

## Family Planning in Iran and the Expansion of Rural Health Houses

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### Abstract:

As a middle-income country with the most dramatic decline in fertility in the Middle East, Iran's recent fertility experience has been of keen interest to scholars and policy makers alike. Interestingly, the decline was most rapid in rural areas. Many have attributed the substantial decrease in rural fertility to the active participation of the government in providing access to family planning through the expansion of rural Health Houses. In this paper we assess the relationship between having a Health House in one's village at the time of marriage and fertility related outcomes. For illiterate women, we find a robust association between having a Health House and number of live births, as well as attitudes on who should make household decision about the method of contraception. To ensure our results are not driven by the endogenous placement of the Health House, we control for village level fixed-effects. These results suggest that Health Houses may have indeed served to reduce fertility in an under-served population.

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## Introduction

Iran is the most populous country in the Middle East, and as such, its population growth and decline has been a subject of great interest. Throughout the 1980's, Iran had one of the fastest growing populations in the world, only to have the fastest declining one in the 1990's. More notably, the biggest drop in total fertility rates occurred in rural areas, declining from 8.1 in 1976 to 2.4 in 2000 (Roudi-Fahimi, 2002). Also, the urban-rural gap drops from nearly 2 children in 1985 to 0.5 children 2000. Since 30% of Iran's population still resides in the rural areas, the fertility experience of the rural population has been of great importance to both scholars and domestic policy makers.

Many scholars suggest that the active participation of the government in the expansion of rural Health Houses<sup>2</sup> as the purveyors of contraceptives is the reason for the dramatic decline in fertility (Roudi-Fahimi, 2002). Erfani and McQuillan argue that the expansion of contraception use was the main factor in the fertility decline, accounting for 61% of the reduction in fertility from its theoretical maximum (Erfani and McQuillan, 2008). Others believe that the substantial increase in female education and labor force participation explain most of the observed decline in fertility (Mehryar). Some scholars argue that more than anything, the socioeconomic situation in Iran during the late 1980's led to this decline (Abbasi, et al., 2002). The real explanation is most likely a combination of all these hypotheses.

It is established in the literature that availability of family planning services in remote areas lowers the cost of obtaining contraceptives. By doing so, it makes family planning a viable option for those who demand it, and encourages use for those who are newly exposed to its services. Such public policy programs can also empower women by educating them about different methods of family planning as well as alter their rights and roles within the household (Miller, 2005, Schultz, 2007).

In this paper, we will focus on the Iranian governments' role in providing family planning services. This is not to underestimate the merit and validity of the other aforementioned explanations. On the contrary, these can be thought of as parallel processes at work in reducing total fertility in Iran. In other words the Iranian population control program succeeded because of all these mechanisms, and not in spite of them. Moreover, different mechanisms may have served to reduce fertility differently for different women. For example, education and labor opportunities may have contributed more dramatically to the decline of fertility for urban women, while contraception supply may have contributed to the decline in rural populations.<sup>3</sup> We focus on rural areas

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<sup>2</sup> Health Houses are the smallest health units in the country. Depending on different attributes of the geographical location, in particular population and communication potentials (i.e. roads, phone, etc), each Health House covers one or a few villages, and about 1500 people. Health Houses keep files of all people in the area they cover, and no one outside of the covered population is allowed to seek treatment in a clinic. A team of health workers regularly visits the villages that do not have a clinic in them; these villages are called satellite villages, so satellite villages are also covered by a Health House).

<sup>3</sup> According to the Iranian 2001 Health and Demographic Survey (IDHS), 45% of literate rural women aged 6-24 discontinued their education versus 30% of urban women. Moreover, the main reason for discontinuing education for these rural was that the school was out of reach. This suggests that education

because the bulk of the transformation occurred in those regions, and the extensive data on the Health Houses are only available for rural areas.

In this paper, we look at the association between having a Health House in women's rural village at the time they get married and the number of their live births as well as women's perceptions of who in the household should be involved in family planning decisions. We use the availability of a clinic at the time of marriage because women become eligible for reproductive services only after they are married.<sup>4</sup> To avoid selection issues regarding placement of Health Houses, we compare outcomes for women in the same village who were married before and after a clinic opened.

### **I. Institutional Setting**

In rural Iran, each village, or group of villages, contains a Health House staffed by at least two trained "Behvarz" or community health workers (one male and one female). The health workers are selected from the local population and undergo two years of training. Health Houses, which are the basic building blocks of Iran's primary health network, are the health system's first point of contact with the community in rural areas. In addition, there are Rural Health Centers, which include a physician, a health technician and administrator to deal with more complex health problems. On average, there is one Rural Health Center per 7,000 inhabitants. In urban areas, similarly distributed urban health posts and Health Centers have been established. The whole network is managed and administered through District Health Centers, answerable to the Ministry of Health and Medical Education. The duties of health workers include but are not limited to (a) registration of health information, (b) health education, (c) providing maternal and child care, (d) school health, immunization, (e) oral health, (f) occupational and environmental health, (h) home visits, and (i) offering rehabilitation services (Malekafzali, 2008).

