Overcoming Gender-based Constraints to Utilization of Maternal and Child Health Services in Pakistan: The Role of the Doorstep Delivery System

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Abstract:

In Pakistan, as elsewhere in South Asia, there are significant gender differentials in health outcomes which are attributable to inadequacies in health services, as well as gender-based constraints to service utilization. For example, we show that more strenuous efforts are made to seek health care for males than for females, in both childhood and adulthood. For maternal and child health services, constraints on women's mobility and access to information pose serious hurdles to using services even when they are available.

A program for doorstep delivery of health services is in place in Pakistan, to help improve women's access to health services. Using nationally representative household survey data from 2001-02, we find that this program significantly increases the use of those maternal and child health services for which the program is directly responsible, indicating that this is a successful approach to alleviate gender-based constraints to the utilization of MCH services. However, we also find that the program could be far more effective if it coordinated better with the system of health clinics.

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1) INTRODUCTION

Despite recent improvements in women's health and reproductive outcomes and decline in fertility to less than 5 births per woman, maternal mortality and under-five mortality remain high in Pakistan (World Bank, 2005, Sathar and Casterline, 1998). For example, in the late 1990s the maternal mortality ratio was estimated to be 500 deaths per 100,000 live births[1] while the under-five mortality rate was close to 103 deaths per 1000 live births[2]. These poor health outcomes can be attributed partly to very low rates of utilization of maternal and child health services. For example, in 2001-02, only 35 percent of new mothers received antenatal care and more than 70 percent of all births took place at home, largely in the absence of a trained attendant.

While inadequate access to clinics and poor quality of services explain a large part of this low utilization of services, gender-based constraints to service utilization are also an important factor. For example, we show that more strenuous efforts are made to seek health care for males than for females, in both childhood and adulthood. For maternal and child health services, constraints on women's mobility pose serious hurdles to using services even when they are available.

Recognizing such gender-based constraints, the government introduced a doorstep delivery of services program in 1994. The key feature of this mainly rural program is home visits by trained educated women, called Lady Health Workers, to offer married women of reproductive age, health and family planning services.

Such doorstep delivery systems have been tried with varying degrees of success in Sri Lanka, Bangladesh, India and elsewhere in the developing world (Berman, Gwatkin and Berger, 1987). Sri Lanka's Public Health Midwives and Bangladesh's Female Health Workers have been credited with dramatic improvements in maternal mortality (in Sri Lanka) and sharp drops in fertility (in Bangladesh and Sri Lanka) (Pathmanathan et al, 2003, Phillips and Hossain, 1998, Arends-Kuenning, 2002). But such programs can be costly — one reason for the recent movement away from the reliance on female field workers in Bangladesh — and coordination with other health service delivery structures can be difficult (Arends-Kuenning, 2002, DHS report reference, Barkat-e-Khuda). Finally, such programs have been open to the charge that they do little to empower women because they do not encourage women to step out of their homes to access services (Schuler, Hashemi and Jenkins, 1995).

Using nationally representative household survey data from 2001-02, we show that gender based constraints, mainly limited mobility, very low levels of female education and the consequent low level of information among women, reduce rural women's use of maternal and child health services. We also show that, controlling for distance to health clinic and a variety of household and community characteristics, the presence of a Lady Health Worker (LHW) significantly increases the use of some MCH services but not all. Moreover, both educated and uneducated women benefit from the services of the Lady Health Workers. We conclude that LHW program can do much to alleviate gender based constraints to the utilization of MCH services. But there are some issues with the program. There is evidence of a lack of coordination between the field workers and the health clinics which adversely affects women's utilization of health services. Also, the required educational qualifications for LHWs means that communities

[1] The estimates in this paragraph are taken from WHO, UNICEF and UNFPA (2004), Table 4 and Annex Table G. Due to the paucity of data, estimates of maternal mortality for most developing countries are subject to a wide confidence interval. However, it seems clear that the ratios are very high in Pakistan by world standards.

[2] Pakistan Reproductive Health and Family Planning Survey 2000-01.

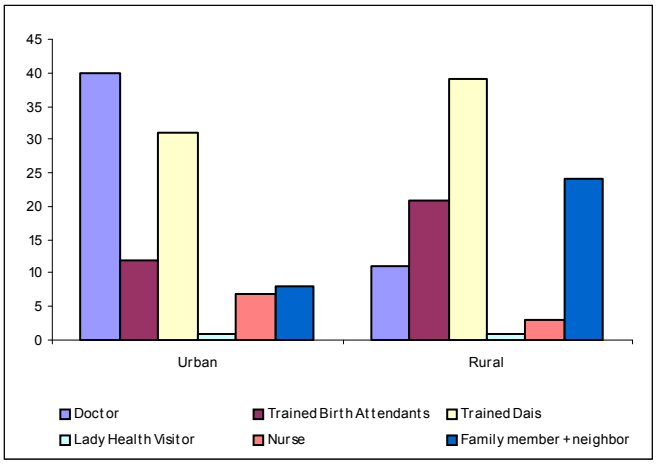
with a high percentage of educated women are more likely to have the LHW program and this poses a serious challenge to the program's ability to reach women living in less developed communities who are most in need of doorstep delivery of services.

