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REPRODUCTIVE HEALTH IN FAMILY PLANNING

REPRODUCTIVE HEALTH IN FAMILY PLANNING:
A STUDY OF THE COMMUNITY-OPERATED REPRODUCTIVE HEALTH PROJECT
IN RURAL BANGLADESH

A Thesis
submitted to the Faculty of the
Graduate School of Arts and Sciences
of Georgetown University
in partial fulfillment of the requirements for the
degree of
Master of Public Policy
the Georgetown Public Policy Institute

By

Tingli Lai, B.Soc.Sc

Washington, DC
April 18, 2006
The Community-operated Reproductive Health Project (CORHP) is a family planning program in rural Dhaka, Bangladesh. Contrary to focusing on fertility rates, a characteristic of the household contraceptives delivery and family planning advice characteristic of previous family planning programs in Bangladesh, CORHP is a site-based project that emphasizes the comprehensive, rights-based approach rather than fertility reduction. The paper evaluates the effectiveness of CORHP in improving reproductive health. The regression results show that CORHP is more effective in delivering services pertaining to reproductive health, but less so in building awareness. The results also suggest that facilities such as CORHP are adequate substitutes for the household delivery system.
Introduction

Since the 1960’s, developments in government population policies throughout Asia have caused dramatic demographic changes in many countries of the region. Of these countries, Bangladesh is of particular interest because of its remarkable achievements in reducing fertility rates in the absence of substantial socioeconomic development. The Bangladesh anomaly suggests that the demographic transition does not necessarily trigger development, and conversely, that socioeconomic development is not a prerequisite for successful family planning programs. Regardless, while decreasing population may not produce socioeconomic development, it is plain that it reduces the population burden on the state and its exhaustible resources (National Research Council, 1986).

In 1994, the International Conference on Population and Development (ICPD) held in Cairo caused dramatic changes in approaches towards family planning and population policy. The most significant of these was the shift from an emphasis on fertility reduction to the comprehensive concept of women’s reproductive health. The ICPD and its outcomes have had significant influence on the design and implementation of population programs in Bangladesh.

This paper evaluates the impact of the Community-operated Reproductive Health Project (CORHP) on reproductive health in Bangladesh. CORHP is one of a new phase of projects in the country that attempts to replace traditional family planning with a reproductive health approach. Thus, CORHP is a direct response to the paradigm shift in government-led family planning programs that is stipulated in the final statement from
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the ICPD in 1994. This new development follows a long chain of family planning initiatives by the Bangladeshi government beginning in the 1970’s which had successfully lowered fertility rates. A study of CORHP will provide some information about the advantages, disadvantages and challenges of switching from the more traditional methods of family planning to the reproductive health approach.

This has important implications for various stakeholders in Bangladesh’s population and development policies. Especially for the government itself, Bangladesh’s family planning programs are heavily funded by foreign assistance with Japan, the sponsor of CORHP, being the largest bilateral assistance donor to Bangladesh. CORHP, if less costly and more effective, increases aid quality despite a decline in the presence of Japanese assistance in Bangladesh (JICA, 2003:p.39). In examining the impact of CORHP on reproductive health in rural Dhaka, this paper considers its viability as a long-term nationwide family planning program. It also attempts to identify some best practices that can be considered in family planning initiatives in developing countries.

The first two sections in this paper outline the characteristics of population in Bangladesh and the country’s population policy. These are followed by a review of previous studies conducted on family planning in Bangladesh. The fourth section provides the framework for analysis and the fifth section presents the data and findings. Finally, the paper concludes with an examination of the research and policy implications of these findings.
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Population and Demographics in Bangladesh

At the time of its independence, population size of Bangladesh was 74 million and it was growing at a rate of 3.0 percent per annum. Total fertility rate was 6.3 children per woman and contraceptive prevalence was only about 8.5 percent (BFS, 1975, quoted in BBS, n.d.). In contrast, according The World Factbook (2005), the population of Bangladesh has nearly doubled in the preceding 25 years to 144 million, and is currently growing at a rate of 2.1 percent. Nonetheless, the substantive growth was not unexpected as Bangladesh was entering the initial phases of the fertility transition, where a period of high fertility was accompanied by a sharp decline in mortality as well as an increase in life expectancy, thus generating the population boom.

Figure 1 shows the 2004 Bangladesh population pyramid. From the broad base of the pyramid, it is clear that population momentum, although slowed, will definitely continue to drive population growth. In order to lower dependency ratios and reduce burden on the country, population policies and family planning programs continue to be required in the country’s development plans. The Bangladesh Population Policy estimates that if replacement-level fertility (2.10 children born per woman) is achieved by 2010, population size should stabilize at 210 million by 2060 (NIPORT, et. al, 2005:p.2).

About 80 percent of the population lives in rural areas, and up to 65 percent of its total land area is employed in agriculture (The World Factbook, 2005). In addition, Bangladesh is one of the most densely populated countries, with approximately 900 persons per square kilometer, and is surpassed only by microstates such as Singapore; it
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has the highest rural population density in the world (National Institute of Population Research and Training (NIPORT), Mitra and Associates, and ORC Macro, 2005:p.2).

Figure 1. Population Pyramid, Bangladesh 2004

Source: NIPORT, et. al., 2005

Population Policy: The Household Delivery System

Population planning was seen as an integral part of the total development process in Bangladesh. From the early years of national development, the government emphasized the necessity of immediate adoption of drastic steps to slow down the population growth. The country launched its First Five Year Plan for national development in 1973. The household delivery of family planning services was introduced in Bangladesh in 1978.

Under the system, 23,500 female fieldworkers (officially known as family welfare assistants) were employed by the government. In addition, another 12,000 fieldworkers
were introduced by non-governmental organizations. The fieldworkers counseled, motivated and distributed contraceptive supplies to women in rural areas. Government fieldworkers supplied 85 percent of all contraceptive pills, condoms and injectables (hormonal injections) in some areas.