In the years immediately following the Islamic revolution, the government of Iran had pronatalist policies. They encouraged big families and implicitly disapproved of family planning, albeit limited family planning was still available. During the first decade after the revolution (1979-1988), the family planning program was suspended and government propaganda and policy stressed early marriage and reproduction as basic Islamic values, especially in a time of war. Nevertheless, the Ministry of Health continued to offer such classic contraceptives as birth control pills, Intrauterine Device (IUD), and condoms through its Maternal and Child Health clinics. Motivated couples were also able to obtain contraceptives from the private health sector. Condoms were in fact easily available through drugstores or even major supermarkets. These services were, however, far from sufficient to meet the needs of all couples (Aghajanian and Mehryar, 2005). This policy,

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opportunities are still limited for rural women. Moreover, more rural women get their contraception from public sources than urban women.

<sup>4</sup> Moreover, having access to a Health House at the time of marriage may be particularly important in rural Iran where fertility practices and negotiations between husbands and wives may be formed early in the marriage.

combined with increases in migration from both Iraq and Afghanistan, led to a rapid population boost in Iran.

After a conference in Mashad in September of 1988 in which scholars and policy makers addressed the population boom and its potential consequences, the family planning program was launched in December of 1989. This program had three major goals: (1) to increase the age at first birth and spacing between children, (2) to discourage pregnancy for young women, and (3) to decrease family size. In 1993, the legislature passed a family planning bill and removed most of the economic incentives for large families that existed during the war years. Also, it dropped some maternity benefits for couples that had more than three children. The program also focused on increasing female education and labor force participation, as well as addressing child health indicators, such as infant mortality. The family planning program was incorporated into the already existing and expanding primary health care system of Iran (PHC). As the PHC had a focus on rural areas, the incorporation of family planning program combined with the expansion of the PHC system allowed for wide access to family planning services in rural Iran. There are currently more than 16,000 Health Houses in Iran, covering around 95 percent of the rural population; mobile clinics bring health services to people living in remote areas. Each Health House serves around 1,500 people, usually consisting of the people in the central village (where the Health House is located) and those in satellite villages that are within an hour's walk (Roudi-Fahimi, 2002).

Expansion of Health Houses and availability of family planning services in Iran never entirely stopped even though the government pushed a pronatal policy for many years following the Islamic revolution. Although religious figures encouraged larger families and discouraged family planning, they never formally announced that family planning was entirely against Islam. In fact there is general consensus amongst Muslim sects that contraception is not prohibited in the Koran or Sunnah, the main Islamic scriptures, and family planning is generally thought to be acceptable in the context of marriage (Roudi-Fahimi, 2004). Still, after the decisive Mashad conference, policy makers pushed to gain explicit religious approval for a government provided family planning program. The proponents argued on the basis of the Islamic principle that a Muslim has to protect his or her physical well being from any harm. They, then, presented evidence of instances where family planning saved mother and/or child's life. This resulted, in 1989, in an explicit religious decree, "fatwa", that deemed family planning legal provided that four conditions were met: each party in the couple has to consent; there cannot be any strong side effects; the process has to be reversible,<sup>5</sup> allowing for future pregnancies; the method used should not be accompanied by sin.<sup>6</sup> In 1993, when the family planning law was passed, the family planning program became much more comprehensive and readily available to the public, and particularly in rural areas. However, our data shows that Health Houses were rapidly expanding in rural areas well before 1993.

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<sup>5</sup> Reversibility of vasectomy was established after a series of arguments based on (very limited) evidence that, theoretically, a vasectomy has been seen to be reversed.

<sup>6</sup> For example, to the extent possible, same sex providers should be consulted.

Figure 1 shows the total fertility rates (TFR) for Iran from 1972-2000 in both rural and urban areas using the own child method. The own-children method uses the reverse-survival procedure to estimate fertility measures for the years prior to a census or household survey. Based on the information on the household record, children under the age of 15 are matched to women aged 15-64 in the same household, with the assumption that the women are the mothers of the children enumerated in the same household. These own child TFR estimates are based on three sources (1) the 1986 census, (2) 1996 censuses and (3) 2001 Iranian Demographic and Health Survey (IDHS). The blue lines show TFR in rural areas for each data source and the red lines show TFR in urban areas by each data source (Abbasi, et al., 2002). The overlapping and non-linear shape of the TF curves are particularly interesting because they shows an increase in TFR rates in the early 1980 (post-revolution) then the marked trend down by 1985 throughout the country. While there are slight differences in some years, the estimates are remarkably similar especially. Using all three also gives a long-term view of fertility trends in Iran.

Figure 1 also shows the number of Health Houses operating in each year. Graphically it seems as though the second wave of rapid expansion of Health Houses in 1985 coincides with the onset of the rapid fertility decline. These observations are consistent with supply side models explaining how expansion of public policies can affect fertility behavior through the lowered cost of access to those services.

These trends serve to motivate this study, since there has been much speculation but very little empirical assessment of the clinics' impact in Iran. Given that several studies have documented the vast variation in fertility based on province and level of development of region (Mehryar), any attempt to assess the impact of Health Houses must take into account possible endogeneity of clinic placement in the first place. This study will use village level fixed effects to account for this problem. We further discuss this issue in the methodology and results section.

