

PAKISTAN POPULATION REVIEW

VOL.5.

SPRING 1994

NO.1

I. Research Articles

1. Fertility Transition in Developing Countries:
An Evidence From WFS and DHS/FHS -- Sultan S. Hashmi
2. Fertility Desires in Pakistan -- Naushin Mahmood
Karin Ringheim
3. Seasonality of Births in Pakistan -- Mohammad Afzal
A. Razzaque Rukanuddin

II. Research Notes and Comments

1. A Note on Evaluation Study of IEC Component
of Population Welfare Programme of Pakistan -- Abdul Hakim
2. A Note on Study of Male Attitude and
Motivation Toward Family Planning -- Mansoor-ul-Hassan Bhatti
Abdul Hakim

III. Book Reviews

1. The Demographic Transition -- Aysha Sheraz
2. Women in Movement -- Nawazish Ali Asim
3. The Poverty Curtain: Choices for the Third-World -- Zahir Hussain



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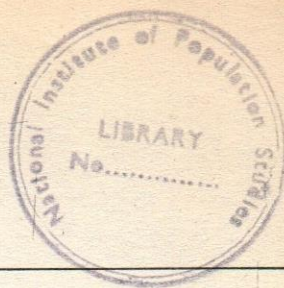
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CONTENTS

Title		Page No.
I. Research Articles		
1. Fertility Transition in Developing Countries: An Evidence From WFS and DHS/FHS	-- Sultan S. Hashmi	1
2. Fertility Desires in Pakistan	-- Naushin Mahmood Karin Ringheim	33
3. Seasonality of Births in Pakistan	-- Mohammad Afzal A. Razzaque Rukanuddin	59
II. Research Notes and Comments		
1. A Note on Evaluation Study of IEC Component of Population Welfare Programme of Pakistan	-- Abdul Hakim	77
2. A Note on Study of Male Attitude and Motivation Toward Family Planning	-- Mansoor-ul-Hassan Bhatti -- Abdul Hakim	87
III. Book Reviews		
1. The Demographic Transition	-- Aysha Sheraz	93
2. Women in Movement	-- Nawazish Ali Asim	99
3. The Poverty Curtain: Choices for the Third World.	-- Zahir Hussain	103

FERTILITY TRANSITION IN DEVELOPING COUNTRIES: AN EVIDENCE FROM WORLD FERTILITY SURVEYS AND DEMOGRAPHIC HEALTH / FAMILY HEALTH SURVEYS

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Assisted by
FAATEH UD DIN**

The data obtained through the widely known series, World Fertility Survey and Demographic Health / Family Health Survey have been mostly published, used and analysed throughout the world. Also these data have been analysed mostly through simple regression and correlation analyses. Besides simple correlation, partial and multiple correlation analyses are used in this article to explore further, the independent effect of CPR on TFR and each of other selected variables such as female mean / median age at marriage, mean / median length of breastfeeding, mean number of children ever born, mean desired family size and infant mortality rate on TFR. The comparison of results of the two series shows a transition from high to medium fertility. Besides, there is a remarkable similarity in the behaviour of corresponding variables of the two series.

I. INTRODUCTION

The main objective of the present article is to undertake a comparative study based on some results of two of three major series of cross-sectional surveys undertaken in the developing countries of the world (including Pakistan). These series consist of World Fertility Survey (WFS) series in which data were collected for 41 countries during 1970s and early 1980s, and were tabulated for 40 countries^a. Contraceptive Prevalence Survey (CPS) series in which data were collected for 33 countries from mid 1970s to mid 1980s and the Demographic and Health Survey (DHS) series in which data collection started around mid 1980s and is still continuing. The present comparative study is based on WFS and DHS series.

In WFS and DHS series, the design and contents of questionnaires used, followed the respective model questionnaires with minor modifications and changes from country to country. Both the series were scientifically designed and standard procedures were used for data collection among countries. First some basic data

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a. Data for Iran were collected but no report was prepared.

were collected on each household through household questionnaires in which respondents - (married women of reproductive age including those who were in informal and consensual unions in some countries) were identified and interviewed by female interviewers. Although no population data obtained through surveys are perfect, both series are based on nationally representative samples and the data obtained through these surveys are expected to have better quality, completeness and international comparability than data obtained through other sources. A large amount of population and family planning data are made available through these surveys which have been and are being analysed by researchers all over the world. More details of evaluation of WFS data, differences between the two series and within DHS series are given in [1,pp.45-63], [2,pp.618-643], [3,pp.1548-1551], [4] and [5].

In this article, using the simple regression and correlation technique first, the data on TFRs, CPRs and other correlates obtained in the two series are evaluated, analysed and compared. As this technique is rather simplistic and hides the impact of other determinants, multiple and partial correlation analyses are used by including such variables as female mean/median age at marriage, mean length of breast feeding, mean number of children ever born, mean desired family size and infant mortality rate.

The specific objective is to assess limitations and the independent contribution of CPR in explaining the variation in TFR by separating the effect of above mentioned determinants. Also a separate contribution of each determinant in explaining the variation in the TFR is assessed. Finally, as the CPRs have substantially increased over time, the results obtained from WFS and DHS are compared to observe the pattern of change and the importance of determinants.

II. BACKGROUND

The use of simple regression and correlation analysis has shown a high degree of negative correlation between the contraceptive prevalence rate (CPR) and total fertility rate (TFR). While the influence of other proximate determinants of fertility such as age at marriage, induced abortion and breast feeding is recognized, Bongaarts (1984) has shown that the CPR is "The principle cause of the decline in TFR" [6,p.342]. This view is supported and demonstrated by several studies in which the technique of simple regression and correlation is used and it is also supported by the present study.

