Poverty and fertility decline in rural Pakistan: results of a longitudinal study in Punjab and NWFP

Sharon Ghuman
Zeba Sathar
Cynthia B. Lloyd

Population Council

Despite convincing evidence of very rapid fertility decline since the late 1980s (Feeney and Alam 2003), Pakistan continues to be characterized in the international community and the development literature as a case of economic "growth without development"(Easterly 2003). This is not only because of historically low levels of government investment in the provision of health and education services but also because of high levels of economic inequality and social polarization. The most recent estimates (2004/05) from the World Bank (n.d.) suggest that the percent living in poverty in rural Pakistan remains very high at around 35 percent. In such unfavorable circumstances, a rapid fertility decline might seem unlikely and even implausible. In poor rural environments, a large family is often seen as the best hedge against risk (Amin and Casterline 2005; Cain 1983). But the association between fertility behavior and economic status is complex due to income and price effects and the tradeoff between the quality and quantity of children. Other factors including changes in available schooling opportunities for children, family planning services, and wider accessibility to credit and labor markets are also important for shaping household fertility behavior across different wealth strata.

In this paper, we plan to use panel data from 1997 and 2004 collected in rural Punjab and NWFP to understand some of the factors which may underlie changes in fertility behavior in recent years. One possible partial explanation could be that the service environment on the ground is beginning to change as lady health workers, who provide door-to-door contraceptive services and advice, become more widely accessible in rural areas. This explanation would imply that after three decades of "growth without development", social investments are beginning to make a difference. A second possible partial explanation is that since poverty rates have fallen in Pakistan since 2000, families have greater security in planning their futures and building their families. A third explanation could be that families are increasingly motivated to limit family size because of rapidly rising aspirations in the context of globalization. In exploring the relative importance of these explanations, we will examine separately how intentions to limit future childbearing among women have changed over time, and how actual behavioral changes with respect to adoption of modern contraceptive methods align with shifts in expressed intentions. And in the consideration of aspirations and actual behavior, we will examine the role of schooling (e.g. women's schooling attained or the availability of schooling opportunities for children in the community in which the family lives) as attributes that likely encourage families to view limiting family size as not only desirable but possible.

Data

Our analysis will draw upon a longitudinal study of educational opportunities among children and family building behavior in rural Punjab and Northwest Frontier Province (NWFP) conducted in 1997 and then again in 2004 (Sathar et al 2000 and 2006). The study covers twelve villages (six in Punjab and six in NWFP) that were chosen to represent a range of primary school enrollment conditions across the two provinces. Within each village, a random sample of about 60 households was taken, and in each household, all married women age 20-45 were interviewed. In 1997, interviews with 731 women age 20-45 were completed. In 2004, these same households were visited again, along with all the households that formed when individuals split off from the

original 1997 sample households in the 6 years between the two survey interviews. The sample in 2004 contained 763 households, and was expanded to include ever married women age 20-55 to ensure that all women in the 1997 survey were re-interviewed. Attrition between the two surveys is modest compared to many other longitudinal surveys in developing countries that we are aware of (Alderman et al 2001). About 82 percent of women interviewed in 1997 were successfully followed up in 2004.

These data contain a number of valuable and important features for the purposes of the questions of interest in this paper. The longitudinal data allow the dynamic modeling of individual behavior related to fertility and family building. (Note that we will test for the presence of non-random attrition with respect to observed variables and adjust our estimates as needed per reweighting methods discussed and illustrated by Behrman, Parker and Todd, 2005). Both rounds of the survey administered a truncated version of consumption modules used in World Bank Living Standards Measurement Surveys. The modules measure consumption of food and non-food household items. These data on consumption are comparable across time in that the instrument stayed the same.[1] There are advantages to using data on household consumption compared to other measures such as current income, or a asset index formed by principal components. Such data tend to characterize more closely the long run economic status of the household in terms of its ability to meet its needs compared to income, which may be subject to significant transitory fluctuations, or may not capture farm products consumed by the household, for example. Such considerations are particularly important in rural and agrarian settings such as the ones we consider here. However, we are also interested in measures that capture household susceptibility to risk that, in turn, may be related to changes in fertility intentions and behavior. In addition to longitudinal data on consumption, in 2004, the survey asked the female respondents about the occurrence of unexpected shocks such as a loss of crops of livestock, theft/fires, a fall in remittances, loss of a job, or a death in the six year inter-survey period, along with how the household coped with each event. The data also contain information about assets owned by the household, which contain information about economic status more akin to income. This provides us with information we can compare to actual trends in consumption across time, and through which we can gauge the vulnerabilities of households to risk.