## II. Data

This analysis is based on two separate sources of data. The first dataset, the 2001 Iranian Household Expenditure and Income Survey (HEIS) is a nationally representative survey carried out by the Statistical Center of Iran. HEIS includes individual level characteristics and the precise geographical location of each rural cluster. This survey is done annually, but the data from year 2001 is unique; it is the only year that all ever-married women aged 15-49 are asked a set of questions about their attitudes towards married life in general and reproductive behavior in particular. The survey uses a stratified sampling dividing the sample by province and urban/rural location to ensure representative estimates at the province and urban rural level. The population was divided into 54 strata. Within each stratum several primary sampling units (PSU) were selected, and 30 households per PSU were selected using cluster sampling for the survey. We use all 93 rural clusters in the survey as Health Houses serve only the rural area.

The second source of data contains the location of each rural Health House in Iran and the time they first opened. This dataset comes from the Ministry of Health, (MOH). When a Health House is built, the provincial university who is in charge of the Health House will report it to the Office of Resource Development in Tehran. Once the trained health workers (Behvarz) start work, the university also reports it to the Office of Network Development (OND), which then acknowledges it as a functioning Health House. The Health House data has been compiled from both electronic and paper forms.

Merging the two data sets allows us to know, for every rural village in the HEIS data, if there is a Health House in the village by 2001, and if so, when it started to operate. From this information we construct a variable that lets us know if there was a Health House in the village at the time each woman got married. Given this information we can compare women living in the same village, and hence avoid the potential endogeneity of the placement of clinics in the first place. The outcomes of interest include the number of live births and three attitudes outcomes including (1) Whether the women believes she should be involved in the household decision on the number of children, (2) Whether the women believes she should be involved in the household decision on how many years apart the children should be and (3) Whether the women believes she should be involved in the household decision on the method of contraception.

### **III. Methodology and Results**

We use fixed effects linear regressions to estimate the association of living in a village with a clinic at the time you were married and total number of live births. Logistic regression is used to estimate the association between living in a village that has a clinic at time of marriage and the other three binary outcomes. We also include village level fixed-effects to control for all area-level variables that could confound our estimates as well as the potential endogenous placement of Health Houses. Independent variables include (1) demographic characteristics (age and age at first marriage) (2) socioeconomic characteristics (literacy and ownership of household assets)<sup>7</sup>, and (3) Health House access measure (if there is a clinic in village at time the woman got married). An interaction term that assesses the role of the clinics for literate versus illiterate women is also included in some models. Age variables are categorized by 5-year intervals because age fertility profile in Iran has been very non-linear as shown in Figure 1. All regressions are weighted and used Huber-White robust clustered standard errors at the village level.

While the HEIS contains 2,279 ever married women aged 15-49 living in the rural areas who have not migrated in the last year, our analytical sample only contains 1874 women for whom we have complete information on number of live births, attitudes about who

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<sup>7</sup> Eight household amenities were used to construct the asset variables. They include owning a car or motorcycle, a computer, a television, a refrigerator, a phone and an oven. As well as having electricity and water in the house. Those households with four or less of the amenities were categorized as low asset households and those with seven or eight were categorized as high asset households.

should make fertility decisions in the household, literacy, age, age at first marriage, and ownership of household assets.<sup>8</sup>

We present results for two samples. The first sample consists of all women aged 15-49 for whom the attitude questions were asked. The second is a sub-sample of older women, aged 30-49, who were at prime reproductive age (15-35) at the time most of the changes in fertility were occurring. Table 1 shows the means of our samples. For the first sample, the average age of the women in the sample is 34 years old, the average age of first marriage is 18 years old and 55% are literate. About 60% of the rural clusters sampled have a health clinic in the local village by 2001 but only 31% of women in this sample had a Health House when they first got married.<sup>9</sup> These results are very consistent with the Iranian DHS on all dimensions.<sup>10</sup> When we restrict our sample to the older women, the average age increases to 39 (by construction), the average age of marriage remains at about 18 years, only 17% had a clinic when they got married, and only 41% are literate.

Figure 2 shows the distribution of the number of children ever born to women in the entire sample (N=1874). Since the distribution of the number of children ever born is right-skewed and has a non-normal distribution, we transform the data and use  $\ln(\text{Children ever born})$  as our outcome. Here we are assuming that among ever-married women in Iran at these ages, there is very little selection into motherhood beyond the natural infertility rate. In fact, in this data only 2% of women do not have any children and these women are concentrated in the two lowest age categories, age 15-20 and 20-25.<sup>11</sup>

Table 2 presents the association of having a Health House in the local village at time of marriage with the natural log number of children ever born. We find that having a health clinic in one's village at time of marriage reduces the number of children born by 7-22 percent depending on the subgroup used in the analysis. Panel A presents the results for the entire age range. The first column shows the results without village level fixed effects and the second column includes these fixed effects. When we control for village fixed effects, we find a 7 percent decrease in births for women who were exposed to a clinic at the time of marriage and this estimate is only marginally significant. When we stratify by literacy status we find that in this full sample illiterate women are more strongly affected by having a health house and reduce their number of children by 17%. Interestingly,

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<sup>8</sup> Our analytical samples change for logistic regression models with fixed effects, because villages for which there is no variation in outcome are excluded.

<sup>9</sup> Fifty-four of the ninety-three clusters in the sample has a Health House in the village by 2001. Of those that do not, some may be still served by a satellite clinic.