The household delivery system has been largely successful in reducing fertility rates. Between 1975 and 1996, the national total fertility rate fell from 6.3 to 3.3 births per woman. As illustrated in Table 1, contraceptive use among married women has increased steadily from 14 percent in 1983 to 43 percent in 1999. Increases are also most evident in contraceptive methods being provided under the household delivery system (pill, injectables and condoms).

Table 1. Trends in modern contraceptive use among married women, 1983-2000

<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Any modern method</td>
<td>13.6</td>
<td>18.4</td>
<td>36.2</td>
<td>41.6</td>
<td>43.4</td>
</tr>
<tr>
<td>Pill</td>
<td>3.3</td>
<td>5.1</td>
<td>17.4</td>
<td>20.8</td>
<td>23.0</td>
</tr>
<tr>
<td>IUD</td>
<td>1.0</td>
<td>1.4</td>
<td>1.8</td>
<td>1.8</td>
<td>1.2</td>
</tr>
<tr>
<td>Injectables</td>
<td>0.2</td>
<td>0.5</td>
<td>6.2</td>
<td>6.2</td>
<td>7.2</td>
</tr>
<tr>
<td>Vaginal methods</td>
<td>0.3</td>
<td>0.2</td>
<td>na</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>Condom</td>
<td>1.5</td>
<td>1.8</td>
<td>3.0</td>
<td>3.9</td>
<td>4.3</td>
</tr>
<tr>
<td>Female sterilization*</td>
<td>6.2</td>
<td>7.9</td>
<td>8.1</td>
<td>7.6</td>
<td>6.7</td>
</tr>
<tr>
<td>Male sterilization*</td>
<td>1.2</td>
<td>1.5</td>
<td>1.1</td>
<td>1.1</td>
<td>0.5</td>
</tr>
</tbody>
</table>

na = not available
* Sterilization rates are given cumulatively
Source: NIPORT et. al.

However, by the Fifth Five Year Plan for national development (1998-2002), the growing numbers of women in childbearing ages were making it financially straining to continue the door-to-door services (Ashraf, Haseen, Huq, Mercer, Reza and Udin, 2005:p.115). Under the system, fieldworkers are expected to routinely visit all women of
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reproductive age within a specified area. In 1997, the average workload for a fieldworker was 700-800 women, who were visited once every two months (Baqui, Routh and Thwin, 1997, quoted in Ashraf, Khuda, Routh and Stoedkel, 2001:p.82). With the population explosion and increasing numbers of women entering their reproductive years, it was estimated in 1997 that the number of contraceptive users would have to increase from 12 to 28 million in 2005 in order to achieve the national goal of replacement fertility by 2005. Furthermore, family planning coverage for the same period would have to expand by more than a third from 27 to 40 million couples. Since the country has been unable to meet its 2005 national goal and the fertility rate has settled at about 3.3 births per woman for several years, these estimates may be too optimistic.

Janowtiz (1997) estimated in 1994 that the total cost of salaries and benefits of fieldworkers would increase by almost $10 million to $32.9 million in 2004, if the government had to maintain the 1994 couples-to-fieldworker ratio. Due to the labor intensive nature of the program, labor costs amount to 63 percent of total costs. However, 60-65 percent of the program is funded by donors such as Japan. As donors decide to reduce or level-off funding for population programs, the Bangladeshi government has to find alternative family planning programs and policies.

Moreover, coverage by the household delivery system was poor. In the Demographic and Health Surveys conducted in the 1990s, majority of women in reported that they have not been visited by a fieldworker in the last six months. There were concerns that the inadequate training, supervision and management were affecting the
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quality of services (ibid.). Since fieldworkers are evaluated based on the proportion of
women they visit in their area, they might target the women who are already using
contraceptives, are most likely to demand contraceptives and do not require persuasion or
explanation about contraceptives use.

At the same time, the United Nations International Conference on Population and
Development (ICPD) held in Cairo in 1994 advocated the shift in emphasis of family
programs from fertility reduction to reproductive health. The conference was the fourth
conference of its kind and, up to 1994, was held once every ten years. However, it was
the first ICPD that encouraged multilevel participation, including governments, donors
and civil society. Consequently, the paradigm shift to reproductive health was a rather
unexpected outcome of the conference, driven strongly by women’s rights supporters at
the conference (Finkle and McIntosh, 1995:p.235-238).

In contrast to fertility reducing programs, reproductive health is a comprehensive,
rights-based approach toward family planning. The Cairo Program of Action was the first
international policy document in which the concept of reproductive health was defined. It
states that,

“Reproductive health is a state of complete physical, mental, and social well-being
and not merely the absence of disease or infirmity, in all matters relating to the
reproductive system and to its functions and processes. Reproductive health
therefore implies that people are able to have a satisfying and safe sex life and that
they have the capability to reproduce and the freedom to decide if, when and how
often to do.” (UNFPA, 1994:Program of Action of the International Conference
on Population and Development)
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Accordingly, the Cairo Program of Action calls for all countries to provide reproductive health care services by 2015. The elements of reproductive health care specified in the document are:

1. contraceptive information and services
2. prenatal care
3. safe childbirth and postnatal care
4. prevention and treatment of sexually transmitted diseases (STI)
5. Abortion (where legal), and post-abortion care
6. Prevention and treatment of infertility
7. Elimination of harmful practices against women
8. Other women’s health services, such as diagnosis and treatment of breast cancer

Following the ICPD, Bangladesh began reforms to its population policy. The Health and Population Sector Program (HPSP, 1998-2003), the latest development in Bangladesh’s history of population planning, was introduced with the Fifth Five Year Plan (1998-2002) as a substitute for the door-to-door delivery system. It was an effort to meet the challenges of the growing population in Bangladesh, and also an implementation of the outcome of the Cairo conference. Under this new program, an Essential Services Package (ESP) was identified. The ESP contained a range of health and family planning services that would be provided at community clinics.¹ Once fully functional, the community clinics would take over all reproductive and child health

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services previously provided by paramedics and routine domiciliary services would also be phased out.