Based on poverty lines established by the World Bank for 1998/199 in rural Pakistan, we estimate that in 1997 in our sample areas in both Punjab and NWFP, 36 percent of households were below the poverty line[2] (World Bank 2002). For our purposive sample of rural areas in Punjab and NWFP, the average absolute poverty levels in our sample are comparable to those found in national data for Punjab, although they are lower than those for NWFP (46 percent). Characterizing absolute levels of poverty is complicated. Even if the instruments for consumption and definitions of poverty line are the same across time, estimates of the poverty line are often sensitive to the (imperfect) price indices available to adjust for inflation (World Bank n.d.). The estimate of the percentage below the poverty line is in turn particularly sensitive to such considerations in a context where most households are clustered around the poverty line. We will present absolute poverty levels as they change across time for our sample in the paper and check estimates for robustness to different price indices available.

We show the relative poverty levels for the sample in each round by district (Table 1). There is a diversity across districts in the percentage of households in the lowest quartile, and it

[1] Also, the same interviewers trained to administered it in 1997 were the ones who returned to the sample households in 2004 to administered it again.

[2] This estimate is based on per capita consumption and is adjusted for household size and composition (see World Bank 2002, p. 24, note 8).

lends confidence to our ability to detect enough variability in economic status in the sample to address questions regarding the relationship between poverty and family building behavior. The table also shows that in the inter-survey period, about one fifth of respondents report that their household experienced an unexpected loss of crops or livestock, and about one quarter experienced some type of negative economic event.

All the women in each round were administered a full birth history, as well as questions related to wanting additional children, and ever and current use of contraception by method. Table 2 provides some basic descriptive information for the sample regarding changes in women's preferences related to wanting no more children and the percentage using contraception among those who want no more by age and district. The percentage of women who want to stop childbearing shows a striking increase across time among younger women below age 30 in 1997. Among these younger women who want no more children, there is also a perceptible rise in contraceptive use across time. The bottom portion of the table indicates considerable district level variance in the trend toward wanting less children and using more contraception, with large shifts in both intentions and contraceptive use in some areas in Punjab (D.G. Khan and R.Y. Khan) and NWFP (Abbotabad), small shifts in intentions and contraceptive use in other parts of Punjab (e.g. Sialkot), no shifts in expressed intentions along with a doubling in the percentage using contraception (Karak in NWFP), and no change in the desire to limit childbearing or the percentage using contraception in other areas in the rest of NWFP.

The survey also collected information on the health and family planning services and basic infrastructure (e.g. sewage, paved roads, electricity, public transport routes) at the community level. About eight of 12 village gained a lady health worker in the six years between the two surveys, and a quarter of the villages gained a private doctor. In terms of the schooling options available to families, in each round of the data, there is extensive information on all primary schools (e.g. government-single sex and private-for-profit coed schools) located inside each community as well as all those that were located outside the community boundaries that were attended by at least two sample children. Information on school and teacher quality and amenities were collected from all schools in each round as well. The establishment of new schools, particularly private-for-profit schools, and the increasing utilization of existing schools outside the community boundaries has transformed the schooling environment across the twelve sample communities.

Our analytical approach will involve first describing how relative and absolute poverty (as measured by multiple indicators including consumption and shocks) as well as family building aspirations and behavior has changed over time across the households in our study. We will then examine, in a multivariate framework, how the intentions of women to limit childbearing in 2004 relate to individual factors (schooling, age), household factors (including poverty levels in 1997 and/or the experience of economic shocks in the inter-survey period) and community level changes (e.g. those related to the service environment). We will also explore how similar factors relate to contraceptive behavior among those who no more children. We will allow for non linearities in the effect of economic status on family building behavior, and in some of these estimates, provided that there is sufficient change across time and/or communities, we will use household or village fixed or random effects to control for omitted unobserved variables and check for robustness of our estimates to their inclusion in the models. In some of our specifications, we will also test for interactions between the presence (or gain over time) of a lady health worker and family economic status and/or women's schooling to see if the relation between service availability and contraceptive behavior or intentions is more pronounced among individuals with more (relative to less) resources.