Using the technique of simple regression and correlation, a study of 83 countries based on 1980 estimated TFRs and CPRs of developing countries indicated a highly significant correlation coefficient (Bongaarts, 1984). Although the data on TFRs and CPRs were collected from different sources, the value of r : 0.92 and an average TFR of 6.83 per woman was estimated if no contraceptive was used. The CPR explained 85 percent of the variation in the TFR. As expected, the analysis showed that some countries were below and others were above the regression line as perfect relationships are generally not obtained in such studies. The deviation from the regression line, in most of the cases, was within one birth [6,pp.342-343].

Another study of 74 countries by the same author (1987) using the same technique showed almost the same estimated TFR of 6.83 in the absence of CPR. But greater deviation from the regression line in respect of some countries in the observed TFR than expected was noted [7,pp.133-135]. These deviations were mainly due to errors in data and the effect of other determinants.

A subsequent study by Mauldin and Segal (1988) used the same technique of simple regression. It was based on the latest available data of 86 countries of the world. This study, examined sources and the quality of data and pointed out limitations of data before resorting to the analysis. In this study, it is pointed out that sample surveys produce more reliable data than programme service statistics or

other scattered sources of data [8,pp.335-353]. The results of this study are similar to those studies already cited and show a strong relationship between CPR and TFR with a value of $r: -0.93$ which is highly significant. The CPR explains 87 percent of the variation in the level of TFR and the value of estimated TFR in the absence of CPR is 7.38 per woman which decreases by 0.72 with a corresponding increase of 10 units in the CPR. Since a number of countries as expected deviated from the regression line, further analysis is undertaken by using the same technique on the data of countries by regions. The study, however, cautions that CPR although explains 87 percent of the variation in the TFR, the association of other factors including female education and age at marriage with TFR should be recognized [8,p.338].

In an other article by Westaff (1990) based on data of 134 national surveys of 84 countries obtained during the past couple of decades and consisting of WFS, CPS, DHS and other available surveys, the simple regression technique was used. In this article the dependent variable was the TFR but the predictor instead of CPR was the percentage of women who wanted no more children [9,pp.84-89].

Pointing out to limitations of measurement, differences between sample size of surveys and sampling errors, the author recognized that TFRs have "fewer measurement problems than data on women who intend to have no more births" [9,p.85]. The results of this study are similar to other studies already cited. The value of the correlation coefficient $r: -0.87$ is highly significant and percentage of women who wanted no more children, explained 76 percent of the variance in the TFR. These results are similar to those studies in which the predictor of TFR is CPR instead of reproductive intention. In other words reproductive intention is used as a proxy for CPR. Or, CPR is considered as an intervening variable between reproductive intention and TFR.

The author has further shown by the regression analysis, a negative relationship between TFR and CPR and a positive relationship between CPR and percentage who want no more children. By this analysis he has proved his hypothesis that most of those who want no more children are likely to use contraceptives.

A study of 104 countries by Weinberger (1991) in which the same simple regression and correlation technique was used was presented to Demographic and Health Surveys World Conference held in August 5-7, 1991 in Washington D.C. It showed a strong relation between TFR and CPR. The value of r : - 0.93 and of the explained variance r^2 : 0.86 were highly significant. However, TFRs were obtained from United Nations 1990 estimates used for medium variant projections and the CPRs were based on "most recent available survey data" [10,pp.556-558]. In other words, TFRs and CPRs used in the analysis were obtained from different sources.

These are a few examples of studies undertaken by using the simple regression technique. In all these studies the focus is on the CPR (or reproductive intention in one study) as the major determinant of TFR. On the basis of TFR estimated by the regression, the value of observed TFR among other limitations, is considered as under or over reported as if the reporting of CPR is superior. In this article an attempt is made at the outset to examine the reverse. For example, given the TFR values, how far the reported values of CPR deviate from those estimated by the regression. Besides an attempt is made to determine how much variation in the TFR is explained by the CPR alone and how much is explained by other variables individually and taken together.

III. NUMBER OF SURVEYS AND VARIABLES

The present analysis includes surveys of 40 WFS countries and 43 DHS countries and sub-national areas which are listed along with variables in Annexes I and II. The WFS variables shown in Annex I have been obtained from a published report [11,p.27]. The DHS variables shown in Annex II have been assembled from national and sub-national reports available. The number of surveys in the DHS series is limited to 43 so that it is closer to the WFS series. The variables include:

1. Ft: Total Fertility Rate (TFR) per woman of reproductive age 15-49 years;
2. Cp: Percentage of currently married women of reproductive age 15-49 using contraception;

3. Am: Mean/median age of marriage of female; for DHS series median age of marriage for women 25-29 was used as mean age was not available from all surveys;
4. Bf: Mean length of breastfeeding in months; for DHS series median length of breastfeeding was used;
5. Mc: Mean number of children ever born to woman aged 40-44 years;
6. Df: Mean desired family size in WFS; mean ideal number of children in DHS; and
7. Im: Infant mortality rate per thousand births.

IV. VARIATION IN TOTAL FERTILITY AND CONTRACEPTIVE PREVALENCE RATES

In the WFS series, the observed TFRs varied between 8.5 in Arab Republic of Yemen and 3.3 in Costa Rica and Trinidad and Tobago, with a mean of 5.6, standard deviation of 1.26 and a coefficient of variation of 22.5 percent. The corresponding TFRs in DHS series ranged between 7.2 in Uganda and 1.9 in Goa state of India with a mean TFR of 4.5, standard deviation of 1.4 and a coefficient of variation of 31.1 percent. The comparison shows that on the average the TFR has declined by 1.1 birth since the WFS series was undertaken to the DHS series.

The observed CPR in WFS countries varied between one percent in Yemen Arab Republic and 64 percent in Costa Rica. These are the same countries for which the lowest and the highest TFRs are reported. The observed mean and standard deviation of CPRs of the WFS countries are 26.3 and 17.9 respectively with a coefficient of variation of 68 percent. The CPRs in DHS countries varied between 4.7 percent in Mali and 66.2 percent in Brazil followed by 65.5 percent in Thailand with a mean of 35.7, standard deviation of 19.2 and a coefficient of variation of 53.8 percent. On the average the CPR has increased by 9.4 percent points since the WFS series was undertaken.

