The Pakistan Development Review
Vol. XVIII, No. 3 (Autumn 1979)

Rural-Urban Fertility Differentials: 1975

ZEBA AYESHA SATHAR*

This paper is concerned with identifying differentials in levels and patterns of urban and rural fertility in Pakistan, based on Pakistan Fertility Survey data. Findings show that there are marginal differences in the over-all levels of fertility in the two areas. However, younger urban women are reproducing at a higher rate than rural counterparts, whereas older urban women use relatively more contraception and have lower fertility than older rural women.

INTRODUCTION

All countries with current low levels of fertility have experienced the phenomenon known as Demographic Transition. The theory of the demographic transition envisages a decline first in mortality and then in fertility alongside the economic development of a particular society. In Pakistan, as in many other developing countries, mortality decline in recent decades, together with persistently high fertility levels, has resulted in a rapid population growth. If the historical demography of developed countries is any guideline for the changes to be expected in other countries, fertility must now begin to decline in Pakistan. Since fertility declines in most countries have been associated with increasing urbanisation, it is natural to expect fertility in Pakistan to begin declining first in the urban areas. The purpose of this study, therefore, is to investigate and identify any rural-urban differentials in fertility in Pakistan and to try to explain them in terms of socio-economic and demographic factors, such as education, age at marriage, use of contraception, infant-child mortality, duration of marriage, etc.

METHODOLOGICAL ISSUES

The data for this study have been drawn mainly from the Pakistan Fertility Survey (PFS) conducted on a sample basis for the whole country in 1975. The PFS

*The author is a Research Demographer at the Pakistan Institute of Development Economics, Islamabad (Pakistan). She wishes to acknowledge the help of her colleagues, Dennis De Tray, Naushin Mahmood, Mohammad Afzal, Nasra Shah, Sultan Hashmi and Gulshan.

was one in the set of surveys being conducted in various parts of the world by the World Fertility Survey and supplies the most recent and internationally comparable detailed information on fertility patterns in Pakistan. The Survey included a national random sample of 4,949 ever-married women, aged 15–49 (1,886 in urban areas and 3,063 in rural areas), to whom a detailed questionnaire regarding respondents' background, marriage and reproductive history, was administered. Information from the responses has been used for the core of the analysis in this paper.

There are two methodological issues regarding the PFS data which directly concern the results attained in this paper. Firstly, since the focus of the paper is on an examination of differentials between rural and urban fertility, it is crucial to see the basis on which females in this sample were classified as urban or rural. The classification was based on the 1971 delineation standard developed by the Statistical Division when developing a national sampling frame for urban areas. Thus, the sampling frame of households in urban areas referred to a date at least three years prior to the PFS and is unlikely to have taken into account the rapid expansion of urban areas since that date. There is a need, as in any other country with a rapid rate of urbanization (75 percent in the 1961–72 intercensal period) [12, p. 15], to update the classification and delineation between urban and rural areas as frequently as possible. Since there were already problems of the kind in the 1972 Census [15], the PFS, conducted in 1975, is even more likely to have misclassified urban and rural areas. Another related problem worth mentioning here is that the division of women into urban and rural categories is based on their 'Place of interview'. However, while 73 percent of the PFS respondents resided 'currently' in rural areas, 33 percent of urban women stated that their childhood place of residence was in the village, only 5 percent of the rural women reported their childhood place of residence as the city. This shows quite an extent of net rural to urban migration within the PFS sample and those women classified as urban may not be adhering to city values but, having recently migrated, may still be holding on to rural fertility values. Also, as pointed out above, due to the large expansion of urban areas and the use of the 'outdated' urban sampling frame, it is likely that fringes of urban areas may have been classified as rural, thus making the differentials between the two sub-samples less apparent.

The second issue concerning the PFS data is that fertility estimates are derived mostly from retrospective birth history information asked only of ever-married women who are still alive. Retrospective fertility information is subject to recall errors and omissions in the reporting of births. Misreporting of dates and numbers of children ever born (especially those who died in early infancy) will naturally distort the results of the paper. Reporting is likely to be more defective amongst older and illiterate women. Apart from misreporting births, females in Pakistan also

grossly misreport their ages. Since measures of fertility levels are crucially related to age, misreporting of the latter is bound to affect estimates of levels and patterns of fertility. The female age distribution in the PFS data does seem to indicate that compared to the age distribution reported in Pakistan Growth Survey (PGS), there was underreporting in the 15–24 age group. Also the PFS sample shows a relatively high percentage of females in the 10–14 age group, which may have been due to underreporting of ages of very young women in the sample, i.e. to exclude them from it. Thus the results of the analysis in the paper should be examined in the light of the data problems pointed out above, as well as of the sampling errors of the PFS.

RESULTS

(a) Current Fertility

Marital age-specific fertility rates and total fertility rates have been derived separately for urban and rural women. Since the data on births to women are in the form of a pregnancy-history record for each one, the derivation of current fertility measures is not as straightforward as it would be if a question had been asked on 'number of births in the last twelve months'. Also the interviews of ever-married women took place over a period of a couple of months and the 'last twelve months' would refer to a different reference period for each woman depending on the time of her interview. To overcome the problem of standardising the reference period of twelve months for each woman, the calendar year of 1974 was chosen. Ever-married women were grouped into 5-year age groups according to their exact ages on 1 January, 1975. Errors are likely to have affected the accuracy of the rates, mostly due to misreporting of the ages of ever-married women and the exact timing of their births. It is likely, especially for older women, that births further away in the past will be incorrectly remembered and even omitted: this would apply especially to female births and births which ended in infant deaths.