The Community-operated Reproductive Health Project (CORHP) is one project evolving from this new policy shift. The project is funded by the Japanese International Cooperation Agency (JICA) and jointly implemented by the Ministry of Health and Family Welfare Family Planning Association of Bangladesh (FPAB) and the Japanese Organization for International Cooperation in Family Planning (JOICFP). It is a three-year project which commenced on 15 March 2001 and was completed on 16 March 2004.

CORHP offers services in line with the government’s HPSP. Its aims are to provide packaged basic services for reproductive health at multi-purpose women’s training centers, enlist the participation of rural women in social and economic activities and build the capacity of the FPAB and develop human resources (JICA, 2003:p.38). The five main components to the project include 1) the Essential Services Package (ESP), 2) literacy and functional education, 3) sanitation and parasite control, 4) skills development and training, and 5) income generating activities through micro-credit.

Literature Review

In the years following the shift in Bangladesh’s population policy, various studies have tried to identify its impact on specific regions around the country. A smaller group of studies examine the concept of reproductive health and its practicality. The findings of these studies are mixed and seem to suggest that site-based, comprehensive care and
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don-door contraceptives delivery should be employed simultaneously for optimum
results. However, given the size of the country, the complex relationship factors affecting
socio-demographics, and the relatively short period of time since the policy shift, it is not
surprising that general nationwide trends are still difficult to identify.

One concern of site-based programs such as CORHP is that they may reverse the
progress to fertility decline and contraceptive use made by the door-to-door delivery
system. The decline in the fertility rate in Bangladesh is slowing and has remained
around its 1996 level of 3.3 for the last ten years. Some have argued that the shift away
from the household delivery system was responsible for this standstill. Thus, although
CORHP may enhance service variety, it may not be an adequate substitute for the
existing door-to-door delivery system.

Arends-Kuenning (2001) studied the impact of field workers on contraceptive use
in Bangladesh. Although she agrees in a need for reforms in the Bangladeshi family
planning program, her findings suggest that women with no education, who live in poorer
areas or who face severe constraints or opportunity costs of traveling are most dependent
on the household delivery system. In a different study, she concludes that family planning
should focus solely on these groups of women who will respond most to visitations
(Arends-Kuenning, 2002).

Similarly, Bates, Islam and Shuler (2001) put forward the idea of a service delivery
“culture” ingrained in rural Bangladesh by a generation of household delivery. The
findings of their qualitative study imply that demand for family planning is heavily
driven by the ready availability of the services; thus site-based services may not be popular and may not be utilized. In a later study, Bates, Islam, Schuler and Al-Kabir (2003) also expressed concern that the demand for contraceptives among those who, for various reasons, are unwilling to unable to access the health service site, may simply remain hidden if field-workers stop home visitations.

However, one major motivation behind programs such as CORHP is concern about the sustainability of the household delivery system. New site-based programs like CORHP are expected to be more manageable in the long term. The doorstep delivery system was both time-consuming and labor intensive. As mentioned earlier, the dense rural population and the declining donor support implies that program costs are becoming an increasingly large burden on the country. Despite the success of family planning in the last two decades, population momentum will cause the proportion of fecund population to increase before finally decreasing. This implies a larger demand for the family planning and a need for more field-workers. A site-based delivery system will resolve the problem of growing labor costs, and also allow resources to be channeled into quality improvements (JOICFP, n.d.).

Furthermore, two rural studies conducted by Ashraf, Khuda, Routh and Stoeckel (2001) contribute to the hypothesis that site-based systems are not only more efficient, but do indeed improve several aspects of reproductive health, rather than simply curbing fertility. They suggest that site-based delivery, by providing ready access to contraceptives for all women, may even increase contraceptive prevalence. This is
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supported by Caldwell and Khuda (2000) and Caldwell et al. (1999) who found that, contrary to Arend-Kuenning, the demand for contraceptives was driven by both observable and non-observable socioeconomic factors, and were not affected by the home visitations of field-workers.

Harvey (1996) points out another concern with programs such as CORHP. He argues that an overemphasis on reproductive health may be counter-productive. According to him, programs advocating reproductive health are necessarily more expensive because they “require the involvement of trained health workers who must deal with each client face-to-face” and given limited resources, programs focusing on reproductive health may be “depriving many thousands of deserving couples [the contraceptives] that may do most to improve their ‘reproductive health’ (p. 284).

Clearly, for CORHP to be an effective model for long-term national program in improving reproductive health, it has to be an adequate substitute for household delivery systems. Many authors (for example Arends-Kruenning, 2001; and Caldwell, Caldwell, Caldwell, Khuda and Pieris, 1999) have recommended a mixed system of household and site-based services. However, these are expected to be costly to maintain. Secondly, CORHP also has to adopt a realistic definition of reproductive health. As Garcia-Moreno and Turmen (1995) noted, the needs of every country are different and reproductive health should be considered in their respective contexts. However, CORHP offers no clear definition or measurement method for its objectives for reproductive health (JICA, n.d.). While the ESP offers an indication of the services that need to be provided, policy
effectiveness is still measured generally in terms of fertility and population growth. While this may not be a problem for a short-term project such as CORHP, it may pose a challenge to designing feasible nationwide programs.

The outcome of the CORHP has several implications for the next phase of Bangladesh’s population and development policy. First, it should provide an indication of whether site-based facilities are an adequate substitute for the door-step delivery system, particularly in the rural areas. By analyzing different aspects of reproductive health, this paper allows policymakers to identify areas that are still lacking or are in need of reform. Although this paper does not examine the cost-effectiveness of the project, especially if it were to be implemented as a nation-wide program, the outcome of the CORHP offers valuable insight into the design of sustainable family planning programs in Bangladesh.

This paper also contributes to debate on reproductive health. Again, by breaking down reproductive health into different aspects, it is easier to single out challenges in the practical application of a broad, comprehensive concept. Furthermore, this paper provides a stepping-stone for future research on the link between reproductive health and the status of women. A better understanding of this relationship will allow policymakers to develop more appropriate policies that improve the well-being of women, and also the population in general.

