2.07	1.68	369	2.07	1.62	373	0.995
34	Number of days in past month couple has sex	8.18	5.55	367	7.92	5.19	374	0.510
35	Number of children husband has with other women	0.61	1.25	364	0.53	1.06	367	0.361
36	Frequency at which couple has talked about contraception in last year	1.70	1.05	371	1.78	1.05	378	0.334
37	Couple has ever disagreed on number of children	0.13	0.33	371	0.14	0.34	378	0.661
38	Couple has ever disagreed on contraception use	0.12	0.32	371	0.11	0.31	378	0.661
39	Have used contraceptive method without husband's knowledge	0.14	0.35	370	0.14	0.35	377	0.997
40	Wife would hide money from husband if given 5000 kwacha	0.25	0.43	371	0.28	0.45	377	0.306
41	Husband would hide money from wife if given 5000 kwacha	0.30	0.46	313	0.34	0.47	311	0.319
42	Husband drinks at least 2 to 3 times a week	0.42	0.49	371	0.41	0.49	378	0.830
43	Husband has ever threatened physical violence	0.57	0.50	371	0.52	0.50	378	0.169
44	Husband has ever been physically violent conditional on having threatened violence	0.66	0.48	207	0.68	0.47	195	0.595
45	Wife ever pressured to have sex	0.52	0.50	371	0.50	0.50	378	0.632
46	Wife ever pressured violently to have sex	0.15	0.36	370	0.13	0.33	375	0.415
	Financial Decision Making Measures							
47	Husband decides savings	0.62	0.49	368	0.61	0.49	378	0.811
48	Husband holds the money	0.17	0.38	368	0.16	0.37	372	0.793
49	Husband does budgeting	0.16	0.36	370	0.14	0.35	378	0.595
50	Husband decides major purchases	0.65	0.48	371	0.66	0.48	377	0.813
							Chi2	37.94
							Probability < Chi2	0.903

Notes:

[1] The sample used in this table is the goup of households selected for treatment.

[2] The variable "Couple has talked about contraception in the last year" takes on the following values: 0 = never, 1 = once or twice, 2 = three or four times, 3 = five or more times.

[3] Variables 28 through 38 are all dummy variables, taking on values of 1, 0 or missing,. For variables 35 through 38, the variable took on 0 if the respondent said the wife or both of them was in charge of the respective task.

[4] Modern contraception includes use of the pill, IUD, implant, injectable, diaphragm, female and male sterilization.

[5] A concealable method is comprised of the following contraceptives: IUD, implant and injectable.

[6] All data comes from husband and wife baseline surveys. If not specified, data comes from wife's baseline survey.

[7] Variables 1-5 come from the tracking data not the baseline survey data. The tracking data was used to balance the samples.

TABLE II
Effect of Private Information Treatment on Voucher Use

Variable	Voucher Redeemed Nurses Logs		Voucher Redeemed [Husband Desires Larger Family than Wife]		Voucher Redeemed [Husband Desires Same as Wife]		Voucher Redeemed [Wife Desires Larger Family than Husband]	
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Assigned to Individual Treatment	0.101***	0.090**	0.177**	0.197**	0.076	0.088*	0.058	-0.036
	(0.036)	(0.037)	(0.071)	(0.077)	(0.047)	(0.048)	(0.104)	(0.127)
Age		0.002		-0.013		0.004		0.025
		(0.006)		(0.012)		(0.008)		(0.021)
Husband's age		0.003		-0.002		0.005		-0.012
		(0.004)		(0.008)		(0.005)		(0.017)
Highest schooling completed		0.008		0.019		0.010		0.015
		(0.007)		(0.018)		(0.009)		(0.024)
Husband's highest schooling		-0.006		-0.017		-0.002		-0.019
		(0.007)		(0.014)		(0.009)		(0.024)
Number of living children		0.014		0.060		-0.000		0.058
		(0.018)		(0.037)		(0.024)		(0.077)
Difference between husband's and wife's total number of children		0.011		0.026		0.000		0.054
		(0.022)		(0.044)		(0.028)		(0.099)
Ideal number of children		-0.004		-0.015		0.006		-0.058
		(0.015)		(0.033)		(0.020)		(0.059)
Husband's ideal number of children		-0.006		-0.027		0.006		0.004
		(0.012)		(0.021)		(0.016)		(0.058)
Using an injectable at tracking		0.078		-0.123		0.115*		0.245
		(0.052)		(0.111)		(0.066)		(0.221)
Using a pill at tracking		-0.034		-0.030		-0.042		0.008
		(0.047)		(0.094)		(0.063)		(0.161)
Using any modern method at tracking		0.028		-0.100		0.022		0.119
		(0.059)		(0.131)		(0.074)		(0.232)
Average monthly income		-0.536**		-0.029		-0.813*		-0.326
		(0.263)		(0.800)		(0.415)		(0.504)
Husband's monthly income		-0.081		-0.087		-0.089		-0.170
		(0.085)		(0.136)		(0.120)		(0.440)
Husband larger ideal family size than wife		0.014		0.007		-0.044		0.014
		(0.015)		(0.125)		(0.085)		(0.173)
Wife understands when she is most fertile		-0.027						
		(0.061)						
Wife 40 or older		-0.104		0.065		-0.200*		-0.334
		(0.097)		(0.214)		(0.120)		(0.540)
Time since last birth		0.002		0.011		0.001		-0.003
		(0.003)		(0.007)		(0.004)		(0.013)
Constant	0.429***	0.716	0.421***	1.035**	0.431***	-0.615	0.432***	-0.214
	(0.026)	(0.517)	(0.051)	(0.461)	(0.033)	(0.418)	(0.076)	(0.812)
Observations	749	749	197	197	457	457	95	95

* significant at 10%; ** significant at 5%; *** significant at 1%.