2) UTILIZATION OF MATERNAL AND CHILD HEALTH SERVICES

Maternal and child health outcomes are greatly influenced by the quality of care during pregnancy, delivery, and after delivery. This is especially important under conditions of repeated childbearing by women who are in poor overall health. The Pakistan Integrated Household Survey (PIHS) 2001-02 data indicate that the proportions of women receiving good maternal care have risen slowly since the 1980s, but these proportions remain far from adequate (World Bank, 2005). According to PIHS 2001-02, only 35 percent of women in Pakistan reported receiving antenatal care during their most recent pregnancy, which represents only a 17-percent increase from the late 1980s. Coverage is particularly low in rural areas with only 26 percent of women accessing antenatal care. During their most recent pregnancy, 41 percent of women received tetanus toxoid immunization. Encouragingly, coverage expanded during the 1990s by 40 percent overall, and by 70 percent in rural areas.

Nearly four out of five births in Pakistan during 1998-2001 took place at home. In urban areas, nearly one-half of deliveries occurred in institutions, but in rural areas 86 percent of deliveries occurred at home. The proportion of institutional deliveries rose by only 8 percent from the late 1980s. The risks of home delivery have potentially been diminished by programs to provide various types of trained birth attendants. As a result, few births in urban areas of Pakistan take place without a trained person, and only one-quarter of births in rural areas are attended solely by family members / neighbors (Figure 1). We have no information on the trend in the proportion of births attended by trained traditional midwives (*dais*), but there has been little overall change in the proportion of births attended by trained birth attendants (TBAs). Levels of postnatal care are very low, even in urban areas.

Figure 1: Percentage of Births Assisted by Type of Attendant, 1998-2001



Source: PIHS 2001-02. The data are for births in the three years prior to the survey.
Note: Dais are traditional birth attendants. While PIHS asked about whether Lady Health Workers attended any births, no woman reported the presence of these workers during birth.

Turning to child health, childhood immunization coverage rose significantly during the 1990s, as a result of the efforts undertaken through the Expanded Program on Immunization (EPI). By 2001-02, over 50 percent of children aged 12-23 months were "fully immunized," i.e., they had received the full course of recommended vaccinations against tuberculosis, diphtheria, pertussis, tetanus, measles, and polio. As immunization coverage increased during the 1990s, the gender gap in immunization coverage narrowed (World Bank 2005, Hazarika, 2000). Substantial gender gaps remain only in rural Sindh and urban NWFP. This is probably attributable to

heightened efforts to make bring free immunization to people's doorsteps through health worker outreach, as well as through immunization camps.

In sum, not only are health and nutrition levels low in Pakistan, but *over and above this,* females face additional health disadvantages. They enter their childbearing lives carrying the burdens of deprivation during childhood and adolescence. Their health reserves are further drained by repeated childbearing and inadequate care during pregnancy, childbirth, and the postnatal period. The resultant cumulative depletion takes its toll in high maternal morbidity and mortality, and in poor health outcomes for their children.

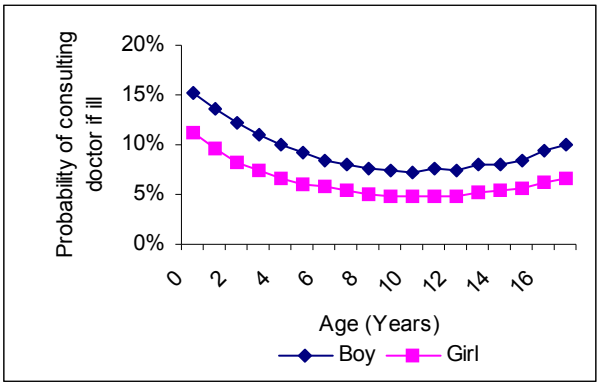
3) GENDER-BASED CONSTRAINTS TO ACCESSING HEALTH CARE: BIAS AGAINST FEMALES, MOBILITY, DECISION-MAKING, AND ACCESS TO INFORMATION

In Pakistan, as elsewhere in South Asia, there are significant gender differentials in medical care but not in child nutritional outcomes (Chen, Huq and D'souza, 1981, Das Gupta, 1987, Hazarika, 2000, Strauss and Thomas, 1995, Behrman, 1992). Excess female child mortality is also evident: child mortality rates are 24 for girls and only 15 for boys. The United Nations mortality estimates indicate that female children in Pakistan experience 9 percent higher under-five mortality than their brothers.[3] This has also been documented in other parts of South Asia and East Asia, notably India and China, but there is no clear evidence that son preference in Pakistan has yet manifested in sex-selective abortions or female infanticide (World Bank, 2005).

Gender bias in medical expenditure in childhood and adulthood

Data on medical expenditure for household members were not collected in the PIHS. Analysis of data from a survey of rural areas, the Pakistan Rural Household Survey (2001), show that gender differentials in medical care of children are statistically significant, even after controlling for household socioeconomic status, parental education, and distance to health facilities. First, girls' illnesses are significantly less likely to be reported.[4] Second, among all children whose illnesses are reported are significantly less likely to be taken for a medical consultation (figure 2). Third, even if girls are taken for a consultation, less is spent on their medical care than on

Figure 2: Gender Differences in Probability of Consulting a Doctor in Case of Illness



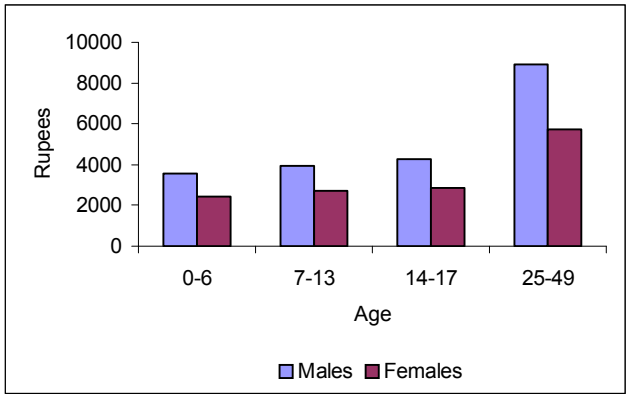
Source: Pakistan Rural Household Survey 2001. The probability of consulting a doctor is predicted from a regression of probability of being ill on child and household characteristics.

