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Family Planning as an Investment in Development and Female Human Capital: Evaluating the Long Term Consequences in Matlab, Bangladesh*

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Abstract
The paper analyzes 141 villages in Matlab, Bangladesh from 1974 to 1996, in which half the villages received from 1977 to 1996 an outreach family planning and maternal-child health program. Village and individual data confirm a decline in fertility of about 15 percent in the program villages compared with the control villages, as others have noted. The consequences of the program on a series of long run family welfare outcomes are then estimated in addition to fertility : women's health, involvement in production other than childcare, household assets, participation in group activities outside of the family, use of preventive health inputs, and finally the inter-generational effects on the health and schooling of the woman's children. Many of these indicators of the women's welfare and that of their children improve significantly in conjunction with the program-induced decline in fertility, suggesting substantial social returns to this reproductive health program in rural South Asia..

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1. Introduction

How do population policies contribute to improve the welfare of women, their children and families, and their communities, and possibly foster economic development? Though women in various parts of the world have been provided with improved birth control technologies for the past fifty years, few studies have identified the impact of these policies on the fertility and health of women and on their lifetime productivity, consumption opportunities, savings, and asset accumulation. There is a common belief that women who avoid ill-timed or unwanted births due to a population program will also be likely to invest more in each of their children's human capital, reducing poverty in the next generation. But again, there is little evidence of this quantity-quality trade-off based on sources of variation in fertility which are independent of parent preferences and preconditions, with the exception of a few studies of twins, which do not seem to answer quite the same policy questions (Schultz, 2005).

To evaluate population policies, the program intervention should be designed to distinguish between well defined treatment and control populations, both of which are followed over an extended period of time. After the program starts, the cumulative repercussions for a cohort of women and any inter-generational effects on their children should be assessed. In Matlab Bangladesh, a family planning and maternal and child health (MCHFP) program along these lines was introduced in 1977. Field workers visited all women of childbearing age every two weeks with contraceptive services and supplies. Additional child and maternal health services were added over time. Neighboring villages are also recorded in censuses in 1974, 1978, and 1982, and sampled in a comprehensive socioeconomic survey in 1996. These policy interventions in combination with census and survey data provide an unusual opportunity to evaluate long-term welfare effects of family planning and health outreach efforts at the household level which could be informative as to the likely consequences of comparable family planning and health programs in other very low-income rural areas in the world.

Section 2 describes the Matlab data and the program intervention. Section 3 explores how fertility differed in the treatment and control areas before the program started and thereafter. It also examines other issues that could bias the observed differences in the 1996 survey outcomes between the treated and control villages and thus the effect of the program on the treated. Section 4 reviews a regression analysis of differences between treatment and comparison areas in 1996 for women and their families. Section 5 concludes with an interpretation of the empirical evidence. Because this research project is only in its early stages, we discuss problems and issues which are not yet analyzed to our satisfaction, and which will be investigated in future work by the authors.

2. The Matlab Family Planning and Health Program

Matlab is a field research station of the International Center for Diarrhoeal Disease Research, Bangladesh (ICDDR, B), located about 60 kilometers south-east of Dhaka (See maps in Appendix figures 1 and 2).. The area is a deltaic plain intersected by the tidal rivers Gumti and Meghna and their canals. Being flat and low-lying, the region is subject to frequent flooding, which may have contributed to its persistent poverty, sustained its high mortality, and slowed the introduction of even basic infrastructure. The area is relatively isolated and inaccessible to communication and

transportation other than river transport. There are no major towns or cities except for the small Matlab bazaar.

Eighty-five per cent or more of the people in Matlab are Muslims and the others are Hindus. Despite a growing emphasis on education and increasing contact with urban areas, the society remains relatively traditional and religiously conservative (Fauveau, 1994). Infant mortality has fallen from 110 per thousand live births in 1983, to 75 in 1989, to 65 in 1995, while the total fertility rate has declined by half from more than 6 in 1976, to 3.2 by 1995 (Fauveau, 1994; ICDDR,B, 2005).

Matlab has been the site of numerous studies, starting with four cholera vaccine trials between 1963 and 1968. This involved a census of the entire area, assigning a census identification number to each individual. A Demographic Surveillance System (DSS) was established in 1966 to track on a monthly basis births, marriages, deaths, divorces, internal migration in and out of the area as well as movements within the area. In the mid 1970s the focus of the field station shifted from testing of vaccines to broader public health interventions. In October 1977 the ICDDR,B initiated an experimental maternal, child health and family planning (MCHFP) program in Matlab. The study area originally consisted of 149 villages with a total population of about 180,000 in 1977. Seventy of the villages in the study area (blocks A,B,C and D) received new family planning outreach services, while the remainder continued to receive only regular government health and family planning programs, which generally required that women visit her local health clinic.[1] The MCHFP project is noteworthy not only because of the poor rural conditions under which it was implemented, but also for its assignment design and its duration within a population for which vital events are accurately recorded. The project seemingly satisfies the definition of a formal experiment, with a well-defined "treatment" area where services are introduced and a “comparison” area where such services are absent, but geographical, social, economic, demographic, political and historical conditions are much the same.

In the initial stages of the MCHFP program, Community Health Workers (CHWs) made home visits to married women in the treatment villages about every two weeks, consulted them regarding their contraceptive needs, and encouraged them to adopt contraception. Women were offered a choice of pills, condoms, foam tablets, or injectable contraceptives (depo-medroxy-progesterone acetate), and later the copper T intra-uterine device was offered, and women wanting menstrual regulation or a tubectomy were referred to the local district clinic or hospital (Phillips et al.,1982). CHWs were women from generally influential families in the village, who were married, had eight or more years of education and were themselves users of contraception.

[1] Some of these villages had been the site of a two-year trial, called the Contraceptive Distribution Project (CDP) which was carried out between 1975 and 1977 in 150 villages of the Matlab are. An additional 84 villages had served as a comparison area at this time. The CDP aimed to distribute oral pills and condoms by Lady Village Workers, who were elderly, illiterate, and non-medically trained village midwives. They were assigned the task of supplying contraceptives. The project did not provide follow-up services to deal with side-effects or discontinuation of contraceptives. Fauveau and Chakraborty (1994: p.90) write that “Although in the first three months, the project was successful, raising levels of contraceptive use from a baseline one percent to 18 percent of married couples, it had virtually no demographic impact (Stinson et al., 1982)”.

Over time, however, additional services were added to the program. In 1982 block A and C villages (half of the treatment total) were offered additional maternal and child health (MCH) services, including the provision of maternal tetanus inoculation of all married women, measles immunizations to all children from the age of nine months to five years, training of traditional birth attendants and the distribution of safe delivery kits, oral rehydration therapy for diarrhoea and antenatal care (DeGraff et al., 1986; Phillips et al., 1988; Fauveau, 1994)). In the other blocks, B and D, the Community Health Workers continued to deliver the same services as in the preceding phase.

From 1986, there was a major thrust in the development of MCH services in all of the treatment region (blocks A-D). As often as possible, new services were implemented in phases in a controlled design. In 1986 all four blocks received the following services: a complete immunization against the 6 EPI diseases, child nutrition rehabilitation and the provision of vitamin A supplements. In 1987, services focused on maternity care (MCP). Professional midwives were posted to 39 of the treatment villages (assigned to blocks C and D), and the midwives with provided a referral network to assist women with delivery complications to transport them to the maternity clinic in Matlab, or if necessary to the district hospital in Chadpur (Fauveau et al., 1991; Maine et al., 1996). In 1988, the control of acute respiratory infection and dysentery, together with maternity care, was also assigned priority. By 1990, all four blocks of the treatment area received similar levels of MCHFP services.

Since 1966, the control villages of the Matlab area have been served by the Government of Bangladesh Health and Family Planning Programme, which has less coverage and required women to visit local health clinics for their contraceptives and maternal health and child health needs.

The Matlab Health and Socioeconomic Survey (MHSS) is a random survey of households in 141 villages in this area collected in 1996. [2] Several features of the data are helpful for examining the effects of the family-planning program. First, because all individuals in the area have permanent identification numbers, matching and merging information over time is relatively easy and presumably accurate, and prior exposure to policy interventions by village of residence is known, and potential long-run consequences of the policies treatments for the women, their families, homesteads (i.e., extended family compounds called Bari), and entire village communities.[3] Second, for each ever-married woman, the survey collected detailed information on maternity histories, contraceptive use, health, children's health and anthropometric outcomes, as well as numerous questions about the socioeconomic status of the woman and her household. Third, the MHSS also administered a community-level retrospective questionnaire about the local health care providers, schools, economic shocks to the area, industrial activity, government policies and natural disasters and weather.

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[2] This survey is a collaborative effort of RAND, the Harvard School of Public Health, the University of Pennsylvania, the University of Colorado at Boulder, Brown University, Mitra and Associates and ICDDR,B. It was primarily funded by the national Institue on Aging with additional support from National Institute of Child Health and Development. It is distributed by the Inter-University Consortium for Political and Social Research (ICPSR) at the University of Michigan.

[3] We have found only a few investigations that compare the features of the treatment and comparison areas or populations before the program of 1977. Exceptions are Sinha (2003) and Chaudhuri (2005).

3. The Assignment of the Population to Treatment and Comparison Groups

Assignment of Villages to Treatment Regimes

To establish a causal connection between the family planning and health program and the 1996 observed characteristics of the population in the treatment and control villages researchers appear to assume that the half of the 141 villages in MHSS were randomly assigned to the program treatment. But the treatment and comparison villages were selected so as to be adjacent to each other in contiguous regions, perhaps to reduce spillover effects from the treatment to controls and to facilitate the delivery of the services (Cf. Freeman and Takeshita, 1969). The same problem arises in the assignment of the villages to the MCH and MCP. The treatment and control populations may differ in characteristics that are associated with fertility and well-being before or after the program started in 1977, which could bias intergroup comparisons as a basis for evaluating the effect of the population and health policies. The extensive literature on Matlab and its experimental programs does not appear to have analyzed potential bias due to nonrandom treatment assignment. Some studies compare fertility and a few other characteristics of the populations between the treatment and control areas before and after the program started (e.g., Phillips et al., 1988; Sinha, 2003; Fauveau et al., 1991), but the majority treat the assignment as if it were random.

Our first objective, therefore, is to link the 141 villages sampled in the 1996 MHSS to earlier Censuses to estimate fertility levels of women in the treatment and comparison villages. Those who completed their childbearing years before the program started can be readily compared to the fertility of younger women who could possibly benefit from the family planning program contraceptive subsidy. Figure 1 plots the number of children ever born per woman by five-year age intervals as reported in the 1996 MHSS and confirms that the average number of children ever born among women over the age of 55 in 1996 appears indistinguishable between the treatment and control villages. This is consistent with comparisons of age-specific birth rates in the treatment and control villages reported from 1974 to 1979, which led Phillips et al.(1982) to conclude there was little difference in total or general fertility rates between the treatment and comparison areas until the program had its impact in1978.

Although the number of children ever born to a woman is not reported in the 1974 Census, the age and sex of all residents is known in each village. The ratio of the number of children age 0 to 4 to the number of women of childbearing age 15 to 49 (C04/W) is a measure of period surviving fertility which is commonly consulted when birth registrations are incomplete and total fertility rates cannot be directly estimated (Bogue and Palmore, 1964;United Nations, 1967). The ratio of children age 5 to 9 per woman age 15-49 (C59/W) approximates the surviving fertility for a period five to nine years before the census. It should be noted that about a tenth of the children born in either five year period in Matlab do not survive to be enumerated in the subsequent census.

In the 141 villages sampled in the 1996 MHSS, the 1974 C04/W for the treatment areas are slightly larger than in the comparison areas, although the difference is not statistically significant. Based on 1978 Census, the treatment half of the villages report a lower C04/W, and this difference is statistically significant. The negative treatment effect is absolutely larger in magnitude in 1982 and 1996. These village observations on surviving fertility are likely to be noisier estimates of fertility for smaller villages than for larger villages. A generalized least squares procedure is therefore adopted which weights the village observation by the inverse of the square root of the number of

women age 15 to 49 in the village. Using these weights does not change substantially the estimates reported in Table 1, although they tend to be somewhat more precise.

Pooling cross sections of villages from two years, in which the first year is collected before the program in 1974, and the second year after the program (i.e. 1978, 1982, or 1996), permits one to estimate a "difference in difference" effect of the program treatment, summarized by the coefficient on the added effect on fertility of being in a treatment village in the period after the program started. This double difference specification eliminates any time invariant village fixed effect and avoid possible bias if these village fixed effects were related to the village's assignment to the treatment. The coefficient on this "treatment*after" variable in top panel on Table 1 indicates that the C04/W is -.06 in 1978 compared with its value in 1974 (sample mean in 1974 of .82) . Since the program started in October 1977, it could only have affected fertility in the second half of 1978 and thus the estimated program effect in 1978 is no more than a half-year estimate. Indeed, by 1982 the Census data suggest the treatment villages report child-woman ratios -.14 lower than in 1974, and by 1996 the treatment villages report ratios -.13. The lower panel of Table 1 reports the regressions for C59/W for which the treatment and comparison areas do not differ in 1978 or 1982 compared with preprogram data from 1974, but as expected by 1996 the treatment areas show significantly lower surviving fertility, or -.14 from a sample mean in 1974 or .61.

These village level cross sectional time-difference estimates are consistent with the hypothesis that the program treatment was assigned to villages which exhibited very similar fertility levels before the program started. Regardless, it seems advisable to control for the village fertility levels in 1974 with difference in difference calculation as reported in Table 1. We then find the aggregate child woman ratios were slightly larger in treatment villages in 1974 and declined according to this cross sectional measure by about 16 percent (C04/W) by 1996 (i.e. -.13/.82= .16), roughly the same magnitude as observed in figure 1 based on comparing cohort completed fertility or children ever born among women age 45-49 in the 1996 MHSS.

Because the Census of 1974 did not collect good indicators of personal wealth and of different economic potential for growth of the treatment and comparison villages which could be matched to the 1996 MHSS, difference in difference methods can not be implemented to analyze other family welfare outcomes and their change over time. We assess the pre-program differences in the socio-economic status of treatment and control villages by restricting our attention to simple proxies for socioeconomic status: the average years of schooling of individuals over the age of 15 (we exclude religious education, since we do not know the duration of religious education), the proportion of individuals in the village who report they have had no schooling, the proportion of children between the ages of 9 and 15 who report they have had no schooling, the proportion of individuals in a village who live in houses whose roofs and walls were made of tin, and the average proportion of individuals in the village who are Muslims.[4] Measures of schooling and measures of

[4] Another set of questions in the village module of the 1996 MHSS report retrospectively when public facilities and services were first provided in each village, including the year of establishing primary and secondary schools, different health care providers, electrification, the timing and intensity of the last flood and other natural disasters. The community-level data also contain information on distance of the villages from towns, markets, and various providers of services. Village access to these and other forms of public and private services, infrastructure,and vulnerability to natural disasters may possibly account for differences in subsequent economic and demographic change across the groups of villages that might otherwise be mis-attributed to, or deducted from,

residential housing quality have been have been used by Filmer and Pritchett (1999) to approximate the economic status of households in the Demographic Health Surveys. We examine the difference in religious composition of village populations mainly because Hindus and Muslims differ in sources of income, and in patterns of marriage and child-bearing (Fauveau, 1994).[5] Table 2, panel (a) presents estimates of weighted means and differences in the means of the above-mentioned variables between treatment and control areas.[6] The last column of Table 2 presents the coefficient from the weighted-regression of the variable on the variable "treatment area" and thus provides an estimates of the pre-program (1974 Census) between the two areas. There appears to be no statistically significant difference in the pre-program schooling of individuals older than 15 between the treatment and control areas. In fact, the fraction of individuals over the age of 15 who report they have never been to school is higher in the treatment villages. This is also true for the group 6 to 15. The weighted coefficient indicates that children in this age group who reside in treatment areas are 2.5 percent more likely to report that they have never been to school. The last row of the upper panel of Table 2 confirms that there are more Muslims in the treatment villages. The different proportions of Hindus and Muslims in the two regions has been documented in the past literature on Matlab areas (Fauveau, 1994).

To investigate the changes in these variables over the period that the family planning program was in operation, we use data from the 1996 MHSS to construct the same variables. Since the 1996 MHSS is a full socio-economic survey, we can examine whether our measures of education and housing quality are indeed a proxy for socioeconomic status.[7] The means of treatment and control areas, as well as the difference between them (again weighted by village populations) is presented in Panel (b) of Table 2. Compared to the estimates in panel (a) we now note a significant difference between treatment and control areas. In particular, the average years of schooling in the treatment area is higher by .6 years . Moreover, by 1996 individuals over the age of 15 in treatment areas were 2.6 percent more likely to have ever attended school and children 6 to 15 were 4.3 percent more likely to have attended school. The reversal of the difference in educational attainment between treatment and control areas has reversed between 1974 and 1996 is noteworthy.

A further analysis of the occupation structure and religious composition of treatment and control villages in 1974 and 1996 is needed to increase our confidence that the half of the 141 villages in the MHSS were indeed randomly assigned to the program treatment. If significant differences in the characteristics of the treated and control villages are discovered in 1974 and replicated in the censuses of 1978 and 1982, and these characteristics are associated with fertility and other family welfare outcomes of interest measured in the 1996 survey, a propensity score

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the estimated effect of a program treatment if these changing characteristics of the villages before and after 1977 were correlated with both their treatment status and subsequent demographic, health, and economic outcomes.

[5] Muslims are more involved in agricultural activities, while Hindus are more likely to be fishermen and skilled and craft occupations.

[6] As before, our weighs are the population of the village.

[7] The correlation coefficient of head's education with the number of rooms in a household is .21, with pucca (bricks or cement) roof and walls is .22, with electricity is .22, with a well to provide drinking water to the vari is .21, and with total household income (excluding the purchase of assets) for the year 1995 is .10, all of which correlations are statistically significant at the 5(???) percent level.

matching methodology may be implemented in the future to obtain alternative estimates of the program's effect on fertility and family long-term welfare outcomes (Heckman, Ichimura and Todd, 1997/1998). We have decided to include in the reduced form estimates of fertility and family outcomes interactions between the program treatment effects and the woman's age cohort, with Muslim, and with a three-way interactions between treatment, four age categories of women, and her years of schooling. Therefore, even if the programs implemented in Matlab were not assigned to a strictly random sample of villages, or the responses to the program were heterogeneous across these religious, schooling and age groups, we may capture these compositional variations in responses as they express themselves between the treatment and control villages.

Treatment Effects on Women's Migration and that of their Children

A second problem with interpreting the differences in outcomes observed in the 1996 MHSS survey between the treatment and control villages as evidence of program effects on the treated is that the program may have also affected the probability of migration from (and into) the registration areas, causing migration to differ between treatment and control villages from 1977 to 1996. This could in turn affect characteristics of the population blocks, and influence fertility and other program evaluation outcomes. [8] Evaluation of the effect of the program on a woman's children could also be biased if the program influenced when children leave their mother's home or affect the information reported on children who are not in residence.[9] The indicators of child health are only observed if the child is residing in their mother's household. To minimize any possible sample selection bias in the analysis of the child's schooling, we therefore restrict initially the sample to children who are age 0 to 14 and consequently likely to still be residing in their mother's household.