References

Alderman, Harold, Jere R. Behrman, Hans-Peter Kohler, John A. Maluccio, and Susan Cotts Watkins. 2001. "Attrition in Longitudinal Household Survey Data: Some Tests for Three Developing-Country Samples." *Demographic Research* 5(4): 79-123.

Amin, Sajeda and John Casterline. 2005. "Poverty, Risk, Aspirations and Childbearing." Paper presented at the Annual Meeting of the Population Association of America, Philadelphia, March 31-April 2, 2005.

Behrman, Jere R., Susan W. Parker and Petra E. Todd. 2006. "Long-Term Impacts of the Oportunidades Conditional Cash Transfer Program on Rural Youth in Mexico." In Stephan Klasen and , ed., *Poverty, Inequality, and Policy in Latin America.* Cambridge, Mass.: MIT Press.

Cain, Mead. 1983. Fertility as an Adjustment to Risk. *Population and Development Review* 9: 688-702.

Easterly, William. 2003. "The Political Economy of Growth without Development: A Case Study of Pakistan." Pp. 439-472 in *In Search of Prosperity: Analytic Narratives of Economic Growth*, R. Dani (editor). Princeton, NJ and Oxford: Princeton University Press.

Feeney, Griffith and Iqbal Alam. 2003. New Estimates and Projections of Population Growth in Pakistan. *Population and Development Review* 29(3): 483-492.

Sathar, Zeba, Minhaj ul Haque, Mumraiz Khan, Cynthia B. Lloyd, Monica J. Grant. 2006. Fewer and Better Children: Expanded Choices in Schooling and Fertility in Pakistan. Population Council: Islamabad, Pakistan.

Sathar, Zeba, Cynthia B. Lloyd, and Minhaj ul Haque. 2000. Investments in Children's Education and Family Building Behavior in Pakistan: Findings from Rural NWFP and Punjab. Population Council: Islamabad, Pakistan.

World Bank, 2002. Poverty in Pakistan : Vulnerabilities, Social Gaps, and Rural Dynamics. Poverty Reduction and Economic Management Sector Unit, South Asia Region, Report No. 24296-PAK. World Bank: Washington D.C.

--.n.d.. Estimates of Poverty Headcount Rates of Pakistan between 2000/01 and 2004/05. Accessed online: http://siteresources.worldbank.org/INTSAREGTOPPOVRED/1337567-1152551765388/20987772/PovertyHCR2000-2005.pdf

Table 1. Percentage of households in lowest quartile of expenditure distribution per capita by district, and percentage of respondents who reported an economic shock in inter-survey period

(State) District	1997	2004
Punjab		
Sialkot	14.5	27.5
D.G. Khan	30.7	40.3
R.Y. Khan	25.4	27.5
NWFP		
Abbottabad	8.3	20.2
Karak	31.6	20.0
Sawat	38.1	14.4
Percentage reporting unexpected events:		
Loss of crops or livestock	n.a.	19.6
Loss of business	n.a.	10.0
Any economic shock[a]	n.a.	27.7

Source: authors' calculations. Per capita expenditure adjusted for household size and composition.
a Refers to loss of crops, business or bankruptcy, theft, fire, fall in remittances, and job loss.

Table 2. Wanting no more children and contraceptive use among those who want no more children by age and district

	Wanted no more children		Wanted no more children and used contraception	
	1997 (%)	2004 (%)	1997 (%)	2004 (%)
Ages in 1997				
20-24	20.3	47.7	4.4	17.7
25-29	46.3	64.7	13.9	32.3
30-34	65.5	74.8	22.3	35.9
35-39	73.3	74.2	22.8	28.5
40-45	72.3	68.0	21.2	23.4
District				
Sialkot	55.5	62.2	23.3	27.7
DG Khan	36.1	60.0	5.7	25.7
RY Khan	43.1	69.4	5.2	28.4
Abbottabad	65.5	85.8	28.2	44.7
Swat	64.6	65.6	30.3	26.2
Karak	59.6	57.1	10.9	20.1

Source: Sathar et al 2006.