doi:10.1093/heapol/czi014
HEALTH POLICY AND PLANNING; **20**(2): 117–123

Increasing contraceptive use in rural Pakistan: an evaluation of the Lady Health Worker Programme

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Past efforts to promote family planning in Pakistan have been disappointing, but between 1990–91 and 2000–01 contraceptive use has more than doubled. This rise has coincided with a concerted effort on the part of the Pakistani government to increase access to contraceptive services, particularly in rural areas. The Lady Health Worker Programme (LHWP), initiated under the Ministry of Health in the early 1990s, aimed at integrating family planning into the doorstep provision of primary health care. This paper presents findings from the first national evaluation of this Programme. Data are analyzed from a random sample survey of 4277 women living in households served by the LHWP and those living in control areas. Logistic regression analysis was performed to determine the effect of the Programme on the uptake of modern reversible contraceptive methods, controlling for other independent variables. The data provide strong evidence that the LHWP has succeeded in increasing modern contraceptive use among rural women. Women served by Lady Health Workers are significantly more likely to use a modern reversible method than women in communities not served by the Programme (OR = 1.50, 95% CI = 1.04–2.16, p = 0.031), even after controlling for various household and individual characteristics. The model of providing doorstep services through community-based female workers should remain central to achieving universal access to safe family planning methods by the end of the decade – the long-term objective of Pakistan's most recent population policy adopted in 2002.

Key words: family planning, community-based workers, evaluation, mobility, health service access, Pakistan

Introduction

Past efforts to promote family planning in Pakistan have been disappointing, despite it having one of the highest levels of unmet need in the world (Shelton et al. 1999). Numerous observers have commented on the poor performance of one of the oldest family planning programmes in the world, highlighting weak management, low coverage and poor quality care among other factors (Rukanuddin and Hardee-Cleaveland 1992; Rosen and Conly 1996; Shelton et al. 1999; Fikree et al. 2001; Rukanuddin 2001; Collumbien and Douthwaite 2003). In the last decade, however, contraceptive use has more than doubled, from 11.9% in 1990–91 (National Institute of Statistics and IRD/Macro International 1992) to 27.6% in 2000–01 (Hakim et al. 2001), and there are signs that fertility rates are also falling (Sathar and Casterline 1998).

The increase in contraceptive prevalence has coincided with a concerted effort on the part of the Pakistani government to increase access to contraceptive services, particularly in rural areas. A network of community-based female workers providing family planning services to women in their homes has been established through two parallel schemes, one under the Ministry of Health and one under the Ministry of Population Welfare (MoPW). Research indicates that this effort is beginning to pay off. Specific studies on the MoPW's scheme show that the placement of workers is accompanied by increased contraceptive use (Population Council 1997b). And a recent national survey found that married women living within 5 km of community-based workers were significantly more likely to use a modern, reversible method than were women who had no access (Sultan et al. 2002).

The Ministry of Health's programme – the National Programme of Family Planning and Primary Health Care, commonly referred to as the Lady Health Worker Programme (LHWP) – was launched under the Eighth Five-Year Plan (1993–98). The scheme grew out of a broader community health worker programme aimed at increasing access to basic preventive health care services, particularly in rural areas. Lady Health Workers (LHWs) deliver a range of services related to maternal and child health including: promoting childhood immunization, growth monitoring, family planning, and health promotion and education. They treat minor ailments and injuries, and are trained to identify and refer more serious cases. Their family planning responsibilities include motivating women to practice family planning, providing pills and condoms, and referring for injections, IUD and sterilization.

LHWs must have a minimum of 8 years of education and be resident in the community that they serve. They undergo 15 months of training, 3 months full-time followed by 12 months of in-service training. They receive a small allowance and are supervised by LHWP supervisors. Each LHW is attached to a government health facility, from which they receive training and medical supplies. They serve around 1000 individuals. Approximately 75% of the served population lives in rural areas.