4. Evaluation of the Effects of Family Planning and Reproductive Health Programs

[8] We plan to consider who has migrated out of the region based on known initial characteristics (limited to Census information), whereas it is expected that there was little net in-migration into this very poor region, except for women who married residents of the region, which may be approximately offset by women who married out of the DSS. For example, we might hypothesize that women, who were helped by the program to control their reproduction after 1978 and thereby have fewer children, were more likely than the average woman to migrate away from the Matlab region, because they would have incurred lower costs of migration with their smaller family sizes. It is possible, on the other hand, that the treated villages became more prosperous and accumulate the capital to provide more employment opportunities for their residents and, therefore, experienced lower net rates of out-migration. Estimates by ICDDR,B of age and sex survival rates will be used to forecast the survival of the 1974 Census population to the 1978 and 1982 Censuses, and then to compare the age and sex compositions of the population enumerated in the MHSS survey in 1996. The surplus in survived initial population compared with the final enumerated population is then a rough estimate of the net out-migration rate by age and sex in the treatment and control villages.

[9] For example, if women in the program treatment area are inclined to increase the schooling of their children, it is likely that their age of marriage would be delayed and thus a larger fraction of their children would be observed at a early school-attending age in the 1996 survey. But once these children's education is complete, their probability of out-migration is likely to increase if they have completed more schooling. The 1996 MHSS collected information on the completed schooling of *all* of a woman's children, including those who did not currently co-reside with their mother. But as we will discover, reporting of educational attainment for older children is more complete for boys than girls, suggesting that selective response bias could be present in the available information on the schooling of older children age 15 to 29, who will therefore be analyzed as a separate sample.

Fertility of Women

Women less than age 55 in 1996 who resided in the villages provided the program treatment reported fewer children than women residing in the comparison villages, as illustrated in Figure 1. However, many other characteristics of women are likely to differ across birth cohorts, potentially affecting fertility and other family outcomes, introducing omitted variable bias in this unconditional estimates of the program's effect on fertility or other outcomes. Estimating a more comprehensive "reduced form" specification of the age-specific effect of the program on fertility and family economic and demographic outcomes is thus the first stage in our analysis. The second stage in our analysis estimates the effect of fertility variation on many of these family outcomes, where the fertility is assumed to be endogenous to family economic and demographic decision-making, and the family effects of fertility are identified by the program treatment and age interactions.

At a minimum, the program's effect on fertility should be expected to vary across birth cohorts of women. For those whose lifetime fertility was nearly complete in 1978, over age 40, the program effect on their fertility should be negligible. The program effect reducing fertility may be absolutely larger for younger birth cohorts who were exposed to the program for a larger fraction of their childbearing years. The absolute magnitude of the program effect may then diminish among the youngest women, unless the program alters substantially the timing of early births. In our view, the interrelationship between the woman's age in 1996 and the program's treatment effect on her fertility should be estimated flexibly to fit the data and not assumed to take a specific structural form. We allow the program treatment effect to vary freely across 10 five-year age groups of women, although a more parsimonious parametrization of program effects across mothers of different ages might be explored. The 10 age-dummies and their interaction with a dummy variable indicating that a woman resides in a treatment area are denoted by *Age25to30, Age30to35, Age35to40, Age40to45, Age45to50, Age50to55, Age55to60, Age60to65, Age65Over, TrXAgeUnder25, TrXAge25to30, TrXAge30to35, TrXAge35to40, TrXAge40to45, TrXAge45to50, TrXAge50to55, TrXAge55to60, TrXAge60to65, and TrXAge65Over, respectively, where the omitted category of women is those less than 25 years of age*.

What are the key environmental determinants of fertility which should be controlled in such a reduced form comparison? Schooling of women is often observed to be positively correlated with women's wage rates and with other indicators of their labor productivity. The monthly earnings of married women in the Matlab survey in their primary occupation and their total income are positively related to their schooling (Cf. Table 6 col.1 and 2). This empirical regularity suggests that women with more schooling will face a higher price for having a child, because the opportunity cost of the mother's time for child care is more valuable to the household. This effect on the price of children may dominate her schooling's effect increasing her income, and thereby may explain why better educated women tend to have fewer children, holding other things constant (Mincer, 1963; Schultz, 1981, 2002). A second hypothesis for why better educated women have lower fertility is that they incur lower learning costs in evaluating and adopting new improved forms of birth control, which would lead them to avoid more unwanted births. We thus include women's years of schooling (*YrsSch)* as a control variable.

Family planning programs may reduce the information and learning costs of adopting a new form of birth control and thereby provide an economic substitute for the innovational advantages which better educated women already enjoy. We expect that both the schooling of women and their residence in program village would thus be associated with their reduced fertility. But if the

woman's schooling and access to the family planning program provided substitute skills and capacities to evaluate and adopt useful new forms of birth control, this would explain the empirical regularities noted in previous studies in Colombia in 1964, Taiwan in the late 1960s, and Thailand in the late 1970s (Schultz, 1980, 1984, 1988, 1992) where the interaction of schooling and program subsidy was associated with higher fertility, implying they are substitutes. However, if the demand for improved birth control in Matlab in 1996 is still highly concentrated among better educated women, or the demand for birth control is price inelastic among the least educated, the more educated may stand to benefit more directly from the family planning program subsidies than the less educated, or in other words, education and the services of this outreach program would be complements in reducing fertility. To assess how the Matlab outreach program affected the distribution of gains, we specify the reduced-form equation for fertility and other family outcomes to include an interaction variable which is the product of the woman's years of schooling and a dummy if she resides in a program village (TrXYrsSch).[10]

The home visits of the MCHFP field workers reduce the monetary costs (free) and the time costs of obtaining information and supplies to control unwanted births from local government clinics. If the demand for birth control were uniform across women, the monetary cost might represent less of a deterrent to the use of birth control by women with more schooling or those in higher income households. But the time costs might be a stronger deterrent for the better educated whose time is more valuable. Social stigma associated with changing traditional behavior related to family planning and using modern birth control could also impact differentially women in different strata of society. Due to the practice of Purdah in Matlab, women may be restricted in their movements outside of their homestead, and the design of the MCHFP program to visit all women in their homes (i.e. outreach) may have had the consequence of also reducing the social stigma associated with coordinating with other family members to obtain birth control from the local clinic or from private providers. A woman in a village provided with the MCHFP treatment is also informed that other women in her village are also being contacted by the field worker, and this common knowledge may encourage her to discuss the options of family planning with her neighbors and local relatives and develop more quickly a social consensus in support of the adoption of this relatively new form of behavior which is facilitated by the new technological inputs (Cf. Munshi and Myaux, 2002).[11]

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[10] In the case where the program complements the fertility reducing effect of women's education, we would expect, other things being equal, for fertility differentials by women's education to increase in successive generations, due to the program. Where program services offset or substitute for women's education, fertility differentials might be expected to diminish across generations due to the program (Schultz, 1984, 1988, 1992). More complex forms of this heterogeneity in response to the program treatment in Matlab may also clarify why the trend downward in fertility was initially pronounced in Bangladesh and then more recently slowed (IPPF, 2005).

[11] Theories of social learning, that recognize that contraceptive behavior is socially regulated provide an additional explanation for the response to program intervention in Matlab (Munchi and Myaux, 2002). Individuals are shown to respond to contraceptive prevalence within their religious group in their village, but not the prevalence within the other religion group or those in other villages, presumably because social interactions which facilitate learning among women rarely occur across these geographically and culturally separated groups. Theories of this form of social learning may be tested more widely with the Matlab data, to account for not only contraceptive behavior but also the adoption of preventive health measures (i.e. immunizations) which improve reproductive and child health outcomes, and are documented at both the household and village levels.

If women in treatment villages communicate and share information about contraceptive choices with their neighbors in comparison villages, we would expect that there to be better information about birth control in comparison villages that share a boundary with a treatment area than other comparison villages. In this case, differences in behavioral outcomes between treatment villages and comparison villages on the boundary of the treatment area to the system of home visits by the field workers. We explore this possibility by also interacting the age of a woman with a dummy variable that indicates whether she lives in a comparison-area village that shares a boundary with a treatment area village (BoundXAgeUnd35,BoundXAge30to55, and BoundXAgeOver55). [12]

Table 3 (a) contains a description of the outcome variables observed in the MHSS that we hypothesize the family planning program could affect over time. We consider measures of fertility, women's health status, women's earnings and income, and participation in social groups, household assets, housing quality and sources of water, women's use of preventive-health-inputs including prenatal care and various inoculations, and intergenerational human capital outcomes reflecting the health and schooling of the woman's children. These dependent variables are described as follows:

Measures of fertility: These include (I) the total number of children ever born (*TotalChildren),* (ii) the total number of children alive (*TotalAlive)*; (iii) the fraction of a woman's children who died before the age of five (*FracDied5);* (iv) the age (in years) at which they had their first birth (*AgeFirstBirth)*; (v) the time (in years) between the birth of the first and second child (*SecondBirthInterval*); and (vi) the time (in years) between the birth of the second and third child the (*ThirdBirthInterval).*

Measures of women's health: We consider (I) a subjective measure of current health (*CurrHealthy*), which is a dummy variable that takes value 1 if a woman's self-assessment of her health status as "Healthy" and 0 otherwise; (ii) The woman's weight in kilograms (*Weight); (iii)* The woman's height in centimeters (*Height);* (iv) The woman's body-mass-index in kg/m^2 (*BMI*); (v) an index of the capacity to perform five activities of daily living (ADLs) that is 1 if no functional limitations are reported or is 0 if the maximum number of limitations occurs in the sample *(ADLIndexEquals0).*[13]

[12] Alternative specifications for this spillover of program provided birth control information are considered, such as the distance between all comparison villages and the nearest treatment village, measured by graphic coordinates estimated from ICDDR,B published maps of the demographic surveillance area. These linear or quadratic spillover variables explained less of the variation in fertility than did the three boundary and age interactions described in the text.

[13] *ADLIndex* is an index that measures a woman's ability to perform 5 activities of daily living: (a) walk for one mile; (b) carry a heavy load (like 10 seer of rice) for 20 meters; (c) draw a pail of water from a tube-well; (d) stand up from a sitting position without help; (e) use a ladder to climb to a storage place that is at least 5 feet in height. The responses to these questions were coded either as can perform the task easily (a value of 1), can do it with difficulty (a value of 2) and unable to perform the task (a value of 3). We combined the responses to the five ADL measures listed to create an ADL index for person `i', (Stewart et al., 1990): ADLIndex(i)= (Score(i) – Minimum score)/(Maximum score – Minimum Score); *ADLEq0 is a dependent variable that takes a value 1* if the individual can perform all the ADLs without difficulty and thus have an ADL Index equal to 0. For the justification for this normalization see Stewart, et al. 1990.

Measures of women's income, employment and participation in groups: To examine the effect of the family planning program on women's productive employment, we examine (i) a woman's reported earnings, in taka, for the year 1995, in her primary occupation (*PrimOccIncome),* (ii) the woman's total income in 1995 (*TotalIncome*) (iii) a dummy variable indicating whether a woman owns productive assets (*OwnProdAssets)* and (iv) two dummy variables that indicate whether a woman participates in a group for the purpose of obtaining a loan (*GroupLoan), or* participates in an employment group. Group-membership is mainly considered because of the wide range of group-related employment, credit and savings programs in rural Bangladesh at this time, e.g. BRAC and Grahmeen. We believe participation in such groups may be correlated with women's participation in income-generating activities and village enterprise and may not be readily combined with caring for young children.

Household assets, housing quality and sources of water: To explore the hypothesis that a family planning program may affect the socio-economic status of entire households, we also choose a set of dependent variables that reflects measures of wealth in the Matlab area. These include (i) a dummy variable indicating whether the household owns farmland (*HhdOwnFarmland*) and jewelry (*OwnJewelry*) and a pond or an orchard *(OwnPond).* (ii) A dummy variable that indicates whether the main room of the household has a tin roof as well as a tin wall (*TinRoofWall),* (iii) a dummy variable indicating whether the household obtains drinking water from a tubewell and this well is within the Bari (DrWaterWellInBari), and (iv) Whether the household's main sources of water for cleaning and bathing is also in the Bari (*ClWellWater*).Although the current values of all household assets are not reported in MHSS, many are and they are summed and expressed in logarithmic terms to capture proportional variations as in log wage functions for individuals (Mincer, 1974). Total household assets (logwealth) and the value of the principal asset held in farmland (loglandvalue) are subsequently analyzed as a family outcome potentially affected by the village program and by differences in fertility related to access to the program. These assessments of household wealth are far more comprehensive and detailed than the questions on consumer durables and housing available from the Demographic Health Surveys (Filmer and Pritchett, 1999).

Measures of women's use of preventive health measures: Since the MCHFP program directly provided maternal and child health services, we expect the program to affect women's use of preventive health inputs. As a measure of improvements in health, these inputs have the advantage that they measure the use of preventive and not curative health services used *before* health problems arise, and thus avoid the problems of sample selection bias in examining morbidities and treatments of diseases conditional on the individual being sick during a reference period. We consider the following measures of preventive health measures: (i) the fraction of a woman's pregnancies in which she received a check-up before the birth (*PregCheckUps),* (ii) the mean number of ante-natal check ups received in each pregnancy (*NumAnteNatalChecks*), (iii) the fraction of pregnancies where a woman received a tetanus inoculation (*ATSInject*), (iv) for the most recent child born in the past 5 years, did this child receive an inoculation against polio (*PolioVac*), Measles (*MeaslesVac*) and DPT (*DPTVac).*

Measures of children's educational attainment: To examine the effect of the family planning program on children's schooling attainment, we consider several measures of children's schooling attainment: (i) Fraction of a woman's boys and girls aged 9-14 who are currently enrolled in school (*CurrEnroll);* (ii) the average education Z-score for boys and girls aged 9-14 (*BoyEdZScore* and *GirlEdZScore),* and (iii) the average education Z-score for boys and girls aged 14-30 (*BoyEdZScore2*

and *GirlEdZScore2)*. The z-score for the education of the children of a woman is defined as the average across her children of the difference between the child's observed years of schooling completed and the average educational attainment of other children in the MHSS sample of his/her age, divided by the standard deviation of the years of schooling of the group of individuals his/her age.[14]

In addition to the program treatment variables interacted with the individual woman's age and schooling, controls are included for the husband's education (*HusYrsSch)* as a measure of household income/wealth, which are not expected to reduce fertility as much as their wife's education (Schultz, 1981). The husband's age is also included in quadratic form (*HusAge and HusAgeSq)* as a auxiliary indicator of household life cycle income/wealth.[15] A dummy is included if the woman is Muslim, and it is interacted also with the treatment area dummy to assess whether the program's impact differs between Muslims and Hindus (*TrXMuslim).*[16]

Previous study of the different types of households in Matlab suggest that female headed households are of two types: widows (whom we refer to as *unmarried female heads*), and married women whose husband tend to be migrants (whom we refer to as *married female heads*) (Joshi, 2004). The married female heads and their children have many advantages, whereas the widows and their children do not.[17] The variables *UnmarriedFH, MarriedFH and HusAbsentNH* denote unmarried female heads, married female heads, and women whose husbands are absent but they are not heads of their own households, respectively. Control for each of these small but very different groups of women, in contrast to the omitted category of women whose husband is their household head.

Finally, we include controls for village characteristics and infrastructure which could influence the economic, health, and environmental conditions of families in the village. In particular, we control for whether the Bangladesh Rural Advancement Committee is present in the village[18] (*BRACInVill)*, whether the village has any paved/pucca road (*AnyPuccaRd)*, the average distance of a

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[14] Child health was also assessed in terms of Z scores based on height and weight-for-height by age and sex, without finding statistically significant relationships with the treatment or fertility, perhaps because of the relatively small samples of about 1000 children age 0 to 9 years of age.

[15] If the husband's education or birth-date is not reported, dummy variables are included to indicate these continuous variables are set to zero (HusEdMissing, HusAgeMissing =1).

[16] This religion variable captures many features of stratification in the society in addition to religion, which could affect the incentives for fertility. Because Hindus in Matlab are frequently engaged in fishing and nonagricultural occupations, returns to child labor and larger sized families may be different in these Hindu occupations from the agricultural livelihoods of most Muslim farmers.

[17] These women differ not only in their incomes and assets, but also in their circumstances at the time of marriage: When compared to women residing in male-headed households, widows (married women) are poorer (wealthier), have poorer (wealthier) natal homes, are less (more) likely to have paid dowries to their husband's families and more (less) likely to have lost their father and/or mother before their marriage, finding themselves disadvantaged in the marriage market. These differences extend to children who reside in these households. Children belonging to households headed by married female-heads are more likely to have ever attended school, to be currently enrolled in school, and to have completed two years of primary school. Children belonging to households headed by widows, however, are more likely to work outside the home and appear to have attained less schooling compared to children in more conventional male-headed households (Joshi, 2004).

[18] BRAC has 3.9 million members by the end of 2003 and has expanded it program of activities to include not only providing microcredit, but also (1) coordinating savings among low income households; (2) providing insurance, and (3) helping in distributing and marketing its clients output, such as handicrafts (Aghion and Morduch, 2005. Pp. 2,14).

village to an ICDDR,B sub-center health clinic where contraceptives are provided (*SubHospDist),* whether there is a secondary school in either the same village or a neighboring village (*SecSchNearby),* and .whether the village is accessible by motor boat (*VillMotBoat),*

Program Effects on Fertility

Table 4 column 1 reports estimates of the fertility (children every born) regression as specified in the previous paragraphs for all married women age 15 or older, with the program treatment variables interacted with the age of the woman, religion and age-schooling, plus other control variables. The program treatment is associated with 1.3 fewer children for women between the ages of 45 to 50, and about 1.0 fewer children between the ages of 30 and 45 and 0.9 fewer children between age 50 and 55. Each year of schooling a woman has completed is associated with a reduction in her fertility of -0.065, but the effect of schooling of the mother does not have a different effect on fertility in the treatment area. For her husband, however, the coefficient on the years of education is not significantly different than zero. Muslims have .35 more children than do Hindus, and in the treatment area they have 0.24 more children, but this treatment difference is not significant. Women in villages that share boundaries with the program treatment villages report lower fertility, which are statistically significant for women younger than 55, although the magnitude of the reduction in their fertility is about a quarter of the size associated with residing in a program village. Some spillovers are evident beyond the communities as might be expected, especially when the program has been in operation for nearly two decades.

At the bottom of the regression in column 1 is reported the joint F test for the statistical significance of the 11 variables interacted with treatment, which are significant with a p value of less than .0000. Perhaps more conceptually relevant is the second joint test of the significance of the program interactions for women between the age of 15 to 55 ($F(7,5200) = 7.97$; $p < .0000$) .The subsequent F for education tests the joint significance of the woman's schooling and its interaction with treatment. The F for Muslim tests the joint significance of the two Muslim variables, the F for boundary areas tests the joint significance of the three boundary area variables, and the village F tests the joint significance of the five infrastructure variables measured at the village level. All are significant at least at the 10% level. The sample size is 5208 married women, and the R squared is .57.