A comparison of rural and urban rates for ever-married women in Table 1 shows that urban fertility in the ages below 35 is higher than rural fertility. For older ages, 35–44, the levels are higher in rural areas but for the oldest ages, 45–49, it is again higher for urban women. The TFR (total fertility rate) for ever-married women is 6.8 per 1,000 in the urban areas and 6.6 in rural areas. Thus, though very slight and almost negligible, current marital fertility seems to be lower in rural areas and also shows a differential age pattern of fertility.

However, these rates are in conflict with the age-specific fertility rates presented in the Population Growth Survey (PGS) 1971 [12], which show a clearly lower level of fertility in urban areas. The question that arises is whether the PFS

Table 1

Marital Age-Specific Fertility Rates

Age Group	Fertility Rates of Female Respondents	
	Urban	Rural
15–19	.216	.213
20–24	.330	.299
25–29	.333	.295
30–34	.258	.242
35–39	.177	.184
40–44	.037	.085
45–49	.014	.009
TFR per 1000	6.827	6.635

data portray a completely different trend or whether the PFS rates reflect the peculiarities of the PFS data set. A complete and thorough comparison between the PFS and PGS data is not possible in this paper. It has already been pointed out that there were differences in the PGS and PFS age distributions, which may have affected the rates derived from those two surveys. Also, the classification of rural and urban subsamples of women must have captured quite a different set of females in the two surveys because of the changing nature of urban areas since 1971 (which may not have been taken into account in the PFS) and rapid rural-urban migration. It is, however, possible to check the internal validity of these estimates of MASFR by looking at the mean number of births to ever-married women in the past 5 years (considering only those women who have been continuously married for that time period).

Table 2 shows once again that current fertility of urban women aged less than 35 years was higher than that of rural women of the same age. This conforms with the previous findings of current patterns of marital age-specific fertility rates. This shows a fair amount of consistency within the PFS data but not with PGS results. It is, however, possible that urban women aged less than 35 do have higher fertility than rural women of corresponding ages and the pattern should reverse itself at ages beyond 35. It was found in a study of fertility transition in Europe and Asia [9] that the age pattern of marital fertility amongst populations *not* practising family limitation was very different from that amongst populations in which birth control was more widespread. When plotted graphically, age-specific marital fertility rates for ever-married women in ultra-20–24-year age groups showed a *convex* curve for

Table 2

Births in Past Five Years to Ever-Married Women who have been Continuously Married for Five Years

Age Groups	Mean Births for all Women in the Age Group	
	Urban	Rural
15–19	1.4	1.2
20–24	2.0	1.8
25–29	1.9	1.7
30–34	1.7	1.6
35–39	1.2	1.3
40–44	0.7	0.8
45–49	0.2	0.2

the former types of population but a distinctly *concave* curve for the latter types of population.

In Fig. 1, age-specific marital fertility rates for urban and rural areas of Pakistan (as shown in Table 1) have been plotted. Although contraceptive practice cannot be said to be 'widely' practised in urban areas, about 21 percent of the sample of urban ever-married women reported the use of some sort of contraception compared to only 6 percent in rural areas. It can, however, be seen that the urban fertility curve (Fig. 1) does have a concave shape after the age of 20–24 whereas the shape of the rural curve is relatively convex. The shape reflects the sharper decline of fertility in urban areas after the age of 35 compared to the more gradual decline of fertility in the older ages in rural areas. The reason given for the difference in the shapes of natural fertility and controlled fertility population curves is that when fertility is controlled it declines more rapidly at relatively younger ages when couples have attained their family size in the earlier part of their child-bearing span and are effectively preventing subsequent births [9]. The findings of this study also show that the earliest available estimates of rural and urban marital fertility show that urban fertility resembles more closely the pattern of controlled fertility populations as compared to rural fertility which was closer to natural fertility patterns that is even before any major fertility declines come about [9]. Thus it is possible that younger Pakistani urban women are having more births than their rural counterparts but their fertility is falling off at older ages when they may be limiting their family size. It is, therefore, likely that the pattern of current high fertility for the younger ages in urban areas, which is being shown by the PFS data, is real and not a result of data irregularities. This will be explored in more detail later in the paper.