Finally, an effective community-operated reproductive health program may contain some best practices that may be adopted in other developing countries facing similar burdens from population growth. With the worldwide decrease in mortality and increase
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in life expectancy, many developing countries are just entering the demographic transition. As fertility declines more slowly than mortality, baby booms similar to that in Bangladesh can be expected to rapidly increase population in these countries. Especially for countries with low socioeconomic development, lessons learned from the Bangladesh experience will provide valuable information on the development of effective and sustainable programs to improve the reproductive health of populations.

Research Methodology

To assess the effectiveness of CORHP, this paper examines the overall reproductive health of women who have received services provided by the program and compared to those who have not. The working hypothesis is that CORHP improves reproductive health. Thus, if effective, the CORHP contributes to the 2015 target elements of reproductive health, in addition to lowering fertility to meet the country’s population needs.

Since reproductive health is a broad and comprehensive concept, this paper tests the three elements of reproductive health which are most consistent with the target areas of the project. Exhibit 1 shows the five dependent variables of interest and their corresponding elements of reproductive health. Descriptions of all the variables used in each equation are found in Appendix 1.
Exhibit 1: Measures of Reproductive Health

<table>
<thead>
<tr>
<th>Name</th>
<th>Variable</th>
<th>Element of Reproductive Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>unmet</td>
<td>Unmet need</td>
<td>Contraceptive information and services</td>
</tr>
<tr>
<td>contra</td>
<td>Rate of modern contraception use</td>
<td>Contraceptive information and services</td>
</tr>
<tr>
<td>stiknow</td>
<td>Knowledge of STIs</td>
<td>Prevention of STIs</td>
</tr>
<tr>
<td>mother</td>
<td>Maternal health</td>
<td>Prenatal, antenatal and postnatal care</td>
</tr>
<tr>
<td>child</td>
<td>Infant health</td>
<td>Prenatal, antenatal and postnatal care</td>
</tr>
</tbody>
</table>

The equation for reproductive health is estimated by the following general model:

\[ RH = \hat{\beta}_0 + \hat{\beta}_1 CORHP + \hat{\beta}_2 X_2 + \ldots + \hat{\beta}_j X_j + u \]

where RH represents reproductive health and CORHP represents participation in the program. \( X_1 \) to \( X_j \) represent standard variables added to the model to control for socioeconomic and demographic differences in the women, namely, age, education, religion and income. Since close to 100 percent of the sample is Muslim, the religion variable is omitted from the tests in this paper.

The impact of CORHP is tested in a separate regression for each element of reproductive health. Since all the measures are binary variables, a logistic model is used to evaluate the probability of seeing differences in reproductive health between the women who utilize the CORHP and those who do not. Thus, the dependent \( RH \) variable in the general model is substituted with each measure, forming the following 5 equations:

\[ P(RH = 1 \mid CORHP) = \frac{1}{1 + e^{-f(x)}} \]

where \( f(x) = \hat{\beta}_0 + \hat{\beta}_1 CORHP + \hat{\beta}_2 X_2 + \ldots + \hat{\beta}_j X_j + u \)
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\[ P(\text{unmet} = 1 | \text{corhp}) = \frac{1}{1 + e^{-f(x)}} \]  
\[ \text{... Equation 1} \]

\[ P(\text{contra} = 1 | \text{corhp}) = \frac{1}{1 + e^{-f(x)}} \]  
\[ \text{... Equation 2} \]

\[ P(\text{stiknow} = 1 | \text{corhp}) = \frac{1}{1 + e^{-f(x)}} \]  
\[ \text{... Equation 3} \]

\[ P(\text{mother} = 1 | \text{corhp}) = \frac{1}{1 + e^{-f(x)}} \]  
\[ \text{... Equation 4} \]

\[ P(\text{child} = 1 | \text{corhp}) = \frac{1}{1 + e^{-f(x)}} \]  
\[ \text{... Equation 5} \]

The primary measure of reproductive health is a woman’s unmet need for family planning, tested in Equation 1. Unmet need is defined as the gap between a woman’s demand for family planning, either for spacing or limiting births, and the actual fulfillment of her demand. Similarly, a woman with no unmet need (met need) has successfully been able to space or limit the number of births she has. Thus, if CORHP were successful, unmet need can be expected to be lower among the treatment group. This is a more appropriate measure for family planning than contraceptive use which simply considers the rate of use, without taking the possible shortage of contraceptives in the market into account.

In contrast, Equation 2 measures the rate of modern contraceptive use. While a less suitable measure for reproductive health than unmet need, assessing disparity in modern contraceptive usage among CORHP users and non-users is useful in evaluating the impact of the shift in government policy. Finding no significant differences or increases in contraceptive use suggests that the CORHP is an adequate substitute for the home-
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delivery system in the aspect of supplying contraceptives. Consequently, it implies that
problems related accessibility to site-based facilities may not be significant concerns. If
CORHP is found to lower contraceptive use but increase unmet need, it could suggest
that reproductive health is efficient in decreasing fertility through other means such as
education and rights advocacy.

Equation 3 estimates the impact of CORHP on a woman’s knowledge of sexually-
transmitted infections (STI). While most married persons in Bangladesh appear to have
some knowledge about HIV/AIDS, as much as 93.5 percent of ever-married women have
no knowledge of STIs other than HIV/AIDS (NIPORT, et. al, 2005: p.185-201). Thus, it
is important to see if CORHP was effective in education and promoting awareness.

Finally, Equations 5 and 6 estimate the health impacts of CORHP by looking at
both maternal and infant health. Equation 5 uses experience of complications around
delivery to measure maternal health; Equation 6 uses infant mortality – mortality within
the first twelve months of birth – to measure infant health. Again, since the CORHP
improves the health of both mother and child, the relationship between participation and
health should be positive.