The demographic transition involves the decline in both child mortality and fertility, and the program in Matlab was likely to affect both. It is important, therefore, to estimate the determinants of the surviving number of children a woman has in column 2., and assess how this outcome was affected by the program's impact on the fraction of her children who have died before they reach their fifth birthday. This measure of child mortality is defined for only 4961 mothers who have had at least one child 60 months before the survey. As expected, the program is significantly associated with lower rates of child mortality among women age 35 to 40 and 45 to 55. The lower level of child mortality among women over age 65 who could not have directly benefitted from the program's provision of contraceptive or child health services cannot be attributed to the program. The implied reduction in child mortality by age five of 4 to 5 percentage points represents a reduction in the sample average child mortality of about one fourth, a remarkable achievement. Column 4 shows that the program is not jointly or individually associated with the age at which the women have their first birth, but the program appears to begin to increase significantly the spacing of their births between

second and third birth, as reported in column 6.[19] Apparently the outreach MCHFP program contributed to women adopting contraception not only to avoid unwanted final births at the end of their reproductive period, but also to space their births further apart during their reproductive period, as had been suggested in previous studies (Koenig et al., 1992; DeGraaf, 1991).

The MCHFP program's effect on the number of surviving children per woman is absolutely smaller than the effect on children born, declining between -.86 and -.42 averaged across the birth cohorts of women who were likely to benefit most from the program between the ages of 25 to 50 in 1996. The effect of the woman's schooling on her number of surviving children is diminished to 0.04 per year of her schooling. Although husband's schooling is not associated with decreased fertility of his wife, it is associated with decreased child mortality before age five (column 3, -.002), and thus with an increase in surviving fertility in column 2. Over the last 25 years the educational attainment of children in Matlab area has increased rapidly, and enrollment rates are today similar between boys and girls (Sinha, 2003). But even with women's schooling increasing from 1.0 years to 3.1 years between mothers age 50 to 55 and those age 25 to 30, this relatively large gain in women's schooling is associated with only a small overall reduction in fertility (-.14) or surviving fertility (-.09) according to these cross sectional estimates in Table 4 . The fertility and surviving fertility effects of the program are roughly ten times larger than those directly associated with women's increased education in this 25 year period.

The provision of the program services after 1977 appears to be associated with a substantial reduction in fertility after the program was introduced, but not before. This empirical regularity can be interpreted as a specification check. We found no evidence that the provision of the Maternal Care Program after 1987 is associated with any additional declines in fertility as measured by the child woman ratios at the village level, or at the level of individual women's fertility in the 1996 MHSS.

Consequences of the Family Planning Program on Women and their Children

Family planning has been subsidized as a social welfare policy and a means to slow population growth and facilitate economic development. This commitment to population programs was reevaluated after some 40 years in the 1994 Cairo International Conference on Population and Development. Our understanding is that this conference concluded family planning was insufficient and improved access to birth control should be only one facet of the package of reproductive health services for women, which would strengthen their reproductive rights, empowerment, lifetime opportunities and welfare. To our knowledge population program evaluation studies have been slow to quantify how helping women control their reproduction and improve their health status would lead to their improved well-being and that of their families.

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[19] The burden on parents of providing a dowry for daughters to marry may increase as the young woman grows older and becomes a less desirable match, even if she is thereby able to thereby obtain more schooling. Observers interpret the early age of marriage for women in Bangladesh as a constraint on women's rights and a barrier to female secondary education (IPPF, 2005; Population Reference Bureau, 2005; Field, 2004). Further investigation is required to understand the determinants of the age at marriage and first birth in order to understand why women continue to marry early, even though completed fertility appears to have declined by half in Matlab. Our analysis finds the MCHFP appears not to have delayed ages at first birth in the treatment compared with the control areas.

In the balance of this paper we estimate how women exposed to the Matlab MCHFP program reduced their fertility and also improved their adult health, productivity, individual involvement in economic activities, and collective participation in groups beyond the family. Did the program increase a variety of preventive health measures, and enhance the health and schooling of the woman's children.[20]

Women's Health, Productivity, Status, and Empowerment

The program-related changes in fertility and health of women are expected to improve their lifetime productivity, as would human capital, by allowing women to control more precisely the allocation of their time between childbearing and other activities over their lifetime. Table 5 reports the reduced-form regressions for the available indicators of the mother's health status. First, it may be noted that the health indicators are related to life cycle aging in the expected manner, declining with age for the subjective health assessment, weight, height, body mass index, and an index measuring absence of functional disabilities in performing activities of daily living (ADLs). A self reported health assessment may not be a reliable indicator of health status, but it tends to be somewhat higher for women age 35 to 40 in the treatment villages and generally positive; the restricted joint F is significant at the 5 percent level. The ADL normalized index is suggests fewer disabilities from age 50 to 55, when ADLs are thought to be more discriminating indicators of health among older persons. The association between the full set of treatment interaction variables and woman's weight is significant at the one percent level ($p < .0067$), but this is not primarily due to the association between ages 15 and 55 when the program's effect should be more evident. The height of a woman is presumably influenced by early childhood health and nutrition, and thus should be unrelated to the program treatment of women at later ages. But the body mass index, an indicator of health status affected by current nutrition and health conditions, is significantly associated with exposure to the program in the relevant age groups, especially between age 30 and 55 when it increases as much as one unit in the treatment villages among women age 40 to 45. There is a tendency for most of the more responsive adult indicators of health to be enhanced for mothers in the treatment villages. Unfortunately, we do not know how such improvements in maternal health status are likely to influence a woman's economic productivity or consumption.

The effect of the treatment program on woman's weight and BMI deserve emphasis. Stunting and wasting are a common occurrence in this population. Women on average weigh 41.4 kg and have an average body-mass-index of 18.7 kg/m^2 (Table 3A). In the comparison area, these estimates are lower. The reduced form estimates from Table 5, column 2 suggest that the MCHFP program helped women aged 40–45 increase their weight by 2.2 kg and add to their BMI by as much as 1.2 kg/m^2. According to the estimates of Fogel (2004), an increase in BMI in a sample where the average is as

[20] Comparisons of maternal mortality between the MCP treatment and control villages reveal a significant impact of the program on these relatively rare events. Maternal deaths related to obstetric causes declined in the treatment areas from 4.4 to 1.4 per thousand live births between the three-year period before and three years after the MCP program started in 1987, whereas the decline was insignificant from 3.9 to 3.8 in the control area (Fauveau et al., 1991). But the mechanisms underlying this reduction in maternal mortality are complicated, and studies suggest they are heavily affected (6/14 of the deaths reduced in the treatment area) are abortion related (Maine et al., 1996). Safer abortion or greater use of early pregnancy termination procedures may have reduced the need for unsafe abortions in treatment areas wjocj were likely to lead to maternal mortality.

low as 17.5 kg/m^2, is associated in the European context with a reduction of mortality risks by as much as one fifth.

Table 6 reports the reduced form estimates of the program's association with women's economic productivity and market activities. The woman's primary occupational income is not significantly associated with the program, but for better educated older women the treatment is associated with higher earnings and total incomes. For each year of schooling, women living in treatment villages, report a primary occupational income that is 482 taka higher than if they reside in a comparison village.[21]. The results in column 3 suggest that women in treatment villages are less likely to own their own cash savings, whereas column 4 suggests that women's savings may be more likely to be channeled into the purchase of productive assets in program villages. Contrary to what we expected, women's participation outside of the family in groups is decreased in all three designated activities for receiving a loan, for working as in coordinated handicrafts self employed businesses, and in investing savings. Bangladesh is known for the active role of microcredit institutions, such as the Grameen Bank, which have used joint liability group lending arrangements to provide poor women with credit to expand their self employed activities. Omitting the control for BRAC Bank activity in the village results in the anticipated partial effect of the family planning program being associated with more frequent group loan, savings and work participation by women

Table 7 reports the reduced-form regressions on whether households own assets. Total household savings is difficult to measure from the 1996 survey, because assets of the household are not comparably valued at two points in time. But of the several assets distinguished in the MHSS survey, only jewelry is significantly lower when fertility is lower due to the program, either when jewelry is reported in the household questionnaire or as an asset owned by the woman herself. We hypothesize that holding family wealth in the form of jewelry is a decision the parent make jointly with their number of children, because the practices of exchanging dowries when children marry are often accomplished by transfers of jewelry. Women in households in villages providing the family planning program are more likely to own farm land. The effect is the most pronounced for women between the ages of 35 to 45. The estimated coefficients suggest that as a result of the program, women in this group are .about 13–14% more likely to live in households that own some farmland. The joint-test of all the treatment interaction effects is significantly different from zero There is also evidence that households in the treatment villages report having access within the Bari compound to a tubewell for drinking water and a source of water for cleaning and bathing which should presumably reduce the time required of women to fetch water and be beneficial for family hygiene. In almost all age groups, we find that the treatment program is associated with a greater likelihood of having potable water for both drinking and cleaning. The effect is again particularly strong for the age-groups who have received maximum exposure to the MCHFP program. Women aged 45–50 in the

[21] In results not reported here, we explored further whether this income effect was concentrated in particular age-groups of women. To do this, we further interacted TrXYrsSch with three age dummies: AgeUnder25, Age25to40 and AgeOver40. We found that the effect was the strongest for women over the age of 40. More specifically, for each year of schooling, women over age 40 in treatment villages report a primary occupational income that is 982 taka higher than if they lived in comparison village Women traditionally specialize in certain forms of agricultural production, but the sale of eggs and milk do not appear to be the source of the increased income that better educated women in treatment villages report. Again, in results not reported here we found that women's income from selling eggs is larger, but income from selling milk is not significantly affected

treatment area appear to be 22% more likely to draw drinking water from a tube well on the bari, and 27% more likely to have a source of water for cleaning and washing on their bari. The time of women which is not required for childcare and provision of water can be reallocated to other family productive activities although we have not deciphered how to quantify the activities expanded by women due to the village level program.

Before considering the consequences of the program on children, it is useful to assess whether the program encourages greater use of standard preventive health inputs. The use of curative health care is more difficult to interpret, because these demands tend to be conditional on the individual being ill or in poor health, and the program is designed to minimize such illnesses. Maternal and child health initiatives were added to the MCHFP treatment villages after 1982, and some of these inputs could be promoted and often provided by the program field staff (Fauveau, 1994). Table 8 reports the reduced-form estimates for three indicators of the mothers use of such preventive health inputs and three indicators of child vaccinations. The dependent variable in column 1 is the fraction of the woman's pregnancies during which she obtained prenatal care from a health professional, column 2 reports the fraction of pregnancies she received an inoculation against tetanus, a common cause of infant and maternal mortality in the region, and column 3 is the number of prenatal visits she received per birth, averaged across all of her births. The final three columns report whether the last child the woman had in the last five years received three vaccinations for polio, measles, and DPT (diphtheria/pertussis/tetanus). All six forms of preventive health care are jointly significantly related to the MCHFP program treatment variables in the village. For example, women age 30 to 40 report a 75 percent greater probability of having some prenatal care for all of her pregnancies than the average for the survey, i.e. mean= .13 in Table 3A. Mothers age 35-40 who have a tetanus inoculation are 80 percent more common in the treatment villages than is the average in the survey, i.e. .17. In the case of childhood vaccinations, about two thirds of the recent births received these inoculations and 20 to 30 percent more report having these vaccination in the treatment than the comparison areas.[22] The coefficient for TrXYrsSch is generally negative, indicating that less educated women are more likely to increase their use of these preventive health care inputs when they are promoted by the program field staff in their village.

The estimated association with village infrastructure variables are also informative. Distance to the ICDDR,B sub-hospital has a negative effect on the use of all three maternal preventive health inputs,n suggesting that the time costs for the mother to obtain these health inputs are an important constraint on their use. Perhaps because child immunization campaigns are in later years promoted by the government in all villages, the distance to the clinic is not associated with any differential in child vaccination rates. Pucca or paved roads in the village are not associated with increased use of these preventive health inputs, and access to water transport by motor boats is associated with less frequent prenatal care, although more tetanus inoculations for mothers.

Investment in Children's Human Capital : Nutrition, Health, and Schooling

It has been widely hypothesized by social scientists that parents who have fewer children commit more of their time and resources to each of their children (e.g. Becker, 1960, 1981; Becker and Lewis

[22] The unconditional means for the treatment and comparison populations are also reported in Appendix Table 12.

1974; Zajonc, 1976; Blake, 1989). This inverse pattern between what is called the "quantity of children" and the "quality of children" might suggest that a population policy that helps parents avoid unwanted births would also contribute to the parents allocating more resources to the nutrition, health, and schooling of their children. But these potential inter-generational consequences of family planning and reproductive health programs have not been empirically estimated in a manner that avoids omitted variable bias (Schultz, 2005). In other words, parent preferences and unobserved constraints on their household that could affect both fertility and many of these other favorable family-coordinated choices and outcomes in opposite directions. Such omitted variables would then be the cause for any observed inverse relationship between quantity and quality of children, and the relationship would not represent the causal consequence one could anticipate from a family planning program that reduced birth rates. One reason society might decide to subsidize the diffusion and use of birth control is the belief that better timing of births and fewer births will allow women to invest more in themselves and in each of their children, and thereby increase the likelihood that the woman and her children will escape poverty and achieve more in their lifetimes. The MCHFP program in Matlab appears to have induced a decline in fertility which is reasonably assumed to be independent across villages of parent preferences and unobserved constraints on families, allowing us to estimate the cross effects of the program-induced decline in fertility on the welfare of children, as measured by their schooling, or nutrition and health.

The samples of children are separately considered for boys and girls, because there has historically been greater schooling among males than females, and health and nutrition differentials between the boys and girls might also exist and respond to different household conditions and program benefits. Rather than structure the analysis by child, we have decided to retain the woman as our observational unit in the regressions which follow, and we average the child human capital indicator across a woman's children, and then weight her observation by the number of children observed for a woman. The weighting scheme recognizes that the child human capital observation should be less variable and thus less subject to stochastic variability and measurement errors for women with more children in the sample over which her measure of child quality has been averaged.[23] Although our measurement of schooling by means of z scores, which should normalize years of schooling completed by age and sex levels and dispersion within the sample, there may still be some systematic variations in outcomes associated with the child's age. Consequently, we include the child's age in years (or average age if the mother has more than one child in the relevant age interval) as an additional control variable in the child regressions, and interact that age variable with the program treatment dummy, because program effects on the child's schooling could decrease among older children for she would have been exposed to the program for a shorter period of time at

[23] Estimates are also obtained without weighting the women differentially and by using the child as the unit of analysis as did Sinha (2005). In the case of relying on the child observations, it is then necessary to weight the observations down for women with more children in the sample in order to not overweight the outcomes for high fertility women. As one might expect with only about a quarter of the women with more than one child of one sex in a schooling sample, the alternative sampling and weighting methods yield similar estimates. However, weighting the analysis to focus on women as the unit of observation maintains a parallel sampling framework as the previously reported estimates based on the women and mothers.

his/her birth, and is thus able to reallocate cumulatively less family resources from having more children to more investments in the schooling of each of her children.

The dependent variable in the reduced forms in column 1 and 3 of Table 9 is the current enrollment rate for the woman's sons and daughters between the ages of 9 and 14, respectively. Columns 2 and 4 of Table 9 contain the reduced form regressions of the average years of schooling completed normalized for the mean and distribution of schooling attainments by age for boys and girls in the survey. The full set of program treatment variables are jointly significant for enrollment and Z scores for sons and not for daughters, and the positive program effects are largest individually for women who are age 25 to 50 and over 55, whereas for daughters the program effects on Z scores are between a third and a fourth the size as for sons, and consequently fail to be statistically significantly different from zero. The mother's and father's schooling is associated with their child having a higher Z score, but the enrollment rate is significantly related to the father's schooling and not the mother's schooling.

Among older children age 15 to 29 the Z scores for completed schooling are significantly associated with treatment for both males and females. The set of all treatment variables are jointly significant at the 5% level for both boys and girls, but the magnitude of the treatment effects is larger for sons than for daughters, and they are more statistically significant for sons. For example, women in the age-group of 35 to 40, the effects of the program are to increase schooling z-scores by about 0.6 for girls and about 0.9 for boys. However, it should be observed that parents report educational attainments among their older children more frequently for boys than for girls, i.e. samples of responses are 2159 vs.1259 . This may suggest some sample selection recall bias may be present in these reports of educational attainment for older children. In both age groups Muslims report more years of schooling than do the Hindus for their children in the comparison areas, but in the treatment areas this educational disadvantage of Hindu girls and boys is largely eliminated, controlling for the various reduced form variables in Table 9.[24]

Another result from Table 9 is that sons and daughters of unmarried female household-heads (in most cases, widows) have worse schooling outcomes compared to children living with both parents. This is true for both the 9–14 and 15–29 age groups, though the coefficients are significant only for sons between the ages of 9–14 and daughters between the ages of 15–29. Sons and daughters of married women who head their own households (in most cases, the wives of migrants), however, have schooling outcomes which are better than children living with both their parents. Both these findings are consistent with previous work (Joshi, 2004) which reports that these women differ from wives of male household-heads not only in their current socio-economic circumstances, but also in their circumstances prior to marriage. Widows have poorer (wealthier) natal homes, are less (more) likely to have paid dowries, and are more (less) likely to have lost a parent before marriage. These socioeconomic differences extend to children who reside in these households. Children belonging to

[24] Foster and Roy (1997) found evidence of the MCHFP effect increasing the schooling of some earlier born children, whereas Sinha (2005) analyzing enrollment rates in the MHSS found no significant program effect, although she considered a different sample, and her instrumental variable estimate for fertility did not allow for heterogeneous program effects by five year birth cohort of women, religion, or women's schooling within age groups.

households headed by married female-heads are less likely to work outside the home and have stronger educational attainment: they are more likely to have ever attended school, be currently enrolled in school and have completed two years of primary school. Children belonging to households headed by widows, however, are more likely to work outside the home and appear to have attained less schooling compared to children in male-headed households.