By 2000/01, 58 000 LHW positions were allocated, but by June 2001 only 37 838 posts were filled. This is less than 50% of the original 100 000 LHWs planned for this period, in part due to under-funding (Oxford Policy Management 2002c). Scepticism has been voiced regarding the ability of the Ministry of Health's community-based programme to prioritize and deliver family planning services. Indeed previous attempts to integrate family planning into an already overburdened health system in Pakistan have failed. Unlike the MoPW's scheme, the Ministry of Health's programme was not pilot tested, and critics have commented on the relatively poor quality of worker training, and the politicization of worker selection (Rosen and Conly 1996). Recently, the MoPW's Village Based Family Planning Workers (VBFPWs) scheme has been integrated into the LHWP. In this context, the question of the effectiveness of the LHWP at delivering family planning services becomes particularly important.

This article assesses the impact of the LHWP on the uptake of modern contraceptive methods using data from a national evaluation of the LHWP, completed in 2002. Because a major aim of the Programme was to increase access to services in rural areas, this paper focuses specifically on the impact of the Programme on rural women. The limited effect of the Programme in urban areas is addressed elsewhere (Oxford Policy Management 2002a,c).

Design and methods

The data for this analysis come from a national evaluation of the LHWP. The evaluation was commissioned by the Ministry of Health in Pakistan, funded by the Department for International Development (DFID), UK, and implemented by Oxford Policy Management in collaboration with the Population Council in Pakistan. The evaluation used a number of analytical approaches, including quantitative and qualitative data collection, a review of Programme management systems and an analysis of Programme expenditure. The analysis presented here uses data from the quantitative component of the evaluation.

The objective of the quantitative survey was to provide a nationally representative picture of the functioning of the LHWP and to assess the Programme's impact by comparing LHW areas with non-programme, control areas. Fieldwork was conducted between October 2000 and April 2001 and covered all provinces and federally administered areas of Pakistan.

This evaluation was conducted 6 years after the Programme began and unfortunately no baseline data were collected at the start. Measures of impact in this evaluation are estimated from a comparison between the population served by the LHWs and a control population that was selected for the study. To allow sufficient time for LHWs to have had an impact on outcome measures in the population that they serve, only LHWs who had worked in their community for a minimum of 4 years were eligible for inclusion in the sample.

LHWs and the population they serve were sampled in a three-stage process. In the first stage health facilities with at least one eligible LHW were selected with a probability proportional to the number of eligible LHWs employed there. Two LHWs were selected randomly from the eligible LHWs found at the selected facilities. A sample of eight households was drawn from each of the selected LHW's register of households that they serve. The register defines the households that are supposed to receive services from that LHW and so provided an appropriate sample frame.

The definition of an appropriate control sample was complicated by the process by which LHWs were employed, which was non-random and reflected the various factors that determined the growth of the Programme in each province. These processes could not have been replicated to select directly comparable control communities and instead a different sampling scheme was used. Census enumeration areas (in urban areas) and villages (in rural areas) were selected with a probability proportional to size by the Federal Bureau of Statistics, from the national sample frame held there. Households were then listed in selected Primary Sampling Units (PSUs). During the listing process, each household was asked whether it was served by an LHW.

A second stage of sampling selected a sub-sample of PSUs in proportion to the fraction of unserved households found there. Unserved households were sampled from these PSUs. These households were subject to a more detailed screening procedure to ensure they were not served by LHWs before being interviewed. A total of 334 PSUs were selected, comprising 253 in the Programme area and 81 in the control area. From these PSUs, 5161 households were interviewed in total (4015 from the Programme area and 1146 from the control). Female interviewers visited the sampled households and interviewed all ever-married women aged 15–49 years. Sampling weights were defined to allow the calculation of representative estimates for both populations (Oxford Policy Management 2002a,c). The analysis presented in this paper is restricted to a sub-sample of these women, consisting of 4277 currently married rural women aged between 15 and 49 years.[1] They comprised 931 living in non-intervention control areas and 3346 women resident in LHW areas. A larger sample was taken in intervention areas than in the control in order to provide estimates of Programme variables disaggregated by province, an important level of management within the LHWP.[2]

This analysis focuses on the currently married rural population because a major aim of the LHWP was to provide preventive health and family planning services to rural areas. Also, the provision of family planning services in Pakistan is focused on currently married women. The main outcome variable of interest is current use of reversible modern methods. This includes oral pill, injection, condom and IUD. Women using sterilization are excluded from the analysis because many sterilizations pre-date the beginning of the Programme.