Evidently there is a sufficiently more variation in the reporting of CPR than TFR although both indicators have concomitant relationship and are obtained from the same source. Apart from the effect of other variables, more deviation in the reporting of CPR than of TFR in both WFS and DHS series seems to be due to better reporting of TFR than CPR. But the coefficient of variation is higher for WFS than DHS series, indicating improvement in the quality of reporting of CPR since the WFS series was undertaken.

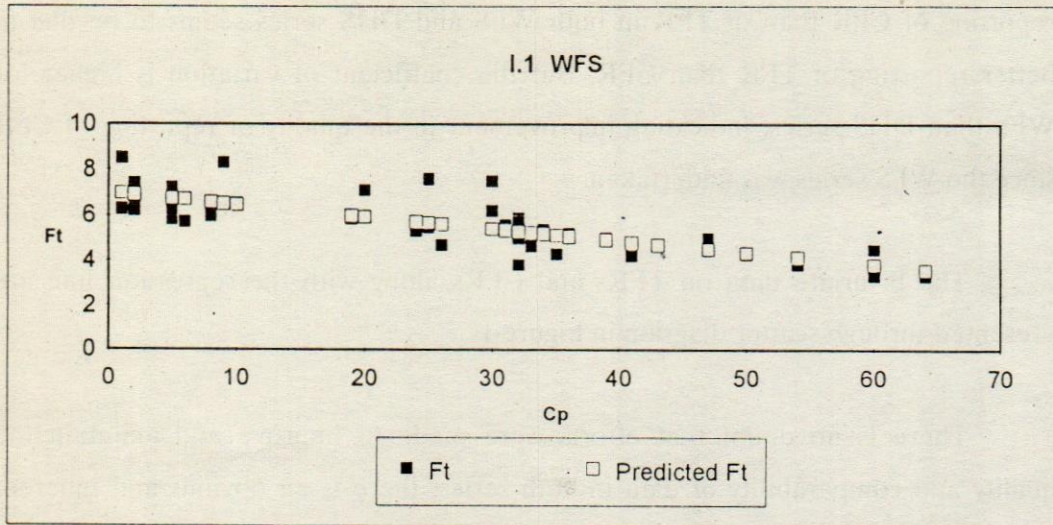
The bivariate data on TFRs and CPRs along with the regression line are presented through scatter diagram in Figure-I.

There is no doubt that efforts were made to improve and maintain the quality and comparability of data in both series, there is an obvious and inherent reason due to which TFR is better reported than CPR.

The reason is that live births obtained in both series, occurred during the last twelve months. Most of the infants born were alive and were present at the time of interviews conducted by female interviewers. Besides most of infants were in the laps of their mothers and most of the rest were reported in the infant mortality. There may be a small fraction of infants who might have escaped reporting.

Whereas, reporting of current use of contraception is a subjective matter and is difficult for the interviewer to verify and prove it to be true. In some countries respondents might not report due to cultural inhibition such as shyness as she is hesitant to discuss sexual matters with a stranger, even with a female interviewer, especially when others are present at the time of interview in the household. Besides, if respondents are using traditional methods, they might not report that they are current users of contraception.

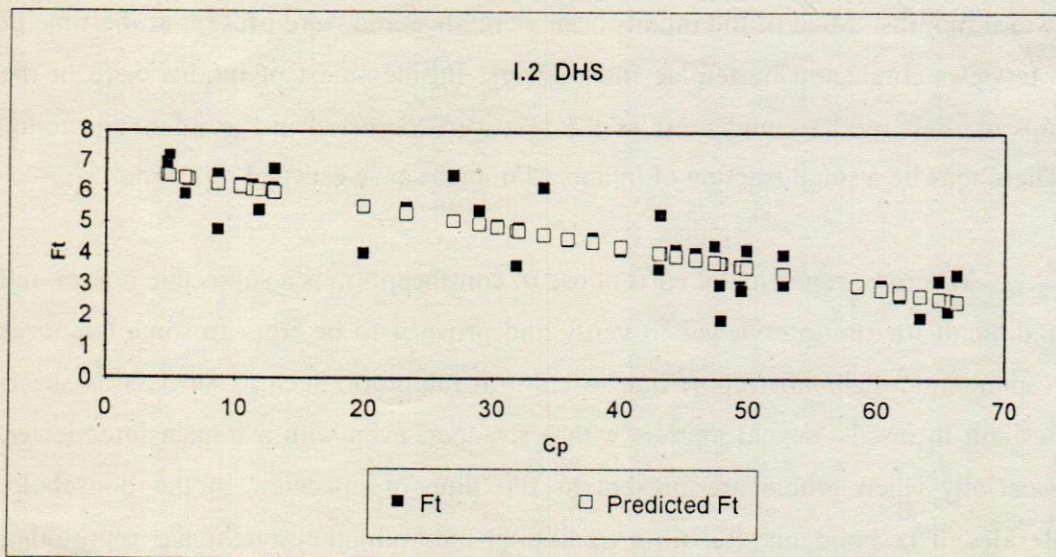
FIGURE I
Total Fertility Rate and Contraceptive Prevalence Rate
WFS and DHS Series



$r^2 = 0.5771$

$Ft\ (est) = 7.03 - 0.054$

$n = 40$



$r^2 = 0.7520$

$Ft\ (est) = 6.8092 - 0.0648$

$n = 43$

This hypothesis is tested by predicting the values of CPR given the values of TFRs. The results are presented in Annexes III and IV. The element of shyness in reporting the use of contraception was previously noted on the basis of analysis of CPS and DHS data for Pakistan [12,pp.86-87] and [13,pp.19-39]. Preliminary observation of the more recent contraceptive prevalence survey undertaken in 1994-95 in Pakistan by Population Council also shows that about 11 percent of the respondents were shy users. If they are included, the CPR reported by this survey for the country increases from 18 percent to 29 percent.