[3] *Source*: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, *World Population Prospects: The 2002 Revision* and *World Urbanization Prospects: The 2001 Revision*, http://esa.un.org/unpp

[4] The problems of under-reporting in self-reported morbidity data are well-documented (see for example Murray and Chen). We find that only 11 percent of children aged 0-17 years were reported to have been ill during the year preceding the survey, which implies significant under-reporting. However, this does not necessarily affect our analysis, because there is no reason why there should be differential under-reporting by the gender of the child; such a differential should reflect parents' lesser concern about the illness of children of one gender.

care for boys (figure 3). For example, among 0-6 year olds, parents spent an average of Rs. 3,553 on treatment of boys as compared to Rs. 2,442 for the treatment of girls, a difference of nearly Rs. 1100. Alderman and Gertler (1997) found that rural households in Pakistan were more likely to consult private doctors (considered to be of higher quality) for boys than for girls. They also found that the use of medical care for girls was more sensitive to the price of services. We find that this gender differential on medical care is also evident during adolescence and adulthood. For the 25-49 age group, the difference in medical expenditures is close to Rs. 3,200.

Figure 3: Rural Households' Annual Average Medical Expenditure by Age and Sex



Note: The gender differences in expenditures are statistically significant.
Source: Cross-tabulations based on Pakistan Rural Household Survey 2001 data. The figures refer to medical expenditures reported for each household member who had been ill during the year and for whom any medical practitioner was consulted.

Constraints to women's mobility

Gender inequities can restrict women's access to health services in a variety of ways. Women face social constraints in managing their own health and that of their children, although they are largely responsible for domestic management of health: preventing disease by good health and hygiene practices; recognizing illness early and providing home care; seeking medical care when needed; and interpreting and implementing medical instructions. In order to take effective care of their own and their children's health, women need to be well-informed and to be able to act quickly on their perceptions.

A number of studies on women's access to health services in South Asia emphasize women's restricted mobility as a constraint (World Bank, 2005, Dyson and Moore (1983); Durrant and Sathar (2000); Schuler, Hashemi,and Riley (1997); Khan (1998); Mumtaz and Salway (2005). Indeed, for women and girls, having family members (especially male members) accompany them to health facilities, constitutes "social resources" that can greatly improve their utilization of health services (see also Mumtaz and Salway, 2005).

Restrictions on women traveling to a facility do not disappear if a health facility is nearby, but they do become less stringent with proximity (Sathar and Kazi (1997); Khan, 1998; Mumtaz and Salway (2005), World Bank, 2005). Rural women and girls face the most stringent restrictions on mobility if they have to cross the settlement boundary to reach a health care provider.

Another reason why women cannot quickly seek health care is that they are typically not empowered to make independent decisions: husbands and other male elders decide whether or not women may act on their perceived need for health care outside the home. A qualitative study on gender conducted in rural areas of Punjab and Sindh found that women spontaneously raised concerns about access to health services, even though the study did not directly ask about this (World Bank, 2005). As many as 40 percent of respondents stated that the primary constraint to accessing health services was their mobility, and fewer (27 percent) stated that the primary constraint was proximity to the facility. Difficulties getting to the health facility included having to be accompanied by the husband or mother-in-law—even if the treatment was for her children

and not for herself. If there was an emergency health situation and no one around to accompany them, some women said that as a last resort they were permitted to venture outside the household only if they took along one of their children as a guarantee of proper conduct.

Although women are typically the first to perceive their own and their children's health problems, they must first overcome successive hurdles of decision-makers within the household, which can result in significant delays in seeking care and sometimes denial of permission altogether. Delays can be life-threatening for infants experiencing dehydration from diarrhea, and women experiencing complications while giving birth.

The problems of mobility and low decision-making power are compounded by difficulties in accessing the information needed to enable women to access health services in a timely and effective way. Illiteracy rates are high, especially among women, and this in conjunction with limited mobility reduces the opportunities to learn from interacting with the outside world. This problem is partly offset by sources of information within the home or the neighborhood. For example, 40 percent of rural women interviewed in 2000-01 reported watching television, and 36 percent reported listening to the radio (Pakistan Reproductive Health and Family Planning Survey, 2000-01). The messages received from these and other sources are further disseminated through informal social networks. International evidence from countries such as Bangladesh suggests that such social networks can be quite effective in aiding the flow of health-related information among women (Munshi and Myaux 1998; Montgomery, Casterline, and Heiland 2001).

4) THE LADY HEALTH WORKER PROGRAM

The obstacles that women face in seeking timely health care, even if a functioning facility is available nearby and the household can afford the financial costs involved, are considerable. They have to persuade their husband and/or elders that care is needed, obtain permission to seek care, and find someone to accompany them. They also have to know *when* to seek medical care and *what* health services are supposed to be available to them. In such a set up much can be achieved through the doorstep delivery of health services provided through the Lady Health Worker Program.

Overview of the program

The Lady Health Worker (LHW) program (formally called the National Program for Family Planning and Primary Health) seeks to provide active outreach of maternal and child health services. LHWs are contract workers hired by the program, to serve populations of about 1,000. They are residents of the communities they work in, and work out of their home, which makes it easy for them to reach their clients. They are young married women aged 20-50 with at least 8 years of schooling. Their status in the community is enhanced by the fact that their wages were initially set at a level comparable to that of primary school teachers, though their real wages have eroded over time (Oxford Policy Management, 2002). They operate in rural and poor urban areas, and their job is to deliver preventive and promotive health services to women and their children. By 2001, about one-third of rural communities had a LHW in the community, but coverage was low in Balochistan.