<sup>10</sup> According to the Iranian DHS, which has a much larger sample of the rural population, 65% are literate (using women aged 6 and older as opposed to those age 15-49) and average age at first marriage for rural women is 18 years old.

<sup>11</sup> We drop 46 observations when we use the log of children ever born as the outcome variable for women who have no children. These observations are concentrated in the first two age categories. Of women aged 15-20, 22% do not have any children. Of women aged 20-25, 5.6% do not have any children. For the remaining age groups less than 2% do not have any children. Consequently, we think that a log model simply captures the main features of the data without imposing too much selection and the age dummies capture most of the selection process. We also used zero inflated Poisson models that give similar results (not presented).

being literate has a similar effect as having a clinic in your village at the time of marriage. Column 1 shows that the effect of literacy is about a 12% reduction in number of live births and column 4 shows that having a clinic was associated with an 11% reduction on the number of live births for literate women. The most significant effect of the clinic that we find is for illiterate women when examine women in the entire age range.

Panel B of Table 2 presents the results for the restricted sample of older women.<sup>12</sup> Here, again, we find slightly stronger results where clinics reduce the number of children ever born by 13%. When we stratify by literacy status, we find that literate women who were exposed to a clinic at time of marriage had 22% fewer children. The estimate for illiterate women is that same as for the entire sample, except slightly less significant. In both samples we also find that there are clear non-linear age trends, which are always significant. Also, being literate has an independent effect of reducing fertility by about 10 percent. Moreover, comparing column 1 with 2, and 5 with 6 we see that the significance of high wealth falls. Our proxy for high wealth is having 7 or 8 of the 8 possible assets. This may be pointing to some selection issues in the areas the clinics were placed, such that richer rural areas might have more clinics.<sup>13</sup>

Table 3 presents the association between having a Health House and attitudes towards gender roles in fertility decisions for the full sample. Note that by 2001, most women in rural Iran already believe that women should be involved in the household decision on family planning. Therefore, there is little variation in this variable to exploit. If we look at columns 1 and 3 where we do not control for fixed effects, we find that illiterate women in areas where there was a Health House are more likely to believe that women should be involved in the household decision making process for the number of children and the spacing of children. However, when we control for area-level fixed effects, having a clinic in the village is never statistically significant for either literate or illiterate women. Again, this points to some selection issues, such as differing social of familial norms for women associated with the initial placement of the Health House, which is why fixed effects are particularly important.

In Table 4 we present the association between having a Health House and attitudes towards gender roles in fertility decisions for the older sample of women. Here we find that when we include fixed effects, literate women with a clinic are more likely to believe that they should be involved in the decision for the number of children. This is, however, only marginally significant. Also, women with high wealth are more likely to believe that they should be involved in the decision-making process. We find no effect of the clinic on the attitude questions regarding spacing of children, although both the sign and magnitude of the coefficients are in the hypothesized positive direction. Finally, for

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<sup>12</sup> In this sample we are not worried about any selection into motherhood and we are particularly interested in their fertility experience because they were in their key fertile years when the Health Houses were expanding.

<sup>13</sup> There are no documents explaining the exact rules for these clinic expansions. We need village level income data to address this potential placement issue. However, such data is not available to us and is unlikely to become available. Thus, we use of fixed effects to address this issue to a reasonable degree.



illiterate women who had a clinic in their village at the time of marriage, we find an effect of the Health House. Illiterate women are more likely to believe they should be involved in the decision of which method of contraception they should use if there was a Health House in their village at the time of their marriage. The effect for literate women is in the opposite direction, effectively canceling out the effect of the clinic for this population.

According to a law passed in 1993 in Iran, all couples who wanted to get married were mandated to take a sex education course prior to their marriage. We looked at adding a marriage after 1993 dummy as well as an interaction between getting married after 1993 and having a health clinic. The only effect we observe is the reduction in the coefficient on younger ages, and the coefficient is not significant. Attitude changes are thought of as a measure of women's empowerment. While results are weaker here, there is some evidence of empowerment with respect to method of contraception for older cohorts of women. Other analysis shows that women are less likely to use coitus interruptus if there is a clinic in village at time of marriage. However, the sample size is small and the coefficients are only marginally significant. These results are not presented here. We also looked to see if having a clinic in one's village was associated with age at first marriage as age at first marriage might respond to Health House supply, which would bias our results. Having a clinic in your village at age 15 or 20 (the range in which most women were married in this sample) is not related to age at first marriage (controlling for age, literacy, wealth and area fixed effects) in this sample. Finally, we have looked to see if the interaction of wealth and clinic would produce the same results, as the interaction between literacy and having a clinic could be measuring a socio-economic construct, but that is not the case in this sample.

#### **IV. Discussion and Conclusion**

Many different factors explain the success of the government run family planning program in Iran. Policy makers worked with religious figures to ensure religious acceptability of family planning; they took into account the cultural, religious, and ethnic sensitivities of the populations they were serving. Finally, they incorporated family planning services in the already existent and expanding rural Health House system (Malekafzali, 2005). Our results indicate that Health Houses primarily may have affected women's fertility, and that these effects varied by age and literacy status.