The countries and sub-national areas which reveal two percent points or more deficit in the reporting of CPR from the estimated in WFS series are 19 out of 40 and the deviation ranged between 2.3 percent points in Haiti to 19.4 percent points in Nigeria. Only two countries Fiji and Guyana reported CPR which was closer to the adjusted CPR within one percent point. The countries which over reported the CPR were also 19 and the over reporting ranged between 4.5 percent points in Peru and 24 percent points in Syria.

The under reporting of CPR in DHS series excluding those eight countries and sub-national areas which reported CPR closer to the adjusted, within one percent points, were 17 out of 43. The under reporting ranged between 1.3 percent point in Kerala to 24.2 percent points in the Sudan. The remaining 18 over reported and the range of over reporting was 2.3 percent points in Egypt and 17.5 percent point in Brazil.

What could be the possible reasons for over or under reporting of CPR ? There could be several reasons. However, looking at the female literacy rates of countries and sub-national areas of DHS series, it is interesting to find that average literacy rate of females 15 years and more in 1990 [15 and reports of NFHS of States of India] was 40 percent in those countries and areas which under reported, 58 percent in those which correctly reported and 70 percent in those which over reported.

Does it mean that women who are illiterate or have low education are more shy in reporting the use of contraception ? Especially, if they are using traditional methods, do they consider that they are using contraceptives in the modern sense? Or, are there other cultural factors involved. These are issues which need further investigation. However, Pakistan is included among those which under reported the CPR in WFS as well as in DHS series and the extent of under reporting was 14 percent points in WFS and 13 percent points in DHS. (Annex III and IV)

V. VARIATION IN OTHER VARIABLES

With regard to other variables, used in the analysis, the highest variation in WFS series was in the reporting of mean length of breast feeding (46 %) followed by the reporting of infant mortality rate (39%) and mean desired family size (35%). The variations in the reporting of female age at marriage (11%) and mean number of CEB (12%) were the lowest.

Among the DHS variables the highest variation was in the reporting of infant mortality rate (41%) followed by mean number of children desired (38%), median length of breast feeding (32%) and mean number of CEB (25%). The variation in the reporting of median age at first marriage was the lowest (11%). These variations may be partly real and / or due to errors of reporting.

One limitation of this comparison is that the countries and areas in WFS series are not exactly the same as those in the DHS series, but all are from the developing world. However, 15 countries are the same in both series. These are: Ghana, Kenya, Senegal, Egypt, Morocco, Sudan, Tunisia, Indonesia, Pakistan, Sri Lanka, Thailand, Dominican Republic, Ecuador, Mexico and Trinidad and Tobago.

VI. SIMPLE LINEAR CORRELATION

In table 1 zero order correlation coefficient along with mean and standard deviation of each selected variable indicates strong negative relationship of TFR

TABLE 1

MEAN AND STANDARD DEVIATION AND ZERO ORDER CORRELATION COEFFICIENT
OF CPR, AGE AT MARRIAGE, BREAST FEEDING, MEAN CEB, DESIRED FAMILY SIZE,
INFANT MORTALITY RATE WITH TFR OF WFS AND DHS COUNTRIES

Variable	Mean	Standard Deviation	Zero Order Correlation Coefficient						
			Ft	Cp	Am	Bf	Mc	Df	Im
WFS									
Ft	5.62	1.26	1.0000	-.7597**	-.4997**	.3112	.6159**	.5905**	.5400**
Cp	26.28	17.86	-.7597**	1.0000	.6051**	-.5653**	-.1944	-.4388*	-.6599**
Am	20.70	2.19	-.4997**	.6051**	1.0000	-.3198	-.0094	-.3647	-.5533**
Bf	13.47	6.21	.3112	-.5653**	-.3198	1.0000	.0531	.3482	.4442*
Mc	6.17	0.72	.6159**	-.1944	-.0094	.0531	1.0000	.3592	.1545
Df	4.93	1.73	.5905**	-.4388*	-.3647	.3482	.3592	1.0000	.1824
Im	84.80	33.03	.5400**	-.6599**	-.5533**	.4442*	.1545	.1824	1.0000
DHS									
Ft	4.49	1.44	1.0000	-.8672**	-.3595*	.1754	.7323**	.8011**	.6672**
Cp	35.70	19.20	-.8672**	1.0000	.4013*	-.3570*	-.6818**	-.7825**	-.6689**
Am	19.27	2.12	-.3595*	.4013*	1.0000	-.4075*	-.2366	-.1898	-.5591**
Bf	17.75	5.68	.1754	-.3570*	-.4075*	1.0000	.3779*	.2919	.1943
Mc	5.43	1.36	.7323**	-.6818	-.2366	.3779*	1.0000	.8275**	.5020**
Df	3.96	1.51	.8011**	-.7825**	-.1898	.2919	.8275**	1.0000	.4847**
Im	73.19	27.84	.6672**	-.6689**	-.5591**	.1943	.5020**	.4847**	1.0000

** significant at 0.001 level;

* significant at 0.01 level;

Ft = TFR: Total Fertility Rate
 Cp = CPR: Current (Contraceptive) Prevalence Rate
 Am = Age at Marriage
 Bf = Breast feeding
 Mc = CEB: Mean Number of Children Ever Born
 Df = Desired Family Size
 Im = Infant Mortality Rate

and CPR for both WFS and DHS series which is significant at 0.001 level. The other negative coefficient which is significant in both series is between TFR and age at marriage but the level of significance is stronger for WFS than for DHS series. The correlation coefficients which are positive and significant at 0.001 level in both series are between TFR and mean number of children ever born, between TFR and desired family size and TFR and infant mortality rates. These results are consistent between the two series.

If the association between CPR and other variables is observed, it transpires that the pattern of relationship is similar in both the series with the exception of level of significance. Especially, the relationship between CPR and the mean number of children ever born although is in the same direction, it is not significant in the WFS series, whereas it is highly significant in the DHS series.