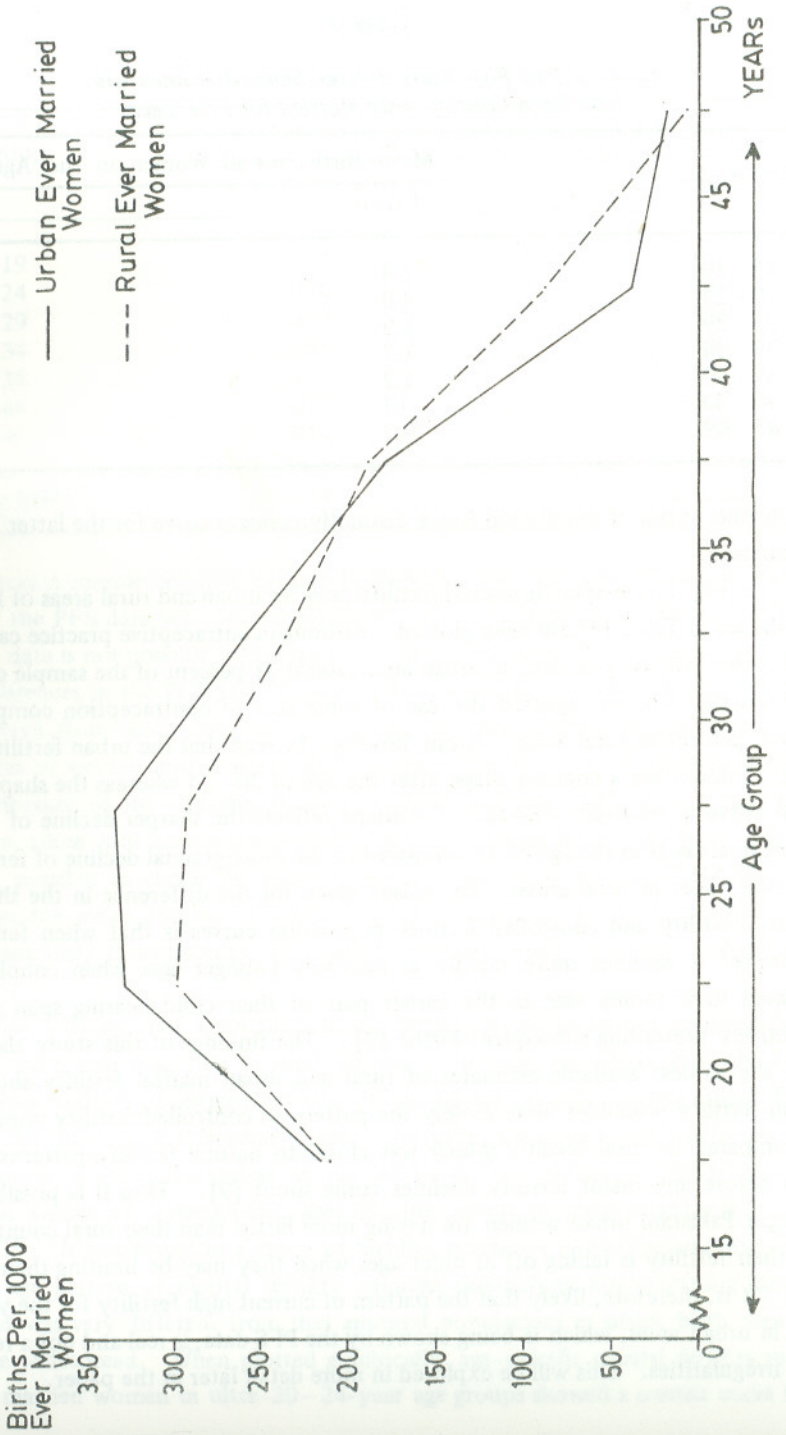

Fig. 1. Marital Age-Specific Fertility Rates for Urban and Rural Ever-Married Women.

(b) Cumulative Fertility

Cumulative fertility, measured by the total number of children born alive, reflects the total childbearing experience of women up to the time of interview and is strongly related to the age of each woman, her age at marriage and the duration of her marriage. Table 3 shows the number of children ever born (CEB) to ever-married women of different ages in rural and urban areas separately. This table shows once again that younger urban women report a higher average number of CEB than their rural counterparts. Only rural women aged 35–39 reported higher average parity than urban women. The average parity of women aged 40–44 is about the same in both rural and urban areas but is slightly higher for women aged 45–59 in urban areas. The age pattern of cumulative fertility shows the same rural-urban differentials as is shown by current marital fertility. A similar finding was reported by Afzal [2] in his study of the fertility of East Pakistani women. He suggested that this may be due to urban women becoming mothers at earlier ages or to their having relatively more children in the earlier years of marriage. Also he suggested that, due to 'better' sanitary environment, urban women may be having less foetal loss and still births and, therefore, a higher number of live births per conception.

Table 3

Mean Number of Children Ever Born by Current-Age of Mother

Age Group	Total Number of children ever born		Total Number of ever-married women		Mean Number of children	
	Urban	Rural	Urban	Rural	Urban	Rural
15–19	125	233	197	387	0.634	0.602
20–24	621	980	323	521	1.923	1.900
25–29	1308	1823	375	548	3.488	3.326
30–34	1717	2432	319	505	5.382	4.815
35–39	1315	2290	242	383	5.433	5.979
40–44	1553	2740	222	394	6.995	6.954
45–49	1359	2092	196	306	6.933	6.844

Table 3 also shows that, in both rural and urban areas, women aged 45–49 reported lower cumulative fertility than women in the younger age group 40–44. Such a finding is quite common from CEB distributions based on data from censuses and surveys that include questions about past childbearing. This pattern almost necessarily reflects a stronger tendency amongst women at the end of their child-

bearing period to underreport the number of CEB [10]. If women aged 40–44 can be taken as having completed their family size, then it can be seen that both urban and rural women in these ages have 6.9 children on an average. It seems that despite differentials at earlier ages, rural and urban women eventually have the same number of children.

On the average, urban women of all ages combined report having 4.36 children which is higher than the 4.0 children reported by rural women. The age distribution of the particular samples of urban and rural ever-married women is bound to affect the average number of CEB, and when standardisation is made using the age distribution of urban areas for rural women, their average CEB also rises to the same urban level. Thus there seems to be a small differential in average parities of urban and rural ever-married women explained to quite an appreciable extent by differences in age distributions.