Notes:

[1] Missing values were replaced with a zero and a dummy variable flagging zeroes was included in the regression.
[2] Income has been divided by 1000 to get visible coefficients in the regression analysis.
[3] The sample discussed in this table is the final sample that received a voucher.
[4] Husband demographic and fertility preference information is gathered from the husband's survery.
[5] Wife demographic and fertility preference information is gathered from the baseline survey.
[6] A wife understands when she is most fertile if she says she is most fertile half way between periods.
[7] A husband has a larger ideal family size than the wife, if she believes he wants more children then she does.
[8] The difference between the husband's and wife's total number of children captures the number of children from other marriages.
[9] In addition, the regression controls for differences in survey questions .
[10] The final sample is split into three groups for this analysis based on heterogeneity in ideal family size between wife and husband. The husband's ideal family size is the wife's reported perception of her husband's ideal family size. The difference between that perception and her ideal is used to determine whether theyhave the same ideal family size, or one desires more children than the other.
[11] A voucher was "redeemed" if there is a record of a voucher use by a woman in the study at the Chiapata Clinic.

TABLE III

Effect of Private Information Treatment on Voucher Use and Concealable Method Take-up

	Redeemed Voucher Wife Wants Child in Next 2 Years		Redeemed Voucher Wife Doesn't Want Child in Next 2 Years		Received a Concealable Method Full Sample		Received a Concealable Method Wife Doesn't Want Child in Next 2 Years	
Variable	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Assigned to Individual Treatment	0.062	0.040	0.113***	0.092**	0.062**	0.060*	0.089**	0.075*
	(0.070)	(0.079)	(0.043)	(0.044)	(0.032)	(0.032)	(0.038)	(0.038)
Age		0.018		-0.003		-0.004		-0.007
		(0.014)		(0.007)		(0.005)		(0.006)
Husband's age		0.005		0.002		0.003		0.001
		(0.010)		(0.005)		(0.003)		(0.004)
Highest schooling completed		0.026*		-0.001		0.002		0.001
		(0.016)		(0.009)		(0.006)		(0.007)
Husband's highest schooling		-0.004		-0.010		0.001		-0.006
		(0.013)		(0.008)		(0.006)		(0.007)
Number of living children		-0.049		0.022		0.021		0.040**
		(0.044)		(0.021)		(0.015)		(0.019)
Difference between husband's and wife's total number of children		0.016		0.007		0.012		0.000
		(0.055)		(0.025)		(0.019)		(0.021)
Ideal number of children		0.021		-0.007		-0.009		-0.006
		(0.032)		(0.018)		(0.013)		(0.016)
Husband's ideal number of children		0.006		-0.012		-0.002		-0.010
		(0.025)		(0.014)		(0.010)		(0.013)
Using an injectable at tracking		-0.025		0.093		0.237***		0.236***
		(0.109)		(0.061)		(0.045)		(0.053)
Using a pill at tracking		-0.236**		0.027		-0.065		-0.079
		(0.097)		(0.055)		(0.040)		(0.048)
Using any modern method at tracking		0.112		0.033		-0.020		0.019
		(0.130)		(0.070)		(0.051)		(0.060)
Average monthly income		-0.582		-0.589**		-0.207		-0.351
		(0.642)		(0.296)		(0.226)		(0.257)
Husband's monthly income		0.110		-0.124		-0.089		-0.054
		(0.177)		(0.101)		(0.073)		(0.087)
Wife understands when she is most fertile		0.011		0.012		0.001		-0.009
		(0.029)		(0.019)		(0.013)		(0.016)
Wife 40 or older		-0.026		-0.015		-0.012		-0.007
		(0.121)		(0.073)		(0.052)		(0.063)
Time since last birth		-0.059		-0.074		-0.047		-0.071
		(0.345)		(0.106)		(0.083)		(0.092)
Constant	0.392***	0.087	0.442***	0.607*	0.218***	0.029	0.242***	1.220***
	(0.049)	(0.618)	(0.030)	(0.348)	(0.022)	(0.060)	(0.047)	(0.429)
Observations	201	201	548	548	749	749	197	197

* significant at 10%; ** significant at 5%; *** significant at 1%.

Notes:

See Notes to Table 2

[1] The final sample is split into two groups for this analysis based on heterogeneity in wife's preference for timing of the next child. If a wife said she wanted to have in 24 months or less at the time of baseline, she is included in the group that wants a child in the next two years. All other study participants who either answered they didn't know, didn't want any more children, or said they wanted children after 24 months were included in the category "Wife Doesn't Want Child in Next 2 Years."

[2] A voucher was "redeemed" if there is a record of a voucher use by a woman in the study at the Chiapata Clinic.