It is interesting to observe positive but not significant correlation coefficient at 0.01 level between TFR and breastfeeding and the significant negative relationship between CPR and the breast feeding in both the series. It appears that women who breastfeed do not use contraception as they are under the impression that they are free from the risk of pregnancy. This seems to be consistent at least with the study undertaken in Pakistan, which shows that a substantial proportion (15.4 percent) of non user respondents gave breastfeeding as one of the reason for not using contraception [14,p.94]. These respondents unaware of the complete knowledge about the breastfeeding and susceptibility period, do not use contraception thinking that they are protected for the entire period of breastfeeding and thus there is a weak but positive relationship between the TFR and breastfeeding. For the same reason, women who are breastfeeding are less likely to use contraception which is shown by a strong negative relationship between breastfeeding and CPR.

TABLE 2

PROGRESSIVE COEFFICIENTS OF MULTIPLE CORRELATION
AND EXPLAINED VARIANCE IN TFR

Independent Variables Progressively Added	Symbol	Progressive Multiple Correlation Coefficient		Explained Variance %	
		WFS	DHS	WFS	DHS
CPR (zero order)	Ft.Cp	0.7597**	0.8672**	57.7	75.20
Age at Marriage	Ft.Cp.Am	0.7613**	0.8673**	58.0	75.21
Breast feeding	Ft.Cp.Am.Bf	0.7744**	0.8810**	60.0	77.6
Mean CEB	Ft.Cp.Am.Bf.Mc	0.9109**	0.9118**	83.0	83.1
Desired Family Size	Ft.Cp.Am.Bf.Mc.Df	0.9225**	0.9162**	85.1	83.9
Infant Mortality Rate	Ft.Cp.Am.Bf.Mc.Df .Im	0.9244**	0.9182**	85.5	84.3

** Significant at .001 level

Ft = TFR: Total Fertility Rate
 Cp = CPR: Current (Contraceptive) Prevalence Rate
 Am = Age at Marriage
 Bf = Breast feeding
 Mc = CEB: Mean Number of Children Ever Born
 Df = Desired Family Size
 Im = Infant Mortality Rate

VII. PROGRESSIVE COEFFICIENTS OF MULTIPLE CORRELATION

The multiple correlation analysis shown in table 2 indicates that besides CPR, when age at marriage is taken into account, there is no significant change in the coefficient of correlation of TFR and CPR. Consequently the change in the explained variance is insignificant which is the case in both WFS and DHS series. The contribution of breastfeeding is somewhat more than age at marriage which increased the explained variance by two percent points in WFS series and by 2.4 percent points in DHS series. The addition of mean number of children born alive makes more significant contribution to the explained variation. Especially, in case of WFS series the explained variation is increased by 23 percent points. The corresponding increase in the explained variation of DHS series is from 77.6 percent to 83.1 percent. At this stage the explained variation in both the series is almost equal 83.0 and 83.1 percent respectively.

The addition of the variables of desired family size and infant mortality rate increases the explained variation further to 85.5 percent in WFS series and 84.3 percent in DHS series. The extension of the relation of TFR to a set of variables used in this multivariate analysis explains most but not all variation in the two series. This is due to the nature of multiple correlation which cannot exhaust the effect of all possible correlated variables.

However, the increase in the explained variance of 57.7 percent in the simple correlation to 85.5 percent in the multiple correlation of WFS series and the corresponding increase from 75.2 percent to 84.3 percent in the DHS series is due to the effect of variables other than and together with the CPR.

VIII. RESULTS OF PARTIAL AND MULTIPLE CORRELATION ANALYSIS

In table 3 are presented the consolidated results of correlation analysis. The coefficients of simple, partial and multiple correlations along with the amount of variance explained by the multiple correlations for the WFS and DHS series are given separately. The partial correlation coefficients measure the dependence between TFR and CPR when the effect of each selected variable is controlled. Also it measures the dependence between TFR and each selected variable when the effect of CPR is removed. Each multiple correlation coefficient is an extension of the relation of TFR and CPR to each selected variable taken one at a time. Each of these multiple correlation coefficients are shown along with the percentage of variance explained in the last column of table 3.

Age At Marriage

It is observed that the zero-order correlation coefficient between TFR and CPR in the WFs series is $r: -0.7597^{**}$ and between CPR and age at marriage is $r: 0.6051^{**}$. When the effect of age at marriage is removed, the partial correlation coefficient between TFR and CPR is $r: -0.6631^{**}$. On the other hand the zero order correlation between TFR and age at marriage in WFS is $r: -0.4997^{**}$ and when the effect of CPR is removed, the partial correlation $r: -0.0773$ is statistically insignificant.

It appears that age at marriage is related to TFR through CPR which has positive relation with age at marriage. When the relation of TFR and CPR is extended to include age at marriage, the multiple correlation coefficient is increased slightly from the zero order correlation coefficient of $r: -0.7597^{**}$ to $r: 0.7613^{**}$ and the coefficient of determination explains 57.96 percent of the variation.

TABLE 3

SIMPLE PARTIAL AND MULTIPLE CORRELATION EXPLAINED
VARIANCE FOR TFR

Variables	Correlation Coefficients				Variance Explained by Multiple Correlation
	Simple	Partial		Multiple	
		(a)	(b)		%
WFS Series					
CPR- Zero order	- 0.7597**				57.7
Age at Marriage	- 0.4997**	-0.6631**	- 0.07731	0.7613**	57.96
Breast Feeding	0.3112	-0.7447**	-0.2204	0.7731**	59.8
MEAN CEB	0.6159**	-0.8281**	0.7340**	0.8972**	80.5
Desired Family Size	0.5905**	-0.6903**	0.4401*	0.8118**	65.9
Infant Mortality Rate	0.5400**	-0.6378**	0.0791	0.7614**	58.0
DHS Series					
CPR- Zero order	-0.8672**				75.2
Age at Marriage	-0.3595*	-0.8458**	-0.0253	0.8673**	78.2
Breast Feeding	0.1754	-0.8749**	-0.2884	0.8790**	77.3
MEAN CEB	0.7323**	-0.7385**	0.3873*	0.8884**	78.9
Desired Family Size	0.8011**	-0.6449**	0.3953*	0.8892**	79.1
Infant Mortality Rate	0.6672**	-0.7601**	0.2355	0.8751**	76.6