The LHW is expected to register all the children under five and married women aged 15-49 in her catchment area, and to provide various services to them. These include providing

essential drugs for treatment of minor ailments (such as diarrhea, malaria, acute respiratory tract infection, and intestinal worms); supplying contraceptives; and identifying those eligible to receive vaccinations and coordinating vaccinator visits to the villages or setting up immunization camps near the villages. Since 2001, more LHWs are being trained to give vaccinations to children and mothers (Government of Pakistan, 2004). They are also expected to motivate and refer women to obtain safe motherhood services (prenatal care, safe delivery, and postnatal care). To this end, LHWs are supposed to coordinate with the nearest primary health care facility, typically called Basic Health Unit (BHU), traditional birth attendant, or other skilled birth attendant. In addition, they are supposed to organize women's groups and health committees in the community to discuss issues related to better health, hygiene, nutrition, sanitation, and family planning (Government of Pakistan, 2004). LHWs also provide hygiene education on drinking water and sanitation, advice on child care and nutrition, and growth monitoring of children.

The LHW program is a national program, centrally funded and directed.[5] Policy formulation and operational planning are done at the federal level. Implementation of this operational plan is the responsibility of the provincial and district program implementation units. These implementation units are staffed either by health department employees who are on deputation to the LHW program or by contract employees. The LHWs are hired, placed, and supervised by the District Implementation Units of the program, with oversight by the Federal and Provincial Implementation Units of the program.

Costs of the program

A 2001 evaluation of the LHW program, calculated larger impact on health outcomes per unit of cost than comparable alternative services provided through the public primary health facilities (Oxford Policy Management, 2002). This same evaluation also found that cost per LHW had dramatically fallen since the program began in 1994. The decline arose partly from declines in the amount spent on supplies and LHW salaries.

Following this review, the program was expanded. By 2004, 70,000 LHWs were working in the field, and further expansion is underway. Punjab will be the greatest beneficiary of the projected expansion, while Balochistan's low coverage will receive much less attention. Part of this interprovincial inequality can be attributed to differences in the availability of qualified women.

Accountability structure and relationship to primary health clinics

The LHWs are not accountable directly to the health facilities. A separate cadre of Lady Health Supervisors (LHS) is employed by the LHW Program on a contract basis to supervise and monitor the LHWs. The 2001 evaluation by Oxford Policy Management found the frequency of supervision was quite high: 70 percent of LHWs had been supervised in the preceding month and 87 percent in the two months preceding the survey. At the same time, the LHW has some relationship with the local primary health care facilities. She is attached to the nearest basic health unit (BHU) or other public primary health facility, which has a say in her selection and trains her.

They are expected to refer patients to these health facilities. They visit the facility periodically to collect supplies and to meet with and report to the Lady Health Supervisor. They do not report to the person in charge of the health facility. The LHW program thus runs through

[5] World Bank (2004a).

the provincial and district departments of health, in cooperation with the local health facilities.

5) IMPACT OF LHW PRESENCE ON USE OF MATERNAL AND CHILD HEALTH SERVICES

Using data from the Pakistan Integrated Household Survey (PIHS) 2001-02 we estimate the impact of LHW availability on households' use of maternal and child health services. The PIHS is a nationwide multipurpose household survey gathered data on household expenditures, consumption and employment, and information from ever-married women aged 15-49 on their pregnancy history, and young children's health. Those who had given birth between 1998 and 2001 were asked about their use of services for antenatal and postnatal care, and for delivery. Currently married women aged 15-49 were also asked about their use of contraceptives. We base our analysis on a sample of currently married women aged 15-49. In the case of maternal health services, our analysis is based on currently married women who had a birth in the three years preceding the survey. In the case of child immunizations, our analysis is based on immunization status of children aged 12-23 months.

Women's use of maternal health and family planning services is influenced by a range of socio-economic characteristics of the woman, her husband, her household, and the community in which she lives, including the availability of health services in the community. We use a Probit model to estimate the impact of LHW presence on women's use of a range of reproductive services for which information was collected in the survey: contraceptive use, antenatal consultations, antenatal tetanus toxoid immunization, postnatal consultations, and delivery in a medical institution. Since the women interviewed in the PIHS belonged to households selected using a two stage stratified random sampling design, we applied sampling weights to the Probit model regression.

Summary Statistics

Summary statistics presented in Table 1 show that rural women are underserved by reproductive health services. Only 10 percent of currently married women used family planning methods. During their last pregnancy in the three years preceding the survey, only 23 percent of women reported using antenatal care services. A higher percentage of mothers (29 percent) had received tetanus toxoid immunization, which is a relatively simple intervention because it can be given over several months of pregnancy. Nearly 90 percent of the births had taken place at home, where complications of delivery cannot be properly handled, and as many as a quarter of all births were attended by only relatives or neighbors — no trained personnel. Postnatal consultations were rare: only 6 percent of women reported having had them.

The generally low level of schooling among rural women and their husbands is evident from the table. Only about 12 percent of women have ever attended school. In stark contrast, 51 percent of husbands have ever attended school. Nearly 11 percent of mothers reported receiving health messages through media in the twelve months preceding the survey. The effective availability of public health care is very low. Only 43 percent of rural women lived in communities with any type of public primary health care facility within five kilometers. About 29 percent of women lived in communities with a Lady Health Worker in the community.