TABLE IV
Effect of Private Information Treatment on Voucher Use

Variable	Birth 9-13 Months After Voucher Given [Sample Final Participants]		Unwanted Birth 9-13 Months After Voucher Given [Women Who Want to Wait Longer than 2 Years to Have Another Child]		Unwanted Birth 9-13 Months After Voucher Given [Women Who Want to Wait Longer than 2 Years to Have Another Child] [Sample Intent to Treat]		Births 9-13 Months After Voucher Given [Control v Couples]		Unwanted Birth 9-13 Months After Voucher Given [Women Who Want to Wait Longer than 2 Years to Have Another Child] [Control v Couples]	
	[1]	[2]	[3]	[4]	[5]	[6]	[9]	[10]	[7]	[8]
Assigned to Individual Treatment	-0.028	-0.024	-0.051**	-0.043*	-0.040**	-0.035*				
	(0.019)	(0.020)	(0.022)	(0.023)	(0.018)	(0.019)				
Assigned to Couples Treatment							0.006	0.009	0.025	0.027
							(0.016)	(0.016)	(0.018)	(0.018)
Age		-0.004		-0.003		-0.001		-0.002		-0.002
		(0.003)		(0.004)		(0.003)		(0.003)		(0.003)
Husband's age		0.001		0.002		0.001		-0.001		-0.000
		(0.002)		(0.002)		(0.002)		(0.002)		(0.002)
Highest schooling completed		-0.004		-0.006		-0.006		-0.006*		-0.007
		(0.004)		(0.005)		(0.004)		(0.004)		(0.004)
Husband's highest schooling		-0.003		-0.001		0.002		0.000		-0.001
		(0.004)		(0.004)		(0.004)		(0.003)		(0.004)
Difference between husband's and wife's total number of children		0.015		0.022		0.019***		0.002		0.006
		(0.012)		(0.014)		(0.006)		(0.005)		(0.005)
Ideal number of children		-0.007		-0.011		-0.038*		-0.002		-0.008
		(0.009)		(0.010)		(0.022)		(0.013)		(0.016)
Husband's ideal number of children		-0.003		-0.003		0.046*		-0.003		0.009
		(0.006)		(0.007)		(0.023)		(0.014)		(0.017)
Using an injectable at tracking		-0.023		-0.016		-0.029		-0.037*		-0.040*
		(0.028)		(0.032)		(0.027)		(0.022)		(0.022)
Using a pill at tracking		0.004		0.014		0.004		-0.014		-0.002
		(0.025)		(0.029)		(0.024)		(0.021)		(0.023)
Using any modern method at tracking		0.068**		0.049		0.040		0.008		0.003
		(0.031)		(0.036)		(0.029)		(0.028)		(0.031)
Average monthly income		-0.038		0.085		-0.005		-0.009***		-0.009***
		(0.137)		(0.151)		(0.012)		(0.003)		(0.004)
Husband's monthly income		-0.011		-0.017						
		(0.044)		(0.050)						
Husband larger ideal family size than wife		0.015*		0.013		-0.038		0.002		-0.003
		(0.008)		(0.010)		(0.024)		(0.014)		(0.017)
Wife understands when she is most fertile		0.034		0.037		-0.003		-0.013		0.012
		(0.032)		(0.037)		(0.029)		(0.022)		(0.026)
Wife wants a child in first 2 years		0.007						0.005		
		(0.024)						(0.022)		
Wife 40 or older		-0.014		-0.025		-0.061		-0.055		-0.063
		(0.057)		(0.061)		(0.053)		(0.035)		(0.039)
Time since last birth		0.002		0.001		0.002		0.003**		0.002
		(0.002)		(0.002)		(0.002)		(0.001)		(0.001)
Constant	0.082***	0.128	0.090***	0.300	0.084***	0.009	0.058***	0.125	0.071***	0.122
	(0.013)	(0.146)	(0.015)	(0.279)	(0.013)	(0.277)	(0.010)	(0.140)	(0.010)	(0.105)
Observations	706	706	513	513	705	705	877	877	1174	1174

* significant at 10%; ** significant at 5%; *** significant at 1%.

Notes:

See Notes to Table 2

[1] The wife is asked if she has had a child in the 2 years since she was last surveyed. If that date is 9 to 13 months after the date she was given a value of 1, otherwise she was given a value of 0.

[2] The analysis looks at the total sample of individuals that received a voucher, as well as women who didn't want a child in the next 2 years following baseline. All study participants who either answered they didn't know, didn't want any more children, or said they wanted children after 24 months were included in the category "Wife Doesn't Want Child in Next 2 Years."

[3] Modern contraception includes use of the pill, IUD, implant, injectable, diaphragm, female and male sterilization.

[4] Birth parity is controlled for using a fixed effect on number of children.

[5] Regressions on Controls and Couples used only respondent's report of husband characteristics. Probability weights were used to account for changes in sampling probabilities of treatment and control midway through the experiment.