* Significant at .01 level; ** Significant at .001 level

- (a) The correlation coefficient between TFR-CPR after partialing out the effect of each selected variable
- (b) The Correlation coefficient between TFR and each selected variables after partialing out the effect of CPR

The same variables in the DHS series behave the same way. The zero order correlation coefficient $r: -0.8672^{**}$ observed between TFR and CPR is reduced to a partial correlation coefficient $r: -0.8458^{**}$ when the effect of age at marriage is removed. When the effect of CPR is controlled, the observed zero order correlation coefficient $r: -0.3595^*$ between TFR and age at marriage is lowered to a partial correlation coefficient $r: -0.0253$ which is not significant. The reason is the same as for WFS series that age at marriage and CPR have positive zero order correlation coefficient which is significant at 0.01 level. In other words, as age at marriage increases, the use of contraceptive also increases and TFR declines. But the increase in age at marriage has very little direct impact on reducing TFR.

Similar to WFS series age at marriage does not make any significant contribution to the multiple correlation coefficient and the explained variation when it is included along with TFR and CPR in DHS series.

Breastfeeding

The zero order correlation coefficients of TFR and breastfeeding in both the series $r: 0.3112$ and $r: 0.1754$ respectively are positive but not significant at 0.01 level. When the effect of breastfeeding is removed, the partial correlation coefficient between TFR - CPR in WFS is, $r: -0.7447^{**}$ whereas the correlation coefficient between the same variables in DHS series has increased from the zero order, $r: -0.8672^{**}$ to partial correlation coefficient, $r: -0.8749^{**}$. This means that the breastfeeding was hiding some effect of CPR which became more manifest at the time of DHS than WFS.

When the effect of CPR is controlled, the correlation coefficient of TFR and breastfeeding in WFs series changes from zero order $r: 0.3112$ to partial correlation coefficient, $r: -0.2204$ and that of DHS series from $r: 0.1754$ to $r: -0.2884$. The pattern of the change is similar and the partial correlation coefficients in both cases are negative but are not significant at 0.01 level. The independent effect of

breastfeeding on TFR is negative, although it is mild. In any case breastfeeding does provide a safe period varying between six to ten months but not for the entire period. Thus its independent effect on TFR is negative but it is mild. The coefficient of partial correlation was somewhat higher at the time of DHS than WFS series. In other words, breastfeeding has direct impact of lowering TFR.

When the relation of TFR and CPR is extended to include breastfeeding, the multiple correlation coefficient is increased from $r: -0.7597^{**}$ to $r: 0.7731^{**}$ in WFS series and from zero order $r: -0.8672^{**}$ to a multiple $r: 0.8790^{**}$ in DHS series indicating its importance and contribution. Consequently the explained variances increase to 59.8 percent and 77.3 percent in WFS and DHS series respectively.

Mean Children Ever Born Alive (CEB)

The zero order correlation coefficients of TFR and CEB are $r: 0.6159^{**}$ in WFS series and $r: 0.7323^{**}$ in DHS series. This means that as CEB increases, TFR also increases. But there is a difference in the zero order correlation coefficient of CEB and CPR, in WFS $r: -0.1944$ and in DHS $r: -0.6818^{**}$. This means that CEB has become more important predictor of TFR since WFS. When the effect of CEB was controlled the zero order correlation coefficient of $r: -0.7597^{**}$ between TFR - CPR in WFS series increased to partial $r: -0.8281^{**}$ and in DHS series it decreased from zero order $r: -0.8672^{**}$ to partial $r: -0.7385^{**}$, but both are highly significant at 0.001 level. This shows that if CEB increased, CPR decreased. This association has become more evident with the increase in CPR. When the effect of CPR is removed, the zero order correlation coefficient of $r: 0.6159^{**}$ between TFR and CEB is increased to $r: 0.7340^{**}$ in WFS series and it is lowered from $r: 0.7323^{**}$ to a partial $r: 0.3873^{*}$ in DHS series. But both coefficients are significant. This means that controlling CPR, as CEB increases, TFR also increases. In other words, the independent effect of CEB on TFR is positive which is highly significant.

The multiple correlation coefficient of TFR, CPR and CEB $r: 0.8972^{**}$ is the highest and explains 80.5 percent of the variation in the WFS series. In the DHS series, this coefficient has also increased substantially to $r: 0.8884^{**}$ with explained variation of 78.9 percent.

Desired Family Size

The zero order correlation coefficient between TFR and desired family size for WFS series is $r: 0.5905^{**}$ which is higher, $r: 0.8011^{**}$ for DHS series, meaning in both series that TFR increases with desired family size. If the effect of desired family size is partialled out the partial correlation coefficients between TFR and CPR is reduced from $r: -0.7597^{**}$ to $r: -0.6903^{**}$ for WFS series and from $r: -0.8672^{**}$ to $r: -0.6449^{**}$ for DHS series but both are still highly significant. When the effect of CPR is controlled, the partial correlation coefficient of TFR and desired family size is reduced from $r: 0.5905^{**}$ to $r: 0.4401^*$ for WFS series and from $r: 0.8011^{**}$ to $r: 0.3953^*$ for DHS series. In other words controlling the effect of the CPR, TFR increases as the desired family size increases and this relationship is significant at 0.01 level.

The coefficient of multiple correlation of TFR, CPR and desired family size, $r: 0.8118^{**}$ in WFS series and $r: 0.8892^{**}$ in DHS series are highly significant and desired family size together with CPR explains 65.9 percent and 79.1 percent variations in the TFR of WFS and DHS series respectively.