There are several concerns and limitations in this model. Firstly, the model is
heteroskedastic, due to the nature of the logistic regression. A concern with the model is
the possibility of selection bias in the sample data. Since the CORHP employs a less
aggressive approach to family planning compared with the domiciliary delivery system,
the propensity of women to not utilize it may be higher. In other words, women who
either voluntarily or involuntarily decide not to use CORHP services may be
systematically different from those who use it. Some of the problem may be resolved by
controlling for such characteristics.

Similarly, this paper assumes a homogenous population and dependence of
improved reproductive health on participation in CORHP. However, it should be noted
that there might be simultaneity between the independent variables and the use of
CORHP services. In other words, while the model assumes that the CORHP variable is
exogenous and independent of reproductive health, it could in reality be partially affected
by the various tested components of reproductive health. For example, women with more
pregnancy complications and need more prenatal care may be more likely to utilize the
CORHP facilities, as might women with a higher unmet need and demand for
contraceptives.

Finally, it is important to exercise caution when drawing conclusions that generalize
the wider population because only one rural area is examined and because the degree of
government influence in the project is unknown. Ignoring any regional differences in
population characteristics and demography, without information about the amount of
control the Bangladesh government had over the design and implementation, it is unclear
whether site-based reproductive health projects run by the government or by other NGOs
will have similar results. Further, although the site-based service may be less costly than
door-to-door deliveries, it is also unclear if the Bangladesh government can maintain the
same level of services on a larger scale without donor sponsorship.
Nonetheless, this does not imply that CORHP is completely irrelevant. The project is designed in line with the government population policy and HPSP, together with the Family Planning Association of Bangladesh. It fulfills the guidelines and standards set by the government and thus shares a certain amount of characteristics with any other projects of similar nature. Furthermore, by looking at various aspects of reproductive health, this paper identifies where the new approach may be most effective with regards to the rural population of Bangladesh.

Data and Findings

The data is obtained from the 2004 Bangladesh Demographic and Health Survey (BDHS). It contains a comprehensive set of information on the demographic, health and socioeconomic status of the ever-married females and their children. The timing of the dataset is appropriate. The survey was administered and completed in the last six months of 2004. Since CORHP ended in March, 2004, the absence of a long lag allows immediate impacts of CORHP to be measured.

However, one main problem with using this dataset is that it does not have exact information whether individual respondents used CORHP. Thus, this information has to be inferred from the behavior of respondents. Since government-led family planning services in Bangladesh, particularly in the rural areas, have focused specifically on home visitations by family planning workers and the distribution and promotion of condom-use,

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users of CORHP can be identified by selecting those who have received site-based care over the three years. This includes care at a temporary health facility, a satellite clinic or a mobile clinic, all of which are services provided by the CORHP.

A sample of 1464 ever-married females between ages 10 and 49, currently residing in rural Dhaka were analyzed. Since this is the reproductive age group, it is the target population for CORHP. As shown in Table 2, the average woman in the sample is about 30 years old, has nearly 3 years of education and falls in the lower-middle income group. CORHP users make up about one quarter of the sample, are about 6 years younger and have about 2 years more education than the average non-user.

Table 2: Characteristics of Women in the Sample

<table>
<thead>
<tr>
<th></th>
<th>All Women</th>
<th>CORHP User</th>
<th>CORHP Non-User</th>
</tr>
</thead>
<tbody>
<tr>
<td>mean</td>
<td>mean</td>
<td>mean</td>
<td>mean</td>
</tr>
<tr>
<td>s.d.*</td>
<td>s.d.*</td>
<td>s.d.*</td>
<td>s.d.*</td>
</tr>
<tr>
<td>age</td>
<td>29.8</td>
<td>25.2</td>
<td>31.3</td>
</tr>
<tr>
<td>education</td>
<td>2.8</td>
<td>4.2</td>
<td>2.4</td>
</tr>
<tr>
<td>wealth index</td>
<td>2.6</td>
<td>2.7</td>
<td>2.5</td>
</tr>
</tbody>
</table>

*standard deviations

Table 3a shows the unmet need of the women in the sample by their use of CORHP. Failure refers to a contraceptive failure during an attempt to have family planning and no need refers to women with no demand for family planning. In this study, contraceptive failure is considered an unmet need and no need is considered a met need. Only 13.5 percent of the sample population’s needs are not being met, and a larger share of them do not use CORHP. However, on a relative sense, CORHP users have more unmet needs, whereby 2 in 10 CORHP users have unmet needs compared to only 1 in 10 in non-users (Table 3b).
Table 3a: Distribution of Sample, by CORHP Participation and by whether Needs were Met (percentage)

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>CORHP User</th>
<th>CORHP Non-User</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>100</td>
<td>24.6</td>
<td>75.5</td>
</tr>
<tr>
<td>Met</td>
<td>86.5</td>
<td>19.3</td>
<td>67.3</td>
</tr>
<tr>
<td>Unmet</td>
<td>13.5</td>
<td>5.3</td>
<td>8.2</td>
</tr>
</tbody>
</table>

Table 3b: Distribution of Users and Non-Users of CORHP, by whether or not their Needs were Met

<table>
<thead>
<tr>
<th></th>
<th>CORHP User</th>
<th>CORHP Non-User</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Met Need</td>
<td>78.5%</td>
<td>89.1%</td>
</tr>
<tr>
<td>Unmet Need</td>
<td>21.5%</td>
<td>10.9%</td>
</tr>
</tbody>
</table>

While CORHP users account for only about 25 percent of the population, the prevalence of modern contraceptives is relatively higher among them than CORHP non-users. Similarly, CORHP users in general have higher awareness of STIs (see Table 4).