TABLE V

Effect of Private Information Treatment on Use of Concealable Method and Fertility

	Full Sample				Husband Desires Larger Family than Wife				Wife Doesn't Want Child in Next 2 Years				Full Sample [Control v Couples]				Wife Doesn't Want Child in Next 2 Years [Control v Couples]			
	Using Concealable Method at Time of Follow-up		Had a Child in 14-24 Months Following Baseline		Currently Using Concealable Method at Time of Follow-up		Had a Child in Second Year Following Baseline		Using Concealable Method at Time of Follow-up		Had a Child in 14-24 Months Following Baseline		Using Concealable Method at Time of Follow-up		Had a Child in 14-24 Months Following Baseline		Using Concealable Method at Time of Follow-up		Had a Child in 14-24 Months Following Baseline	
Variable	[1]	[2]	[3]	[4]					[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]
Assigned to Individual Treatment	0.008	0.015	0.017	0.009	-0.000	0.004	0.041	0.012	0.046	0.057	0.050	0.040								
	(0.031)	(0.031)	(0.031)	(0.032)	(0.061)	(0.063)	(0.063)	(0.068)	(0.038)	(0.039)	(0.036)	(0.038)								
Assigned to Couples Treatment													0.011	0.001	-0.009	-0.003	-0.003	-0.010	-0.015	-0.001
													(0.023)	(0.023)	(0.025)	(0.025)	(0.028)	(0.028)	(0.027)	(0.027)
Age		-0.002		0.000		-0.006		0.012		0.001		-0.002		0.005		-0.006		0.005		-0.011**
		(0.005)		(0.005)		(0.010)		(0.011)		(0.006)		(0.006)		(0.004)		(0.004)		(0.004)		(0.004)
Husband's age		-0.001		-0.003		-0.002		-0.016**		-0.001		-0.003		-0.001		0.001		-0.003		0.003
		(0.003)		(0.003)		(0.006)		(0.007)		(0.004)		(0.004)		(0.003)		(0.003)		(0.003)		(0.003)
Highest schooling completed		0.007		0.002		0.010		0.035**		0.008		-0.001		0.003		0.004		0.002		0.002
		(0.006)		(0.006)		(0.014)		(0.015)		(0.008)		(0.007)		(0.004)		(0.005)		(0.005)		(0.005)
Husband's highest schooling		0.004		-0.005		-0.003		-0.024*		-0.001		-0.005		0.005		-0.007		0.004		-0.003
		(0.006)		(0.006)		(0.011)		(0.012)		(0.007)		(0.007)		(0.004)		(0.005)		(0.006)		(0.005)
Number of living children		0.020		-0.021		0.008		-0.023		0.016		-0.017		-0.003		-0.009		-0.005		-0.004
		(0.015)		(0.016)		(0.031)		(0.033)		(0.019)		(0.019)		(0.011)		(0.011)		(0.013)		(0.011)
Difference between husband's and wife's total number of children		0.008		-0.014		-0.015		-0.031		0.010		-0.011		-0.021***		0.006		-0.016*		0.002
		(0.018)		(0.019)		(0.036)		(0.039)		(0.022)		(0.021)		(0.007)		(0.007)		(0.009)		(0.008)
Ideal number of children		0.001		0.018		0.034		0.042		-0.002		0.018		-0.002		0.017		-0.001		0.008
		(0.013)		(0.013)		(0.027)		(0.029)		(0.017)		(0.016)		(0.019)		(0.020)		(0.023)		(0.022)
Husband's ideal number of children		-0.012		0.002		0.015		-0.011		-0.018		-0.002		-0.017		-0.005		-0.015		-0.000
		(0.010)		(0.010)		(0.017)		(0.018)		(0.012)		(0.012)		(0.019)		(0.022)		(0.023)		(0.024)
Using an injectable at tracking		0.137***		0.004		0.051		-0.097		0.138**		-0.003		0.202***		-0.022		0.215***		-0.043
		(0.044)		(0.046)		(0.092)		(0.099)		(0.054)		(0.052)		(0.036)		(0.034)		(0.044)		(0.037)
Using a pill at tracking		-0.047		-0.009		-0.071		-0.025		-0.043		-0.020		0.016		-0.029		0.003		-0.038
		(0.039)		(0.041)		(0.076)		(0.082)		(0.048)		(0.047)		(0.028)		(0.031)		(0.034)		(0.033)
Using any modern method at tracking		0.047		-0.041		-0.086		0.041		0.074		-0.054		0.003		-0.051		-0.003		-0.071
		(0.049)		(0.051)		(0.106)		(0.114)		(0.060)		(0.059)		(0.032)		(0.043)		(0.040)		(0.048)
Average monthly income		-0.291		0.060		-0.861		0.597		-0.164		0.190		-0.007*		-0.006		-0.004		-0.002
		(0.218)		(0.226)		(0.646)		(0.694)		(0.257)		(0.250)		(0.004)		(0.004)		(0.004)		(0.004)
Husband's monthly income		0.183***		-0.134*		0.315***		-0.158		0.143*		-0.088								
		(0.069)		(0.072)		(0.109)		(0.117)		(0.086)		(0.083)								
Husband larger ideal family size than wife		0.011		0.009						-0.006		0.010		0.014		-0.005		0.007		-0.010
		(0.013)		(0.013)						(0.016)		(0.016)		(0.021)		(0.023)		(0.025)		(0.025)
Wife understands when she is most fertile		0.084*		-0.039		0.136		-0.107		0.112*		-0.055		-0.037		-0.035		-0.026		-0.017
		(0.050)		(0.052)		(0.101)		(0.108)		(0.063)		(0.061)		(0.034)		(0.035)		(0.042)		(0.040)
Wife 40 or older		-0.022		-0.084		-0.274		-0.206		-0.034		-0.012		-0.077		-0.010		-0.073		0.022
		(0.081)		(0.084)		(0.174)		(0.187)		(0.092)		(0.090)		(0.059)		(0.060)		(0.064)		(0.062)
Time since last birth		-0.000		-0.001		0.010*		-0.002		0.001		-0.003		-0.002		0.002		-0.001		0.001
		(0.003)		(0.003)		(0.006)		(0.006)		(0.003)		(0.003)		(0.002)		(0.002)		(0.002)		(0.002)
Constant	0.207***	0.202	0.212***	0.058	0.225***	0.500	0.225***	0.908**	0.219***	0.844*	0.184***	0.257	0.180***	0.003	0.214***	1.187***	0.208***	0.040	0.188***	0.337**
	(0.022)	(0.227)	(0.022)	(0.236)	(0.044)	(0.373)	(0.046)	(0.401)	(0.027)	(0.447)	(0.025)	(0.436)	(0.015)	(0.098)	(0.016)	(0.106)	(0.018)	(0.152)	(0.017)	(0.155)
Observations	706	706	706	706	187	187	187	187	513	513	513	513	1174	1174	1174	1174	877	877	877	877