Infant Mortality

Finally, the hypothesis that the infant mortality rate increases TFR is examined. The importance of this variable as a determinant of TFR is shown by highly significant zero order correlation coefficients of $r: 0.5400^{**}$ in WFS series and $r: 0.6672^{**}$ in DHS series. In other words as IMR increases TFR also increases.

The simple correlation coefficients between CPR and IMR are $r: -0.6599^{**}$ in WFS and $r: -0.6672^{**}$ in DHS series which mean that as IMR increases CPR decreases which corroborates the positive association between TFR and IMR.

When the effect of IMR is controlled, the zero order correlation coefficient of TFR and CPR is reduced from $r: -0.7597^{**}$ a partial correlation coefficient, to $r: -0.6378^{**}$ in WFS and from $r: -0.8672^{**}$ to $r: -0.7601^{**}$ in DHS series. Similarly when the effect of CPR is controlled the highly significant relationship between TFR and IMR changes into insignificant at 0.01 level in both WFS and DHS series. But IMR, independently, did contribute to the increase in the TFR in both WFS and DHS but more in the DHS series.

The multiple correlation coefficient of TFR, CPR and IMR for WFS series is $r: 0.7614^{**}$ and for DHS series $r: 0.8751^{**}$ which are significant at 0.001 level and IMR together with CPR explains 58.0 percent and 76.6 percent variation in TFR in WFS and DHS series respectively.

IX. SUMMARY AND CONCLUSION

There is more variation in the reporting of CPR than TFR. This is found in both WFS as well as in DHS series. Relating the reported CPR to the literacy level of women in DHS series, it is noted that on the average women with low literacy level under report, women with medium literacy level report nearly accurately and those with higher literacy level over report the use of contraception. Why is this, needs further exploration based on more precise data.

On the average TFR has decreased from 5.6 per woman at the time of WFS to 4.5 at the time of DHS. Similarly on the average there is increase in the CPR from 26.3 percent when WFS series was undertaken to 35.7 percent when the DHS series was undertaken. Also, there is on the average a decline in the mean number of children born alive from 6.2 to 5.4.

These and other results based on correlation analysis indicate a transition in the TFR and its correlates from WFS to DHS series. In general, the TFR has declined from the high to a moderate level. The results obtained in the two series are consistent with each other.

The simple correlation coefficients of TFR - CPR show results which are similar to all other studies undertaken in the past and the CPR emerges as the major determinant of TFR. The zero order correlation coefficients of TFR and CPR and between other variables are shown in a matrix in Table 1. Those variables which have negative relationship with TFR have positive association with CPR and vice versa in both series which is a test of consistency.

The pattern and direction of corresponding variables in both the series with minor exceptions are also consistent with each other. This similarity in the two series indicates that data in both the series are adequately reliable and useful for such analysis.

The multiple correlation analysis when each variable is added progressively, shows in table 2, a progressive increase in the multiple correlation coefficients from $r: 0.7597^{**}$ to $r: 0.9244^{**}$ in WFS and from $r: 0.8672^{**}$ to $r: 0.9182^{**}$ in DHS series. The increase is due to the addition of small independent effect of each variable and shows that TFR in addition to CPR is related to a set of other variables. Especially the mean CEB makes a substantial contribution to the increase in the multiple correlation coefficient.

Table 3, besides simple, partial, multiple correlation coefficients and variance explained by the multiple correlation shows a comparative picture. How the zero order correlation coefficient between TFR and CPR changes when the effect of each selected variable is removed and also the independent effect of each of these selected variables on TFR when the effect of CPR is removed.

In WFS, the dependence between TFR and CPR is reduced when the effect of each variable such as age at marriage, breastfeeding, desired family size or infant mortality is removed but it increases when the effect of mean CEB is removed.

In DHS the dependence between TFR and CPR is reduced when the effect of each age at marriage, mean CEB, desired family size or infant mortality is removed but it rises when the effect of breastfeeding is controlled.

The partial correlation coefficients measuring the dependence of TFR and each selected variable unlike the simple correlation coefficients, reveal a different picture for both WFS and DHS series.

In WFS, age at marriage and infant mortality rate showed highly significant zero order correlation coefficients at 0.001 level with TFR but the independent effect of these variables on TFR when the effect of CPR is removed, the partial correlation coefficients are insignificant even at 0.01 level. Similarly in DHS, zero order correlation coefficient of age at marriage was significant at 0.01 level and that of IMR was significant at 0.001 level and when the effect of CPR is removed the partial correlation coefficients of both are not significant at 0.01 and 0.05 levels respectively.

The zero order correlation coefficients of TFR and mean CEB and TFR and desired family size were also highly significant in both WFS and DHS but when the effect of CPR is removed the partial correlation coefficients are still significant at least at 0.01 level.

When the effect of CPR is removed, the partial correlation coefficients of some variables such as TFR and breastfeeding in WFS and TFR and breastfeeding and TFR and IMR in DHS, are not significant at 0.01 level. But, inspite of this, these variables explain some variation in the TFR independent of CPR.

The explanatory strength of each variable along with CPR is manifest in the multiple correlation coefficients and the explained variance shown in the last column of Table 3. In WFS breastfeeding, mean CEB and desired family size and in DHS the same variables and IMR individually and collectively make a substantial contribution to the explained variance in the TFR.