Heterogeneity in Individual Response to the Program and Program Design

The design of reproductive health programs might be improved if we understood more about the driving forces behind the demographic transition and how different groups responds to a program of family planning, child health preventive care, and maternal and reproductive health services, such as provided under the MCHFP. Competing conceptual frameworks advanced by demographers, economists and others for the fertility transition have not been subjected to widely accepted validating tests. Equally puzzling are the occasions when the decline in fertility after the onset of the transition peters out or even reverses its course for a time, as may be occurring now in Bangladesh. This pause is unexpected by demographers who view fertility as determined by a gradual diffusion of cultural ideas establishing new normative modes in acceptable reproductive behavior (National Academy of Sciences, 2000). Some economists think that a cause for the decline in fertility is the increasing educational attainment of women, which tends to raise the opportunity cost to couples of having additional children (Schultz, 1981). Reducing the gender gap in education is associated in most countries with more equal employment opportunities outside of the family for women relative to men. Although these trends are rarely reversed as a country develops, some economic models for fertility assume couples make choices among competing uses of their resources, and as the number of desired births declines, the biological space for the timing of births increases. Thus, fertility rates in the short run can become more volatile as the demographic transition progresses, if economic and social conditions deviate from what people had expected earlier. Nonetheless, in the case of Matlab, the estimated effects of women's schooling as reported in Table 4 would seem likely to account for only a fourth of a child reduction in fertility (i.e. 2 years more of women's schooling has been achieved in the last 25 years), whereas the actual fertility decline in the country as a whole has been about three children, from more than six to about three children (IPPF, 2005). Other changing conditions need to be explored to understand more fully the demographic transition occurring in this region.

In evaluating the family planning program's effect on fertility, the initial working assumption is that this effect is constant across groups in the population (Schultz, 1984). In this investigation we recognized in the specification of the reduced form equation that the program treatment effect will vary because the program would impact women at different periods in their reproductive lives. In addition the program is allowed to impact the family differently for women of different education levels, where education may have been an endowment of women which was had increasing specialization effects on her family roles in more recent birth cohorts. Since fertility may differ between the dominant majority religious and ethnic group in Bangladesh, Muslims, and the small minority, the Hindus, we allow the program treatment to differ for these two groups (Munshi and Myaux, 2002). We found some indication that Muslims tend to have somewhat larger surviving family sizes, but this is as much due to increased fertility as to decreased mortality among the Muslims than the Hindus. The heterogeneity in program response that we could estimate with regard to women's education and religion was of limited general importance in so far as it might be the basis

for targeting of the program to groups whose fertility was more responsive to program services (Schultz, 1992).

Because the analyzed preventive health inputs are used somewhat more often by less educated women, it is interesting to note that the program's effect is more beneficial for less educated women, and thus the program reduces the gap in the use of preventive care between mothers with more and less schooling, but does not significantly reduce the fraction of child deaths more among the less educated (Table 4 column 3). Nonetheless, living in a program treatment village is associated with women reporting about 5 percentage points fewer child deaths by age five when the average in the survey is 13.7 percent. The advantage enjoyed by Muslims in the comparison villages in terms of child survival, is offset in the treatment villages, presumably by the program outreach activities. Muslim women are less likely to receive a polio vaccination for their children in the comparison areas, but the program treatment eliminates this gap between these ethnic groups (Table 8, column 4).

Instrumental Variable Estimates of Program Welfare Effect Operating through Fertility

The reduced- form estimation methods employed in the previous sections make no assumptions about the actual mechanisms through which the treatment program affects the welfare of women and their children. There are several possible pathways through which the MCHFP program could have led to the improvements in well being that are documented in the previous section: avoiding ill timed and unwanted births, improving maternal health, and improving child health status. We explore one particular pathway of influence by making the restrictive assumption that the MCHFP program's effect on family well being in the treatment areas operates only through the reduction of women's number of children ever born alive. This is an unrealistic assumption because it neglects the other elements of the program which were given increasing emphasis in the later years of the program, say after 1986. We have been unable to identify as a separate channel of influence the maternal and child health programs initiatives begun in different communities in the later years of the program, while controlling for the overall exposure to the family planning program begun in 1977.

In Table 10 the full set of the first 12 variables interacted with residence in a program treatment village that are included in Table 4, column 1, reduced form equation for fertility are assumed to affect several of the long term family outcome variables only through their impact on fertility. Otherwise, the control variables in the second stage Instrumental Variable (IV) regressions remain the same as in the reduced form regressions. Column 1 of Table 10 presents the estimated coefficients on endogenous fertility from the IV regressions, identified as noted by the exclusion of the treatment interactions from the equations determining the family outcome variables. For the purpose of comparison, estimates of the OLS coefficient on fertility are presented in column 2, which would be unbiased if fertility were exogenous to the various family outcomes, or omitted variables representing family preferences and unobserved constraints had no effect on both fertility and family outcomes. In 6 out of 21 cases, the IV and OLS coefficients differ at the 5 percent confidence level, and the Durbin-Wu-Hausman specification test rejects the null hypothesis that fertility is exogenous, and consequently the OLS estimates are probably biased and IV estimates are preferred. The full F tests reported in tables 4 to 9 indicate that in many of the same family outcomes, the exclusion restriction has significant power to determine the IV estimates. These significant endogenous effects of fertility are implied for explaining the mother's weight, BMI, the Bari's own two sources of water,

and the son's years of schooling Z score at age 9 to 14. In 10 out of 22 cases the Sargan over-identification test rejects that the heterogeneity of the response to the treatment captured by the treatment interaction variables do not map into the same IV estimates of fertility's effect. This occurs specifically with in the case of four of the five household asset variables, which are rejected at the 5 percent level. Among those long term family outcomes for which fertility appears endogenous and passes the overidentification test, we are left with mother's weight, BMI, owning a tubewell in the Bari as a source of drinking water, and son's educational Z score.

The instrumental variable estimates imply that if the program affected child mortality only through its reduction of a woman's fertility, one fewer birth caused by the program treatment is associated with a 0.025 reduction in the proportion of children who died before the age of five. This is a relatively large decline of one fifth from the sample mean (Table 3A). The IV estimates indicate that one less child is associated with an increase in a woman's weight by 1.5 kg and BMI by 0.63 kg/m^2, both of which are typically associated with an improvement in her health status. Women's primary occupational income is 1023 taka larger per year, if she is expected to have reduced her fertility by one birth due to the program, which represents a doubling of this source of income in the sample. She is 3 percent more likely to be a member of an employment group in the community. The estimates also indicate that as a result of the treatment program, women are 8 percent more likely to reside in a household that draws drinking water from a well that is located within the bari, and 7 percent more likely to derive its water for cleaning utensils and bathing from a source located within the bari.

The intergenerational effects of the program operating through a fertility decline are statistically significant for the z scores for boys age 9 to 14, but not significant among girls in this age-group or older children at age 15 to 30. The effect of a program induced reduction of one child is associated with boys receiving .40 standard deviations more years of schooling.

Since the impact of the program in the first decade from 1977 to 1986 is likely to have been predominantly due to its provision of birth control services and supplies as part of the initial program design, future analysis plans to estimate the IV effects of fertility on family outcomes among women of different ages. We anticipate that the IV estimates of the impact of program induced declines in fertility among older women, who are age 40 to 55, will be primarily due to the program's effect on their fertility, whereas the program effect on the fertility of younger women is more likely to be due to the combined impacts of family planning services *and* maternal and child health initiatives introduced into the program in the later years (Fauveau, 1994). Alternatively, the program treatment may be disaggregated into distinct components , and it will prove possible to estimate how the various components of the program impacts on fertility, on women's health (e.g. BMI), and on the health of her children (e.g. survival), and perhaps evaluate how these three program outcomes operate individually and as a group on the key facets of family welfare.

Unresolved Issues for Further Investigation

In future work we propose to analyze in more detail the effects of migration on the estimates of the program on the treated. First, women may migrate over their reproductive lives and may not have lived since marriage in the village they are observed to reside in at the time of the 1996 survey. Married women may have their origin villages in the demographic surveillance areas (SSA) and they

may be distinguished as either having been exposed to the MCHFP program before they were married or not. If they moved into the SSA this should also be inferred from the migration module in the MHSS, and can be included in the program analysis of their years of exposure to the program treatment after some threshold age of menarche, or age 15.

The second effect of migration is to modify the unobserved characteristics of the resident populations sampled in the 1996 MHSS. The program could affect the probability of migration and thereby cause differential patterns of migration in the treatment and control areas. We will attempt to estimate the rates of in- and out-migration of populations of the treatment and comparison villages. In particular we will need to take account of the differential fertility and family outcomes for those migrating, and how their movement affects the program treatment effects estimated here.

The third effect of migration is the effect of the program on the migration of children, which may be as important as health and education as a form of lifetime human capital investment made by the youth of Matlab. It will be important to assess how the program has influenced out-migration of youth, and possibly affected who migrates into the Matlab district as well.

5. Conclusions

This paper examines how Matlab district of Bangladesh has evolved 19 years after an intensive family planning program was launched in 1977 to visit every two weeks women of childbearing age in one half of the district's villages, while recording births, deaths, and migration for the entire area**.** No evidence was found of fertility differences between the treatment and comparison areas in 1974 before the program started, but fertility by 1978 was falling more rapidly in the treatment than in the comparison areas, and fertility has remained lower since that date. Other indicators of economic development potential and individual endowments, such as education, which could possibly influence fertility and family welfare, were also not found to be strongly related to the assignment of villages between the program and the comparisons areas in 1974.

The program associated fertility declines in the 70 treatment villages are shown to be linked to women's health improvements, their economic activities outside of the household, and their household assets and Bari sources of water. The survey in 1996 found women who benefitted from the program in their village report greater weight and BMI and perhaps fewer limitations on their physical capacity to engage in activities of daily living. The households of women in the treatment villages are more likely to own land and ponds and the women to have their own productive assets and savings. The women in treatment villages engage in more group activities**,** including those which support their own occupational specialization, such as groups for getting a loan, coordinating handicraft production, and saving money. Perhaps because of the difficult of measuring the full range of women's work we were less successful in isolating the productive contributions of women which may have followed from the decline in fertility and improvements in household health and assets. The primary occupational incomes of better educated older women's is larger in treatment areas, but how the productivity may have changed for women without such monetized incomes cannot be assessed in the survey. It is our hypothesis that the family planning and health program has improved women's productive capacities, and a next step may be to analyze expenditures and home produced consumption as a more comprehensive measure of household income to which women may be expected to contribute more as their fertility declines and their health improves.

Finally, the inter-generational consequences of the family planning outreach program in Matlab are consistent with the quantity-quality hypothesis, which anticipates that parent will invest more in the human capital of each of their children when they are able to avoid unwanted births. Women who fortuitously reside in a village where contraceptives are delivered by MCHFP to their home without private cost, in a convenient and socially acceptable form, we observe fertility is reduced by about one child, and today the total fertility rate in the comparison set of villages is on the order of 3.5 children per woman. The years of schooling completed by boys age 9 to 14 increases significantly in the treatment areas , whereas the program effects for girls schooling are not statistically significant, and their magnitude is about a third as large in terms of z scores. Among older children age 15 to 30, the male schooling effects of the program continue to be statistically significant although somewhat smaller in terms of its impact on z scores than at the younger ages, whereas those for older females remain about half the size of the program induced gains for sons.

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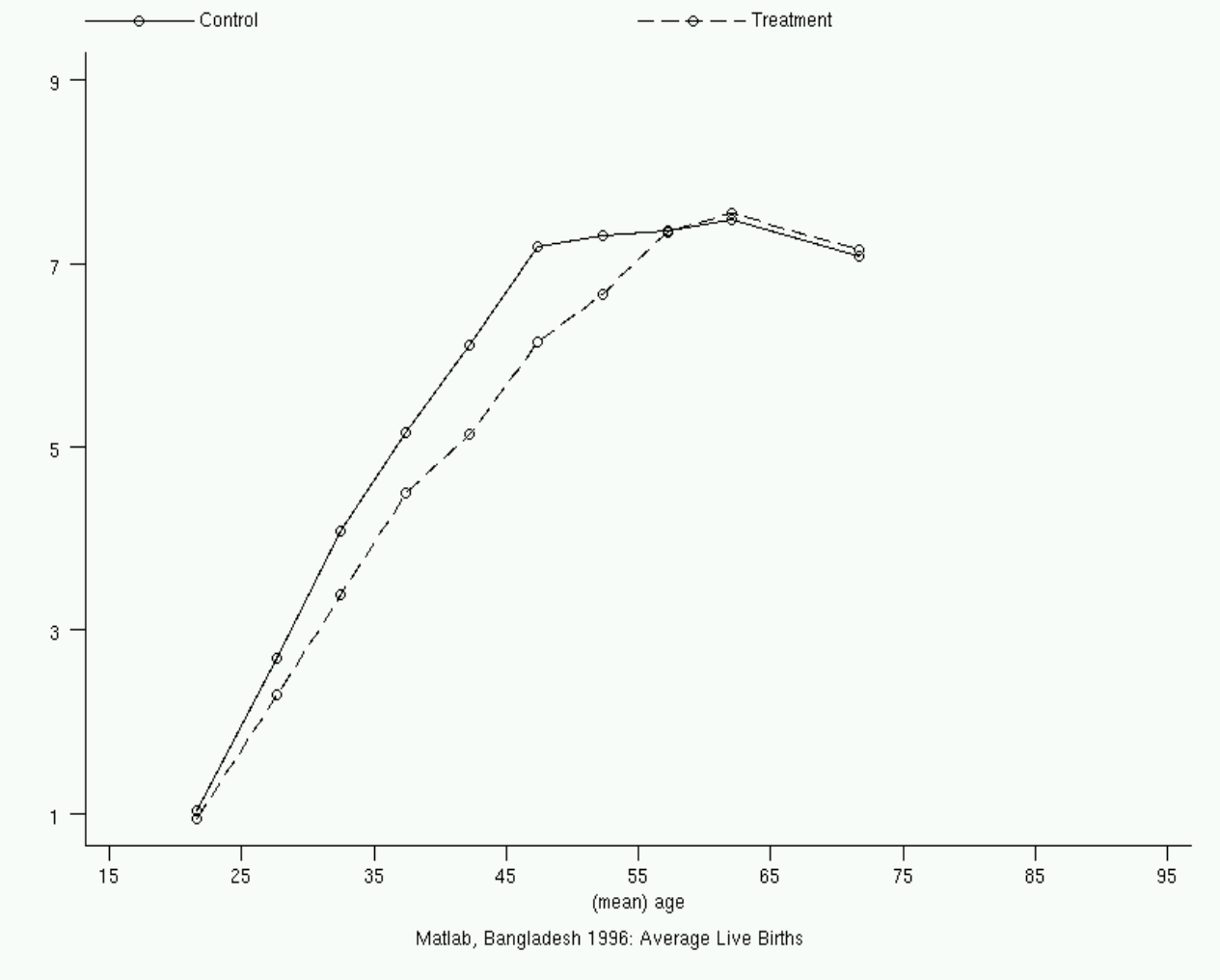

Figure 1: Number of Children Ever Born per Ever Married Woman by Five Year Age Groups in Matlab Health and Socioeconomic Survey 1996, by resident in Treatment and Control Villages

Dependent and Independent Variables	**1978 and 1974**	**1982 and 1974**	**1996 and 1974**
Children 0-4/Women aged 15-49			
Treatment Villages	0.0215	0.0215	0.0215
	(1.30)	(1.58)	(2.14)*
Treatment after programs	-0.0614	-0.143	-0.127
	(2.62)**	(7.777)**	(4.92)**
Final Year after program	0.154	-0.064	-0.314
	(9.09)**	(4.80)**	(16.90)**
Intercept	0.810	0.810	0.810
	(67.7)**	(82.2)**	(112.0)**
R-squared	0.294	0.541	0.760
Children 5-9/Women aged 15-49			
Treatment Villages	0.0103	0.0103	0.0103
	(0.84)	(0.93)	(0.96)
Treatment after programs	-0.0252	-0.0113	-0.142
	(1.46)	(0.76)	(5.19)**
Final Year after program	-0.136	-0.0125	-0.0004
	(10.9)**	(1.16)	(0.02)
Intercept	0.617	0.617	0.617
	(70.0)**	(77.4)**	(80.4)**
R-squared	0.520	0.025	0.168

Table 1: Regression results of child-woman ratios in 141 villages on program treatment, both before and after the program. Notes: (i) Regression estimates are weighted by the number of women aged 15-49 in each village population in the census or 1996 survey (in STATA8, this is the "aweight" option); (ii) The estimates are obtained from a GLS regression where the village mean child woman ratio is assumed to have a variance that is inversely proportional to the square of the denominator in the child woman ratio. (iii) The sample size for each of the two pooled cross sections is 282 (since there are 141 villages) (iv) Absolute values of the t-statistics are presented in parentheses below the weighted coefficients; ** indicates 1% significance level, * indicates a 5% significance levels.

Summary statistics for dependent variables and difference in mean values between treatment and control areas.

Variable	Obs	Weighted Mean Treatment=0	Std Error	Obs	Weighted Mean Treatment=1	Std Error	Difference
Panel (a): 1974 DATA							
Average years of schooling	30259	1.737	.018	37217	1.729	0.016	-.008 (0.35)
Individuals older than 15 report no schooling	77047	.546	.002	84472	.599	.002	.052 (21.31)**
Individuals aged 6 to 15 report no schooling	21689	.317	.003	23813	.342	0.003	.025 (5.74)**
Household had a tin roof and wall	76268	.164	.001	83757	.197	.001	.033 (17.01)**
Individual reported religion as muslim	77047	.881	.001	84472	.851	.001	-.030 (17.64)**
Panel (b): 1982 DATA							
Average years of schooling	10590	3.028	.032	10444	3.620	.0366	.592 (11.99)**
Individuals older than 15 report no schooling	10590	.385	.004	10444	.357	.004	-.026 (4.00)**
Individuals aged 6 to 15 report no schooling	3372	.256	.002	2842	.213	.001	-.043 (3.97)**
Household had a tin roof and wall	12847	.466	.004	12360	.465	.004	-.001 (0.19)
Individual reported religion as muslim	12847	.958	.001	12360	.881	.002	-0.077 (22.41)**

Table 2: Summary statistics for dependent variables and difference in mean values between treatment and control areas. Notes: (i) Though the 1974 census was carried out over 149 villages, we restrict our attention to the 141 villages that were in the 1996 MHSS. Regression estimates are weighted by the population of each village population in the census or 1996 survey (in STATA8, this is the *aweight* option) (ii) In the 1974 data, the average years of schooling excludes religious education because there was no information on the years of religious schooling; (iii) t-statistics of the differences between treatment and control areas are in parentheses; (iv) *** indicates 1% significance level, ** indicates a 5% significance level and * indicates a 10% significance level.

Table 3A: Summary of dependent variables.

Variable	Description	Obs	Mean	Std. Dev	Min	Max
TotalChildren	Total number of children ever born	5337	4.984	2.903	0	17
TotalAlive	Total number of children alive	5337	3.953	2.224	0	12
FracDied5	Fraction of children under the age of 5 who died	5082	.137	.183	0	1
AgeAtFirstBirth	Age at which a woman had first child	5033	23.101	4.813	11.25	50
SecondInterval	Yrs between first and second child	4556	3.261	2.097	1	19.5
ThirdInterval	Yrs between second and third child	4037	3.191	1.925	.75	28.167
CurrHealthy	Dummy variable indicating whether womans self-reported health status is "Healthy"	5329	.751	.432	0	1
Weight	Woman's weight (in kg)	4660	41.433	6.599	20	70
Height	Woman's height (in cm)	4660	148.864	6.016	109	175

Continued on next page

Table 3A: Summary of dependent variables.