In the served population, interviews were conducted with LHWs, the households that they serve, groups of men and women in the communities where they work, the LHWs' supervisors, and with key staff at the health facilities to which the LHWs are attached. In control areas, information was

collected from households, health facilities and the community. Information was collected on the background characteristics of the household; the respondent's socio-demographic characteristics, including education and age at marriage; birth history; characteristics and health of children under 3 years; women's mobility; basic knowledge about preventive health care; pregnancy; information about the last live birth; fertility desires; and knowledge, ever-use, and current use of contraception. Ever and current users of modern methods were asked about when they first started using modern methods. Questions were also asked about access to contraceptive services, contact with health workers and attitude to family planning.

The lack of an experimental design limits the confidence with which programme effect can be inferred. Nevertheless, two different analytical approaches are employed that together provide a relatively strong test of programme impact. First, trends in ever-use of modern reversible contraception over time are compared between programme and control area, based on retrospective information provided by respondents. Secondly, two-level statistical modelling was performed using the software package STATA to estimate the effect of the LHWP on the current use of reversible modern methods in rural areas, controlling for other differences between the two populations. Logistic regression with a random effect was applied and results are shown as adjusted odds ratios with 95% confidence intervals and p-values for the significance of the difference between these odds ratios and one. Women with no children were omitted from the logistic regression analysis because they were not asked whether they wanted any children, reducing the sample from 4277 to 3759 women.

Characteristics of the sample

The information collected allows a detailed comparison of the served and control populations. It shows that the rural population served by the LHWP usually has better social and economic indicators than the control population (see Table 1 for selected measures). Where the comparison can be made, the served population also has better indicators than the national rural population. For instance, national figures show that only 17% of rural women and 51% of rural men are literate (Federal Bureau of Statistics 2000), compared with 27% and 58%, respectively, who are literate in areas served by LHWs. National figures show that three-quarters of rural households have electricity (Hakim et al. 2001), compared with 85% in LHW areas. Information in Table 1 also shows that women tend to be more autonomous in LHW areas compared with those in the control. The differences between the LHW and control areas reflect the non-random allocation of LHWs, and are probably due in part to the recruitment criteria of the LHWs that demands relatively well-educated women.

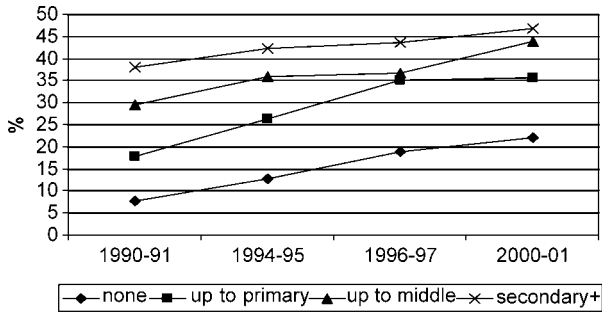
That LHW areas are more advantaged than control areas on a number of socio-economic indicators may have an important impact on the uptake of contraception in these areas, although national data on trends in current contraceptive use show that the increase in contraceptive use has been secular, and not confined to the more advantaged groups of the population (see Figure 1).