* significant at 10%; ** significant at 5%; *** significant at 1%.

Notes:

See Notes to Table 2

[1] The wife is asked if she has had a child in the 2 years since she was last surveyed. If that date is 9 to 13 months after the date she was given a value of 1, otherwise she was given a value of 0.

[2] The analysis looks at the total sample of individuals that received a voucher, as well as women who didn't want a child in the next 2 years following baseline. All study participants who either answered they didn't know, didn't want any more children, or said they wanted children after 24 months were included in the category "Wife Doesn't Want Child in Next 2 Years."

[3] A concealable method was used at the time of follow-up if the woman said she was currently using a concealable method in the follow-up surv

[4] Birth parity is controlled for using a fixed effect on number of children.

[5] Regressions on Controls and Couples used only respondent's report of husband characteristics. Probability weights were used to account for changes in sampling probabilities of treatment and control midway through the experiment.

Table VI
Effect of Private Information Treatment on Voucher Use

Variable	Tried a New Contraceptive Method since Baseline Survey [Sample Final Participants]		Tried a New Contraceptive Method since Baseline Survey [Women Who Want to Wait Longer than 2 Years to Have Another Child]		Tried a New Contraceptive Method since Baseline Survey [Women Who Want to Wait Longer than 2 Years to Have Another Child] [Sample Intent to Treat]		Tried a New Contraceptive Method since Baseline Survey [Control v Couples]		Tried a New Contraceptive Method since Baseline Survey [Women Who Want to Wait Longer than 2 Years to Have Another Child] [Control v Couples]	
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
Assigned to Individual Treatment	-0.014	-0.006	-0.032	-0.023	-0.020	-0.007				
	(0.030)	(0.031)	(0.035)	(0.037)	(0.029)	(0.030)				
Assigned to Couples Treatment							0.173***	0.172***	0.181***	0.180***
							(0.017)	(0.017)	(0.020)	(0.020)
Age		-0.003		-0.001		-0.001		0.001		0.001
		(0.005)		(0.006)		(0.005)		(0.002)		(0.002)
Husband's age		-0.001		-0.002		-0.003		-0.001		-0.001
		(0.003)		(0.004)		(0.003)		(0.001)		(0.001)
Highest schooling completed		0.004		0.006		0.002		-0.001		0.001
		(0.006)		(0.007)		(0.006)		(0.002)		(0.003)
Husband's highest schooling		0.016***		0.012*		0.004		-0.001		-0.006
		(0.006)		(0.007)		(0.006)		(0.003)		(0.004)
Difference between husband's and wife's total		0.000		-0.005		-0.002		-0.003		-0.005*
		(0.019)		(0.022)		(0.010)		(0.003)		(0.003)
Ideal number of children		-0.008		0.013		-0.025		-0.009		-0.012
		(0.014)		(0.017)		(0.035)		(0.007)		(0.009)
Husband's ideal number of children		0.002		-0.004		0.040		0.010		0.015
		(0.010)		(0.012)		(0.037)		(0.008)		(0.010)
Using an injectable at tracking		-0.048		-0.028		-0.049		-0.017		-0.019
		(0.044)		(0.052)		(0.042)		(0.018)		(0.022)
Using a pill at tracking		-0.059		-0.097**		-0.079**		-0.022		-0.032*
		(0.039)		(0.047)		(0.038)		(0.015)		(0.017)
Using any modern method at tracking		0.039		0.031		0.036		0.026		0.020
		(0.050)		(0.059)		(0.046)		(0.017)		(0.020)
Average monthly income		0.010		0.049		-0.003		-0.005**		-0.005**
		(0.218)		(0.247)		(0.019)		(0.002)		(0.002)
Husband's monthly income		-0.187***		-0.196**						
		(0.070)		(0.082)						
Husband larger ideal family size than wife		-0.004		0.009		-0.030		-0.016*		-0.023**
		(0.013)		(0.016)		(0.038)		(0.008)		(0.011)
Wife understands when she is most fertile		-0.049		-0.096		-0.088*		-0.023		-0.032*
		(0.050)		(0.060)		(0.046)		(0.016)		(0.018)
Wife wants a child in first 2 years		0.004								
		(0.038)								
Wife 40 or older		-0.084		-0.090		-0.016		0.004		-0.010
		(0.090)		(0.099)		(0.083)		(0.040)		(0.040)
Time since last birth		0.001		-0.015		-0.001		-0.001		-0.002*
		(0.021)		(0.026)		(0.002)		(0.001)		(0.001)
Constant	0.207***	0.391*	0.215***	0.281	0.189***	-0.076		-0.019		-0.039
	(0.021)	(0.231)	(0.025)	(0.455)	(0.021)	(0.056)		(0.023)		(0.027)
Observations	706	706	513	513	705	(0.000)		(0.000)		(0.000)

* significant at 10%; ** significant at 5%; *** significant at 1%.