Our results suggest that in the early years of expansion literate women were more affected by the health houses, but that that trend has changed for younger cohorts. Early on when Health Houses could only provide limited family planning services, it may have well been that educated women were more capable of navigating the system to get their family planning needs met. For younger cohorts, illiterate women might not have the same access to or control in accessing resources prior to the existence of the Health Houses. For example, illiterate women may be less able or less likely to travel to seek

family planning services.<sup>14</sup> Moreover, interaction with the Behvaz might also serve to crystallize latent demand for contraception. Also, the ease of access may facilitate their use otherwise not feasible given the limited autonomy these women traditionally have. From our analysis, it seems that the clinics are helping women control and perhaps better negotiate their fertility practices. Changing women's attitudes toward who should decide on contraceptive practices is indeed the most direct way that Health Houses would have had an effect on women's attitudes and we find support for that in our analysis. Furthermore, while we do not find statistically significant results for the spacing and number questions, the direction is always in the hypothesized direction.

We have looked at the (relatively) short-term impact of Health Houses on fertility behavior. For a more complete picture of the impact of Health Houses on fertility behavior and attitudes of rural women, we need to look at total completed fertility by cohort. Traditional means of birth control, such as prolonged breast feeding, post partum delay of intercourse, and even induced abortion may diminish in the aftermath of a modern family planning, implying that the uptake of modern contraception may overstate the program's impact on fertility (Schultz, 2007). The impact of family planning programs can also be overstated if the program initially increases the interval between births, but not in the long run. Therefore, only a long-term study across a series of birth cohorts could assess the impact on the final number of children ever born and their birth spacing.

For attitudes, as time goes by women's attitudes on fertility converge and thus in order to understand the effect of the Health Houses on attitudes we would ideally measure these attitudes as closely as possible before and after exposure to Health House to parse out the effects of the clinics from period effects. Here we can only control for cohort effects and the timing of the question may be related to the limited variation in attitudes questions.

A key concern in this literature is that the response to fertility programs differs by a woman's reproductive goals, number of children desired, age, fecundity, etc. It can be argued that, women who already have a high desire to limit their fertility choose to use the Health Houses more than the rest of the population. To understand the nature of this heterogeneity in response to clinics, we included a number of interactions between women's characteristics and the clinic variable (such as education, wealth, etc.). To the extent that these variables are strong proxies for characteristics such as desired number of children, these interactions can help address this self-selection concern. In fact, we find that literate women with access to the a Health House in the older cohort had a higher reduction in their fertility than illiterate women with access to a Health House Also, there is great regional variation in terms of level of development, income, adult literacy, availability of public water, etc. Insofar as living in a more developed region or a more literate community, regardless of one's own education, affects couples' demand for

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<sup>14</sup> It seems that travel time is a key component for family planning effectiveness as 25% of rural women who were unsatisfied with Family Planning services complained about long travel time to the health clinic according to the 2001 IDHS.

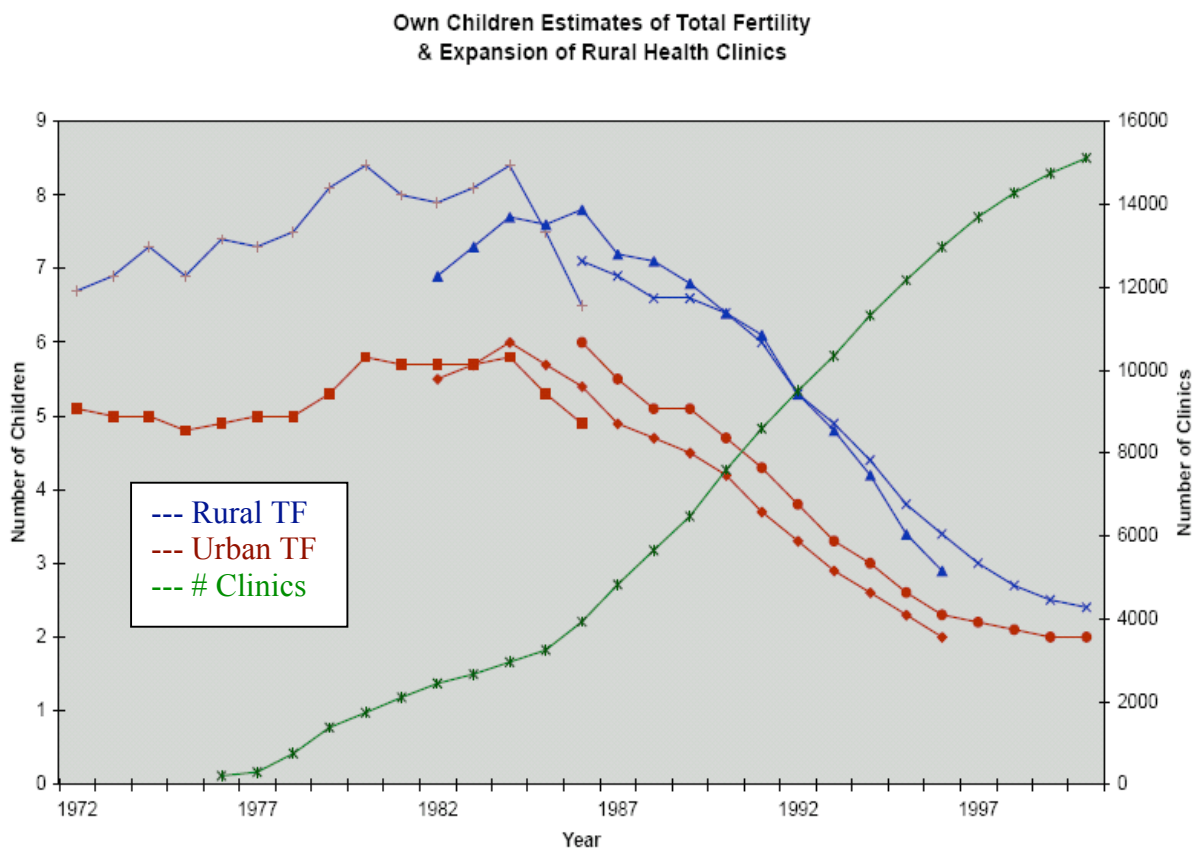
children, our results may be biased. Obtaining income and development measures at the village as well as province level would help address this issue.