Table 1. Comparison of socio-economic measures in LHW and control areas: rural areas

Measure	LHW areas	Control areas
Household consumption and consumption poverty:		
Median consumption expenditure (Rupees per month)	1018	999
% below relative poverty line	25	30
Facilities and utilities:		
% of households with any toilet	55	33
% of households with a protected water supply	83	79
% of households with an electricity connection	85	62
% of households with a telephone connection	9	3
Literacy:		
% of adult women literate	27	14
% of adult men literate	58	44
Media:		
% of adult women ever listening to the radio	34	34
% of adult men ever listening to the radio	47	51
% of adult women ever watching television	55	41
% of adult men ever watching television	61	48
Women's work, mobility and role in decision making:		
% married women who do work other than household work	24	22
% who work away from home, of those who work	36	42
% who can keep some or all of the money earned, of those who work	70	62
% of married women who approve of working outside the home	73	62
% who went outside the village in past month unaccompanied, of those who went outside village	26	17
% who can go alone to clinic or hospital outside village	41	30
% who would usually take a decision by herself to buy medicine for a sick child	37	25

Results

First we compare trends in ever-use of modern reversible methods between the population served by LHWs and the control population. Using information on when women first began using modern contraceptive methods, it is possible to estimate the proportion of women who had ever used such methods at earlier points in time. In 1993, the proportion of



Source: Hakim et al. (2001).

Figure 1. Trends in current use of any method among currently married women by education

currently married women who had ever used a modern reversible method of contraception was similar in both the LHW and control populations (Figure 2). Between 1993 and 2000 the proportion of ever-users increased in both populations, reflecting the secular trend during the 1990s referred to earlier. However, by 2000 ever-use of modern reversible methods was substantially higher in LHWP areas compared with control areas. Although exactly comparable measures are not available, the increase in the use of modern reversible contraceptives in the served rural population also appears somewhat larger than in the national rural population as a whole, where it increased from 14% in 1994–95 (Ministry of Population Welfare and The Population Council 1995) to 32% in 2001–02 (Hakim et al. 2001).[3]

As well as using cross-sectional measures that compare two different groups of married women in 1993 and 2000, it is also possible to look at trends within the cohort of women who were married and aged 15–40 in 1993. This analysis shows a similar pattern, with a greater increase in ever-use of modern methods in the served population than in the control (Table 2, second panel).

These data suggest that the higher level of contraceptive use seen in rural LHW areas has occurred after the introduction of the LHWs, and is consistent with the hypothesis that LHWs have played a role in increasing contraceptive use in the population that they serve. However, as pointed out earlier,

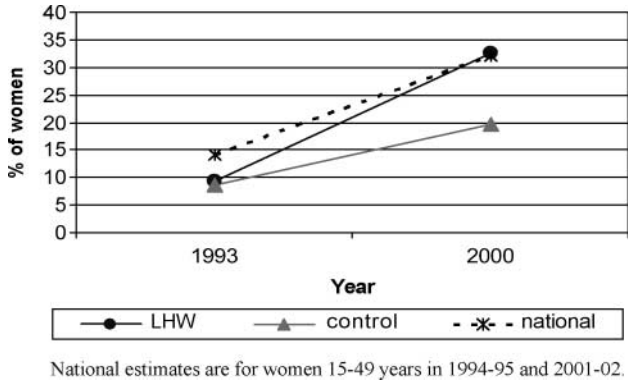


Figure 2. Percentage of married women aged 15 to 40 who have ever used reversible modern contraception in rural LHW and control areas, 1993 and 2000

Table 2. Percentage of women who have ever used modern reversible contraception in 1993 and 2000, cross-sectional and cohort comparisons: LHW and control rural areas

	LHW	Control
Women aged 15–40, and married, in the year given:		
1993	9.3	8.7
2000	32.5	19.6
Cohort aged 15–40 and married by 1993:		
1993	9.3	8.7
2000	40.3	27.5

Table 3. Percentage of rural married women currently using contraceptive methods, by population

Method	LHW area	Control area	National 2000–01*
Percentage using any method	30	21	22
Percentage using any modern method	20	14	15
Percentage using reversible modern method	13	7	10
Percentage currently using:			
Pill	2.2	0.2	1.9
Injectable	2.6	1.4	2.6
Condom	4.9	3.4	5.5
IUD	3.7	2.3	3.5
Female sterilization	6.8	6.1	6.9
Withdrawal	6.7	5.5	5.3
Rhythm	4.6	3.2	1.6
Other (male sterilization/implant)	0.0	0.0	0.5

**Source*: Hakim et al. (2001).

LHW areas are more advantaged than control areas on a number of socio-economic indicators, and this may impact on the uptake of modern reversible methods in these areas. Logistic regression is used to control for these factors and investigate the net effect of the LHWP on the current use of modern reversible methods.