Notes:
See Notes to Table 2
[1] The wife is asked if she has had a child in the 2 years since she was last surveyed. If that date is 9 to 13 months after the date she was given a value of 1, otherwise she was given a value of 0.
[2] The analysis looks at the total sample of individuals that received a voucher, as well as women who didn't want a child in the next 2 years following baseline. All study participants who either answered they didn't know, didn't want any more children, or said they wanted children after 24 months were included in the category "Wife Doesn't Want Child in Next 2 Years."
[3] Modern contraception includes use of the pill, IUD, implant, injectable, diaphragm, female and male sterilization.
[4] Birth parity is controlled for using a fixed effect on number of children.
[5] Regressions on Controls and Couples used only respondent's report of husband characteristics. Probability weights were used to account for changes in sampling probabilities of treatment and control midway through the experiment.

Appendix A
Sample characteristics versus DHS sample

	Pooled			DHS 2007 All Women Ages 15 -49 Urban Locations			DHS 2007 All Women Ages 15 -49 All Locations		
Variable	Mean	SD	N	Mean	SD	N	Mean	SD	N
Variables Used to Balance Sample									
Age	27.61	6.22	746	31.20	0.40	787	30.91	0.13	5,420
Highest schooling attained	6.42	3.05	749	7.50	0.36	787	5.95	0.13	5,420
Number of living children	3.03	1.75	749	2.96	0.09	787	3.40	0.04	5,420
Ideal number of children	3.96	1.57	749	4.28	0.09	771	4.98	0.05	5,068
Difference in husband's ideal and wife's ideal number of children (reported by wife)	0.29	1.32	705						
Using injectable at baseline	0.24	0.43	749	0.11	0.02	787	0.08	0.01	5,420
Using pill at baseline	0.31	0.46	749	0.13	0.02	787	0.10	0.00	5,420
Other Observable Characteristics									
Husband's age (reported by wife)	34.15	7.13	667	37.25	0.66	569	37.44	0.19	4,142
Husband's highest schooling attained (reported by wife)	9.46	2.67	680	12.58	0.85	726	10.39	0.29	4,985
Using any modern contraceptive method at baseline	0.55	0.50	749	0.36	0.02	787	0.31	0.01	5,420
Have ever used a modern contraceptive method	0.83	0.37	749	0.81	0.02	787	0.69	0.01	5,420
Average wealth quintile (1=poorest)				4.43	0.09	787	3.04	0.07	5,420
Wife plans on becoming pregnant in following 2 years	0.27	0.44	749	0.15		502	0.13		3751
Intimacy and Violence Measures									
Difference in husband's and wife's income	0.30	0.67	743						
Difference in husband's and wife's age	6.47	3.95	666	6.12	0.26	569	6.35	0.08	4,142
Difference in husband's and wife's education	2.94	3.05	680	5.19	0.70	726	4.59	0.27	4,985
Difference in wife's perception of husband's ideal and actual husband's ideal number of children	-0.04	1.89	700						
Husband wants more children	0.28	0.45	705	0.16		558	0.23		4,077
Husband wants same number of children	0.59	0.49	705	0.48		558	0.36		4,077
Husband wants less children	0.13	0.34	705	0.09		558	0.06		4,077
Number of days in past 7 days couple had sex	2.07	1.65	742	0.47	0.02	787	0.47	0.01	5,412
Husband decides major purchases	0.65	0.48	748	0.34	0.03	571	0.44	0.01	4,160

Notes:

[1] Sample final participants are the households that received a voucher and went through the complete survey process.

[2] Variables 28 through 44 are all dummy variables, taking on values of 1, 0 or missing,. For variables 41 through 44, the variable took on 0 if the respondent said the wife or both of them was in charge of the respective task.

[3] Modern contraception includes use of the pill, IUD, implant, injectable, diaphragm, female and male sterilization.

[4] A concealable method is comprised of the following contraceptives: IUD, implant and injectable.