Another concern in our analysis is the catchment areas we use, namely the village of residence. Insofar as some villages have access to Health Houses in nearby villages, there may be measurement error in estimating the impact of having a Health House in one's village. If we have incorrectly categorized a village as not having access to a clinic, when in fact it does because it has access to a clinic in a nearby village, then may lead to an bias in the relationship between having a Health House in one's village and fertility outcomes. However, populations who generally reside within close proximity of the clinic are completely identified.

Iran presents an astonishing case of government provided family planning program. One important and highly relevant point in policy making is the issue of child quality and welfare. As far as we know, Health Houses provide most maternal and childcare and the health workers visit schools, provide school health, and provide general health education. At the same time, there are models hypothesizing a tradeoff between quantity and quality of children (Becker, 1992). It is, therefore, of interest to study the long run impact of these Health Houses on child outcomes like child mortality, child health and education. Insofar as Health Houses have a real affect on outcomes such as the fertility rate and health and education of mothers and their children, they can be considered a successful investment in the infrastructure for future development and growth of Iran's rural sector.

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Figure 1: Estimates of Total Fertility Based on the 1986 and 1996 Censuses, and 2001 IDHS, and the Expansion of Health Clinics.



Total Fertility (TF) Source: Jalal Abbasi-Shavazi, M. and P. McDonald. 2006. "Fertility Decline In The Islamic Republic Of Iran: 1972–2000." *Asian Population Studies* 2(3): 217-37. Table 2.

The three blue/three red lines are TF estimates using the own-child estimates from three different sources, 1986 and 1996 Censuses and 2001 IDHS. All three lines are presented to show the overall trends. The line beginning in 1972 is based on the 1986 census. The line beginning in 1982 is based on the 1996 census. Finally the line beginning 1986 is based on the 2001 IDHS.