Current use of contraception

At the time of the survey, 13% of married women living in rural LHW areas were using a reversible modern method, compared with just 7% in control areas. Overall, 30% of married women were using a form of family planning in LHWP areas compared with 21% in control areas. This compares with a national prevalence of 22% for rural Pakistan (Hakim et al. 2001).

A multivariate logistic regression was performed to estimate the net effect of the LHWP on the current use of reversible modern methods. The age of the women was excluded from the model because of the collinearity with number of children. Women with no children are also excluded because they were not asked whether they wanted any children. Explanatory variables included in the model were selected on the basis of prior knowledge of determinants of contraceptive use and initial exploratory data analysis. Bivariate analysis was conducted on a number of community, household and individual characteristics, and those not significantly associated with the outcome were excluded from the analysis.

Table 4 presents the results from the logistic regression analysis. These data show that even after controlling for other factors, current use of reversible modern methods is higher in LHWP areas than in control areas. The net effect of the LHWP on the use of reversible modern methods is substantial and significant (OR = 1.50, 95% CI = 1.04–2.16, p = 0.031). The programme effect remains significant if the desire for more children is dropped from the model and all women–including those with no children–are included in the analysis.

Table 4. Adjusted odds ratios, 95% CI and p-values for multivariate logistic regression analysis of modern reversible contraceptive methods in rural Pakistan (n = 3759)

Explanatory variable	OR	p-value	95% CI
LHW programme			
Non-programme area	1.00		
Programme area	1.50	0.031	1.04–2.16
Community characteristics			
Distance to nearest shop			
0–2 km	1.00		
2 km+	0.70	0.015	0.52–0.93
Province			
Punjab	1.00		
Sindh	0.49	<0.001	0.34–0.70
NWFP & FATA	1.43	0.012	1.08–1.89
Balochistan	0.87	0.610	0.51–1.49
AJK and Northern Areas	1.00	0.981	0.67–1.48
Individual/household characteristics			
Woman's education	1.07	0.001	1.03–1.12
Number of living children			
0–1	1.00		
2–3	2.04	0.006	1.09–3.09
4+	2.59	<0.001	1.54–4.35
Ratio of boys to girls			
Same number of each	1.00		
> girls than boys	1.14	0.521	0.77–1.69
> boys than girls	1.48	0.086	0.95–2.31
Wants more children			
Yes	1.00		
No	1.79	0.001	1.26–2.53
Watches TV			
Never/rarely	1.00		
Daily/usually	1.45	0.016	1.07–1.97
Type of household flooring			
Mud/brick/earth	1.00		
Cement/tiles	1.77	0.001	1.26–2.49

Note: All OR adjusted for other explanatory variables in table.

Conclusions

The current use of reversible, modern contraceptive methods is significantly higher in rural areas served by the LHWP compared with control areas, even after controlling for a range of socio-economic factors. Furthermore, there have been large increases in the ever-use of contraceptives in served areas since the LHWs began working, and these increases are larger than those in the control population and in the national rural population as a whole. Despite some inherent design limitations, this study provides strong evidence that the LHWP has succeeded in integrating family planning into the doorstep provision of preventive health care and in increasing the use of modern reversible methods in rural areas.