Differences in reproductive behaviour are often related to differences in marriage patterns, such as proportions married and age at marriage. Raising of the age at marriage has been put forward as an anti-natalist measure and it is, in general, known to vary inversely with fertility levels. On this basis, a differential in the age at first marriage is an important indication of likely social and demographic differences between two groups of women. Age at marriage has shown a secular rise amongst women of both urban and rural areas and is higher amongst the former. While 66.1 percent of the *urban* sample of ever-married women married before the age of 18 years, 71.1 percent of the *rural* ever-married women married before that age. Similarly, while 87.4 percent of urban women married before 21, 91.4 percent of their rural counterparts married before that age. The mean age at marriage calculated for the whole sample of ever-married women of all ages is 16.4 years for rural areas and 16.7 years for urban areas. The secular decline in age at first marriage can be seen in Table 4 which shows that age at marriage amongst those women who married before 25 is higher for the younger age groups and falls with age except for the last age group.

The importance of age at first marriage in relation to fertility stems from the fact that in a society like Pakistan (where fertility is rarely controlled and childbearing outside marriage is virtually non-existent) it marks the beginning of exposure to childbearing. If rural women marry earlier, they are, on the average, exposed longer than urban women. However, an early marriage may not necessarily mean an immediate start of childbearing. It is possible that despite earlier marriages, rural women may take longer before having their first child. There does seem to be some evidence of this in this sample, in which 43.5 percent of urban women, compared to 38.2 percent of rural women had a first birth interval of less than 2 years. Also 72.4

Table 4

Mean Age at First Marriage of Those Women who First Married Before Age 25 by Current Age

Current Age Groups	Mean Age at First Marriage	
	Rural Women	Urban Women
25–29	16.9	17.1
30–34	16.5	16.8
35–39	16.2	16.4
40–44	15.7	15.7
45–49	16.2	16.2
All	16.4	16.5

Source: [12, Table 1.1.3].

percent of urban women had a first birth interval of less than 4 years while the corresponding percentage of rural women was 68.9 percent. This finding does show a tendency of rural women to spend a longer time on an average between marriage and first birth. However, possible reasons for this finding are higher levels of sub-sterility and higher pregnancy wastage in the rural areas.

It was also found that the length of breastfeeding, as measured for its duration during the last closed interval, was shorter in urban areas than in rural areas. The sample means for women who had breastfed at all in urban and rural areas, in their last closed interval, were 15.4 and 17.4 months respectively. Except for those women aged less than 20 (an unreliable group to look at since many women in this group had not had a first birth), urban women had breastfed for shorter lengths in their last closed interval for all ages. The difference does seem to be largest for women aged 20–34 and 44+ and lower for women aged 35–44. Although no direct conclusion can be drawn from this finding, because it presents averages and those, too, not for all women in the subsamples, it does seem to suggest that there may be a connection between relatively higher urban fertility (especially in the younger age groups up to 35) and their shorter period of breastfeeding. If breastfeeding in the last closed interval is at all reflective of the length of breastfeeding after most other births, then if urban women breastfeed for shorter durations, their period of post-partum amenhorrea (natural contraception) is likely to be shorter as well, leading to longer periods of risk to conception over the durations of marriage for urban women than for rural women.

One of the most direct determinants of children ever born is the duration of marriage. In a society like Pakistan, wherein almost all children are born within

marriage, the number of children that can be born to a couple is necessarily limited to the number of years they have been married. Women who have been married for 20 years or more are likely to have completed their fertility experience: the mean number of children for this group in rural areas is 7.1 which is the same as in urban areas. For the duration of marriage of less than 10 years, average parity in urban areas is 1.6 as against 1.5 in rural areas. Also, for the duration of marriage of 10–19 years, urban average parity is 5.0 which is once again higher than the rural average (4.7). Once again, this may be, at least partially, a cause of shorter length of breast-feeding among urban women which may be reducing intervals between births, thereby leading to relatively higher cumulative fertility in urban women than in rural women for the same duration of marriage. Although it appears that eventually rural and urban cumulative fertility reach the same level (i.e. after 20 years of marriage), the pattern of childbearing does seem to differ in the two sub-groups.

The increase of education amongst females is held firmly as one of the factors most directly linked with declines in fertility. As women get educated, they may find alternatives to childbearing and generally prefer to have fewer but 'better quality' children. In view of it, it seems that if the degree of pervasion of education differs amongst rural and urban women this may explain some of the fertility differentials between the two groups. Only 23 percent of urban women passed any classes in school, while the corresponding figure for rural women was only 5 percent! Thus an average urban woman was relatively more educated than a rural woman. The average number of children born to urban women with *no* education is 4.6; for those with 1–5 years of schooling, it is 3.8; for those with 6–10 years of schooling, it is 3.2; and for those with 11–16 years of schooling, it is 1.8. In rural areas, on an average 4.1 children were ever born to women with *no* schooling, 2.8 to those with 1–5 years of schooling and 2.3 to those with 6–10 years of schooling. There were no women in the rural sample who had more than 10 years of schooling. Although there seems to be a strong inverse relationship between levels of education and average children ever born, particularly in rural areas, this result may be very biased because age, marital duration and other relevant variables have not been controlled. There has definitely been a secular increase in educational levels in Pakistan and it is therefore important to control for age before comparing levels of CEB between women of different educational levels. Table 5 shows the mean number of children to women of different age groups in urban and rural areas. This table shows that the corresponding average CEB is still higher in urban than in rural areas. Also, in rural areas, the relationship between level of education and mean parity is quite clearly inverse, there being clear differentials between women with some education and