Figure 2: Histogram of Children Ever Born in Sample of Women Aged 15-49

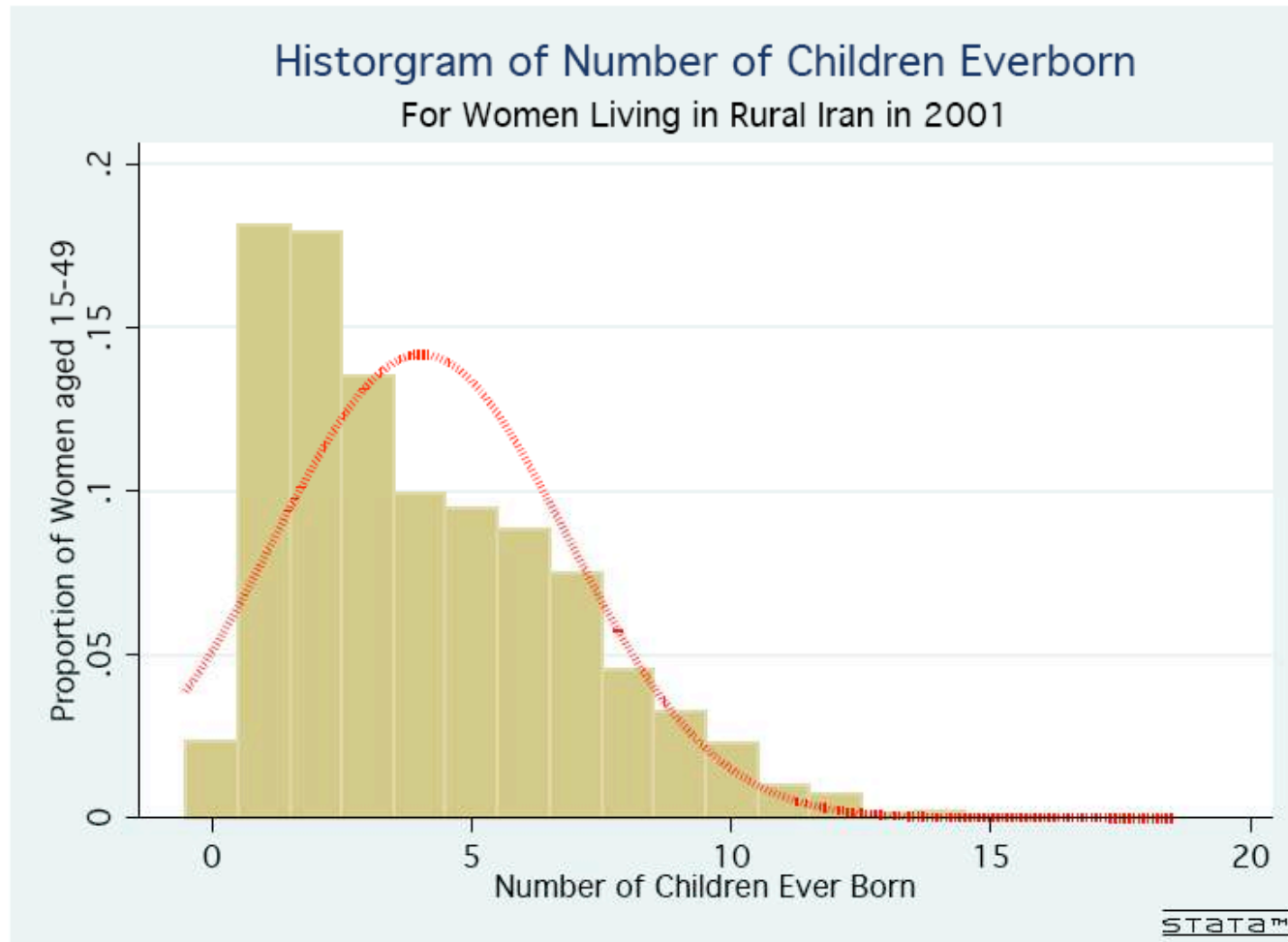


Table 1: Means of key variables for full and analytical sample

Variable	Ever Married Rural Women Aged 15-49		Ever Married Rural Women Aged 30-49	
	Analytical Sample		Analytical Sample	
	N	Mean	N	Mean
Age	1874	33.89	1208	39.15
Age at first marriage	1874	17.53	1208	17.67
Clinic in village at time of marriage	1874	0.31	1208	0.17
Literacy status	1874	0.55	1208	0.41
Asset	1874	4.96	1208	5.07
Children Ever Born	1874	4.14	1208	5.38
Household decision on Number of Children	1874	0.90	1208	0.88
Household decision on Spacing of Children	1874	0.90	1208	0.88
Household decision on Method of Contraception	1874	0.93	1208	0.93

Table 2: Association between having a Health House in the village at time of marriage and number of live births ever married women living in rural Iran in 2001

	Panel A				Panel B			
	ln(Number of Children Ever Born)				ln(Number of Children Ever Born)			
	Entire Sample	Illiterate	Literate		Entire Sample	Illiterate	Literate	
Age 15-20	-1.18 (0.05)**	-1.23 (0.04)**	-1.23 (0.22)**	-1.21 (0.05)**				
Age 20-25	-0.84 (0.055)**	-0.86 (0.051)**	-0.92 (0.108)**	-0.84 (0.066)**				
Age 25-30	-0.32 (0.04)**	-0.33 (0.04)**	-0.23 (0.07)**	-0.36 (0.04)**				
Age 35-40	0.29 (0.04)**	0.33 (0.04)**	0.33 (0.06)**	0.35 (0.04)**	0.29 (0.04)**	0.33 (0.03)**	0.32 (0.06)**	0.36 (0.05)**
Age 40-45	0.5 (0.05)**	0.52 (0.05)**	0.54 (0.06)**	0.53 (0.09)**	0.48 (0.05)**	0.51 (0.05)**	0.54 (0.06)**	0.47 (0.09)**
Age 45-49	0.63 (0.06)**	0.67 (0.05)**	0.69 (0.06)**	0.65 (0.10)**	0.63 (0.06)**	0.67 (0.05)**	0.69 (0.06)**	0.63 (0.10)**
Age at first marriage	-0.06 (0.00)**	-0.06 (0.00)**	-0.04 (0.00)**	-0.07 (0.00)**	-0.05 (0.00)**	-0.05 (0.01)**	-0.04 (0.01)**	-0.06 (0.01)**
Clinic In Village at Time of Marriage	-0.1 (0.04)*	-0.07 (0.04)+	-0.17 (0.07)*	-0.11 (0.06)+	-0.18 (0.06)**	-0.13 (0.05)*	-0.17 (0.09)+	-0.22 (0.07)**
Asset Level Low	0.08 (0.04)*	0 (0.03)+	-0.03 (0.04)	0.03 (0.04)+	0.08 (0.05)**	0.02 (0.03)	-0.05 (0.03)	0.06 (0.03)
Asset Level High	-0.15 (0.04)**	-0.05 (0.03)+	-0.02 (0.04)	-0.06 (0.04)+	-0.15 (0.05)**	-0.0200 (0.03)	-0.0100 (0.03)	-0.0100 (0.03)
Literate	-0.19 (0.04)**	-0.12 (0.03)**			-0.16 (0.04)**	-0.1 (0.03)**		
Constant	2.4 (0.08)**	2.29 (0.06)**	2.02 (0.10)**	2.32 (0.07)**	2.27 (0.07)**	2.16 (0.09)**	1.94 (0.11)**	2.21 (0.13)**
Observations	1828	1828	805	1023	1201	1201	678	523
R-squared	0.74	0.79	0.68	0.77	0.55	0.66	0.56	0.71
Number of Villages		93	91	92		93	91	84
Village Fixed-Effects	NO	YES	YES	YES	NO	YES	YES	YES
Model	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS

Panel A: Women aged 15-49

Panel B: Women aged 30-49

Robust clustered (at village level) and weighted standard errors in parentheses

+ significant at 10%; \* significant at 5%; \*\* significant at 1%

Table 3: Association between having a Health House in the village and attitudes towards gender roles in fertility decisions for ever-married women aged 15-49 living in rural Iran in 2001

	Wife should be involved in making household decisions concerning:					
	Number of children		Spacing of Children		Method of Birth Control	
Age 15-20	1.78	2.9	1.44	1.87	0.49	0.7
	-1.18	-2.11	-0.9	-1.17	-0.23	-0.44
Age 20-25	0.70	0.89	1.10	1.62	0.61	0.91
	-0.29	-0.55	-0.29	-0.55	-0.25	-0.51
Age 25-30	1.51	2.31	1.84	3.05	1.69	2.31
	-0.62	(0.99)+	-0.88	(1.42)*	(0.51)+	(0.91)*
Age 35-40	1.37	1.43	1.74	2.01	1.14	1.39
	-0.46	-0.6	-0.75	-1.2	-0.32	-0.39
Age 40-45	1.05	0.74	1.25	0.98	1.64	1.39
	-0.42	-0.36	-0.42	-0.46	-0.54	-0.52
Age 45-49	1.15	0.93	1.58	1.66	1.21	1.18
	-0.38	-0.36	-0.54	-0.98	-0.45	-0.48
Age at first marriage	0.99	1	1.01	1.01	0.99	1.02
	-0.02	-0.02	-0.04	-0.03	-0.03	-0.04
Clinic In Village at Time of Marriage	3.46	2.06	2.3	1.66	1.66	1.28
	(1.74)*	-1.04	-1.18	-0.82	-0.74	-0.47
Asset Level Low	0.61	0.59	0.61	1.04	0.81	0.95
	-0.22	-0.24	-0.23	-0.44	-0.25	-0.31
Asset Level High	2.74	4.47	1.08	1.41	1.65	2.08
	-1.69	(3.30)*	-0.29	-0.31	-0.85	-1.39
Literate	2.21	1.01	2.45	1.51	2.44	2.13
	(0.75)*	-0.42	(0.53)**	-0.4	(0.76)**	(0.71)*
Literate X Clinic	0.44	1.24	0.39	0.7	0.5	0.49
	-0.25	-0.68	-0.23	-0.3	-0.23	-0.21
Observations	1874	1252	1874	1219	1874	1114
Number of Villages	93	62	93	60	93	55
Pseudo R-squared	0.06	0.19	0.04	0.17	0.03	0.17
Village Fixed-Effects	NO	YES	NO	YES	NO	YES
Model	Logit	Logit	Logit	Logit	Logit	Logit

Robust clustered (at village level) and weighted standard errors in parentheses

+ significant at 10%; \* significant at 5%; \*\* significant at 1%

Odd Ratios Presented



Table 4: Association between having a Health House in the village and attitudes towards gender roles in fertility decisions for ever married women aged 30-49 living in rural Iran in 2001

Wife should be involved in making household decisions concerning:						
	Number of children		Spacing of Children		Method of Birth Control	
Age 35-40	1.39	1.58	1.64	2.05	1.1	1.48
	-0.45	-0.74	-0.68	-1.29	-0.33	-0.5
Age 40-45	1.06	0.90	1.12	1.08	1.60	1.52
	-0.38	-0.41	-0.42	-0.60	-0.55	-0.66
Age 45-49	1.11	0.99	1.38	1.72	1.12	0.92
	-0.36	-0.45	-0.5	-1.06	-0.45	-0.44
Age at first marriage	0.96	0.96	1.01	1	0.96	0.97
	-0.02	-0.03	-0.03	-0.04	-0.03	-0.03
Clinic In Village at Time of Marriage	2.11	2.39	1.46	1.65	2.53	3.91
	-0.98	-1.4	-0.7	-1.18	-1.71	(2.08)*
Asset Level Low	0.74	0.93	0.63	0.85	0.61	0.88
	-0.28	-0.41	-0.24	-0.43	-0.21	-0.46
Asset Level High	3.77	5.49	0.96	1.1	1.92	0.81
	(2.38)*	(4.06)*	-0.28	-0.24	-1.03	-0.63
Literate	1.78	0.85	2.07	1.31	2.02	1.41
	-0.68	-0.45	(0.58)**	-0.54	(0.64)*	-0.59
Literate X Clinic	1.53	3.82	0.59	0.95	0.39	0.22
	-1.19	-3.52	-0.4	-0.62	-0.31	(0.17)*
Observations	1208	721	1208	674	1208	626
Number of Villages	93	57	93	53	93	48
Pseudo R-squared	0.05	0.19	0.03	0.15	0.03	0.20
Village Fixed-Effects	NO	YES	NO	YES	NO	YES
Model	Logit	Logit	Logit	Logit	Logit	Logit

Robust clustered (at village level) and weighted standard errors in parentheses

+ significant at 10%; \* significant at 5%; \*\* significant at 1%

Odd Ratios Presented

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