These findings have several implications for both policy and research. In July 2002 Pakistan launched a new population policy. Its long-term objectives are universal access to safe family planning methods by 2010, and replacement level fertility by 2020. Studies have shown that insufficient coverage, lack of access and poor quality services are important obstacles to family planning use, particularly among rural women in Pakistan (Cernada et al. 1993; Population Council 1997a; Khan 1999). Women's access to services is limited by social and cultural factors. The observance of *purdah*, which dictates that the sexes be kept apart outside the household, and the threat to *izzat* or family honour by women leaving the confines of the household, impede women's mobility (Khan 1999; Fikree et al. 2001). In a study conducted in rural Punjab, less than one-third of women reported that they could go to a health centre unescorted (Sathar and Kazi 1997). It is the rural population that has the lowest level of contraceptive use and the most difficulty in accessing services, and it is this population that the Programme must reach if it is to have a significant impact on family planning uptake. While some commentators have observed that the LHWP may help to maintain, rather than challenge, social barriers that restrict women's mobility (Khan 1999), research on a similar, older programme in Bangladesh demonstrates that workers can act as important agents of change (Simmons et al. 1988, 1992; Mita and Simmons 1995). Studies in Bangladesh have shown that female workers counteract patriarchy and *purdah* and offer women a choice (Simmons et al. 1988), where otherwise they would have none. In Pakistan, where women's mobility is severely limited and female modesty highly valued, the provision of doorstep services through community-based female workers appears to be one model of service delivery that will help to achieve universal access to family planning by 2010.

As mentioned above, the LHWP is similar to the successful family planning programme adopted in Bangladesh, where total fertility fell from 6.3 children to 3.3 children in 20 years (Caldwell et al. 2002). The Bangladesh programme is currently being re-orientated from a doorstep approach to fixed-site delivery, with an emphasis on longer-term methods such as IUD and sterilization. This has largely come about because of pressure from international donors who have complained about the high cost of the family planning programme, due largely to the reliance on outreach workers providing doorstep services (Arends-Kuenning 2002; Caldwell et al. 2002). Some observers have commented that women's status and mobility have changed over the last 20 years in Bangladesh, reducing the need for universal doorstep provision of services (Finger 1999). The impact that this change in approach will have on contraceptive use is yet unknown.

Donor funding for family planning in developing countries has declined during the 1990s, and as Caldwell et al. (2002) comment, the pressures felt by Bangladesh could widen to other countries. Currently the Pakistani government is the largest contributor of funds to the LHWP, with only 11% coming from external donors (Oxford Policy Management 2002a). This may shield it from a similar fate to the Bangladeshi programme, but the LHWP is experiencing significant funding shortfalls. Financial data collected as part of the wider evaluation of the LHWP found a funding shortfall to the Programme of 39%. Expenditure on key inputs, such as contraceptives, vehicle maintenance, allowances and salaries, is well below planned amounts. However, a fully funded Programme that is expanded to the planned size of

100 000 LHWs could potentially absorb up to one-quarter of total government expenditure on health, since government expenditure per capita is low (Oxford Policy Management 2002b).

Expansion of the Programme must be planned within a realistic resource envelope. Increasing funds to the Programme will be an important component of the strategy to provide universal access to safe family planning methods by 2010. However, an improved understanding of where women's mobility and other social factors make LHWs the most cost-effective method of providing services, and where fixed site services can be used, will be important in ensuring a sustainable mix of services. This should include further qualitative research on the dynamics between LHWs and their female clients to better understand the processes that lead to uptake of modern methods.

Endnotes

[1] Urban and divorced or widowed women are excluded from this analysis. An analysis of the effect of the LHWP in urban areas can be found in Oxford Policy Management (2002a).

[2] The sample was designed to detect, in the national sample, appreciable differences between intervention and control populations for a number of variables that reflect programme output and impact. The effect of the difference in sample sizes between intervention and controls on standard errors depends on the estimate, but it is usually modest. For example, it increases by around 17% the standard error around the (unadjusted) estimate of the difference between the proportions of married women using any contraceptive method, when compared with a design using equal sized samples of the two groups.

[3] Both percentages are of women aged 15–49 years.

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Acknowledgements

The authors would like to thank the many individuals who contributed to the implementation and analysis of the LHW evaluation, in particular Shafique Ali and Minhaj ul Haq, of the Population Council, Islamabad. Thanks also to John Cleland and Philippa Wood for comments on an earlier draft of this paper. Financial support for the evaluation was provided by the Department for International Development of the United Kingdom.

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