Who are the condom users of Pakistan?: An analysis of predictors

Supriya Madhavan
DRAFT – PAA submission 9/22/11

Introduction

While fertility rates have been declining throughout Asia over the last two decades, Pakistan stands out as one of the few countries experiencing a slow pace of decline (Hamid and Stephenson). Using Bongaarts' Proximate Determinants of Fertility framework (Bongaarts), one can conclude that much of this lagging decline in fertility is attributable to slow progress with increasing family planning use, especially modern methods. The recent Demographic and Health Survey (2006/7) showed that only 34.4% of married women of reproductive age are using family planning, and of this, only 26.4% are using modern methods of contraception. Of those women contracepting, and not including already sterilized couples, a full 82% would like to limit their births, while the other 18% would like to space their births. (*Pakistan DHS*)

Currently in Pakistan, the most widely used contraceptive method is sterilization (34%), followed by traditional methods[1] (23%) and condoms (17.5%). Oral contraceptive pills, injectables and intrauterine devices (IUDs) make up the rest of the contracepting population. Given the importance of condom use in the spectrum of family planning practices, this paper seeks to identify key correlates and predictors of condom use in Pakistan. In short, this paper will attempt to elucidate the characteristics of the condom user compared to non-condom users, particularly with respect to birth limiting preferences.

Methods

The dataset used for this secondary analysis is the Pakistan Demographic and Health Survey 2006/7 (DHS). Only the data for the 39,049 married women of reproductive age was used for this analysis. All data analysis has been done using Stata/IC10.0 software.

The primary outcome was defined as condom use (coded 1=yes, 0=no). Several simple logistic regressions were first carried out to find total unadjusted effect sizes and p-values. Multiple logistic regression analysis was performed using the following covariates: residence (i.e., urban vs. rural), wealth index (categorical), age of respondent (categorical), educational level of respondent (categorical), fertility preferences (2 binary variables: one for no more children wanted and one for another child wanted), wantedness of last child (2 binary variables: one for did not want and one for wanted later), number of living children and region (categorical for four provinces: Punjab, Sindh, NWFP, Balochistan). The primary relationships of interest were between the two fertility preference variables and the outcome of condom use. Likelihood ratio (LR) tests were performed. Forward and backward stepwise selection was performed to refine the model.

The weights given in the dataset were applied to all regressions and other statistical analyses to the extent possible. Due to the weighting, goodness of fit tests as well as several other diagnostics could not be performed. A collinearity check was performed to calculate the variance inflation factors (VIFs) and found that all VIFs were below 5.0. Regression diagnostics were performed on unweighted data to assess the impact of leverage and other influential points on the analysis. Given the large number of total observations, removal of the influential points would not have changed the regression results significantly. This, combined with the fact that weighted data diagnostics could not be formed, resulted in no observations being dropped.

---

[1] Traditional methods include periodic abstinence, withdrawal and folkloric methods.

Several variables were dropped in developing the final model – either for reasons of logic and parsimony and/or because the variable selection methods mentioned earlier indicated no additional value in keeping these in the model. The wealth index was dropped as a covariate of interest as it was determined that wealth was highly correlated (if not collinear) with education and that it would not add much predictive value to the model to have both variables included. Similarly, the number of living children, 'want another child' and 'last child wanted' variables were dropped as they serve as proxies for fertility preference (for which the 'no more children wanted' variable was retained). The age category variable was also dropped as it did not show any significant results across a number of different multivariable models.

An adjusted probability was calculated and graphed (Figure 1) for the fertility preference covariate for no more children wanted against all of the other covariates. Effect modification was assessed between several pairs of covariates (fertility preferences and residence; education and wealth; region and education; fertility preferences and education) to determine interaction effects. The model was then re-executed to include each single interaction term at a time to determine individual interaction effects on the main relationships of interest.

Predicted probabilities were calculated for all observation in the dataset using the case of rural residence, no more children wanted preference, primary educational level achieved and Balochistan province. This was followed by calculation of odds and 95% confidence intervals for all observations in the dataset.

Multilevel modelling will be undertaken to determine variations in condom use, accounting for fixed effects at the cluster level.

Results

Table 1 shows demographic, socioeconomic and fertility preference characteristics for condom users compared with non-condom users. Condom users tend to be urban (58.6%), aged 30-39 years (53.0%) more rich than poor (65.7%) and uneducated (46.9%) while non-condom users are largely rural dwelling (64.5%), aged 40-49 years (40.7%) more poor than rich (24.0%) and uneducated (76.4%). Both condom users and non-condom users want no more children (78.6% and 60.7% respectively), but did want their last child (57.4% vs. 65.0%). Almost half of condom users live in Punjab province while 41.3% of non-condom users live in Punjab – which is to be expected given that half of the population of Pakistan lives in Punjab.