Variable	Description	Obs	Mean	Std. Dev	Min	Max
BMI	Womans body-mass-index (kg/^{2})	4660	18.665	2.565	11.253	27.971
ADLEq0	Womans ADL Index is 0	5331	.624	.484	0	1
PregCheckUps	Prenatal care in the last pregnancy	5109	.128	.216	0	1.5
NumAnteNatalChecks	Number of ante-natal checks in last pregnancy	5109	.905	1.414	0	9
ATSInject	ATS vaccination in last pregnancy	5109	.168	.267	0	2
PolioVac	Polio vaccination for child born in past 5 yrs	1764	.766	.423	0	1
MeaslesVac	Measles vaccination for child born in 5 yrs	1764	.622	.485	0	1
DPTVac	DPT vaccine for child born in past 5 yrs	1765	.723	.447	0	1
PrimOccIncome	Income from womans primary occupation in 1995	5337	1035.01	8267.094	0	300200
TotalIncome	Womans total income in 1995	5337	1187.094	8705.183	0	300200
OwnProdAssets	Woman owns productive assets	5331	.152	.359	0	1
GroupLoan	Woman participates in a loan group	5331	.128	.334	0	1
GroupWork	Woman participates in an employment group	5331	.054	.227	0	1
HhdOwnFarmland	Woman's household owns farmland	5320	.669	.470	0	1
OwnJewelry	Woman's household owns jewelry	5331	.528	.499	0	1
HhdOwnPond	Woman's household owns a pond/orchard	5320	.564	.496	0	1
TinRoofWall	Womans household has a tin roof and wall	5337	.467	.498	0	1
DrWaterInBari	Households drinks water from a well on the bari	5337	.602	.489	0	1
ClWellWater	Households cleaning water from a well on the bari	5337	.203	.403	0	1
BCurrEnroll	Frac of boys aged 9–14 currently enrolled	1436	.912	.269	0	1
BoyEdZScore	Average education Z-score for boys aged 9–14	1426	-.019	.949	-1.833	3.465
GCurrEnroll	Frac of girls aged 9–14 currently enrolled	1368	.932	.242	0	1
GirlEdZScore	Average education Z-score for girls aged 9–14	1340	-.023	.973	-2.128	7.599
BoyEdZScore2	Average education Z-score for males aged 14–30	2216	-.132	.951	-1.673	2.851
GirlEdZScore2	Average education Z-score for femmales aged 14–30	1700	-.093	1.01	-2.041	2.428

Table 3A: Summary of dependent variables.

Table 3B: Summary of independent variables.

Variable	Description	Obs	Mean	Std. Dev	Min	Max
TrXAgeUnder25	(Woman resides in Treatment area) XAgeUnder25	5337	0.048	0.213	0	1
TrXAge25to30	(Woman resides in Treatment area) X Age25to30	5337	0.062	0.241	0	1
TrXAge30to35	(Woman resides in Treatment area) XAge30to35	5337	0.077	0.267	0	1
TrXAge35to40	(Woman resides in Treatment area) XAge35to40	5337	0.066	0.248	0	1
TrXAge40to45	(Woman resides in Treatment area) XAge40to45	5337	0.051	0.220	0	1
TrXAge45to50	(Woman resides in Treatment area) XAge45to50	5337	0.046	0.208	0	1

Continued on next page

Table 3B: Summary of independent variables.

Variable	Description	Obs	Mean	Std. Dev	Min	Max
TrXAge50to55	(Woman resides in Treatment area) XAge50to55	5337	0.047	0.211	0	1
TrXAge55to60	(Woman resides in Treatment area) XAge55to60	5337	0.037	0.189	0	1
TrXAge60to65	(Woman resides in Treatment area) XAge60to65	5337	0.029	0.167	0	1
TrXAge65Over	(Woman resides in Treatment area) XAge65Over	5337	0.041	0.198	0	1
TreatXYrsSch	(Woman resides in treatment area) X (Years of schooling)	5336	1.109	2.376	0	12
Muslim	Household head is muslim	5337	0.891	0.312	0	1
TrXMuslim	(Woman resides in treatment area) X Muslim	5337	0.420	0.494	0	1
Age25to30	The woman is aged to 25 to 30, i.e. 25$\leq$ Age<30	5337	0.124	0.329	0	1
Age30to35	The woman is aged to 30 to 35, i.e. 30$\leq$ Age<35	5337	0.148	0.355	0	1
Age35to40	The woman is aged to 35 to 40, i.e. 35$\leq$ Age<40	5337	0.128	0.334	0	1
Age40to45	The woman is aged to 40 to 45, i.e. 40$\leq$ Age<45	5337	0.098	0.297	0	1
Age45to50	The woman is aged to 45 to 50, i.e. 45$\leq$ Age<50	5337	0.090	0.286	0	1
Age50to55	The woman is aged to 50 to 55, i.e. 50$\leq$ Age<55	5337	0.094	0.292	0	1
Age55to60	The woman is aged to 55 to 60, i.e. 55$\leq$ Age<60	5337	0.072	0.259	0	1
Age60to65	The woman is aged to 60 to 65, i.e. 55$\leq$ Age<65	5337	0.062	0.242	0	1
Age65Over	The woman's is over 65 (Age$\geq$ 65)	5337	0.084	0.277	0	1
YrsSch	Years of schooling	5336	2.087	2.870	0	12
HusAge	Age of husband	5337	35.745	23.650	0	95
HusAgeSq	Age of husband squared	5337	18.369	16.363	0	90.25
HusYrsSch	Husband's years of education	5337	3.015	3.838	0	17
UnmarriedFH	Woman is unmarried and heads her own household	5337	0.071	0.256	0	1
MarriedFH	Woman is married and heads her own household	5337	0.051	0.220	0	1
HusAbsentNH	Husband absent, woman not household head	5337	0.117	0.321	0	1
HusAgeMissing	Husband's age is missing	5337	0.193	0.395	0	1
HusEdMissing	Husband's years of schooling is missing	5337	0.070	0.255	0	1
BoundXAgeXAgeUnd35	Boundary village X (Age<35)	5337	0.055	0.229	0	1
BoundXAge30to55	Boundary village X (35$\leq$ Age < 55)	5337	0.051	0.220	0	1
BoundXAgeOver55	Boundary village X (Age $\geq$ 55)	5337	0.032	0.176	0	1
BRACInVil	BRAC is present in the village	5308	0.565	0.496	0	1
AnyPuccaRd	Village has a pucca road	5308	0.184	0.388	0	1
SubHospDist	Distance from the hospital sub-center	5238	3.582	2.339	0.097	10.738
SecSchNearby	Secondary school in village or neighbouring village	5337	0.750	0.433	0	1
VillMotBoat	Village accessible by motor boat	5308	0.327	0.469	0	1

Table 3B: Summary of independent variables.

Table 4: Reduced form results for total fertility, number of children alive, below 5 mortality,

	TotalChildren	TotalAlive	FracDied5	AgeAtFirstBirth	SecondInterval	ThirdInterval
	(1)	(2)	(3)	(4)	(5)	(6)
TrXAgeUnder25	-.3685	-.2217	-.0432	.4021	.2201	.7913
	(.2315)	(.1976)	(.0322)	(.5726)	(.4095)	(.6506)
TrXAge25to30	-.5301	-.4225	-.0002	.3225	.2116	.8969
	(.2255)**	(.1944)**	(.0264)	(.5414)	(.3014)	(.2882)***
TrXAge30to35	-.8994	-.6223	-.0359	.2640	.0631	1.0742
	(.2373)***	(.2019)***	(.0242)	(.5661)	(.3088)	(.2614)***
TrXAge35to40	-.8487	-.4666	-.0514	.3692	-.2161	.7113
	(.2508)***	(.2123)**	(.0266)*	(.5749)	(.3038)	(.2645)***
TrXAge40to45	-1.1348	-.8687	-.0264	-.5723	-.0883	.3561
	(.2845)***	(.2407)***	(.0265)	(.5937)	(.3304)	(.2873)
TrXAge45to50	-1.3452	-.7015	-.0577	-.0072	-.1276	.6333
	(.2886)***	(.2442)***	(.0259)**	(.6106)	(.3341)	(.3011)**
TrXAge50to55	-.9279	-.2738	-.0589	.0722	-.1467	.8290
	(.2943)***	(.2450)	(.0258)**	(.5901)	(.3130)	(.3330)**
TrXAge55to60	-.1180	.1623	-.0360	.1486	-.3903	.7810
	(.3336)	(.2755)	(.0270)	(.6422)	(.3606)	(.3114)**
TrXAge60to65	-.2008	-.1953	-.0101	.3766	-.3178	.1374
	(.3652)	(.3133)	(.0299)	(.6894)	(.3372)	(.2979)
TrXAge65Over	-.1187	.2744	-.0564	-.8863	-.2086	.7379
	(.3285)	(.2870)	(.0283)**	(.6923)	(.3150)	(.3007)**
TreatXYrsSch	.0048	.0002	.0003	-.0413	.0143	.0149
	(.0173)	(.0151)	(.0019)	(.0447)	(.0248)	(.0244)
TrXMuslim	.2441	.1316	.0220	-.2495	.2022	-.4367
	(.2040)	(.1790)	(.0210)	(.4618)	(.2453)	(.2216)**
Muslim	.3464	.3412	-.0162	.1558	-.1352	.0128
	(.1854)*	(.1636)**	(.0191)	(.4094)	(.2178)	(.1634)
Age25to30	1.3591	1.2514	-.0285	.7337	.6321	.5611
	(.0937)***	(.0835)***	(.0215)	(.3015)**	(.2346)***	(.2536)**
Age30to35	2.7135	2.3007	.0087	.0441	.5814	.4662
	(.1044)***	(.0887)***	(.0216)	(.3124)	(.2372)**	(.2479)*
Age35to40	3.7512	3.0641	.0284	-1.0930	.5916	.5288
	(.1386)***	(.1169)***	(.0226)	(.3537)***	(.2452)**	(.2643)**
Age40to45	4.6650	3.8567	.0215	-1.5343	.5638	.7893
	(.1729)***	(.1479)***	(.0232)	(.3828)***	(.2673)**	(.2793)***
Age45to50	5.8938	4.4487	.0596	-2.9013	.4453	.5832
	(.1870)***	(.1602)***	(.0242)**	(.4621)***	(.2777)	(.2895)**
Age50to55	6.1550	4.5328	.0580	-3.4409	.4070	.5153
	(.2090)***	(.1704)***	(.0255)**	(.4678)***	(.2852)	(.2828)*
Age55to60	6.1970	4.4411	.0602	-3.9940	.6160	.3488
	(.2476)***	(.2039)***	(.0279)**	(.5298)***	(.3239)*	(.2941)
Age60to65	6.6412	4.9260	.0524	-4.0915	.4108	.6028
	(.2706)***	(.2321)***	(.0300)*	(.5752)***	(.3250)	(.3246)*

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	TotalChildren	TotalAlive	FracDied5	AgeAtFirstBirth	SecondInterval	ThirdInterval
	(1)	(2)	(3)	(4)	(5)	(6)
Age65Over	6.6755	4.5227	.0723	-3.5961	.3478	.5730
	(.2362)***	(.2055)***	(.0301)**	(.6092)***	(.3152)	(.3044)*
YrsSch	-.0652	-.0442	-.0034	.1262	-.0117	.0150
	(.0164)***	(.0137)***	(.0017)**	(.0406)***	(.0210)	(.0206)
HusAge	.0428	.0413	-.0006	-.0658	-.0081	-.0022
	(.0057)***	(.0048)***	(.0008)	(.0156)***	(.0090)	(.0094)
HusAgeSq	-.0438	-.0435	.0012	.0273	.0061	-.0035
	(.0087)***	(.0073)***	(.0010)	(.0202)	(.0107)	(.0101)
HusYrsSch	-.0065	.0193	-.0020	-.0014	.0052	-.0031
	(.0106)	(.0089)**	(.0009)**	(.0245)	(.0141)	(.0123)
UnmarriedFH	-.4340	-.5262	.0694	-1.8199	.4994	-.6490
	(.2342)*	(.2077)**	(.0370)*	(.8692)**	(.3284)	(.3738)*
MarriedFH	.0803	.2465	-.0150	-1.2283	-.0118	.1807
	(.1117)	(.0990)**	(.0123)	(.3267)***	(.1463)	(.1768)
HusAbsentNH	-1.0610	-1.0344	.0662	-2.1861	.6163	-.6847
	(.2230)***	(.2001)***	(.0382)*	(.8985)**	(.3521)*	(.3783)*
HusAgeMissing	.4759	.5863	-.0354	-.8233	-.7433	.3717
	(.2008)**	(.1832)***	(.0371)	(.7610)	(.3072)**	(.3828)
HusEdMissing	.0122	.1256	-.0165	-.4501	.1327	-.0060
	(.1033)	(.0877)	(.0103)	(.2575)*	(.1496)	(.1381)
BoundXAgeUnd35	-.1912	-.2013	.0164	-.2737	.0234	.0804
	(.0910)**	(.0746)***	(.0148)	(.2879)	(.1682)	(.1542)
BoundXAge35to55	-.2712	-.2034	.0029	-.0041	.2407	.1519
	(.1460)*	(.1211)*	(.0138)	(.3479)	(.1596)	(.1380)
BoundXAgeOv55	-.1151	-.3273	.0302	.4580	.1448	-.0453
	(.2351)	(.1853)*	(.0176)*	(.4418)	(.1902)	(.1512)
BRACInVil	-.1465	-.1167	-.0017	.2865	.0509	.0227
	(.0590)**	(.0498)**	(.0058)	(.1367)**	(.0705)	(.0684)
AnyPuccaRd	.1780	.1389	.0009	-.3002	-.0397	-.0131
	(.0787)**	(.0650)**	(.0072)	(.1837)	(.1005)	(.0891)
SubHospDist	-.0058	-.0066	.0007	-.0387	-.0279	.0113
	(.0210)	(.0175)	(.0021)	(.0510)	(.0227)	(.0215)
SecSchNearby	-.0405	.0178	-.0068	.1289	-.0527	-.0877
	(.0656)	(.0551)	(.0062)	(.1481)	(.0790)	(.0802)
VillMotBoat	.1296	.1079	.0058	.0754	-.0860	-.0770
	(.0630)**	(.0545)**	(.0065)	(.1510)	(.0770)	(.0709)
cons	.4595	.1157	.1378	26.9314	3.1667	2.6620
	(.2691)*	(.2242)	(.0325)***	(.6070)***	(.3828)***	(.3622)***
N	5208	5208	4961	4914	4446	3936
R-squared	.5735	.4878	.0752	.2504	.0148	.0282
F	291.8076	229.0507	10.9516	48.5062	2.0747	3.2737
TreatmentF1	6.0424	4.7114	1.5846	.9585	.9599	2.9337
p-value	.0000	.0000	.0890	.4868	.4854	.0005
TreatmentF2	7.9729	4.7848	1.9752	.9647	.6977	3.8007
p-value	1.53e-08	.00007	.0658	.4476	.6516	.0009

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	TotalChildren	TotalAlive	FracDied5	AgeAtFirstBirth	SecondInterval	ThirdInterval
	(1)	(2)	(3)	(4)	(5)	(6)
EducationF	11.9289	8.0922	3.4331	5.6725	.2160	.9457
p-value	7.00e-06	.0003	.0324	.0035	.8058	.3886
MuslimF	22.6590	19.6827	.5682	.1629	.3641	3.8519
p-value	1.76e-10	3.28e-09	.5666	.8497	.6949	.0214
BoundaryF	2.5357	3.9547	1.2255	.7077	.9146	.6005
p-value	.0551	.0080	.2988	.5473	.4330	.6147
VillageF	2.4111	2.1927	.5073	1.5665	.8558	.5144
p-value	.0343	.0524	.7710	.1661	.5101	.7656

Table 4: Reduced form results for total fertility, number of children alive, below 5 mortality, age at first birth and birth intervals. Notes: (i) The dependent variables are as follows: *TotalChildren* measures the total number of live births for each woman; *TotalAlive* measures the number of children that are still alive; *FracDied5* measures the fraction of a womans children below the age of 5 who died; *AgeAtFirstBirth* measures the age at which a woman had her first child; *SecondInterval* measures the years between the birth of the first and second child; *ThirdInterval* measures the years between the birth of the second and third child; (ii) Robust t-statistics in parentheses below regression coefficients; (iii) Robust standard errors used to calculate the t-statisics are clustered at the bari-level; (iv) * significant at 5%; ** significant at 1%; (v) *All Treatment F* tests the joint-significance of the variables *TrXAgeUnder25, TrXAge25to30, TrXAge30to35, TrXAge35to40, TrXAge40to45, TrXAge45to50, TrXAge50to55, TrXAge55to60, TrXAge60to65, TrXAge65Over, TrXSchXAge15to20, TrXSchXAge20to30, TrXSchXAge30to40, TrXSchXAgeOver40* and *TrXMuslim*; (vi) *Treatment F* tests the joint-significance of *TrXAgeUnder25, TrXAge25to30, TrXAge30to35, TrXAge35to40, TrXAge40to45*, and *TrXAge45to50*; (vii) *Education F* tests the jointsignificance of *TrXYrsSch* and *YrsSch*; (viii) *Muslim F* tests the joint-significance of the variables *TrXMuslim* and *Muslim*; *Boundary F* tests the joint-significance of *BoundXAgeUnd35, BoundXAge35to55*, and *BoundXAgeOv55*; (ix) *Village F* tests the joint significance of *BRACInVil, AnyPuccaRd, SubHospDist, SecSchNearby, and VillMotBoat*.

Table 5: Reduced form results for womens health.