Table 5

Mean Number of Children Ever Born by Current-Age Groups of Women and Their Educational Levels

Educational Level	Age Groups														
	Urban							Rural							
	<20	20–24	25–29	30–34	35–39	40–44	45–49	<20	20–24	25–29	30–34	35–39	40–44	45–49
Nil	.636	2.1	3.7	5.6	4.5	7.1	7.3	.584	1.9	3.4	4.9	6.1	7.0	6.8
Primary	.600	1.7	3.7	5.8	5.4	7.4	5.1	.500	1.3	2.7	4.3	5.1	6.3	(6.6)
Secondary	.400	1.7	2.7	4.5	4.7	(6.6)	(6.5)	–	(2.2)	(1.2)	(2.7)	(4.5)	(5.0)	–
Inter-mediate	–	–	(2.0)	(2.5)	(2.0)	(2.5)	(4.0)	–	–	–	–	–	–	–
University	–	.8	(1.5)	(2.0)	(2.5)	(2.5)	–	–	–	–	–	–	–	–

Note: Means in parentheses indicate that they are based on sample sizes of less than 10 women.

those with no education at all. Of course, in rural areas there are no women with more than secondary education and very few with secondary education. This makes it hard to draw definite conclusions about fertility at that level of education. However, interestingly, urban women aged 25–34 and with some education (primary) show very little difference in their fertility from the fertility of women of similar ages but with no education. In fact, in the case of 30–34-year-olds, women with primary education attained a higher mean parity than those with no education! The same applies to women aged 40–44 in urban areas. Thus, a little bit of education in urban areas does not necessarily lead to lower levels of fertility as it does in rural areas..

When populations of particular societies try to curtail their fertility, they begin by seeking means of physiologically limiting conception. The Family Planning Programme in Pakistan has been making an effort to disseminate information about contraception and making contraception available to those couples who desire them. Needless to say, use of contraception is not yet quite prevalent in Pakistan. There are still many couples who have no knowledge of how to curtail fertility. While 82.2 percent of urban women know of a specific method of birth control, 9 percent knew of methods in general (not a specific one) and 8.8 percent knew of *no* methods at all. In the rural areas, 72.2 percent women knew of a specific method, 14 percent of methods in general and 13.5 percent of no methods at all! Thus, knowledge of contraception seems to be slightly better in urban areas probably due to better means of dissemination of information and publicity in those areas. However, what is more pertinent is to enquire whether urban women are *using* contraception more than rural women to limit their family size.

In urban areas, 39.1 percent of ever-married women had never used contraception but intended to use it; 39.9 percent never had used it and did not intend to use it; 9.3 percent were past users; 2.4 percent were couples with either spouse sterilised; and 9.3 percent were using other methods. In rural areas, 51.9 percent of ever-married women had never used contraception but intended using it; 42.1 percent had never used it and did not intend to use it; only 3.4 percent were past users; 0.4 percent were sterilised; and 2.2 percent were using other methods. These figures do show a greater extent of the use of contraception in urban areas than in rural areas: while 21 percent women had practised or were practising contraception in urban areas, such women were only 6 percent in rural areas. Thus, two-and-a-half times as many women reported use of contraception in urban areas as in rural areas. In an attempt to explore further the possible reasons behind the different age patterns of current fertility pointed out earlier, the age-specific use of contraception was looked at closely. If urban women at younger ages were reproducing at a higher

level than their rural counterparts but their fertility was dropping off more rapidly towards the middle and end of their childbearing period, then this latter group should be using effective contraception more widely than rural women in corresponding ages. It was found that while 10 percent of urban women aged 20–24 used effective contraception, the corresponding figure for rural women was 1 percent. At ages 30–34 and 35–39, 25.5 percent and 30.9 percent of urban women in those age groups are using efficient contraception. The corresponding figures for rural women are 6.7 and 10 percent for those ages. The percentages begin declining for both urban and rural women after the age of 40. Thus, almost one-third of the group aged 35–39 in urban areas is said to be using efficient means of contraception, and that is around the age where urban fertility is showing its most steep decline.

The analysis of cumulative fertility has so far involved only the numbers of children ever born (total live births) to ever-married women. However, in a country like Pakistan, with relatively high levels of infant and child mortality, the number of living children may be quite different from CEB. So, even if a woman gives birth to a number of children, a large proportion of whom do not survive very long, her effective completed family size may be reduced quite a bit. It is quite widely held that reporting of infant and child deaths in retrospective surveys in developing countries tends to lead to underestimates of mortality because of underreporting [10]. Therefore, it is quite possible that women may remember less well those children who are dead, and this may lead in turn to an underreporting of CEB also. As reported in the PFS, infant and child mortality seems to be definitely higher in rural than in urban areas and the average number of children deceased in the whole rural sample was 1.0 compared to 0.9 amongst the urban sample of ever-married women. Although this is just a crude index of infant-child mortality, it does support the fact that there are mortality differentials (despite probable underreporting) between urban and rural areas which may in turn have biased the reported cumulative fertility levels.

It was found that the mean number of living children for ever-married rural women was 3.1 and for urban ever-married women it was 3.5. Thus women in urban areas still maintained a higher family size than rural women.