Table 1. Socioeconomic, demographic and fertility preference characteristics of condom-using vs. non-condom using respondents					p-value
	Condom users		**Non-condom users**		
Residence					<.0001
Urban	1,384	58.6%	13,041	35.5%	
Rural	978	41.4%	23,646	64.5%	
Age (years)					<0.001
15-19	15	0.6%	288	0.8%	
20-29	568	24.0%	7,203	19.6%	
30-39	1,251	53.0%	14,261	38.9%	
40-49	528	22.4%	14,935	40.7%	
Wealth					<0.001
Poorest	100	4.2%	8,091	22.1%	

					p-value
Poorer	317	13.4%	8,028	21.9%	
Middle	395	16.7%	7,562	20.6%	
Richer	632	26.8%	7,176	19.6%	
Richest	918	38.9%	5,830	15.9%	
Education level of respondent					<0.001
No education	1,093	46.3%	28,033	76.4%	
Primary	411	18.7%	4,189	11.4%	
Secondary	485	20.5%	3,295	9.0%	
Higher	343	14.2%	1,170	3.2%	
Fertility preference					<0.001
Want another child	470	19.9%	7,761	21.2%	
Do not want another child	1,853	78.6%	22,237	60.7%	
Other (sterilized, infecund, undecided)	35	1.5%	6,629	18.1%	
Region					<0.001
Punjab	1,154	48.9%	15,149	41.3%	
Sindh	625	26.5%	9,972	27.2%	
NWFP	510	21.6%	7,106	19.4%	
Balochistan	73	3.1%	4,460	12.2%	

The final model that was chosen to perform this analysis included the dependent binary variable of condom use and the covariates of residence, highest educational level attained by the respondent, fertility preference as stated under 'do not want another child' and region of residence.

Table 2 below gives unadjusted and adjusted odds ratios of the main covariates of interest associated with condom use in the model. Adjusting against the other covariates strengthens the association with condom use for the residence, primary education and NWFP and Balochistan regions' variables while mostly minimally attenuating all other associations. With the exception of the Sindh and NWFP regional variables, all odds ratios, be they adjusted or unadjusted, are highly significant ($p<0.001$). The Sindh variable becomes very significant ($p=0.001$) upon adjustment of other risk factors while the NWFP variable's odd ratio becomes non-significant ($p=0.365$).

Rural residents appear to have a 52% decreased likelihood of using condoms compared to urban dwellers, adjusting for all other covariates. We see a dose-response relationship with increasing level of educational attainment of the respondent, adjusting for all other factors. Women with primary school education only are still 1.7 times as likely to use condoms than women without any education. Women with secondary education are 2.2 times as likely and women with higher education are 2.5 times as likely to use condoms as completely uneducated women. Women who do not want another child are about twice as likely to use condoms as those women who want another child now or later, holding all other covariates fixed.

We see regional differences in the association with condom use. Sindh residents are about 16% less likely to use condoms than their Punjabi peers, adjusting for other covariates. NWFP residents seem to not differ significantly from Punjabis in their use of condoms (OR=1.06). Residents of Balochistan are 75% less likely than Punjabis to use condoms (OR=0.283).

Table 2. Adjusted and unadjusted odds ratios of covariates associated with condom use

		OR	p-value	95% CI
Residence (rural=1, urban=0)				
	Unadjusted	0.361	<0.001	0.332, 0.394
	Adjusted	0.476	<0.001	0.429, 0.528
Education of respondent (no education=0)				
Primary				
	Unadjusted	1.409	<0.001	1.263, 1.570
	Adjusted	1.731	<0.001	1.583, 1.955
Secondary				
	Unadjusted	2.525	<0.001	2.265, 2.814
	Adjusted	2.202	<0.001	1.930, 2.513
Higher				
	Unadjusted	2.62	<0.001	2.276, 3.017
	Adjusted	2.517	<0.001	2.131, 2.974
Do not want another child (want another child now or later=0)				
	Unadjusted	1.989	<0.001	1.797, 2.201
	Adjusted	1.986	<0.001	1.792, 2.201
Region (Punjab = 0)				
Sindh				
	Unadjusted	1.049	0.338	0.951, 1.157
	Adjusted	0.842	0.001	0.759, 0.933
NWFP				
	Unadjusted	0.798	<0.001	0.710, 0.897
	Adjusted	1.058	0.365	0.936, 1.197
Balochistan				
	Unadjusted	0.197	<0.001	0.153, 0.253
	Adjusted	0.247	<0.001	0.192, 0.319

QuickTime™ and a
TIFF (LZW) decompressor
are needed to see this picture.