	CurrHealthy	Weight	Height	BMI	ADLEq0
	(1)	(2)	(3)	(4)	(5)
TrXAgeUnder25	.0590	.0334	-.9172	.2795	-.0203
	(.0509)	(.8782)	(.9259)	(.3560)	(.0468)
TrXAge25to30	.0519	.7997	-1.1290	.6606	.0490
	(.0540)	(.8406)	(.8629)	(.3413)*	(.0479)
TrXAge30to35	.0329	1.4306	-.3111	.7563	.0306
	(.0551)	(.8125)*	(.8751)	(.3373)**	(.0486)
TrXAge35to40	.0963	1.5213	-1.1135	.9561	.0388
	(.0560)*	(.8751)*	(.8636)	(.3554)***	(.0519)
TrXAge40to45	.0329	2.1727	-.7518	1.1854	.0557
	(.0617)	(.9258)**	(.9277)	(.3789)***	(.0595)
TrXAge45to50	.0677	1.9921	-.1134	.9163	-.0104
	(.0623)	(.9605)**	(.9283)	(.3915)**	(.0619)
TrXAge50to55	.0402	1.4397	-.6415	.8184	.1336
	(.0626)	(.9070)	(.8912)	(.3841)**	(.0604)**
TrXAge55to60	.0324	1.2648	-.7530	.7832	.0748
	(.0696)	(1.0252)	(.9369)	(.4215)*	(.0632)
TrXAge60to65	.0318	1.4393	.3911	.5677	.0274
	(.0753)	(1.0511)	(1.0666)	(.4357)	(.0576)
TrXAge65Over	-.0212	1.0813	-1.4856	.8829	.0041
	(.0671)	(.9639)	(1.0218)	(.3969)**	(.0479)
TreatXYrsSch	-.0056	.1883	.1555	.0443	.00005
	(.0038)	(.0701)***	(.0641)**	(.0283)	(.0040)
TrXMuslim	-.0644	-.5008	.6729	-.4031	-.0758
	(.0451)	(.6943)	(.7286)	(.2877)	(.0409)*
Muslim	.0234	.4459	1.3184	-.1295	-.0153
	(.0398)	(.5750)	(.6588)**	(.2378)	(.0360)
Age25to30	-.0589	.1319	.4363	-.0503	-.0779
	(.0250)**	(.4691)	(.4841)	(.1809)	(.0225)***
Age30to35	-.0682	-.2405	-.4857	.0055	-.0946
	(.0252)***	(.4669)	(.5262)	(.1738)	(.0230)***
Age35to40	-.1118	.5082	.7204	.0612	-.1731
	(.0302)***	(.5320)	(.5487)	(.2118)	(.0298)***
Age40to45	-.1194	-.3939	-.6439	-.0147	-.2639
	(.0339)***	(.6057)	(.6120)	(.2321)	(.0359)***
Age45to50	-.1765	-1.1382	-1.7478	-.0803	-.3725
	(.0392)***	(.6606)*	(.6684)***	(.2573)	(.0407)***
Age50to55	-.2481	-2.6648	-2.1238	-.6818	-.6008
	(.0413)***	(.6602)***	(.7019)***	(.2607)***	(.0400)***
Age55to60	-.2848	-2.8960	-2.3648	-.7514	-.6589
	(.0487)***	(.7514)***	(.7460)***	(.2846)***	(.0447)***
Age60to65	-.3454	-4.0662	-3.6212	-.9684	-.8000
	(.0517)***	(.7715)***	(.8938)***	(.2928)***	(.0406)***

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	CurrHealthy	Weight	Height	BMI	ADLEq0
	(1)	(2)	(3)	(4)	(5)
Age65Over	-.4138	-4.4504	-3.4768	-1.2338	-.8663
	(.0493)***	(.7819)***	(.8541)***	(.2911)***	(.0363)***
YrsSch	.0043	.1623	.0736	.0518	-.0016
	(.0035)	(.0593)***	(.0576)	(.0238)**	(.0036)
HusAge	-.0014	.0150	.0309	.0006	-.0008
	(.0012)	(.0236)	(.0239)	(.0092)	(.0012)
HusAgeSq	.0012	-.0293	-.0357	-.0062	-.0002
	(.0017)	(.0284)	(.0288)	(.0112)	(.0015)
HusYrsSch	.0033	.2353	.0481	.0949	.0040
	(.0023)	(.0367)***	(.0327)	(.0150)***	(.0022)*
UnmarriedFH	-.0105	.9305	1.9230	-.0648	-.0390
	(.0555)	(.8271)	(.7938)**	(.3257)	(.0500)
MarriedFH	-.0250	.4432	.3606	.1201	-.0253
	(.0280)	(.4961)	(.4959)	(.1880)	(.0296)
HusAbsentNH	-.0467	.5010	1.3022	-.1209	-.0659
	(.0538)	(.8329)	(.8168)	(.3233)	(.0476)
HusAgeMissing	-.0358	-.9431	-.9796	-.1386	.0142
	(.0535)	(.8217)	(.7798)	(.3227)	(.0466)
HusEdMissing	.0254	.1229	-.0043	.0708	.0305
	(.0231)	(.3657)	(.3563)	(.1474)	(.0223)
BoundXAgeUnd35	-.0636	.1675	.4653	-.0232	-.0382
	(.0254)**	(.3923)	(.4095)	(.1511)	(.0243)
BoundXAge35to55	-.1251	-.5996	.1156	-.2822	-.0481
	(.0337)***	(.4433)	(.3983)	(.1812)	(.0325)
BoundXAgeOv55	-.0029	.4503	-.5594	.3497	.0380
	(.0448)	(.6175)	(.5720)	(.2485)	(.0343)
BRACInVil	-.0206	.2262	-.4456	.2078	-.0207
	(.0130)	(.2041)	(.1948)**	(.0798)***	(.0126)*
AnyPuccaRd	.0087	.7602	.7718	.1474	-.0031
	(.0174)	(.2897)***	(.2487)***	(.1180)	(.0162)
SubHospDist	-.0027	.1271	.1551	.0207	-.0091
	(.0046)	(.0728)*	(.0673)**	(.0290)	(.0046)**
SecSchNearby	.0261	-.0115	.3864	-.1091	-.0019
	(.0148)*	(.2191)	(.2139)*	(.0882)	(.0136)
VillMotBoat	-.0026	.3338	.3201	.0656	-.0574
	(.0140)	(.2233)	(.2118)	(.0872)	(.0131)***
cons	.9318	39.6200	146.8384	18.3438	1.0782
	(.0561)***	(.9505)***	(1.0021)***	(.3730)***	(.0513)***
N	5200.0000	4555.0000	4555.0000	4555.0000	5202.0000
R-squared	.1183	.1753	.1013	.1230	.3730
F	18.7057	23.4026	13.4573	13.9158	154.0689
TreatmentF1	.9194	2.2933	1.2350	2.2067	2.0214
p-value	.5263	.0067	.2523	.0094	.0192
TreatmentF2	.7718	2.2439	.8081	2.8184	1.1921
p-value	.5920	.0366	.5635	.0098	.3074

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	CurrHealthy	Weight	Height	BMI	ADLEq0
	(1)	(2)	(3)	(4)	(5)
EducationF	1.1864	16.9836	8.8840	7.9062	.1605
p-value	.3055	4.73e-08	.0001	.0004	.8517
MuslimF	1.9487	.3138	20.8767	5.0697	10.3939
p-value	.1427	.7307	1.02e-09	.0064	.00003
BoundaryF	6.1159	.9654	.8112	1.6602	2.1363
p-value	.0004	.4081	.4875	.1735	.0936
VillageF	1.1017	2.9049	5.5496	2.1369	5.2121
p-value	.3573	.0128	.00004	.0584	.00009

Table 5: Reduced form results for womens health. The dependent variables are as follows: *CurrHealthy* is a dummy variable that takes value 1 if the woman reports that she is currently healthy; *Weight* measures her weight in kilograms; *Height* measures her height in centimers; *BMI* is a measure of her body-mass index in kilograms per square meter; *ADLEq0* is a dependent variable that takes a value 1 if the individual's *ADLIndex* takes value 0. *ADLIndex* is an index that measures a womans ability to perform 5 activities of daily living: (a) walk for one mile; (b) carry a heavy load (like 10 seer of rice) for 20 meters; (c) draw a pail of water from a tube-well; (d) stand up from a sitting position without help; (e) use a ladder to climb to a storage place that is at least 5 feet in height. The responses to these questions were coded either as can perform the task easily (a value of 1), can do it with difficulty (a value of 2) and unable to perform the task (a value of 3). We combined the responses to the five ADL measures listed to create the following ADL index for person 'i: ADLIndex(i)= (Score(i) - (Minimum score))/(Maximum score - Minimum Score); Notes (ii)—(ix) of Table 4 apply.

Table 6: Reduced form regression results for womens income, household income

	PrimOccIncome	TotalIncome	OwnCashSavings	OwnProdAssets	GroupLoan	GroupWork	GroupSaving
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
TrXAgeUnder25	-1960.2300	-1564.8030	-.1438	.0729	-.0835	-.0652	-.1900
	(1299.7940)	(1319.5280)	(.0439)***	(.0391)*	(.0454)*	(.0303)**	(.0543)***
TrXAge25to30	-2892.1270	-2938.3380	-.0891	.0805	.0025	-.0112	-.0961
	(1313.5690)**	(1348.6690)**	(.0447)**	(.0384)**	(.0501)	(.0302)	(.0577)*
TrXAge30to35	-810.1006	-514.7009	-.0694	.0756	-.0054	-.0187	-.1240
	(854.7499)	(884.9147)	(.0446)	(.0414)*	(.0497)	(.0278)	(.0562)**
TrXAge35to40	-490.1973	-267.0740	-.0622	.0527	.0269	-.0110	-.0749
	(1045.5360)	(1165.8380)	(.0452)	(.0418)	(.0518)	(.0336)	(.0582)
TrXAge40to45	1128.4950	1262.4110	-.0746	.1048	-.0363	-.0387	-.1021
	(1256.6100)	(1274.7320)	(.0460)	(.0469)**	(.0519)	(.0329)	(.0577)*
TrXAge45to50	422.5906	573.5344	-.1361	.0582	-.0118	-.0566	-.1074
	(1081.4130)	(1100.4810)	(.0475)***	(.0448)	(.0517)	(.0317)*	(.0587)*
TrXAge50to55	-773.5425	-547.2290	-.0745	.0326	-.0029	-.0190	-.1210
	(780.8621)	(814.9037)	(.0443)*	(.0441)	(.0483)	(.0267)	(.0548)**
TrXAge55to60	-417.6135	-138.8617	-.0792	.0843	-.0241	-.0078	-.0723
	(768.1276)	(808.0812)	(.0477)*	(.0449)*	(.0476)	(.0282)	(.0566)
TrXAge60to65	-151.1087	98.7723	-.0976	.1208	-.0520	-.0586	-.1591
	(733.3828)	(770.7436)	(.0458)**	(.0506)**	(.0490)	(.0270)**	(.0537)***
TrXAge65Over	-424.7540	-85.7566	-.0717	.0611	-.0851	-.0491	-.1782
	(681.9682)	(727.6918)	(.0406)*	(.0358)*	(.0439)*	(.0244)**	(.0501)***
TreatXYrsSch	481.9276	473.0382	.0071	-.0092	.0002	-.0024	.0060
	(224.8319)**	(230.6768)**	(.0041)*	(.0038)**	(.0036)	(.0026)	(.0039)
TrXMuslim	-808.2531	-1233.0320	.0113	-.0273	.0139	.0040	.0819
	(720.4174)	(792.7930)	(.0349)	(.0279)	(.0420)	(.0249)	(.0478)*
Muslim	-263.9432	-78.4564	.0217	.0732	-.0390	-.0135	-.0974
	(539.7540)	(549.2482)	(.0314)	(.0215)***	(.0367)	(.0205)	(.0427)**
Age25to30	1586.9160	2060.0630	.0569	.0435	.0546	.0068	.0617
	(1330.1600)	(1381.3940)	(.0288)**	(.0247)*	(.0250)**	(.0209)	(.0288)**
Age30to35	1059.5250	1221.2400	.0773	.0937	.0840	-.0009	.0656
	(653.0816)	(657.2375)*	(.0287)***	(.0266)***	(.0257)***	(.0206)	(.0288)**
Age35to40	836.9904	1434.8310	.0404	.0812	.0591	.0064	.0645
	(767.1667)	(828.6276)*	(.0309)	(.0304)***	(.0282)**	(.0226)	(.0321)**
Age40to45	923.7310	1226.0250	.0185	.0808	.0597	.0049	.0185
	(921.0096)	(937.6895)	(.0322)	(.0352)**	(.0299)**	(.0232)	(.0322)

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	PrimOccIncome	TotalIncome	OwnCashSavings	OwnProdAssets	GroupLoan	GroupWork	GroupSaving
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Age45to50	548.8167	794.4846	.0600	.0533	.0233	.0003	.0164
	(905.9318)	(921.9127)	(.0349)*	(.0362)	(.0293)	(.0239)	(.0338)
Age50to55	726.7640	928.8102	-.0127	.0646	-.0064	-.0453	-.0212
	(977.1537)	(998.5305)	(.0337)	(.0366)*	(.0297)	(.0226)**	(.0347)
Age55to60	367.5872	491.5805	-.0028	-.0041	-.0044	-.0388	-.0298
	(924.2078)	(946.3248)	(.0366)	(.0383)	(.0290)	(.0221)*	(.0340)
Age60to65	-7.4808	130.6240	-.0256	-.0004	.0002	-.0152	-.0295
	(869.6416)	(893.6952)	(.0369)	(.0394)	(.0307)	(.0253)	(.0354)
Age65Over	-27.3406	102.9079	-.0586	-.0528	.0009	-.0307	-.0239
	(900.3703)	(925.5555)	(.0351)*	(.0358)	(.0304)	(.0238)	(.0345)
YrsSch	246.6904	283.8176	.0139	.0019	.0017	.0023	-.0013
	(126.8260)*	(131.5438)**	(.0034)***	(.0034)	(.0031)	(.0024)	(.0033)
HusAge	-24.1967	-22.9545	-.0015	.0023	.0038	.0014	.0019
	(67.6293)	(67.8178)	(.0013)	(.0011)**	(.0010)***	(.0007)*	(.0012)
HusAgeSq	20.5149	23.5292	.0017	-.0012	-.0042	-.0013	-.0023
	(62.6767)	(63.0001)	(.0014)	(.0014)	(.0012)***	(.0009)	(.0014)
HusYrsSch	-11.1215	-10.3527	-.0026	.0045	-.0032	-.0011	.0002
	(32.5392)	(34.3675)	(.0019)	(.0022)**	(.0018)*	(.0013)	(.0020)
UnmarriedFH	500.4516	617.0901	.0041	.0945	.0270	.0060	.0328
	(1085.2250)	(1097.9140)	(.0472)	(.0434)**	(.0397)	(.0304)	(.0495)
MarriedFH	223.2180	122.1350	-.0187	.0965	-.0141	-.0028	.0293
	(1088.7690)	(1090.7410)	(.0275)	(.0289)***	(.0252)	(.0187)	(.0302)
HusAbsentNH	186.5054	282.2911	-.0135	.0706	-.0055	.0050	.0096
	(1077.3210)	(1092.2250)	(.0476)	(.0418)*	(.0401)	(.0322)	(.0497)
HusAgeMissing	-394.1610	-343.1736	-.0101	.0117	.0204	.0063	-.0280
	(1385.9140)	(1392.7190)	(.0457)	(.0432)	(.0383)	(.0295)	(.0493)
HusEdMissing	-1081.1040	-812.3911	-.0445	.0409	.0113	.0174	.0276
	(312.6393)***	(408.9404)**	(.0190)**	(.0225)*	(.0209)	(.0154)	(.0220)
BoundXAgeUnd35	-1495.8380	-1243.7370	-.0646	-.0111	.0096	-.0117	-.0231
	(537.8804)***	(618.8988)**	(.0233)***	(.0231)	(.0243)	(.0174)	(.0258)
BoundXAge35to55	-1267.8910	-1241.3670	-.0242	.0170	.1072	.0427	.0496
	(327.1794)***	(373.4801)***	(.0229)	(.0256)	(.0292)***	(.0200)**	(.0281)*
BoundXAgeOv55	-731.2621	-820.5894	.0087	.0565	-.0002	-.0152	-.0333
	(264.2634)***	(272.4283)***	(.0280)	(.0290)*	(.0251)	(.0164)	(.0211)
BRACInVil	245.6812	242.6741	.0299	-.0033	.0728	.0229	.0564
	(211.7159)	(217.1100)	(.0093)***	(.0117)	(.0100)***	(.0064)***	(.0107)***
AnyPuccaRd	525.0855	573.1616	.0420	-.0161	.0243	.0039	.0159

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	PrimOccIncome	TotalIncome	OwnCashSavings	OwnProdAssets	GroupLoan	GroupWork	GroupSaving
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	(341.3130)	(362.0929)	(.0137)***	(.0145)	(.0154)	(.0102)	(.0158)
SubHospDist	-184.2924	-214.6583	-.0216	-.0031	-.0129	-.0134	-.0202
	(72.8358)**	(76.0319)***	(.0034)***	(.0038)	(.0035)***	(.0025)***	(.0038)***
SecSchNearby	136.1932	174.3505	-.0028	-.0255	.0260	.0291	.0074
	(195.9452)	(201.3719)	(.0108)	(.0131)*	(.0109)**	(.0067)***	(.0120)
VillMotBoat	603.8306	685.5574	.0440	.0228	-.0048	.0191	.0073
	(299.2589)**	(308.8471)**	(.0109)***	(.0120)*	(.0112)	(.0078)**	(.0116)
cons	1163.8290	784.8584	.1670	-.0507	.0535	.0662	.2352
	(1077.7090)	(1137.2000)	(.0479)***	(.0444)	(.0455)	(.0310)**	(.0566)***
N	5208.0000	5208.0000	5202.0000	5202.0000	5202.0000	5202.0000	5202.0000
F	.0493	.0491	.0608	.0305	.0788	.0416	.0683
R-squared	2.6137	2.6090	7.2654	5.8897	10.2551	4.9118	10.6538
TreatmentF1	1.4720	1.3531	2.3992	1.2830	2.5633	2.4687	3.5261
p-value	.1272	.1815	.0044	.2213	.0022	.0033	.00003
TreatmentF2	2.1640	1.9322	2.4340	1.1452	2.1371	1.4206	2.6476
p-value	.0436	.0721	.0238	.3333	.0463	.2027	.0146
EducationF	8.5633	9.2862	22.3510	3.5878	.2332	.5530	1.3193
p-value	.0002	.0001	2.38e-10	.0278	.7920	.5753	.2675
MuslimF	2.3549	2.4310	2.2188	8.7219	1.1863	.4068	2.8038
p-value	.0951	.0881	.1089	.0002	.3055	.6658	.0608
BoundaryF	5.1293	4.1103	3.0823	1.5294	4.5266	2.3052	2.4027
p-value	.0015	.0064	.0264	.2048	.0036	.0749	.0658
VillageF	2.0187	2.3869	15.4478	2.9916	22.3991	11.6722	14.3022
p-value	.0730	.0360	5.34e-15	.0107	4.73e-22	3.55e-11	7.75e-14

Table 6: Reduced form regression results for womens utilization average use of pre-natal care, ante-natal care, tetnus innoculations for all past births (maximum 9 past births), and polio, measles and DPT inoculations for a child born in the last 5 years. Notes: (i) The dependent variables are as follows: *PregCheckUp* measures the fraction of the womans births (maximum of 9), where the woman had a pre-natal check up; *ATSInject* measures the fraction of the womans births (maximum of 9), where the woman was vaccinated against tetanus; *NumAnteNatalChecks* measures the average of the number of ante-natal checks for each child born (maximum of 9); *PolioVac*, *MeaslesVac* and *DPTVac* are dummies that take a value of 1 if the last child born in the past 5 years was inoculated against Polio, Measles and tuberculosis respectively; Notes (ii)—(ix) of Table 4 apply.