It is argued at times that couples consciously or unconsciously insure against the loss of children by having few more children to make sure a certain number survives. If this holds true, then couples in urban areas may be losing less children than rural couples, even though the former may desire the same or smaller number of children. Findings of the PFS data [12] show that rural women of all ages desire a higher number of children than urban women even when the number of living children is controlled.

(c) Multiple Regression Analysis of Fertility Differentials

Most of the previous analysis done in the study involved contingency tables wherein associations between variables were hard to assess without controlling for related variables. Without such control, the bivariate relationships observed are likely to have been biased and not truly representative of the partial relationship. Thus, multiple regression analysis was chosen to help quantify the independent and joint effects of more than one variable in explaining differences in fertility.

In this study, children ever born (CEB) to ever-married women is the dependent variable, presenting a measure of stock of total live births to women at different ages in their reproductive cycle (15–45). Explanatory variables included in this regression were mostly those which were considered in the earlier part of the analysis (age, age at marriage, child-infant mortality, education level of respondent, contraceptive use). In addition, educational level of respondent's husband and labour force participation of women were included as explanatory variables. The first of these variables was used as a proxy for the socio-economic level of the family. Respondent's labour force status as expressed in terms of whether she had "ever worked" was eventually dropped in preliminary regression because the way the variable is constructed only tells whether a woman had ever worked for cash or kind or not. Thereby it *lumps* together women who continuously worked (and perhaps had to forgo having children in that time) with those who worked intermittently (whenever child care was available or economic pressures forced them to seek employment). Age and Age at First Marriage were treated as continuous variables taking on values between 10 and 49 years. The infant-child mortality variable was constructed as the ratio between the children deceased and the children ever born to ever-married women in the sample. The Contraceptive Use variable classified all ever-married women into one of two categories of users and non-users. The first category included those who had used or were using some form of contraception or had undergone sterilization (themselves or their spouses) and the latter were those who had never used any method of contraception. It should be pointed out that the latter category included those women who were considering the use of contraception sometime in the future.

Three equations have been presented below, all of them having almost the same specifications. The square of age variable was also included in the regression to take into account the obvious drop-off at higher ages of fertility levels [5].

Since the object of this regression exercise was to try to explain differential fertility between rural and urban areas, an exploratory regression was run with urban-rural residence as a dummy variable (acquiring a value of 1 if a woman was urban and of zero if she was rural) to see if it is a significant explanatory variable. It was found to be significant in equation 1 as shown in Table 6. The next step involved regression on rural and urban samples separately to see if the chosen explanatory variables differ in their effect on the dependent variables in the two areas. The equations thus derived are 2 and 3, also presented in Table 6.

Table 6

Regression Comparisons: Pakistan, Rural Areas and Urban Areas
Development Variable: Children Ever Born (CEB)

Explanatory Variables	Equation		
	1 All Pakistan	2 Rural Areas	3 Urban Areas
Current Age	0.613 (26.66)	+0.573 (20.35)	0.671 (17.03)
(Current Age)^2	−0.006 (17.22)	−0.006 (12.65)	−0.007 (11.72)
Urban-Rural Residence	+0.189 (2.85)		
Respondent's educational level	−0.058 (3.85)	−0.070 (2.07)	−0.052 (2.83)
Husband's educational Level	−0.017 (2.10)	−0.012 (0.99)	−0.022 (1.83)
Age at First Marriage	−0.223 (22.94)	−0.207 (17.42)	−0.254 (15.14)
Mortality	+1.424 (12.08)	+1.945 (12.52)	0.790 (4.35)
Use of Contraception	+1.304 (13.34)	+1.293 (8.27)	1.248 (9.64)
Constant	−4.931	−4.731	−4.923
R^2	0.578	0.587	0.570
F	845.778	621.943	354.497
Number of observations	4949	3033	1886

Note: t ratios are in parentheses.

Before discussing the results of the regression equation, the sample means of the variables included in the regression are presented below to see if their levels vary

Table 7

Sample Means for Selected Urban and Rural Characteristics of Ever-Married Women

Variables	Rural Means	Urban Means
Current Age	30.7 years	30.9 years
Level of respondent's education	0.23 (years of schooling)	1.7 (years of schooling)
Level of husband's education	2.20 "	4.98 "
Age at first marriage	16.4 Years	16.7 Years
Children ever born	4.11	4.33
Mortality ratio (children deceased) / (children ever born)	0.185	0.161
Contraceptive use (Proportion of users)	0.060	0.20

much from rural to urban areas. The mean current ages of sample women in rural and urban areas are very similar, with urban women being only 0.2 years older on an average.

The levels of respondents' and of their husbands' education in urban areas are much higher than in rural areas. Age at marriage is also 0.3 years higher in the former. While the average number of children ever born is higher in urban areas, mortality ratio is higher in rural areas.

The findings of regressions 2 and 3 in Table 6 show that Age and the Square of Age both bear a strong association with the dependent variable with very high t ratios. Their inclusion in these regressions explained to a large extent the high R^2 values obtained. While the independent variables jointly explained 0.59 of the variation in the rural areas, they explain 0.57 of the variation in urban areas.

The other explanatory variables, which did not bear as strong a correlation with CEB as Age and Age Squared, were also found to be significant at the five-per-cent level of confidence. Higher age at marriage was associated with lower CEB: the sample mean age at marriage was already shown to be higher for urban women; the B coefficient in equation 3 is also higher than that for rural women. That is to say,

changes in age at first marriage are correlated with a higher effect on CEB in urban areas than in rural areas.