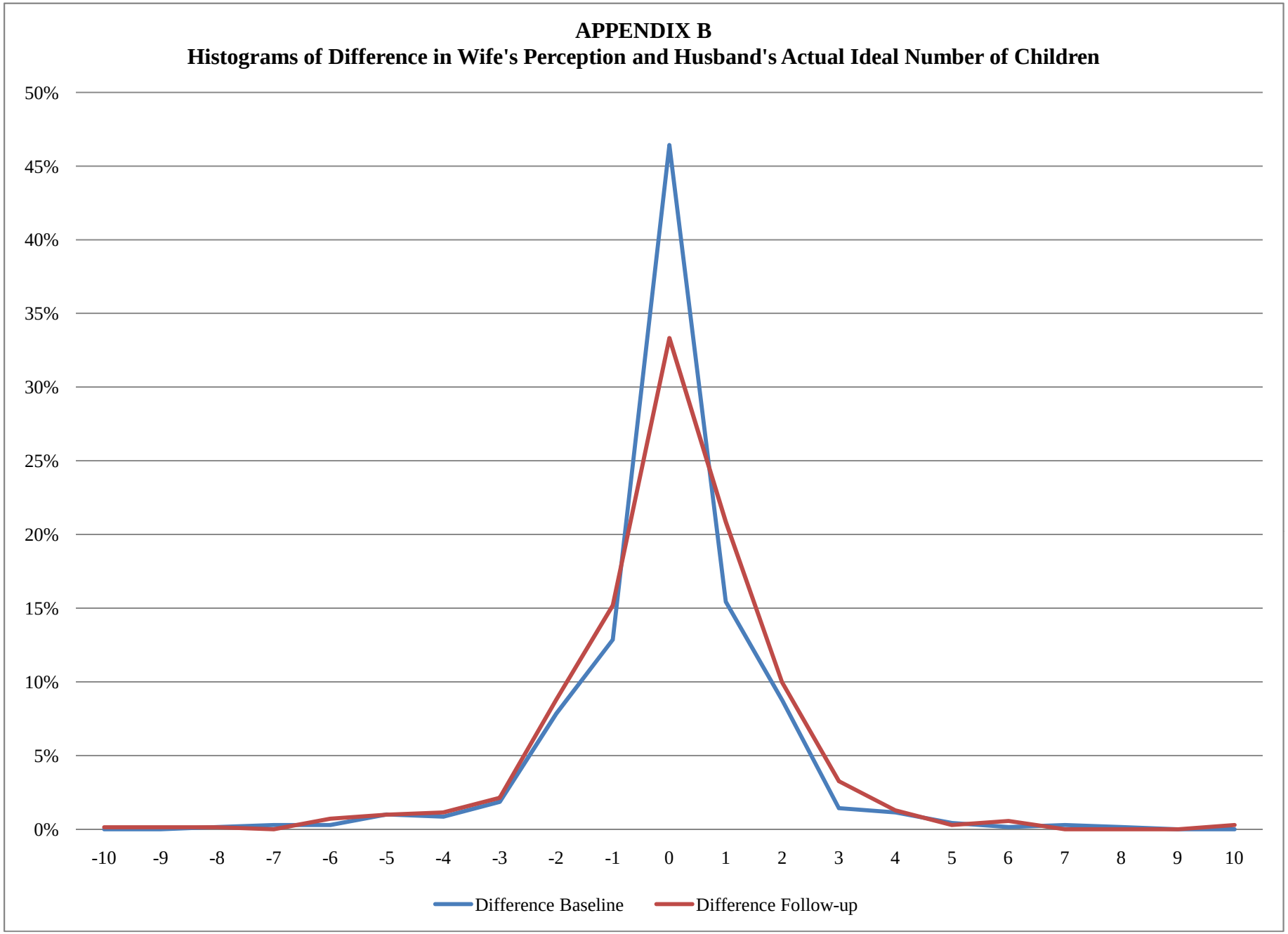
[5] All pooled results data come from husband and wife baseline surveys. If not specified, data are from wife's baseline survey.

the baseline voucher survey were calculated, taking the difference between the wife's perception of the husband's ideal number of children and her ideal. The higher reporting of husband's who want the same number of children in the voucher study could be a result of the ordering of the questions (the wife is asked what she thinks her husband's ideal number of children is, soon after she was asked about her ideal number).

[7] Variable 21, "Wife plans on becoming pregnant in 2 years", was also defined differently across the two surveys. In the voucher baseline survey a respondent was said to want a child in the next two years if she either answered "within two years" to the question "If it were completely up to you, would you like to have another child within the next two years, after two years or not at all?" or if she answered 0 to 24 months when asked "If it were completely up to you, how long would you like to wait until the birth of another child?" In the DHS survey...

APPENDIX B

Histograms of Difference in Wife's Perception and Husband's Actual Ideal Number of Children