Table 4: Knowledge and Use of Modern Contraceptives and Awareness of STIs, by CORHP use (frequency within groups)

<table>
<thead>
<tr>
<th></th>
<th>CORHP User</th>
<th>CORHP Non-User</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge of modern methods</td>
<td>yes 100%</td>
<td>no 0</td>
</tr>
<tr>
<td></td>
<td>yes 100%</td>
<td>No 0</td>
</tr>
<tr>
<td>Use of modern methods</td>
<td>81.8%</td>
<td>18.2%</td>
</tr>
<tr>
<td></td>
<td>73.9%</td>
<td>26.1%</td>
</tr>
<tr>
<td>Awareness of STD</td>
<td>69.8%</td>
<td>30.2%</td>
</tr>
<tr>
<td></td>
<td>52.3%</td>
<td>47.7%</td>
</tr>
</tbody>
</table>

This preliminary assessment of the data suggests that while CORHP may not have reached a large number of users, and does not necessarily improve unmet needs for family planning, it has an impact on the education and awareness of the women who do utilize the facilities.
A correlation analysis is useful in understanding the direction of the relationships between CORHP and each element of reproductive health. Since it is possible that participation in CORHP is highly related with other independent variables, for example users of CORHP are relatively younger than non-users, there is also some concern of multicollinearity in the model. However, the correlation analysis in Table 5 shows that CORHP, the key independent variable, is not strongly correlated with any of the other independent variables; none of the independent variables are related to each other. Thus, the data do not exhibit multicollinearity. A full correlation matrix of all the variables used is shown in Appendix 2.

Table 5: Correlation between CORHP variable and other variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Pearson’s Rho*</th>
</tr>
</thead>
<tbody>
<tr>
<td>unmet</td>
<td>.08</td>
<td>.0021</td>
</tr>
<tr>
<td>contra</td>
<td>.03</td>
<td>.1869</td>
</tr>
<tr>
<td>stiknow</td>
<td>.15</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>mother</td>
<td>.19</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>child</td>
<td>.46</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>age</td>
<td>-.28</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>educ</td>
<td>.23</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>wealthidx</td>
<td>.07</td>
<td>.005</td>
</tr>
</tbody>
</table>

*Prob > |r| under H₀: Rho=0

The correlation coefficients do, however, reveal some interesting dynamics. Participation in CORHP is weakly related with unmet need, knowledge of STIs and maternal complications. All three show a positive correlation, indicating that the use of CORHP is associated with higher unmet needs, greater awareness of STIs and a higher level of maternal complications during pregnancy. Similarly, the association between
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CORHP with infant mortality is also moderately positive ($r=0.46$) and is highly significant. The correlation between CORHP participation and use of modern contraceptives was not statistically significant, suggesting that both CORHP users and non-users have similar access and rate of use of contraceptives.

Simple correlations help in the understanding of the relationship between CORHP and each variable of reproductive health. Regression analysis, on the other hand, helps to isolate the effect of CORHP participation on reproductive health by controlling for variables that are likely to affect both CORHP participation and reproductive health. Using regression analysis, controlling for socioeconomic factors of age, education and income, participation in CORHP was found to have varying results on different measures of reproductive health, indicating that the project has been more effective in some areas of reproductive health than others. Take-up of the program appears to be highest among those who need the services most, in other words, those with poorer reproductive health. Thus, the impact of the project on general reproductive health is hard to determine.

In the first model, the hypothesis that participation in CORHP improves contraceptive information and services is tested. Both the level of unmet need and use of modern contraceptives are used to measure the likelihood of improved contraceptive information and services with CORHP participation. Table 6 shows the result from the logistic regression of unmet need on CORHP and Table 7 shows the result of the regression using CORHP to predict contraceptive use, holding other variables constant.
CORHP was expected to reduce the likelihood of having unmet need for spacing or birth limiting. Even after controlling for age, education and income, the model is weak and explains only 4.2 percent of the variation in unmet need. However, the relationship is highly significant ($p<0.0001$), suggesting that women who participate in CORHP are more likely to have a higher unmet need than women who do not.

While this result contrary to the expected outcome, it is possible that the CORHP facility is utilized more by women who require reproductive health services. Results for
other measures of reproductive health tested in this study also suggest a similar pattern of use, as illustrated later in this section. In particular, for unmet need, it is likely that women who use the CORHP facilities are those who have failed to receive the necessary contraceptive information and services and thus required further reproductive health attention from the CORHP facilities.

The second measure for contraceptive information and services predicts that participation in CORHP does not significantly change the likelihood of having better access to modern contraceptives. The model is very weak, indicating there are many other unexplained factors important to predicting contraceptive use that are not identified here. Nonetheless, it could imply that there is no difference between contraceptive use for CORHP users and non-users., which is an indication that the CORHP is no better or worse than the former household delivery system in the provision of contraceptives. Contrary to the findings of Bates, Islam, Schuler and Al-Kabir (2003), the demand for contraceptives appear to be driven more by a desire to have fewer children, and not the access to contraceptives or the persuasion of family workers (Bates, Islam and Shuler, 2001). Thus, site-based programs such as CORHP to reduce fertility rates may warrant further study.

The association between participation in CORHP and awareness of sexually transmitted infections is found to be weak. Results of the regression are shown in Table 8. The model was statistically significant based on the Wald statistic and explained about 33 percent of the variation in STI awareness. However, CORHP participation was
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significant only at the 90 percent level (p=0.0639). In contrast, age, education and income
status were highly significant predictors of STI knowledge. The model predicted that age
decreased the odds of knowledge about STIs, a positive sign that awareness of infections
is increasingly widespread among the younger generation. Further, it predicted that
higher education and higher income levels increased the odds of STIs awareness.