Inclusion of interaction terms, even if statistically significant terms, largely had no effect on the magnitude or significance of the main covariates of interest – fertility preference, residence, education and region.

Figure 1 above shows the adjusted probability of using condoms by fertility preference. People who did not want another child had a probability of 0.07 (95% confidence interval of 0.035, 0.042) while people who wanted another child then or later had probability of using condoms of 0.04 (95% confidence interval of 0.069, 0.77). This difference in adjusted probabilities is significant given that the confidence intervals do not overlap.

NOTE: Results of the multilevel modelling analysis are pending and will be published in the final version of this paper.

Discussion

The regression analyses make a strong case that condom users in Pakistan are relying on condoms primarily to limit further births, and not to space births. Couples with a fertility preference to 'want no more children' are twice as likely to use condoms as those who want a child now or later. Given that condoms are the least reliable modern method of contraception available, and generally considered a temporary, short-term method, the findings of this paper strongly suggest that barriers to access to other more reliable and longer-term methods abound.

This conclusion is further supported by the fact that residents of Balochistan are 75% less likely than Punjabis to use condoms. Balochistan is the least densely populated province in Pakistan and the most underdeveloped in terms of infrastructure and social services. Therefore, it would be reasonable to conclude that Balochis do not even have access to condoms, much less other, more long-term methods even though they are equally in need of limiting methods as the rest of the country. While Sindh is also relatively socioeconomically underdeveloped, it is much more densely populated with better road and transport systems as is borne out by the higher odds ratio (0.84).

Similarly, rural dwellers are less than half as likely to use condoms as urban dwellers, pointing to more limited access. The education gradient is not surprising – i.e., that more educated people are more likely to use condoms than completely uneducated people. As mentioned earlier, analysis with income yielded a similar wealth effect.

There are several key limitations of this study. Weighting of the data limits the use of several of the methods of statistical analysis designed only for unweighted data. While this does not make the findings of this paper invalid, it does indicate that different tests and analyses might be performed to secure more robust results, and this is outside the scope of this paper/course.

A very limited number of key variables was selected to use in the final model to enable ease of interpretation of results. As explained earlier, while many variables could have served as proxies for each other and/or yielded redundant effects in the regression model, still other variables that speak to the access question could be explored such as distance to a health facility or retail outlet. An obvious weakness of this paper is the lack of comparison of these results to similar analyses of all of the other contraceptive methods currently being used in Pakistan. One could do this with the DHS data and should do this in the interest of elucidating the ultimate question of what factors predict use of which methods. A multinomial regression might be best suited for this or a series of multiple logistic regressions using each of the methods as the outcomes.

Conclusion

The analysis done in this paper highlights the plight of condom users in Pakistan – namely, that they do not have access to sterilization services or even to IUDs. 'Access' is clearly a multifaceted issue not limited to just availability of contraceptive commodities and services. Clearly, if highly educated urban dwellers who want to limit births – and who presumably have much easier access to sterilization services and other long-term methods -- are using condoms, one must consider other social and cultural explanations of this contraceptive method choice. These data also imply that there are underserved pockets in urban areas, which lack adequate services to meet the need of couples wanting to limit births (Stephenson and Henninck). Given that 79% of condom users expressly want to stop having children (Table 1), policy makers must redouble their efforts to expand availability of and access to long-term contraceptive methods throughout Pakistan.

References

Bongaarts, John. The fertility-inhibiting effects of the intermediate fertility variables. *Studies in Family Planning.* 1982. 13(6/7):179-189.

Hamid, Saima and Stephenson, Rob. Provider and Health Facility Influences on Contraceptive Adoption in Urban Pakistan. *International Family Planning Perspectives*, 2006, 32(2): 71–78.

National Institute of Population Studies, Government of Pakistan and Macro International. 2007. *Pakistan Demographic and Health Survey 2006-7 Final Report.* Islamabad, Pakistan.

Stephenson, Rob B and Hennink, M. Barriers to family planning service use among the urban poor in Pakistan. *Asia-Pacific Population Journal.* 2004, 19(2): 5–26.