The level of respondents' education was found to be inversely correlated with CEB. While levels of education are higher in urban areas at present, the B coefficient is relatively higher in rural areas. Thus an extra year of schooling in rural areas, with all other factors constant, is associated with a higher decline in CEB than a similar change in urban areas.

The variable relating to contraceptive use is a dummy variable dichotomising those who had *never used* contraception (giving them a value of 0) and those who had used, or were using, contraception or sterilisation (giving them a value of 1). The variable was found to be significant and positively related to CEB, and the B coefficient was about the same in both rural and urban areas. This result, which seems startling at first glance, has been discovered before. It indicates that if couples are divided into users and non-users of contraception, the former's fertility is higher. It indicates that women in Pakistan begin using contraceptives (or sterilisation) only after a large family size has been achieved, i.e. after their demand for children has been satisfied [16]. It is likely that even in urban areas (where rate of use of contraception is relatively higher), contraception was sought only at later stages of child-bearing.

Husband's educational level was found to be negatively and significantly correlated with CEB only in urban areas. Although this variable is a very rough proxy for socio-economic level of a couple (or family), there does seem to be an inverse relationship between socio-economic level and CEB which appears to be significant only in urban areas.

The mortality variable which was inserted as a measure of child-infant mortality, was found to be positively and significantly related to CEB. However, the B coefficient was quite a bit higher in rural areas, i.e. a larger rise in CEB was associated with a rise in the mortality levels (other factors remaining the same).

LIMITATIONS OF THE STUDY

One limitation of this analysis is that, due to the nature of the PFS sample, only ever-married women were interviewed and only marital rates are presented here. Thus the study does not address itself to the question of how changes in the age at first marriage (mostly its delay) affect general fertility, TFR, GRR and crude birth rates. The differences in marriage behaviour (proportions marrying and age at marriage) are not really given their weight here in the discussion of rural and urban fertility, which focuses primarily on fertility levels and patterns amongst women already married.

Also, the reporting of cumulative fertility may have been biased by differentials in age misreporting and birth-recall errors. There is some evidence from the birth-history data, to which the Brass P/F ratio method was applied, that for the 20–24 age group there was a tendency in rural areas to underreport recent events, whereas in urban areas women may be using a shorter reference period, i.e. reporting their births more closely than they actually took place. Although there is some evidence showing that there are differential patterns of misreporting in urban and rural areas, these particular errors of data have not been tested out thoroughly.

The third limitation pertains to the distinction of urban and rural areas on which this analysis is based. One of the reasons for the lack of difference in fertility in the two areas may be recent migrations from rural to urban areas. A lot of the women who spent their earlier years in rural areas may be still adhering to fertility norms and practices of those areas and may not be truly "urbanised". Thirty-three percent of urban women did report "growing up to the time they were married" in a village. Also, about two-thirds of these women were aged less than 35 years of age and were therefore relatively younger women who were near the peak of their fertility behaviour. This would seem to support the finding of high fertility levels amongst younger urban women. However, there is some recent evidence of considerably low crude birth rates in large cities in Pakistan, which may mean that differentials exist for larger urban conglomerations. A limitation of this paper might be the lack of differentiation of urbanites in terms of recent migrants or original city/town dwellers and of urban areas in terms of their size.

POLICY IMPLICATIONS

The following policy implications emerge from the findings of this study. *First* of all, a regular revision of the urban sampling frame is required to keep up with the rapid rate of urban growth [15]. This will make more meaningful the demarcation between rural and urban areas, from the point of view of researchers analysing differentials between them. Also, a classification of urban areas by their size classes would be useful for the purpose of analysis. *Secondly,* the results of the study of fertility differentials bring out the importance of education as a factor which is likely to be accompanied by major changes in norms and values leading to a reduction of fertility. As yet, there are too few educated women, even in urban areas (where educational levels are relatively higher), to have caused fertility to decline on the whole. Only when education is given its due importance will the partial inverse relationship between education and fertility become more effective. *Thirdly,* it was also found that contraceptive use was related positively to fertility. This was interpreted to show that couples were using contraception only after

achieving a fairly large family size. This finding is an important guideline for research for the Population Planning Programme in Pakistan. If those seeking contraception tend to be older couples with large families, the programme should be directing itself towards motivating younger couples (in their most fecund years) to limit their fertility. It is only when these couples seek the use of contraception that fertility will show a marked decline. For instance, in this study, younger urban women seem to be reproducing at a high rate and it is the job of the population planners to seek out such high-fertility groups and focus on seeking their participation in the programme. *Lastly,* it seems that to view health and environmental conditions separately from fertility levels is shortsighted; the link between infant-child mortality, maternal mortality, foetal wastage and fertility cannot be overlooked. To improve these three factors (especially in rural areas), it is necessary to link health programmes with the Population Planning Programme and expect that despite some possible initial rise in fertility, better child maternal care may, in the long run, lead to reduced fertility *vis-a-vis* improved mortality levels.

CONCLUSIONS

Previous studies which touched upon rural-urban fertility differentials in Pakistan [2; 7; 8] found no startling differences. Although characteristics of marriage behaviour differed between rural and urban areas, reproductive behaviour within marriage was not very different. Robinson put forward the view that perhaps urbanisation in Pakistan had not been accompanied by "urbanism" [7] unlike the experience of developed countries. Another reason given was that as yet the groups whose fertility had begun falling were not large enough for their behaviour to have affected the general levels of urban fertility [7].