Table 7: Reduced form regression results for household ownership of assets,

	OwnFarmland	OwnJewelry	OwnPond	TinRoofWall	DrWellWaterBari	ClWaterIn
	(1)	(2)	(3)	(4)	(5)	(6)
TrXAgeUnder25	.0239	-.2666	.0937	.0912	.1476	.2598
	(.0814)	(.0632)***	(.0908)	(.0794)	(.0872)*	(.0787)***
TrXAge25to30	.0693	-.2798	.0001	.0687	.1306	.2663
	(.0769)	(.0609)***	(.0859)	(.0771)	(.0828)	(.0749)***
TrXAge30to35	.0648	-.2580	.0051	.0166	.1719	.2573
	(.0771)	(.0588)***	(.0861)	(.0741)	(.0819)**	(.0741)***
TrXAge35to40	.1447	-.1993	.0546	.0521	.2240	.2709
	(.0782)*	(.0621)***	(.0859)	(.0772)	(.0835)***	(.0771)***
TrXAge40to45	.1394	-.2594	.0614	.1142	.1624	.3014
	(.0799)*	(.0647)***	(.0893)	(.0795)	(.0854)*	(.0775)***
TrXAge45to50	.0874	-.2144	.0280	-.0694	.2209	.2714
	(.0800)	(.0649)***	(.0899)	(.0801)	(.0860)**	(.0793)***
TrXAge50to55	.0345	-.2152	-.0413	.0134	.1625	.2924
	(.0792)	(.0619)***	(.0873)	(.0792)	(.0838)*	(.0758)***
TrXAge55to60	-.0036	-.2482	-.0437	-.0848	.1358	.2860
	(.0820)	(.0662)***	(.0930)	(.0825)	(.0879)	(.0817)***
TrXAge60to65	.0140	-.3440	-.0697	.0174	.1512	.1988
	(.0841)	(.0680)***	(.0959)	(.0858)	(.0906)*	(.0851)**
TrXAge65Over	.0437	-.2212	-.0940	.1041	.1487	.3554
	(.0809)	(.0579)***	(.0892)	(.0835)	(.0860)*	(.0796)***
TreatXYrsSch	-.0140	.0048	-.0179	-.0117	-.0111	-.0018
	(.0047)***	(.0046)	(.0051)***	(.0051)**	(.0049)**	(.0051)
TrXMuslim	-.0214	.0798	-.0635	.0060	-.0879	-.1819
	(.0683)	(.0469)*	(.0736)	(.0667)	(.0715)	(.0625)***
Muslim	.1863	-.0872	.1159	.0512	.1457	.1536
	(.0606)***	(.0398)**	(.0648)*	(.0589)	(.0631)**	(.0524)***
Age25to30	-.0565	-.0447	-.0106	.0067	.0284	.0235
	(.0381)	(.0340)	(.0396)	(.0370)	(.0400)	(.0400)
Age30to35	-.0326	-.1059	.0322	.0183	.0111	.0320
	(.0390)	(.0356)***	(.0407)	(.0371)	(.0405)	(.0411)
Age35to40	-.0447	-.1841	.0425	.0935	-.0177	.0343
	(.0432)	(.0400)***	(.0441)	(.0409)**	(.0443)	(.0447)
Age40to45	.0242	-.1554	.0693	.0591	.0210	.0313
	(.0445)	(.0453)***	(.0482)	(.0444)	(.0473)	(.0475)

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	HhdOwnFarmland	OwnJewelry	HhdOwnPond	TinRoofWall	DrWellWaterBari	ClWaterIn
	(1)	(2)	(3)	(4)	(5)	(6)
Age45to50	.0774	-.1969	.0984	.2155	.0368	.1000
	(.0464)*	(.0478)***	(.0492)**	(.0463)***	(.0502)	(.0493)**
Age50to55	.1265	-.1854	.1482	.2211	.0408	.0617
	(.0475)***	(.0476)***	(.0511)***	(.0489)***	(.0506)	(.0501)
Age55to60	.0961	-.1752	.1277	.2881	.0831	.0691
	(.0529)*	(.0537)***	(.0554)**	(.0552)***	(.0560)	(.0555)
Age60to65	.1769	-.0936	.1499	.3018	.1359	.1633
	(.0551)***	(.0566)*	(.0584)**	(.0567)***	(.0595)**	(.0589)***
Age65Over	.1549	-.2338	.1921	.2911	.1446	.1133
	(.0555)***	(.0505)***	(.0567)***	(.0561)***	(.0581)**	(.0586)*
YrsSch	.0277	.0162	.0247	.0395	.0338	.0255
	(.0041)***	(.0042)***	(.0045)***	(.0043)***	(.0043)***	(.0046)***
HusAge	-.0019	-.0001	-.0031	-.0034	.0003	-.00006
	(.0014)	(.0017)	(.0017)*	(.0017)**	(.0017)	(.0018)
HusAgeSq	.0045	.0015	.0052	.0038	.0010	.0014
	(.0018)***	(.0020)	(.0021)**	(.0021)*	(.0020)	(.0022)
HusYrsSch	.0178	.0169	.0164	.0217	.0136	.0128
	(.0024)***	(.0026)***	(.0028)***	(.0026)***	(.0026)***	(.0027)***
UnmarriedFH	-.1920	-.1616	-.1749	-.1630	-.0865	-.0627
	(.0587)***	(.0646)**	(.0644)***	(.0670)**	(.0625)	(.0649)
MarriedFH	-.0555	.0612	-.0926	.0174	.0530	.0630
	(.0341)	(.0374)	(.0392)**	(.0381)	(.0379)	(.0389)
HusAbsentNH	.0020	-.2489	-.0430	-.1277	-.0341	-.0535
	(.0581)	(.0651)***	(.0650)	(.0668)*	(.0634)	(.0653)
HusAgeMissing	.0591	-.1103	.0825	.0229	.1008	.1048
	(.0563)	(.0629)*	(.0620)	(.0648)	(.0597)*	(.0643)
HusEdMissing	.0016	.0149	-.0718	-.0197	-.0138	-.0417
	(.0272)	(.0290)	(.0292)**	(.0281)	(.0289)	(.0292)
BoundXAgeUnd35	.1585	-.1421	.0189	.0303	.0233	.0479
	(.0318)***	(.0327)***	(.0385)	(.0356)	(.0399)	(.0368)
BoundXAge35to55	.1048	-.1676	.0301	.0053	.0453	.0351
	(.0296)***	(.0352)***	(.0355)	(.0344)	(.0352)	(.0358)
BoundXAgeOv55	.0629	-.1026	-.0696	.0080	.0418	.0084
	(.0361)*	(.0359)***	(.0460)	(.0423)	(.0434)	(.0435)
BRACInVil	-.0682	-.0208	-.0221	.0026	-.0560	.0639
	(.0171)***	(.0155)	(.0192)	(.0185)	(.0199)***	(.0194)***
AnyPuccaRd	-.1150	-.0180	.0571	-.0690	-.0187	-.0009

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	HhdOwnFarmland	OwnJewelry	HhdOwnPond	TinRoofWall	DrWellWaterBari	ClWaterIn
	(1)	(2)	(3)	(4)	(5)	(6)
	(.0234)***	(.0198)	(.0243)**	(.0239)***	(.0263)	(.0259)
SubHospDist	-.0231	-.0193	-.0374	-.0078	-.0038	.0068
	(.0059)***	(.0054)***	(.0068)***	(.0065)	(.0070)	(.0066)
SecSchNearby	.0252	.0265	.0783	.0291	.0762	.0442
	(.0188)	(.0173)	(.0218)***	(.0202)	(.0222)***	(.0211)**
VillMotBoat	-.0349	-.0044	-.0342	.0106	-.0204	-.0260
	(.0184)*	(.0165)	(.0210)	(.0196)	(.0215)	(.0206)
cons	.4543	.8652	.4420	.2253	.2291	.0149
	(.0820)***	(.0674)***	(.0931)***	(.0821)***	(.0904)**	(.0815)
N	5193.0000	5202.0000	5193.0000	5208.0000	5208.0000	5207.0000
R-squared	.1291					
F	20.9131	71.7050	12.0380	18.7466	10.8586	9.5065
TreatmentF1	2.1761	4.6423	2.7818	2.0875	1.4738	2.1865
p-value	.0106	1.65e-07	.0009	.0149	.1264	.0102
TreatmentF2	1.5318	4.3936	.7290	2.2006	1.6496	2.8054
p-value	.1636	.0002	.6262	.0403	.1295	.0101
EducationF	24.0525	16.4552	15.3103	48.6495	36.4988	23.7448
p-value	4.47e-11	7.92e-08	2.45e-07	1.82e-21	2.33e-16	6.04e-11
MuslimF	17.2070	2.4221	2.7072	1.9086	3.9761	4.6635
p-value	3.77e-08	.0889	.0669	.1485	.0189	.0095
BoundaryF	9.9437	12.2414	1.8092	.2620	.6922	.8099
p-value	2.00e-06	5.95e-08	.1433	.8528	.5568	.4882
VillageF	11.8179	3.1197	11.6816	2.5411	3.7039	4.4117
p-value	2.53e-11	.0082	3.47e-11	.0265	.0024	.0005

Table 7: Reduced form regression results for household ownership of assets, housing quality and sources of drinking water. Notes: (i) The dependent variables are as follows: *OwnFarmland*, *OwnJewelry* and *OwnPond* measure whether the household in which a woman resides owns farmland, jewelry or a pond or orchard respectively; *TinRoofWall* is dummy variables that take a value 1 if the roof and wall of the main room of the house in which a woman resides are constructed of tin respectively, and 0 otherwise; *DrWellWaterBari* is a dummy variables that takes value 1 if the household in which a woman resides drink well water and the well is on the bari, and 0 otherwise; ClWaterInBari is a dummy variables that take value 1 if the source of water for cleaning is on the bari, and 0 otherwise; Notes (ii)—(viii) of Table 4 apply.

Table 8: Reduced form regression results for womens utilization averageuse of pre-natal care, ante-natal care, tetanus inoculations for all past births, and polio, measles and DPT

	PregCheckUps	ATSInject	NumAnteNatChecks	PolioVac	MeaslesVac	DPTVac
	(1)	(2)	(3)	(4)	(5)	(6)
TrXAgeUnder30	.0698	.0017	.7019	.2598	.3070	.3517
	(.0269)***	(.0328)	(.1482)***	(.0768)***	(.0885)***	(.0851)***
TrXAge30to35	.1088	.0646	.7507	.2602	.3296	.3391
	(.0267)***	(.0337)*	(.1556)***	(.0810)***	(.0933)***	(.0903)***
TrXAge35to40	.0865	.1344	.7971	.2434	.2468	.3190
	(.0251)***	(.0327)***	(.1717)***	(.0869)***	(.1016)**	(.0978)***
TrXAge40to45	.0259	.0422	.3241	.2460	.2843	.3188
	(.0227)	(.0343)	(.1588)**	(.1005)**	(.1189)**	(.1077)***
TrXAge45to50	-.0314	.0242	.0414	.2817	.3790	.3237
	(.0212)	(.0313)	(.1537)	(.1364)**	(.1452)***	(.1897)*
TrXAge50to55	-.0213	-.0051	.1300	-.7434	.5152	.3075
	(.0208)	(.0274)	(.1273)	(.1019)***	(.1207)***	(.1134)***
TrXAge55to60	-.0473	-.0318	-.0901			
	(.0209)**	(.0273)	(.1173)			
TrXAge60to65	-.0593	-.0586	-.2105			
	(.0205)***	(.0262)**	(.1381)			
TrXAge65Over	-.0584	-.0541	-.1524			
	(.0201)***	(.0261)**	(.1160)			
TreatXYrsSch	-.0063	-.0094	.0150	-.0221	-.0236	-.0276
	(.0022)***	(.0027)***	(.0148)	(.0062)***	(.0073)***	(.0067)***
TrXMuslim	.0395	.0281	-.0206	.1368	.0484	.0603
	(.0205)*	(.0254)	(.1140)	(.0716)*	(.0822)	(.0794)
Muslim	-.0459	-.0195	.0029	-.1067	-.0035	-.0271
	(.0179)**	(.0223)	(.0845)	(.0671)	(.0709)	(.0736)
Age25to30	-.0701	-.0153	-.1958	.0080	.0636	.0024
	(.0181)***	(.0194)	(.0970)**	(.0278)	(.0327)*	(.0298)
Age30to35	-.1437	-.0604	-.3999	.0085	.0523	.0097
	(.0216)***	(.0255)**	(.1104)***	(.0442)	(.0471)	(.0457)
Age35to40	-.2113	-.1654	-.6819	.0122	.1439	.0182
	(.0210)***	(.0257)***	(.1201)***	(.0567)	(.0601)**	(.0593)
Age40to45	-.2428	-.1858	-.8317	-.0211	.0674	-.0279
	(.0206)***	(.0276)***	(.1309)***	(.0727)	(.0781)	(.0740)
Age45to50	-.2382	-.2249	-.9749	-.0123	.1318	-.1490

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	PregCheckUps	NumAnteNatChecks	ATSInject	PolioVac	MeaslesVac	DPTVac
	(1)	(2)	(3)	(4)	(5)	(6)
	(.0212)***	(.0263)***	(.1456)***	(.1263)	(.1314)	(.1304)
Age50to55	-.2400	-.2438	-1.1280			
	(.0216)***	(.0255)***	(.1213)***			
Age55to60	-.2283	-.2331	-1.0987			
	(.0217)***	(.0258)***	(.1233)***			
Age60to65	-.2245	-.2236	-1.0098			
	(.0221)***	(.0264)***	(.1445)***			
Age65Over	-.2181	-.2165	-.9783			
	(.0222)***	(.0267)***	(.1308)***			
YrsSch	.0074	.0059	.0365	.0109	.0139	.0169
	(.0019)***	(.0025)**	(.0118)***	(.0062)*	(.0067)**	(.0064)***
HusAge	-.0010	-.0001	.0006	-.0010	.0002	-.0017
	(.0009)	(.0010)	(.0048)	(.0027)	(.0031)	(.0028)
HusAgeSq	-.0008	-.0021	-.0095	.0043	.0032	.0075
	(.0009)	(.0010)**	(.0049)*	(.0045)	(.0053)	(.0047)
HusYrsSch	-.0004	-.0009	.0059	.0102	.0095	.0079
	(.0010)	(.0014)	(.0072)	(.0034)***	(.0042)**	(.0036)**
UnmarriedFH	-.0843	-.1014	-.2932	.0542	.0692	.1313
	(.0299)***	(.0390)***	(.1817)	(.1173)	(.1432)	(.1226)
MarriedFH	-.0570	-.0359	-.0263	.0561	.0869	.0905
	(.0162)***	(.0220)	(.1078)	(.0370)	(.0489)*	(.0418)**
HusAbsentNH	-.0913	-.1076	-.3511	-.0516	-.0309	-.0546
	(.0300)***	(.0391)***	(.1829)*	(.1222)	(.1479)	(.1347)
HusAgeMissing	-.0210	-.0219	-.1589	.0575	.0636	.0377
	(.0310)	(.0415)	(.1845)	(.0765)	(.0976)	(.0888)
HusEdMissing	-.0204	.0063	-.0182	.0123	.0010	-.0052
	(.0118)*	(.0171)	(.0827)	(.0361)	(.0423)	(.0380)
BoundXAgeUnd35	-.0106	-.0339	-.2077	-.1298	-.1076	-.1354
	(.0194)	(.0236)	(.1014)**	(.0377)***	(.0394)***	(.0384)***
BoundXAge35to55	-.0022	-.0320	-.1156	-.1098	-.2297	-.1246
	(.0085)	(.0147)**	(.0783)	(.0701)	(.0720)***	(.0719)*
BoundXAgeOv55	-.0039	-.0122	-.0498			
	(.0048)	(.0069)*	(.0508)			
BRACInVil	-.0033	-.0113	-.0340	-.0370	-.0105	-.0324
	(.0054)	(.0072)	(.0371)	(.0201)*	(.0245)	(.0218)
AnyPuccaRd	.0051	.0040	.0438	.0246	.0218	.0261
	(.0077)	(.0099)	(.0508)	(.0260)	(.0308)	(.0273)

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	PregCheckUps	NumAnteNatChecks	ATSInject	PolioVac	MeaslesVac	DPTVac
	(1)	(2)	(3)	(4)	(5)	(6)
SubHospDist	-.0057	-.0095	-.0401	.0047	-.0131	.0017
	(.0017)***	(.0024)***	(.0122)***	(.0078)	(.0086)	(.0083)
SecSchNearby	-.0117	-.0028	-.0414	.0018	.0126	-.0065
	(.0061)*	(.0080)	(.0427)	(.0223)	(.0268)	(.0238)
VillMotBoat	-.0164	-.0132	.1018	.0354	.0392	.0238
	(.0055)***	(.0076)*	(.0406)**	(.0231)	(.0264)	(.0244)
cons	.4201	.4281	1.7256	.6187	.3522	.4991
	(.0330)***	(.0397)***	(.1666)***	(.0960)***	(.1082)***	(.1049)***
N	4988	4988	4988	1725	1725	1726
F	.3925	76.4495	83.5461	.0000	.0000	.0000
R-squared	74.4480					
TreatmentF1	25.6210	14.0205	19.7359	32.8797	8.2698	11.1775
p-value	.0000	.0000	.0000	.0000	.0000	.0000
TreatmentF2	21.4391	6.3308	10.0459	2.4038	2.9638	3.4655
p-value	.0000	.0000	.0000	.0350	.0114	.0041
EducationF	7.5587	6.1806	10.3024	7.6002	5.2044	8.6221
p-value	.0005	.0021	.00003	.0005	.0056	.0002
MuslimF	3.4719	.6322	.0264	1.9265	.5288	.6200
p-value	.0312	.5315	.9739	.1460	.5894	.5381
BoundaryF	.2817	2.3299	2.0866	6.7696	7.6199	7.1530
p-value	.8386	.0725	.0999	.0012	.0005	.0008
VillageF	5.5529	4.2045	3.4857	1.4501	1.0107	.7388
p-value	.00004	.0008	.0038	.2034	.4098	.5944

Table 8: Reduced form regression results for womens utilization average use of pre-natal care, ante-natal care, tetnus inoculations for all past births (maximum 9 past births), and polio, measles and DPT inoculations for a child born in the last 5 years. Notes: (i) The dependent variables are as follows: *PregCheckUp* measures the fraction of the womans births (maximum of 9), where the woman had a pre-natal check up; *ATSInject* measures the fraction of the womans births (maximum of 9), where the woman was vaccinated against tetnus; *NumAnteNatalChecks* measures the average of the number of ante-natal checks for each child born (maximum of 9); *PolioVac*, *MeaslesVac* and *DPTVac* are dummies that take a value of 1 if the last child born in the past 5 years was inoculated against Polio, Measles and tuberculosis respectively; Notes (ii)—(ix) of Table 4 apply.

Table 9: Reduced form regression results for education of individuals aged 9–14 and 14–30.