Table 8: Logistic Regression Predicting STI Knowledge from CORHP Participation

<table>
<thead>
<tr>
<th>Predictor</th>
<th>$\beta$</th>
<th>Wald $\chi^2$</th>
<th>$p$</th>
<th>Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>corhp</td>
<td>0.29</td>
<td>3.43</td>
<td>0.0639</td>
<td>1.33</td>
</tr>
<tr>
<td></td>
<td>(.15)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>age</td>
<td>-0.02</td>
<td>7.93</td>
<td>0.0049</td>
<td>0.98</td>
</tr>
<tr>
<td></td>
<td>(.01)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>education</td>
<td>0.22</td>
<td>78.88</td>
<td>&lt;0.0001</td>
<td>1.25</td>
</tr>
<tr>
<td></td>
<td>(.03)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>income</td>
<td>0.57</td>
<td>101.78</td>
<td>&lt;0.0001</td>
<td>1.77</td>
</tr>
<tr>
<td></td>
<td>(.06)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$N = 1464; d.f. = 4;$
$Maximum Rescaled R^2 = .3284; Likelihood Ratio = 411.20 (p < .0001); Wald \chi^2 = 278.84 (p < .0001)$

With regards to the reproductive health element of prenatal, antenatal and
postnatal care, CORHP participation is significantly related to both measures used in the
model, namely maternal complications experienced and infant mortality (see Tables 9
and 10). However, the predicted outcomes of the relationships between CORHP and both
maternal complications and infant mortality are unexpectedly positive: CORHP
participation is associated with greater maternal complications and infant mortality. As
with case of unmet need, these results suggest that women with more reproductive health
complications are more likely to use the CORHP facilities.
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Table 9: Logistic Regression Predicting Maternal Health from CORHP Participation

<table>
<thead>
<tr>
<th>Predictor</th>
<th>$\beta$</th>
<th>Wald $\chi^2$</th>
<th>$p$</th>
<th>Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>corhp</td>
<td>1.16 (.20)</td>
<td>32.19</td>
<td>&lt; .0001</td>
<td>3.19</td>
</tr>
<tr>
<td>age</td>
<td>-0.06 (.01)</td>
<td>18.90</td>
<td>&lt; .0001</td>
<td>0.94</td>
</tr>
<tr>
<td>education</td>
<td>-0.01 (.04)</td>
<td>0.11</td>
<td>.7416</td>
<td>1.00</td>
</tr>
<tr>
<td>income</td>
<td>-0.21 (.09)</td>
<td>5.16</td>
<td>0.0231</td>
<td>0.81</td>
</tr>
</tbody>
</table>

$N = 1464; \text{d.f.} = 4;\\Maximum \text{Rescaled } R^2 = .1214; \text{Likelihood Ratio} = 78.66 (p < .0001); \text{Wald } \chi^2 = 68.23 (p < .0001)$

Table 9: Logistic Regression Predicting Infant Health from CORHP Participation

<table>
<thead>
<tr>
<th>Predictor</th>
<th>$\beta$</th>
<th>Wald $\chi^2$</th>
<th>$p$</th>
<th>Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>corhp</td>
<td>2.34 (.16)</td>
<td>202.00</td>
<td>&lt; .0001</td>
<td>10.38</td>
</tr>
<tr>
<td>age</td>
<td>-0.12 (.01)</td>
<td>148.50</td>
<td>&lt; .0001</td>
<td>0.89</td>
</tr>
<tr>
<td>education</td>
<td>-0.11 (.03)</td>
<td>18.08</td>
<td>&lt; .0001</td>
<td>0.90</td>
</tr>
<tr>
<td>income</td>
<td>-0.28 (.06)</td>
<td>19.92</td>
<td>&lt; .0001</td>
<td>0.76</td>
</tr>
</tbody>
</table>

$N = 1464; \text{d.f.} = 4;\\Maximum \text{Rescaled } R^2 = .4329; \text{Likelihood Ratio} = 559.08 (p < .0001); \text{Wald } \chi^2 = 339.19 (p < .0001)$

With the exception of the regression on infant health and STI knowledge, the models do not explain much of the variation in reproductive health, reflecting the complexity of biological, demography and socioeconomic factors that affect reproductive health in any one region. In addition, access and use of modern contraceptives, the main instrument of family planning in the household delivery system, appears to be unaffected. Similarly, the concern that an over-emphasis on reproductive health may counter-productive and may deprive couples in need of contraceptives, as highlighted by Harvey (1996), appears to be low.
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Most importantly, the results suggest that site-based facilities like the CORHP may fill a gap in the current family planning system. With the availability of services such as prenatal, antenatal and postnatal care, women with the corresponding reproductive health needs will utilize these services.

Policy Implications

In this paper, the program effects of CORHP on different aspects of reproductive health are examined. Based on the results, CORHP is most effective in the area of providing prenatal, antenatal and postnatal care and somewhat likely to be less effective in promoting awareness of STIs. Also, site-based programs as an adequate substitute for the household delivery program in providing contraceptives and maintaining a low fertility rate warrants further study.

The results suggest that CORHP usage is higher among women experiencing particularly difficult or dangerous pregnancies. This could mean a hidden demand for the services provided by site-based facilities that were not available earlier. Demand for CORHP also appears to be higher among women with unmet need, which could be another gap in the delivery of reproductive health services that the CORHP fills. These findings support the proposition made by donors that site-based facilities are more efficient because they are able to provide a broader range of services and have better coverage than the household delivery system.
Another area for further study is the notion that the recent stabilization of fertility rates around 3.3 could be the result of family preferences and desires, rather changes in the family planning programs. The shift in policy does not appear to have affected the rate of contraceptive use. This implies that the demand for contraceptives among Bangladeshi households is consumer-driven and not affected by the policy change. Consequently, a move from the household delivery to the site-based system of family planning may be a viable policy option.

Furthermore, while rising labor costs and diminishing funding for the household delivery system have been the main reasons to force the government into looking for alternative family planning programs, it is unclear if CORHP can remain sustainable without donor funding. In a report presented to JOICFP (Evaluation Survey on Community-operated Reproductive Health Project, 2003), similar concerns were expressed about achieving sustainability in a short time. Nonetheless, the report was optimistic, citing increased community involvement and the success of the concurrent micro-credit program as instruments aiding cost recovery in the long run.