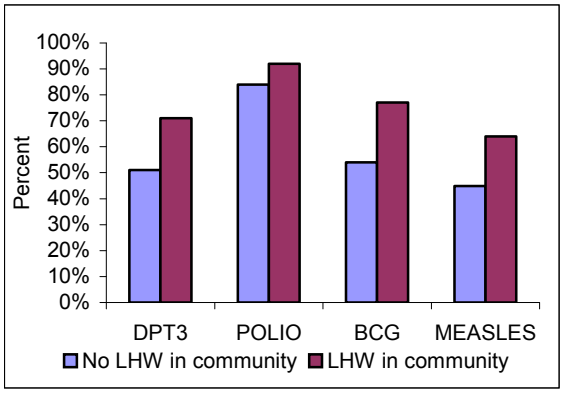
Next, we describe estimation results. The results of our analysis of the impact of LHWs on utilization of maternal and child health (mainly immunization) services are presented in Tables 2 and 3. Before describing the results associated with presence of a LHW in the community, we summarize the impact of two other important determinants, female education and media exposure

to health information, on utilization of maternal health and family planning services.[6] We find that female education and media exposure to health information significantly increase the uptake of maternal health and family planning services. We also find that having health information has a significant impact on service uptake but does not diminish the effect of female education suggesting that health knowledge has a strong impact net of education level. This is similar to the findings of much of the research examining the impact of schooling and health knowledge on uptake of health services (Kenkel, 2000). If, as literature has shown, educated women are better processors of information and are motivated to seek information when they need it (Thomas, Strauss and Henrique, 1991), then mass media health campaigns should have a larger impact on service utilization by uneducated women. However, we find that both uneducated and educated women benefit (through increased service uptake) from receiving health information.

Impact of LHW presence in community

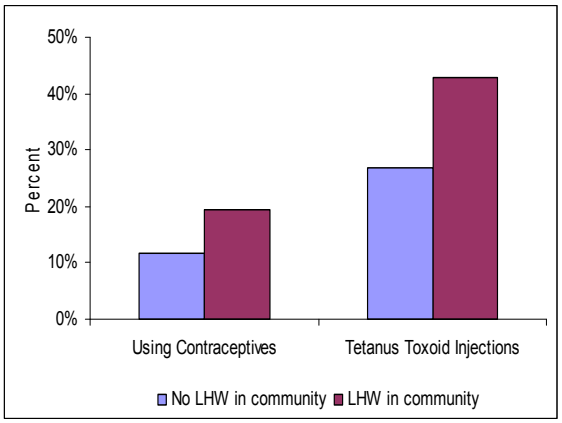
The data indicate that LHWs are effective at delivering the main services for which they are responsible: expanding use of contraception and facilitating the immunization programs for children and pregnant women — but not for expanding the use of other maternal and child health services, as we discuss below (figures 4 and 5). The presence of an LHW appears to be more strongly associated with immunization uptake than the proximity of primary health facilities, probably because they guide clients directly to mobile vaccinators. Moreover, there is no gender difference in the probability of a child being immunized if a LHW is present in the community. Polio immunization is delivered largely through special outreach efforts and camps, so the effect of LHWs is muted.

Figure 4: Presence of Lady Health Worker Increases Child's Chances of Being Immunized



Note: The figures refer to predicted probabilities from Table 3.
Source: PIHS 2001-02 survey data for children aged 12-23 months.

Figure 5: Impact of Lady Health Worker Presence



Notes: PIHS 2001-02 data for rural married women aged 15-49 who had given birth in the thee years before the survey. The figures refer to statistically significant predicted probabilities from Tables A4.3-A4.5.

The presence of an LHW does not, however, significantly increase the probability of receiving antenatal care consultations, skilled attendance at delivery, or postnatal care. These are not services the LHW is trained to deliver, but she is expected to refer women to the network of health facilities to avail of themselves of these services.

[6] A full discussion of these results can be found in Dasgupta, Mansuri, Sinha and Vishwanath (2006).

Distribution of impact by women's education level

Since LHWs deliver information along with services to women's doorsteps, they might be expected to be more helpful to women with no schooling, or to women who may have less access to information from the media. The analysis suggests that this is not the case: the presence of an LHW benefits women *independently* of their schooling or exposure to media. Note that the effects are significant only for the services (contraception and immunization) for which the presence of a LHW has a significant impact.

5) ISSUES WITH THE FUNCTIONING OF THE LHW PROGRAM

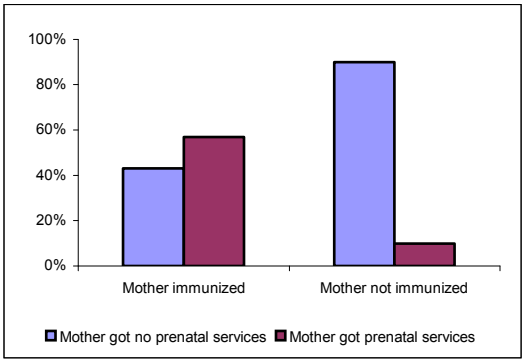
Lack of synergy between LHWs and government health facilities

The LHWs and the primary health care facilities are intended to form a network to provide health services to rural households. Outreach work by LHWs is intended to stimulate families' use of health facilities to meet their health care needs. However, we find virtually no evidence that the presence of an LHW significantly stimulates the use of nearby health facilities for antenatal care consultations, delivery, or postnatal care (see interaction effects summarized in table 3). Only in the case of postnatal consultations do we find some weak evidence that LHWs increase the use of nearby government health facilities and reduce the use of nearby private health facilities. The uptake of postnatal care is extremely low, however. In the case of contraception, we find that if an LHW is present in a community, then people are less likely to turn to private health facilities nearby. This is in line with the fact that distributing contraceptives is one of the main tasks of the LHW.