	Boys aged 9–14		Girls aged 9–14			Males aged 14–30	Girls aged 14–30
	BCurrEnroll	BoyEdZScore	GCurrEnroll	GirlEdZScore		MaleEdZScore	FemaleEdZScore
	(1)	(2)	(3)	(4)		(5)	(6)
ChAvAge	-.0039	.0290	-.0029	-.0244	ChAvAge	-.0046	.0044
	(.0080)	(.0216)	(.0048)	(.0208)		(.0097)	(.0110)
TrXChAvAge	-.0222	-.0539	.0004	.0043	TrXChAvAge	-.0131	.0069
	(.0109)**	(.0318)*	(.0085)	(.0312)		(.0133)	(.0158)
TrXAgeUnder30	.2715	.7346	.0788	.5654	TrXAgeUnder35	.8839	.2654
	(.1440)*	(.4240)*	(.1370)	(.4247)		(.2930)***	(.5497)
TrXAge30to35	.2950	1.1922	.0965	.2058	TrXAge35to40	.8899	.6168
	(.1482)**	(.4239)***	(.1316)	(.4106)		(.2835)***	(.3509)*
TrXAge35to40	.3049	1.1488	.0644	.3196	TrXAge40to45	.7906	.3949
	(.1496)**	(.4344)***	(.1356)	(.4299)		(.3107)**	(.3729)
TrXAge40to45	.3210	1.3787	.0241	.3044	TrXAge45to50	.7435	.2999
	(.1513)**	(.4349)***	(.1367)	(.4353)		(.3284)**	(.3957)
TrXAge45to50	.3491	1.4892	.0356	.3749	TrXAge50to55	.7257	.1783
	(.1554)**	(.4544)***	(.1439)	(.4415)		(.3414)**	(.4097)
TrXAge50to55	.2370	1.0272	-.0596	.2546	TrXAge55to60	.6554	.2721
	(.1731)	(.4710)**	(.1522)	(.4665)		(.3606)*	(.4473)
TrXAgeOver55	.6107	1.2880	-.0647	-.4081	TrXAgeOver60	.9262	.1609
	(.2369)***	(.6200)**	(.1809)	(.6184)		(.3809)**	(.4861)
TreatXYrsSch	-1.00e-05	.0093	.0067	.0194	TreatXYrsSch	-.0183	.0089
	(.0041)	(.0169)	(.0038)*	(.0174)		(.0140)	(.0188)
TrXMuslim	-.0835	-.3816	-.0995	-.3161	TrXMuslim	-.5304	-.5598
	(.0768)	(.2103)*	(.0881)	(.2105)		(.1370)***	(.1769)***
Muslim	.1177	.1456	.2159	.4327	Muslim	.5156	.6698
	(.0694)*	(.1817)	(.0788)***	(.1808)**		(.1143)***	(.1389)***
Age25to30	.2564	.5890	-.1184	-.8005	AgeUnder35	-.0568	-.1544
	(.1637)	(.3517)*	(.0587)**	(.3398)**		(.1354)	(.3676)
Age30to35	.2742	.4817	-.1201	-.7356	Age40to45	-.0939	.0060
	(.1606)*	(.3315)	(.0545)**	(.3237)**		(.0897)	(.1292)
Age35to40	.2167	.3106	-.1035	-.8063	Age45to50	.0017	.1216
	(.1598)	(.3246)	(.0511)**	(.3172)**		(.0976)	(.1389)
Age40to45	.2035	.2077	-.0827	-.9460	Age50to55	.0302	.2178
	(.1594)	(.3209)	(.0462)*	(.3160)***		(.1094)	(.1512)
Age45to50	.2484	.2813	-.0868	-.8159	Age55to60	.1279	.1872

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	(.1588)	(.3167)	(.0500)*	(.3163)***		(.1387)	(.1967)
Age50to55	.2529	.4810	-.0686	-.7524	AgeOver60	.2472	.3954
	(.1602)	(.3282)	(.0414)*	(.3251)**		(.1439)*	(.2099)*
YrsSch	.0035	.0835	.0013	.0934	YrsSch	.0994	.0992
	(.0037)	(.0150)***	(.0026)	(.0146)***		(.0131)***	(.0172)***
HusAge	-.0004	-.0167	-.0003	-.0159	HusAge	-.0040	-.0135
	(.0016)	(.0075)**	(.0013)	(.0070)**		(.0070)	(.0093)
HusAgeSq	.0008	.0231	.0002	.0186	HusAgeSq	.0046	.0119
	(.0026)	(.0102)**	(.0021)	(.0091)**		(.0075)	(.0101)
HusYrsSch	.0113	.0588	.0070	.0539	HusYrsSch	.0682	.0843
	(.0022)***	(.0082)***	(.0016)***	(.0080)***		(.0071)***	(.0090)***
UnmarriedFH	-.1892	-.7771	-.0438	-.3873	UnmarriedFH	-.1740	-.8215
	(.0815)**	(.2951)***	(.0849)	(.2729)		(.2573)	(.3096)***
MarriedFH	.0309	.0752	.0229	.1914	MarriedFH	.3175	.1119
	(.0240)	(.1397)	(.0167)	(.1155)*		(.1172)***	(.1626)
HusAbsentNH	-.1129	-.2917	-.4073	-.9211	HusAbsentNH	-.4594	-.9681
	(.0990)	(.3835)	(.1695)**	(.4145)**		(.2616)*	(.3183)***
HusAgeMissing	.1183	.4078	-.0529	.0858	HusAgeMissing	.1003	.4465
	(.0595)**	(.2729)	(.0735)	(.2598)		(.2753)	(.2979)
HusEdMissing	.0459	.0790	.0187	.0738	HusEdMissing	.0775	-.0574
	(.0279)*	(.0942)	(.0237)	(.0916)		(.0980)	(.1369)
BoundXAgeUnd35	.0011	-.0486	.0453	.0804	BoundXAgeUnd35	.5709	.4791
	(.0323)	(.1095)	(.0266)*	(.1196)		(.2635)**	(.3434)
BoundXAge35to55	-.0419	.0275	.0041	-.0353	BoundXAge35to55	-.0964	.0053
	(.0358)	(.1008)	(.0243)	(.0788)		(.0692)	(.0868)
BoundXAgeOv55	-.6533	-1.2696	.0449	.0125	BoundXAgeOv55	-.0043	-.0089
	(.1579)***	(.3261)***	(.0989)	(.4106)		(.1180)	(.1889)
BRACInVil	.0104	.1256	.0333	.1039	BRACInVil	-.0384	.0271
	(.0149)	(.0491)**	(.0149)**	(.0498)**		(.0404)	(.0549)
AnyPuccaRd	-.0239	-.1380	-.0098	-.0608	AnyPuccaRd	.0429	.0790
	(.0202)	(.0677)**	(.0162)	(.0675)		(.0528)	(.0751)
SubHospDist	-.0038	.0255	.0026	-.0006	SubHospDist	-.0122	-.0051
	(.0055)	(.0186)	(.0051)	(.0159)		(.0140)	(.0188)
SecSchNearby	.0201	.1112	.0260	.1389	SecSchNearby	.0946	.0646
	(.0177)	(.0550)**	(.0193)	(.0562)**		(.0442)**	(.0628)
VillMotBoat	-.0392	-.0202	-.0218	-.0782	VillMotBoat	.0179	.0284
	(.0171)**	(.0544)	(.0162)	(.0531)		(.0434)	(.0565)
cons	.5867	-1.3677	.8187	.3700	cons	-.8551	-1.1244

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	(.2069)***	(.4747)***	(.1147)***	(.4751)	(.2821)***	(.3534)***	
N	1371	1371	1295	1295	N	2159	1259
R-squared	.0954				R-squared	.2686	
F	.0000	.0000	2.7532	16.6856	F	31.4702	21.9730
TreatmentF1	1.1806	2.8769	1.8207	1.1350	TreatmentF1	2.7546	2.0444
p-value	.2995	.0015	.0529	.3321	p-value	.0050	.0386
TreatmentF2	1.1505	3.6085	.8391	.8830	TreatmentF2	3.5719	1.5284
p-value	.3317	.0030	.5219	.4917	p-value	.0066	.1916
EducationF	.7568	27.2375	4.4484	45.4324	EducationF	35.9562	32.2922
p-value	.4694	2.69e-12	.0119	1.03e-19	p-value	4.95e-16	2.35e-14
MuslimF	2.0006	2.7096	8.0078	3.4251	MuslimF	10.2138	11.9922
p-value	.1357	.0670	.0004	.0329	p-value	.00004	7.00e-06
BoundaryF	6.0763	5.1738	1.0451	.2458	BoundaryF	2.2054	.6517
p-value	.0004	.0015	.3717	.8644	p-value	.0856	.5820
VillageF	1.5385	2.9003	2.1080	2.8584	VillageF	1.3876	.8389
p-value	.1749	.0131	.0621	.0143	p-value	.2259	.5220

Table 9: Reduced form regression results for education of individuals aged 9–14 and 14–30. Note: (i) Regression estimates are weighted by the number of girls and boys per woman that are in each age category. (ii) *BoyEdZScore* and *GirlEdZScore* are defined as the difference between the observed years of schooling of a boy or girl and the average educational attainment of other individuals in his/her age, divided by the std deviation of the years of schooling of the reference group; Notes (ii)—(ix) of Table 4 apply.

Table 10: A comparison of IV and OLS coefficients of the endogenous regressor *TotalChildren*

	IV Estimates Coefficient (std. err.)	OLS Estimates Coefficient (std. err.)	Hansen OverId Test Chi-sq stat p-value	DWH Test Chi-sq stat (p-value)
FracDied5	.025 (.011)*	.021 (.001)**	17.783 (0.080)**	0.133 (0.716)
Weight	-1.532 (.440)**	-.049 (.047)	13.932 (.237)	14.121 (.0001)**
Height	-.179 (.378)	.014 (.047)	14.057 (.230)	0.267 (.605)
BMI	-.631 (.181)**	-.024 (.020)	11.754 (.382)	14.724 (.0001)**
HhdOwnFarmland	-.037 (.028)	.006 (.003)	28.218 (.003)**	2.447 (.118)
HhdOwnPond	.012 (.030)	.008 (.003)*	33.453 (.0004)**	0.01333 (.908)
OwnJewelry	.038 (.029)	.002 (.003)	30.207 (.001)**	1.641 (.200)
DrWellWaterBari	-.079 (.032)*	.004 (.003)	10.305 (0.503)	7.959 (.004)**
ClWaterInBari	-.068 (.031)	.005 (.003)	19.906 (.047)*	5.98656 (.014)*
PrimOccIncome	-1023.38 (371.29)**	-198.4159 (48.236)**	15.010 (0.182)	2.62459 (0.105)
TotalIncome	-816.022 (374.544)**	-186.571 (49.208)**	14.646 (0.199)	1.379 (.240)
OwnCashSavings	.031 (.020)	-.0005 (.001)	21.540 (.028)*	2.503 (.113)
OwnProdAssets	-.011 (.022)	.005 (.002)*	12.969 (.295)	0.523 (.469)
GroupLoan	-.005 (.021)	-.0004 (.002)	27.569 (.003)**	0.05486 (.814)
GroupWork	.027 (.015)	-.0004 (.002)	26.210 (.006)**	0.055 (.814)
GroupSavings	.007 (.022)	.0001 (.002)	36.266 (.000)**	0.117 (.731)
BCurrEnroll	.018 (.027)	-.004 (.004)	17.735 (.059)	0.701 (.402)
BoyEdZScore	-.394 (.103)***	-.069 (.014)**	8.395 (.494)	.26810 (.605)
GCurrEnroll	.024 (.041)	-.004 (.003)	16.179 (.040)*	-.004 (.003)**
GirlEdZScore	-.143 (.110)	-.063 (.013)**	11.615 (.235)	0.671 (.413)
BoyEdZScore2	-.016 (.131)	-.014 (.017)	8.661 (.372)	0.0001 (.994)

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GirlEdZScore2	-.091	-.031	11.736	0.0001
	(.156)	(.020)	(.281)	(.992)

Table 10: Estimates from OLS and IV regressions. Notes: (i) Instruments (in the IV regression) and controls (in the OLS regression) include *ChAvAge*, *Muslim*, *AgeUnder35*, *Age35to40*, *Age40to45*, *Age45to50*, *Age50to55*, *Age55to60*, *AgeOver60*, *YrsSch*, *HusAge*, *HusAgeSq*, *HusYrsSch*, *UnmarriedFH*, *MarriedFH*, *HusAbsentNH*, *HusAgeMissing*, *HusEdMissing*, *BRACInVil*, *AnyPuccaRd*, *SubHospDist*, *SecSchNearby*, *VillMotBoat*, *TrXChAvAge*, *TrXAgeUnder35*, *TrXAge35to40* , *TrXAge40to45*, *TrXAge45to50*, *TrXAge50to55*, *TrXAge55to60*, *TrXAgeOver60*, *TreatXYrsSch*, *TrXMuslim*; (ii) * significant at 5%; ** significant at 1%; (iii) The DWH (Durbin-Wu-Hausman) tests the null hypothesis that the regressor "TotalChildren" is exogenous; (iv) Hansen's J statistic is an overidentification test of all instruments: A rejection indicates that the model is overidentified; (v) Standard errors are clustered at the bari-level (for all but the DWH test).

APPENDIX

Table 11: Summary of independent variables.

Variable	Obs	Mean	Std. Dev	Min	Max
Treatment=0					
Muslim	2655	0.947	0.224	0	1
Age25to30	2655	0.124	0.330	0	1
Age30to35	2655	0.142	0.349	0	1
Age35to40	2655	0.125	0.331	0	1
Age40to45	2655	0.094	0.292	0	1
Age45to50	2655	0.090	0.286	0	1
Age50to55	2655	0.096	0.294	0	1
Age55to60	2655	0.071	0.257	0	1
Age60to65	2655	0.068	0.251	0	1
Age65Over	2655	0.087	0.282	0	1
YrsSch	2655	1.966	2.762	0	12
HusAge	2655	35.560	23.732	0	90
HusAgeSq	2655	18.275	16.443	0	81
HusYrsSch	2655	2.822	3.700	0	17
UnmarriedFH	2655	0.072	0.259	0	1
MarriedFH	2655	0.046	0.209	0	1
HusAbsentNH	2655	0.121	0.326	0	1
HusAgeMissing	2655	0.195	0.397	0	1
HusEdMissing	2655	0.075	0.264	0	1
BoundXAgeUnd35	2655	0.092	0.288	0	1
BoundXAge35to55	2655	0.077	0.267	0	1
BoundXAgeOver55	2655	0.050	0.219	0	1
BRACInVil	2626	0.508	0.500	0	1
AnyPuccaRd	2626	0.131	0.337	0	1
SubHospDist	2556	5.444	1.935	1.453	10.738
SecSchNearby	2655	0.767	0.423	0	1

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Table 11: Summary of independent variables.

Variable	Obs	Mean	Std. Dev	Min	Max
VillMotBoat	2626	0.422	0.494	0	1
Treatment=1					
TrXAgeUnder25	2682	0.095	0.293	0	1
TrXAge25to30	2682	0.123	0.329	0	1
TrXAge30to35	2682	0.154	0.361	0	1
TrXAge35to40	2682	0.131	0.337	0	1
TrXAge40to45	2682	0.101	0.302	0	1
TrXAge45to50	2682	0.091	0.287	0	1
TrXAge50to55	2682	0.093	0.291	0	1
TrXAge55to60	2682	0.074	0.262	0	1
TrXAge60to65	2682	0.057	0.232	0	1
TrXAge65Over	2682	0.081	0.273	0	1
TreatXYrsSch	2681	2.207	2.969	0	12
TrXMuslim	2682	0.836	0.371	0	1
Muslim	2682	0.836	0.371	0	1
Age25to30	2682	0.123	0.329	0	1
Age30to35	2682	0.154	0.361	0	1
Age35to40	2682	0.131	0.337	0	1
Age40to45	2682	0.101	0.302	0	1
Age45to50	2682	0.091	0.287	0	1
Age50to55	2682	0.093	0.291	0	1
Age55to60	2682	0.074	0.262	0	1
Age60to65	2682	0.057	0.232	0	1
Age65Over	2682	0.081	0.273	0	1
YrsSch	2681	2.207	2.969	0	12
HusAge	2682	35.929	23.571	0	95
HusAgeSq	2682	18.463	16.287	0	90.25
HusYrsSch	2682	3.206	3.962	0	17
UnmarriedFH	2682	0.069	0.253	0	1
MarriedFH	2682	0.056	0.229	0	1
HusAbsentNH	2682	0.113	0.317	0	1
HusAgeMissing	2682	0.190	0.392	0	1
HusEdMissing	2682	0.064	0.245	0	1
BoundXAgeUnd35	2682	0.019	0.138	0	1
BoundXAge35to55	2682	0.025	0.157	0	1
BoundXAgeOver55	2682	0.014	0.117	0	1
BRACInVil	2682	0.620	0.485	0	1
AnyPuccaRd	2682	0.236	0.425	0	1
SubHospDist	2682	1.808	0.818	0.097	4.381
SecSchNearby	2682	0.733	0.443	0	1
VillMotBoat	2682	0.235	0.424	0	1

Table 11: Summary of independent variables.

Variable	Mean for Treatment=0	Mean for Treatment=1	Difference	Std. Err of difference
TotalChildren	5.236	4.733	-.503	.079**
TotalAlive	4.298	4.01	-.291	.059**
FracDied5	.150	.125	-.0251	.005**
AgeAtFirstBirth	23.110	23.091	-.019	.136
SecondInterval	3.154	3.365	.211	.062**
ThirdInterval	3.0264	3.363	.336	.060**
FracDied5	.150	.1249	-.025	.005**
TotalAlive	4.298	4.006	-.291	.059**
CurrHealthy	.751	.752	.001	.012
Weight	40.945	41.924	.978	.193**
Height	149.134	148.592	-.542	.176**
BMI	18.380	18.951	.572	.075**
ADLEq0	.609	.637	.028	.013*
PregCheckUps	.088	.167	.079	.006**
NumAnteNatalChecks	.621	1.184	.563	.039**
ATSInject	.1313	.203	.073	.007**
PolioVac	.612	.934	.322	.018**
MeaslesVac	.458	.803	.345	.023**
DPTVac	.563	.899	.336	.019**
PrimOccIncome	700.770	1365.87	665.106	226.167**
TotalIncome	895.068	1476.18	581.111	238.212*
OwnProdAssets	.137	.165	.028	.009**
GroupLoan	.105	.151	.046	.009**
GroupWork	.047	.015	.006**	
HhdOwnFarmland	.643	.061	.054	.013**
OwnJewelry	.552	.696	-.049	.014**
HhdOwnPond	.537	.503	.054	.014**
TinRoofWall	.446	.486	.0402	.014**
DrWaterInBari	.560	.643	.0831	.013**
ClWaterInBari	.428	.529	.101	.014**
BCurrEnroll	.913	.910	-.002	.014
BoyEdZScore	-.124	.101	.225	.050**
GCurrEnroll	.944	.919	-.025	.013*
GirlEdZScore	-.107	.070	.178	.053**
BEverAttd2	.639	.631	-.008	.017
BoyEdZScore2	-.175	-.090	.084	.040**
GEverAttd2	.889	.869	-.020	.012*
GirlEdZScore2	-.131	-.057	.073	.0489