In addition to sustainability, the second major challenge of implementing programs such as CORHP remains the accessibility of the facilities. This study does not address the possibility of certain groups of women, such as those with lower income or fewer means of transportation to the clinic, being more marginalized than others, thus leading to the need for a combination of both systems, as suggested by authors such as Arends-Kuenning (2001). Evaluations of other site-based programs in rural Bangladesh will
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provide useful information for this, and can also bring out differences in the effectiveness of programs implemented by the government and by different NGOs.
Appendix 1: Description of variables

### Dependent Variables

<table>
<thead>
<tr>
<th>Name</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>unmet</td>
<td>1 if unmet need exists; includes individuals with unmet need and failed attempts at spacing of births</td>
</tr>
<tr>
<td>contra</td>
<td>1 if individual is currently using modern contraceptives</td>
</tr>
<tr>
<td>stiknow</td>
<td>1 if individual has knowledge of STIs</td>
</tr>
<tr>
<td>mother</td>
<td>1 if individual experienced complications during pregnancy</td>
</tr>
<tr>
<td>child</td>
<td>1 if child born between 2001 and 2004 died in infancy (within 1 year of birth)</td>
</tr>
</tbody>
</table>

### Independent Variables

<table>
<thead>
<tr>
<th>Name</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>corhp</td>
<td>1 if individual participated in CORHP in the last 50 months</td>
</tr>
<tr>
<td>age</td>
<td>age in years</td>
</tr>
<tr>
<td>educ</td>
<td>years of formal education received</td>
</tr>
</tbody>
</table>
| wthindx* | index calculated from wealth score; ranges from 1 to 5:  
|        | 1=poorest, 2=poor, 3=average; 4=rich; 5=richest                             |

* The wealth index is based on a calculated wealth score, which ranges from 1 (poorest) to 5 (richest). Since no data were collected on the income level of each household in the survey, the dataset provides an estimate of the relative incomes of households. These values are obtained by indexing variables such as ownership of land and household durable goods such as radios, televisions and telephones. To resolve potential problems that arise from treating all durable goods nominally by assuming equal values for all durable goods, each asset is assigned a weight and resulting asset scores are standardized and summed to create a wealth score for each household (Gwatkin, Johnson, Rutstein, Pande and Wagstaff, 2000).

### Mean Values of Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>unmet*</td>
<td>.072</td>
<td>.259</td>
</tr>
<tr>
<td>contraceptive use*</td>
<td>.442</td>
<td>.497</td>
</tr>
<tr>
<td>STI knowledge*</td>
<td>.566</td>
<td>.496</td>
</tr>
<tr>
<td>maternal complications*</td>
<td>.081</td>
<td>.273</td>
</tr>
<tr>
<td>child mortality*</td>
<td>.374</td>
<td>.484</td>
</tr>
<tr>
<td>CORHP*</td>
<td>.245</td>
<td>.430</td>
</tr>
<tr>
<td>age</td>
<td>29.82</td>
<td>9.39</td>
</tr>
<tr>
<td>education</td>
<td>2.82</td>
<td>3.44</td>
</tr>
<tr>
<td>income (wealth index)</td>
<td>2.57</td>
<td>1.27</td>
</tr>
</tbody>
</table>

* indicator variables taking values (0,1)
Appendix 2: Correlation Matrix of All Variables

<table>
<thead>
<tr>
<th></th>
<th>corhp</th>
<th>unmet</th>
<th>contra</th>
<th>stiknow</th>
<th>mother</th>
<th>child</th>
<th>age</th>
<th>educ</th>
<th>wthindx</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>corhp</strong></td>
<td>-</td>
<td>0.08</td>
<td>0.03</td>
<td>0.15</td>
<td>0.19</td>
<td>0.46</td>
<td>-0.28</td>
<td>0.23</td>
<td>0.07</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.0021</td>
<td>0.1869</td>
<td>&lt;.0001</td>
<td>&lt;.0001</td>
<td>&lt;.0001</td>
<td>&lt;.0001</td>
<td>&lt;.0001</td>
<td>0.0050</td>
</tr>
<tr>
<td><strong>unmet</strong></td>
<td>-</td>
<td>-0.25</td>
<td>0.0003</td>
<td>0.06</td>
<td>0.09</td>
<td>0.04</td>
<td>-0.07</td>
<td>-0.09</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt;.0001</td>
<td>0.9920</td>
<td>0.0185</td>
<td>0.0003</td>
<td>0.0914</td>
<td>0.0075</td>
<td>0.7243</td>
<td></td>
</tr>
<tr>
<td><strong>contra</strong></td>
<td>-</td>
<td>0.04</td>
<td>0.04</td>
<td>0.04</td>
<td>0.04</td>
<td>0.001</td>
<td>-0.04</td>
<td>0.01</td>
<td>0.6209</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.1097</td>
<td>0.1538</td>
<td>0.1210</td>
<td>0.9548</td>
<td>0.0997</td>
<td>0.6209</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>stiknow</strong></td>
<td>-</td>
<td>-0.03</td>
<td>-0.03</td>
<td>-0.18</td>
<td>-0.16</td>
<td>0.04</td>
<td>-0.06</td>
<td>0.39</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.2242</td>
<td>0.1779</td>
<td>&lt;.0001</td>
<td>&lt;.0001</td>
<td>0.0998</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>mother</strong></td>
<td>-</td>
<td>0.39</td>
<td>0.39</td>
<td>0.06</td>
<td>0.06</td>
<td>0.06</td>
<td>-0.14</td>
<td>-0.14</td>
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<tr>
<td></td>
<td></td>
<td>&lt;.0001</td>
<td>&lt;.0001</td>
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<td>&lt;.0001</td>
<td>&lt;.0001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>child</strong></td>
<td>-</td>
<td>-0.42</td>
<td>0.06</td>
<td>-0.36</td>
<td>0.05</td>
<td>-0.44</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt;.0001</td>
<td>0.0320</td>
<td>&lt;.0001</td>
<td>0.0425</td>
<td>&lt;.0001</td>
<td></td>
<td></td>
<td></td>
</tr>
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<td><strong>age</strong></td>
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<td>-</td>
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<td>0.44</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>educ</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.44</td>
<td>0.44</td>
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<tr>
<td></td>
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<td></td>
<td></td>
<td>&lt;.0001</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>wthindx</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
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<td>&lt;.0001</td>
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</tbody>
</table>


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