In sum, the presence of LHWs has a strong positive impact on the use of contraceptives, which they supply to women, and on the uptake of immunization. This indicates good coordination between two national programs (EPI and LHW) that bring services to people's doorsteps. However, there is no significant impact of LHW presence on the uptake of maternal care services from government health facilities, suggesting that there is a lack of synergy between LHWs and the system of health facilities.

Utilization of antenatal care offers a stark example of this lack of synergy between LHWs and health facilities. Pregnant women are supposed to receive tetanus toxoid injections *and* check ups for signs of potential complications of pregnancy. As part of the Expanded Program on Immunization (EPI), LHWs encourage pregnant women to get tetanus immunization, and our data indicate that this is very effective.[7] The link with the health facilities is weak, however: over 40 percent of the women who received a tetanus immunization report not getting any prenatal care (figure 6). That is, they are contacted by LHWs during their pregnancy (for immunization), but do not receive the antenatal check-ups which the health facilities are supposed to provide.

Figure 6: Use of Antenatal Care Services and Antenatal Tetanus Immunization Status



Notes: Cross tabulation for rural married women who reported births in the three years preceding the PIHS survey (2001-02).

[7] In some districts, LHWs may be delivering these injections themselves.

This could be attributed to the monitoring and incentive structure. The LHW supervisors monitor the LHWs for the number of women they refer to the health clinic for antenatal care. However, they do not monitor LHWs for whether the women referred to health facilities do actually visit the facility to avail themselves of the services. The LHWs have little incentive to facilitate women's travel to health centers and so constraints on mobility may continue to hinder women from going to the centers to avail themselves of these services. In this system, therefore, there is no incentive for LHWs to ensure that women actually use these services.

One could argue that this lack of complementarity or synergy between LHWs and health facilities may have little to do with whether the LHWs are motivating them to use these facilities for maternal health services. Women who are referred to health facilities may avoid visiting the facilities because of previous experiences with unavailable staff and lack of supplies. Low service utilization, however, cannot be entirely attributed to the unavailability of staff and supplies especially since LHWs are placed near the more "functioning" facilities. As we have shown elsewhere, if the demand for services is stimulated, people make greater efforts to access services despite problems of mobility, facility distance, and service quality (Das Gupta, Mansuri, Sinha and Vishwanath, 2006). This suggests that LHWs might not be sufficiently motivating women to access maternal health services.

The placement of Lady Health Workers

The placement of LHWs is expected to be regressive, because the program requires that LHWs have at least middle school education, and are placed within the catchment area of a functioning health facility. The likelihood of finding this conjunction of circumstances is higher in better developed areas. Our data confirm that LHWs are indeed placed as the program intended, where DoH primary health facilities are available. As of 2001, only one-half of rural communities had a public health facility nearby, and only 20 percent had an LHW as well as a public health facility nearby.

Our analysis shows that they are indeed more likely to be placed in more developed areas, as indicated by the presence of drainage in the community (Table 4). The strongest determinant of LHW placement is the availability of a school for girls in the community (Table 4). This is not a surprising finding, as LHWs are required to have at least middle school education, and the availability of a school increases the supply of such women. Thus school incentive programs for retaining girls in middle and high school can be expected to have a direct bearing on the possibilities for expanding the coverage of the LHW program. Since women are much less likely to work outside their own village, it could be difficult to expand the LHW program to areas underserved by girls' schools.

5. DISCUSSION

In Pakistan, as elsewhere in South Asia, there are significant gender differentials in health outcomes which are at least in part, explained by inadequate access to medical services. For example, data on medical expenditure for household members from a survey of rural areas show that there are significant gender differentials in medical care of children, even after controlling for household socioeconomic status, parental education, and distance to health facilities. Girls' illnesses are significantly less likely to be reported much less treated: among all children whose illnesses are reported, girls are significantly less likely to be taken for a medical consultation. Among 0-6 year olds who were reported ill during the year and were taken for a medical

consultation, parents spent on average, Rs1100 less on girls' treatment as compared to boys' treatment. The difference is even larger among adults, where the medical expenditure on women is nearly Rs. 3200 less than that on men.

There is much scope for using doorstep delivery of health services to reduce gender-based constraints to women's access to health services. Using nationally representative household survey data from 2001-02, we find that gender based constraints, mainly limited mobility, very low levels of female education and the consequent low level of access to information among women, reduce rural women's use of maternal and child health services. We also find that, controlling for distance to health clinic and a variety of household and community characteristics, the presence of a Lady Health Worker (LHW) significantly increases the use of those MCH services for which they are held directly responsible. Moreover, both educated and uneducated women benefit from the services of the Lady Health Workers. Thus the LHW program can do much to alleviate gender based constraints to the utilization of MCH services. But there are some issues with the program, mainly related to how well the doorstep delivery system coordinates with the system of health clinics.