Appendix C
Effect of Private Information Treatment on Voucher Use

	Tried an Injectable for the First Time after Baseline Survey [Sample Final Participants]		Tried an Injectable for the First Time after Baseline Survey [Women Who Want to Wait Longer than 2 Years to Have Another Child]		Tried an Injectable for the First Time after Baseline Survey [Women Who Want to Wait Longer than 2 Years to Have Another Child] [Sample Intent to Treat]		Tried an Injectable for the First Time after Baseline Survey [Control v Couples]		Tried an Injectable for the First Time after Baseline Survey [Women Who Want to Wait Longer than 2 Years to Have Another Child] [Control v Couples]	
Variable	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
Assigned to Individual Treatment	0.008	0.017	-0.004	0.019	-0.005	0.012				
	(0.024)	(0.025)	(0.028)	(0.029)	(0.022)	(0.023)				
Assigned to Couples Treatment							0.094***	0.092***	0.093***	0.093***
							(0.016)	(0.015)	(0.013)	(0.013)
Age		-0.002		0.001		-0.001		-0.000		-0.001
		(0.004)		(0.005)		(0.004)		(0.002)		(0.001)
Husband's age		-0.002		-0.003		-0.001		0.000		0.000
		(0.003)		(0.003)		(0.003)		(0.001)		(0.001)
Highest schooling completed		0.000		-0.002		-0.003		-0.001		-0.002
		(0.005)		(0.006)		(0.005)		(0.002)		(0.002)
Husband's highest schooling		0.011**		0.010*		0.002		-0.003		0.000
		(0.005)		(0.005)		(0.005)		(0.003)		(0.002)
total number of children		0.008		-0.003		-0.001		-0.003		-0.001
		(0.015)		(0.017)		(0.008)		(0.002)		(0.002)
Ideal number of children		0.003		0.022*		0.007		-0.003		-0.001
		(0.011)		(0.013)		(0.027)		(0.004)		(0.003)
Husband's ideal number of children		-0.003		-0.007		0.012		0.007		0.005
		(0.008)		(0.009)		(0.028)		(0.005)		(0.004)
Using an injectable at tracking		-0.100***		-0.102**		-0.089***		-0.026*		-0.023*
		(0.035)		(0.040)		(0.032)		(0.015)		(0.013)
Using a pill at tracking		-0.006		-0.021		-0.010		-0.013		-0.008
		(0.031)		(0.036)		(0.029)		(0.014)		(0.012)
Using any modern method at tracking		0.051		0.076*		0.075**		0.026*		0.025**
		(0.039)		(0.045)		(0.035)		(0.014)		(0.012)
Average monthly income		0.058		0.054		-0.003		-0.004*		-0.004**
		(0.174)		(0.190)		(0.015)		(0.002)		(0.002)
Husband's monthly income		-0.124**		-0.148**						
		(0.055)		(0.064)						
Husband larger ideal family size than wife		0.002		0.011		-0.001		-0.008		-0.005
		(0.010)		(0.012)		(0.029)		(0.006)		(0.005)
Wife understands when she is most fertile		-0.037		-0.095**		-0.061*		-0.024**		-0.014
		(0.039)		(0.046)		(0.034)		(0.011)		(0.012)
Wife wants a child in first 2 years		0.008								
		(0.030)								
Wife 40 or older		-0.033		-0.027		0.004		-0.006		0.001
		(0.072)		(0.076)		(0.064)		(0.029)		(0.029)
CHW		0.005**		0.005*		-0.008**		-0.002		-0.002*
		(0.002)		(0.003)		(0.004)		(0.001)		(0.001)
Compound		-0.009**		-0.009*		-0.000		-0.001*		-0.001
		(0.004)		(0.005)		(0.002)		(0.001)		(0.001)
Time since last birth		-0.001		-0.001		-0.064		0.000		-0.047
		(0.002)		(0.002)		(0.205)		(0.000)		(0.038)
Constant	0.113***	0.223	0.113***	0.162	0.099***	0.119	-0.000***	0.060	-0.000***	0.045
	(0.017)	(0.152)	(0.020)	(0.171)	(0.016)	(0.135)	(0.000)	(0.069)	(0.000)	(0.058)
Observations	706	701	513	509	705	701	946	932	1270	1253

* significant at 10%; ** significant at 5%; *** significant at 1%.

Notes:

See Notes to Table 2

[1] The wife is asked if she has had a child in the 2 years since she was last surveyed. If that date is 9 to 13 months after the date she was given a value of 1, otherwise she was given a value of 0.

[2] The analysis looks at the total sample of individuals that received a voucher, as well as women who didn't want a child in the next 2 years following baseline. All study participants who either answered they didn't know, didn't want any more children, or said they wanted children after 24 months were included in the category "Wife Doesn't Want Child in Next 2 Years."

[3] First use of injectable implies the respondent hadn't used one according to the baseline survey and in the follow-up said they had used an injectable in past 2 years.

[4] Birth parity is controlled for using a fixed effect on number of children.

[5] Regressions on Controls and Couples used only the respondent's responses for information on the husband. Additionally, pweights were included to correct for the changes in sampling probabilities at a certain date for the control group.

APPENDIX D
Effect of Private Information Treatment on Follow-Up Measures

Variable	Disagreed on Number of Children with Husband in Follow-up Conditional on Having Disagreed on Number of Children at Baseline [1]	Disagreed on Contraception with Husband in Follow-up Conditional on Having Disagreed on Number of Children at Baseline [2]	Disagreed on Number of Children with Husband in Follow-up Conditional on Having Agreed on Number of Children at Baseline [3]	Disagreed on Contraception with Husband in Follow-up Conditional on Having Agreed on Number of Children at Baseline [4]	Change in Difference of Wife's Perception and Husband's Actual Ideal Number of Children from Baseline to Follow-up Conditional on Wife not Knowing Husband's Actual Ideal Number at Baseline [5]	Discuss Family Planning at Follow-up Conditional on Never Discussing Family Planning at Baseline [6]	Discuss Family Planning at Follow-up Conditional on Discussing Family Planning at Baseline [7]
Assigned to Individual Treatment	0.058	-0.009	0.021	0.018	-0.295	0.016	-0.027
	(0.090)	(0.058)	(0.036)	(0.022)	(0.238)	(0.054)	(0.027)
Constant	0.222***	0.089**	0.253***	0.075***	0.056	0.867***	0.903***
	(0.065)	(0.042)	(0.025)	(0.016)	(0.168)	(0.038)	(0.019)
Observations	95	95	611	611	353	152	550

* significant at 10%; ** significant at 5%; *** significant at 1%.

Notes:

[1] The sample discussed in this table is the final sample that received a voucher.

[2] The question asked in the baseline and follow-up surveys for regressions 1 and 3 is "Have you ever disagreed [with your partner] on number of children?"

[3] The question asked in the baseline and follow-up surveys for regressions 2 and 4 is "Have you ever disagreed [with your partner] on contraception?"

[3] The question asked in the baseline and follow-up surveys for regressions 6 and 7 is "How often have you and your partner talked about how many children to have or when to have them in the last year?" If they responded with "at least once' they were counted as having discussed family planning.