The measurement of current fertility showed that the total marital fertility rate was slightly higher in urban areas than in rural areas. The age-specific marital fertility rates of younger urban women are higher than those of rural women which means that even if they eventually have equal or fewer children than their rural counterparts, urban women are reproducing quite rapidly at younger ages. A possible reason for this is the relatively shorter length of breastfeeding observed amongst urban women, as compared to rural women, with the resulting shorter birth intervals and higher number of births amongst the former group. Another possible reason is that urban women may be relatively more fecund because of better sanitary and health conditions in urban areas. The age-specific marital fertility rates in urban areas also seem to drop off more rapidly at later ages in urban areas. This may be connected with the relatively higher use of efficient contraception at ages 29–39, observed in urban women. Thus urban women may be reproducing at a higher rate

in the younger age groups but they may also be resorting more frequently to the use of contraception in later years, to curtail their family size.

Levels of cumulative fertility amongst urban and rural ever-married women are, once again, not very different despite slight differences in age patterns of fertility. The mean parity reported by 40–44-year-olds (almost at the very end of child-bearing) is 6.9 for both urban and rural women. One noticeable difference in rural and urban cumulative fertilities was observed when level of education was controlled: the relationship was more strongly inverse between fertility and level of education for rural areas. In urban areas, for certain age groups, primary education actually did not lead to very much lower fertility levels, and for age groups 30–34 and 40–44, it was actually associated with higher fertility than that for women of the same ages with no education!

Rural women, however, showed evidence of having a higher incidence of child mortality and infant mortality and this may have slightly increased the differential between 'effective' completed family sizes (number of living children) in urban and rural areas. The number of children desired seemed to be smaller in urban areas than in rural areas, which may mean that family size norms in urban areas had begun changing to lower levels than in rural areas, or that they are likely to change in the next few years. Since urban mortality levels seem lower than those in rural areas, it is possible that couples lost less children than they had anticipated (consciously or unconsciously) and had, therefore, more children than they desired. Once again, this is mere speculation on the author's part and is not supported by empirical evidence.

REFERENCES

1. Afzal, Mohammad *et al.* "Age at Marriage, Fertility and Infant-Child Mortality in a Lahore-Suburb (Part-II)". *Pakistan Development Review.* Vol. XV, No. 2. Summer 1976.
2. Afzal, Mohammad. "The Fertility of East Pakistan Married Women". In W. Robinson (ed.), *Studies in the Demography of Pakistan.* Karachi: Pakistan Institute of Development Economics. December 1967.
3. Bogue, Donald J., and Elizabeth J. Bogue. *Techniques of Pregnancy History Analysis.* Chicago: Community and Family Study Center, University of Chicago. 1970.
4. De Tray, Dennis. "Age of Marriage and Fertility: A Policy Review". *Pakistan Development Review.* Vol. XVI, No. 1. Spring 1977.
5. De Tray, Dennis, and Zubeda Khan. "On the Care and Handling of Regression Specifications in Fertility Research". *Pakistan Development Review.* Vol. XVI, No. 3. Autumn 1977.

6. Driver, Edwin D. *Differential Fertility in Central India.* Princeton, N. J. (USA): Princeton University Press. 1963.
7. Duza, B. "Differential Fertility in Pakistan". In Warren Robinson (ed.), *Studies in the Demography of Pakistan.* Karachi: Pakistan Institute of Development Economics. December 1967.
8. Karim, M. "Fertility Differentials by Family Type". *Pakistan Development Review.* Vol. XIII, No. 2. Summer 1974.
9. Knodel, J. "Family Limitation and the Fertility Transition: Evidence from the Age Patterns of Fertility in Europe and Asia". *Population Studies.* Vol. 31, No. 2. July 1977.
10. Knodel, J., and V. Prachuabmoh. "Demographic Aspects of Fertility in Thailand". *Population Studies.* Vol. 28, No. 3. November 1974.
11. Pakistan. Statistical Division. *Population Growth Survey, 1971.* Karachi: 1974.
12. Population Planning Council of Pakistan. *World Fertility Survey: Pakistan Fertility Survey – First Report.* Islamabad. October 1976.
13. Robinson, W. "Urban-Rural Differences in Indian Fertility". *Population Studies.* Vol. 24, No. 3. March 1970.
14. Sattar A. "Conceptualization of Urban Areas with Reference to Pakistan Implications for the 1981 Census". In Karol J. Krotki and Sultan S. Hashmi (ed.), *Issues in Demographic Data Collection in Pakistan: Proceedings of a Seminar, Rawalpindi, 11–13 August 1975.* Islamabad: Census Organization. 1977.
15. Schultz, T. P., and Julie DaVanzo. *Analysis of Demographic Change in East Pakistan: A Case Study of Retrospective Survey Data.* Santa Monica, Calif. (USA): The Rand Corporation. 1970.
16. Shah, Nasra M., and S. Firasat A. Kazi. "Attitudes, Contraceptive Practice and Children Ever Born . . . Pakistan". *Pakistan Development Review.* Vol. XVI, No. 4. Winter 1977.
17. United Nations. Department of Economic and Social Affairs. *The Determinants and Consequences of Population Trends: New Summary of Findings on Interaction of Demographic, Economic and Social Factors.* Vol. 1. New York. 1973. (Population Study No. 50).