The current debate in this literature revolves around two issues. First, even though community-based doorstep delivery of services is generally cost-effective, little is known about whether it will remain cost effective when scaled up nation wide. Although community workers can provide a cost-effective service (that is, lowest cost per life saved) for a range of health promotion, prevention and curative activities than other primary health services based in fixed facilities (Berman, Gwatkin and Burger, 1987, Walker and Jan, 2005) it is not clear what the pre-conditions are for ensuring such cost effectiveness and this will likely vary case by case especially for considerations of scale up of such interventions. Indeed, a national program relying on field workers is widely believed to be a drain on financial resources because of the costs of coordination, logistics and management; a perception which has led Bangladesh to move away from doorstep delivery model to a clinic-centered model (Arends-Kuenning, 2002, Routh and others, 2004). Our analysis suggests that similar problems of quality and coordination exist in the LHW program. However, what remains to be well understood in the Pakistani context lies beyond the coordination issues, and is fundamentally addressing constraints related to the availability of a "local" pool of educated women (World Bank: 2005)

Secondly, there is concern in the literature about whether doorstep delivery of services to get around mobility constraints further disempowers women. For example, in Bangladesh, doorstep delivery of services has been viewed as reinforcing the norms of *purdah* (see for example, Schuler, Hashemi and Jenkins, 1995). But other authors have argued that doorstep delivery of services in Bangladesh improved women's status by offering them effective fertility control which in turn enhanced their mobility, and autonomy (Phillips and Hossain, 1998, Arends-Kuenning, 2002). What appears clear is that the choice between doorstep and fixed site is not an "either –or" choice but rather one of choosing an appropriate model that may include switching between the two approaches. The challenge of knowing whether or when to switch will depend on country circumstances and should be informed by careful evaluation.

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Table 1: Summary Statistics

Variables	N	Mean
Dependent variables		
Currently using contraceptives (yes=1)	7850	0.108
Used antenatal care services during last pregnancy (yes=1)	4556	0.234
Mothers with tetanus immunizations during last pregnancy (yes=1)	4556	0.291
Postnatal care services after last birth (yes=1)	4556	0.061
Birth in an institution (yes=1)	4556	0.124
Percentage boys aged 12-23 months with DPT3		0.56
Percentage boys aged 12-23 months with Polio 3		0.87
Percentage boys aged 12-23 months with BCG		0.60
Percentage boys aged 12-23 months with Measles		0.51
Percentage girls aged 12-23 months with DPT3		0.53
Percentage girls aged 12-23 months with Polio 3		0.87
Percentage girls aged 12-23 months with BCG		0.56
Percentage girls aged 12-23 months with Measles		0.46
Explanatory variables		
Age (years)	7850	31.159
Woman ever attended school (yes=1)	7850	0.123
Husband ever attend school (yes=1)	7850	0.513
Received health information from media (yes=1)	7850	0.112
Received health information from family (yes=1)	7850	0.478
Log (Per Capita Expenditure) (Rs.)	7850	6.614
Private health facility within 5 kilometers of community (yes=1)	7850	0.372
Public health facility within 5 kilometers of community (yes=1)	7418	0.436
Lady Health Worker present in community (yes=1)	7850	0.285
Primary school for girls in community (yes=1)	7850	0.577
Middle school for girls in community (yes=1)	7850	0.377
Nearest bus stop within 3 kilometers of community (yes=1)	7632	0.853
Dummy for access to roads (yes=1)	7632	0.893
Whether community has electricity (yes=1)	7632	0.750
Whether community has drainage (yes=1)	7620	0.448
Community is within 3 kilometers of nearest market (yes=1)	7620	0.184
Community is within 3 kilometers of Tehsil (sub-district) headquarters (yes=1)	7632	0.096

Source: Pakistan Integrated Household Survey, 2001-02. Sample of currently married women aged 15-49, residing rural areas. Use of maternal health services (antenatal care, postnatal consultation, tetanus immunizations, institutional births) for women who had a birth in the three years preceding survey.

Table 2a: Determinants of use of maternal health services, Rural Women aged 15-49, PIHS 2001-02

	(1)	(2)	(3)	(4)	(5)
	Contraceptive use	Antenatal care	Tetanus Toxoid Immunizations	Postnatal consultations	Birth in a medical institution
Age (Years)	0.055 (7.68)**	0.027 (2.79)**	0.022 (2.27)*	0.010 (2.39)*	0.007 (0.99)
Agesq	-0.001 (7.25)**	-0.000 (2.78)**	-0.000 (2.29)*	-0.000 (2.20)*	-0.000 (1.07)
Woman Ever Attended School (1 if Yes)	0.084 (4.07)**	0.224 (8.49)**	0.207 (7.10)**	0.058 (4.33)**	0.101 (4.89)**
Husband Ever Attended School (1 if Yes)	0.033 (2.72)**	0.031 (1.71)+	0.052 (2.71)**	0.009 (0.89)	0.035 (2.96)**
Ratio of Number of Sons alive to Number of Daughters Alive	0.019 (4.43)**	-	-	-	-
Media Exposure (Heard Hygiene related information through Media) (1 if Yes)	0.052 (2.87)**	0.060 (2.10)*	0.103 (3.08)**	0.005 (0.36)	0.051 (2.36)*
Log (Per Capita Household Expenditure)	0.022 (1.54)	0.122 (5.23)**	0.117 (4.02)**	0.041 (3.91)**	0.113 (6.37)**
Lady Health Worker in Community	0.030 (2.16)*	0.011 (0.47)	0.064 (2.41)*	-0.003 (0.28)	0.009 (0.56)
Government Primary Health Facility (BHU, MCH Center, Family Welfare Center Within 5 Kms)	0.008 (0.61)	0.052 (2.15)*	0.077 (3.04)**	-0.004 (0.37)	-0.011 (0.63)
Private Health Facility Within 5 Kms of Community	0.007 (0.54)	0.025 (0.98)	0.009 (0.33)	0.014 (1.18)	-0.002 (0.10)

Notes: Probit model marginal effects. Regression weighted using household weights. Robust z statistics in parentheses. + significant at 10%; * significant at 5%; ** significant at 1%. Additional variables not shown in table include exposure to hygiene information through family members and community level variables: Community level variables include dummies for electricity, drainage, distance to: tehsil capital, nearest bus stop, market, nearest motorable approach road, public primary school for girls, middle school for girls.

Table 2b Determinants of Immunization, Rural Children aged 12-23 months, PIHS 2001

	(1)	(2)	(3)	(4)
	DPT3 (N=1347)	Polio3 (N=1347)	BCG (N=1347)	Measles (N=1347)
Girl	-0.029 (1.02)	0.002 (0.12)	-0.045 (1.54)	-0.065 (2.04)*
Age in Months	0.030 (0.50)	0.082 (2.30)*	0.002 (0.03)	0.012 (0.19)
(Age)^2	-0.001 (0.41)	-0.002 (2.10)*	0.000 (0.10)	0.000 (0.01)
Mother ever attended school (1 if yes)	0.165 (3.23)**	0.047 (1.61)	0.141 (2.57)*	0.130 (2.53)*
Father ever attended school (1 if yes)	0.122 (3.46)**	0.015 (0.70)	0.096 (2.80)**	0.090 (2.38)*
Mother has Media Exposure (Heard Hygiene related information through Media) (1 if Yes)	-0.016 (0.39)	0.037 (1.42)	-0.004 (0.09)	0.016 (0.37)
Log (Per Capita Household Expenditure)	--	--	0.089 (1.80)+	0.125 (2.38)*
Lady Health Worker in Community	0.089 (1.82)+	0.038 (1.39)	0.142 (2.86)**	0.108 (2.21)*
Government Primary Health Facility (BHU, MCH Center, Family Welfare Center) Within 5 Kms	0.082 (1.73)+	0.006 (0.23)	0.093 (1.80)+	0.137 (2.73)**
Private Health Facility Within 5 Kms of Community	-0.037 (0.77)	-0.025 (0.94)	-0.030 (0.59)	0.005 (0.09)
Immunization Camp held within 5 kms of community	0.068 (1.57)	0.004 (0.16)	0.015 (0.34)	-0.008 (0.20)

Notes: Probit model marginal effects. Regression weighted using household weights. Robust z statistics in parentheses. + significant at 10%; * significant at 5%; ** significant at 1%. Additional variables not shown in table include community level variables: Community level variables include dummies for electricity, drainage, distance to: tehsil capital, nearest bus stop, market, nearest motorable approach road, public primary school for girls, middle school for girls.
DPT 3 and Polio 3 measure whether final dose of each immunization received by child or not. Log per capita expenditure only included for BCG and Measles. DPT and Polio are usually supplied free of cost.

Table 3: Interaction effects, Rural Women aged 15-49, PIHS 2001-02

	(1)	(2)	(3)	(4)	(5)	(6)
	Contraceptive use	Prenatal care	Tetanus Toxoid Immunizations	Postnatal consultations	Birth in a medical institution	Birth assisted by TBA
Media Exposure* Woman Attended School	-0.053 (1.54)	-0.031 (0.59)	-0.083 (1.11)	0.007 (0.24)	0.067 (1.32)	0.012 (0.18)
Media Exposure* LHW in community	0.039 (1.13)	-0.001 (0.01)	0.016 (0.23)	-0.033 (1.66)+	0.045 (0.98)	-0.040 (0.69)
LHW*Woman Attended School	0.001 (0.03)	-0.048 (1.11)	0.010 (0.20)	-0.016 (0.87)	0.001 (0.03)	-0.075 (1.56)
Government Facility * LHW	-0.014 (0.55)	0.029 (0.58)	0.019 (0.35)	0.044 (1.78)+	0.063 (1.60)	0.005 (0.07)

Notes: Probit model marginal effects. Regression weighted using household weights. Robust z statistics in parentheses. + significant at 10%; * significant at 5%; ** significant at 1%. These interaction terms were estimated as part of a full regression that included additional variables not shown in table include woman's age, square of woman's age, whether woman attended school, whether spouse attended school, source of hygiene health information (media or family), log of per capita household expenditure, dummy variables for: availability of Lady Health Worker (LHW) within community, availability of nearest primary health care facility within 5 kilometers of community, availability of nearest private health facility within 5 kilometers of community. Also included are the following community level variables: Community level variables include dummies for electricity, drainage, distance to: tehsil capital, nearest bus stop, market, nearest motorable approach road, public primary school for girls, middle school for girls. Full results of the regressions can be obtained on request.

Table 4: Determinants of Community Level Placement of LHWs

	Column (1)	Column (2) With Village Topography Dummies
Log(Village Population)	-0.072 (0.73)	-0.071 (0.72)
Share of children aged 5 or younger	-0.628 (0.97)	-0.621 (0.95)
Share of Females 15-49	0.438 (0.54)	0.487 (0.58)
Public Primary School for Girls in Village	0.178** (2.81)	0.176** (2.72)
Public Middle School for Girls in Village	0.241** (3.25)	0.229** (3.15)
Average Per Capita Expenditure of Village/100	0.054 (0.95)	0.060 (1.04)
(Average Per Capita Expenditure of Village/100)^2	-0.003 (1.26)	-0.004 (1.34)
Basic Health Unit in Community	0.166* (2.40)	0.177* (2.44)
Nearest bus stop 0-3 Kms from Community	0.085 (1.05)	0.085 (1.01)
Nearest tehsil capital 0-3 Kms from Community	0.113 (1.28)	0.106 (1.22)
Nearest rail station 0-3 Kms from Community	-0.014 (0.13)	-0.008 (0.08)
Community has motorable approach road	0.101 (1.20)	0.072 (0.94)
50 % of households in community have electricity	0.124+ (1.73)	0.128+ (1.77)

Notes: PIHS 2001-02 Data, Community Level Data. Weighted Probit **Marginal Effects**. Absolute value of t statistics in parentheses. + significant at 10%; * significant at 5%; ** significant at 1%.