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Annex - I

DEMOGRAPHIC INDICATORS FOR WFS PARTICIPATING COUNTRIES

Countries	TFR	CPR	Female age at marriage	Mean length of breast- feeding	Mean No. of Children ever born aged 40-44	Mean Desired family size	Infant Mortality Rate
	Ft	Cp	Am	Bf	Mc	Df	Im
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Benin	7.1	20	18	19.2	6.1	7.5	108
Cameroon	6.4	2	18	17.5	5.2	8	105
Ghana	6.5	10	19	17.9	6.1	6.1	73
Ivory Coast	7.4	2	18	17.5	6.7	8.4	113
Kenya	8.3	9	19	15.7	7.6	7.3	87
Lesotho	5.8	5	20	19.5	5.3	6	126
Nigeria	5.7	6	19	0	5.2	0	82
Senegal	7.2	5	18	18.5	6.8	8.9	112
Egypt	5.3	24	21	16.3	6.3	4.1	132
Mauritania	6.3	1	19	15.6	5.9	8.8	90
Morocco	5.9	19	21	14.2	7.1	5	91
Sudan (North)	6	8	21	15.9	6.2	6.4	79
Tunisia	5.9	32	24	14	6.5	4.2	80
Jordan	7.6	25	22	11.1	8.4	6.3	66
Syria	7.5	30	22	11.6	7.4	6.1	65
Turkey	4.3	50	21	0	5.9	3	133
Yemen A.R.	8.5	1	17	10.6	6.5	5.4	162
Bangladesh	6.1	8	16	28.9	7.1	4.1	135
Nepal	6.2	2	17	25.2	5.6	4	142
Pakistan	6.3	5	20	19	6.9	4.2	139
Sri Lanka	3.8	32	25	21	5.3	3.4	60
Fiji	4.2	41	22	9.9	6.1	4.2	47
Indonesia	4.7	26	19	23.6	5.2	4.3	95

Countries	TFR	CPR	Female age at marriage	Mean length of breast- feeding	Mean No. of Children ever born aged 40-44	Mean Desired family size	Infant Mortality Rate
	Ft	Cp	Am	Bf	Mc	Df	Im
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Korea, Rep. Of	4.3	35	23	16.3	5.1	3.2	42
Malaysia	4.7	33	23	5.8	6	4.4	36
Phillipines	5.2	36	25	13	6.4	4.4	58
Thailand	4.6	33	23	18.9	5.9	3.7	65
Columbia	4.7	43	22	9.2	6.1	4.1	70
Ecuador	5.4	34	22	12.3	6.4	4.1	76
Paraguay	5	47	22	11.4	5.8	5.3	61
Peru	5.6	31	23	13.1	6.3	3.8	97
Venezuala	4.5	60	22	7.4	6.1	4.2	53
Costa Rica	3.3	64	23	5	6.1	4.7	53
Dominican Rep.	5.7	32	21	8.6	6.4	4.7	89
Mexico	6.2	30	22	9	6.6	4.5	72
Panama	3.8	54	21	7.4	5.6	4.3	33
Guyana	5	32	20	7.2	6.3	4.6	58
Haiti	5.5	25	22	15.5	5.6	3.6	123
Jamaica	5	39	18	8.1	5.4	4.1	43
Trin. and Tob.	3.3	60	20	8	5.2	3.8	41
Average	5.62	26.28	20.70	13.47	6.17	4.93	84.80
Std Deviation	1.26	17.86	2.19	6.21	0.72	1.73	33.03

Annex - II

DEMOGRAPHIC INDICATORS FOR DHS PARTICIPATING COUNTRIES AND SUB-NATIONAL AREAS

Countries and Sub-National Areas	TFR	CPR	Female age at marriage	Mean length of breast-feeding	Mean No. of children ever born aged 40-44	Mean Desired family size	Infant Mortality Rate
	Ft	Cp	Am	Bf	Mc	Df	Im
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Bostwana	4.68	33.0	24.9	17.4	5.42	5.4	38.6
Burundi	6.54	8.7	19.5	23.9	6.57	5.5	85.8
Ghana	6.10	12.9	18.5	20.9	6.58	5.5	80.9
Kenya	6.52	26.9	18.6	19.5	7.36	4.7	58.9
Liberia	6.35	6.4	17.9	16.2	5.87	6.3	152.5
Mali	6.94	4.7	15.9	18.7	6.99	6.9	131.2
Malawi	6.73	13	17.7	21.2	6.93	5.1	134.3
Namibia	5.4	28.9	18.9	17.3	5.62	5	56.6
Ondo St., Nigeria	5.89	6.1	20.2	17.3	6.5	5.7	58.8
Senegal	6.21	11.3	16.7	19.1	6.83	7.1	90.9
Tanzania	6.25	10.4	19	21.6	6.9	6.1	91.6
Togo	6.12	33.9	18.4	22.8	6.89	5.6	84
Uganda	7.20	4.9	17.5	18.7	7.24	6.7	106
Zimbabwe	5.27	43.1	18.8	18.8	6.4	5.3	56.4
Egypt	4.51	37.8	19.5	18.2	5.8	2.9	93.1
Morocco	4.45	35.8	19.9	14.7	6.69	3.7	81.7
Sudan	4.74	8.7	20.5	19	7	5.8	77.1
Tunisia	4.13	49.8	22.9	14.8	5.53	3.5	55.5
India							
Assam	3.53	43	17.6	27.8	5.62	3.2	88.7
Bihar	4	19.9	15.4	26.5	5.12	3.4	89.2
Delhi	3.02	60.3	18.7	20.9	4.11	2.5	65.4

Countries and Sub-National Areas	TFR	CPR	Female age at marriage	Mean length of breast-feeding	Mean No. of children ever born aged 40-44	Mean Desired family size	Infant Mortality Rate
	Ft	Cp	Am	Bf	Mc	Df	Im
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Goa	1.9	47.8	24.1	16.5	3.64	2.7	31.9
Gujarat	2.99	49.3	18.3	19.7	4.22	2.6	68.7
Himachal Pardesh	2.97	58.4	18.6	21.7	4.27	2.4	0
Karnataka	2.85	49.4	16.9	21.4	4.44	2.5	65.4
Kerala	2	63.3	20.6	23.8	3.32	2.6	23.5
Rajasthan	3.63	31.8	15.2	24.2	4.8	3	72.6
Uttar Pardesh	4.82	32.0	15.6	24.9	5.87	3.4	99.9
Indonesia	3.03	47.7	18.1	23.1	5.19	3.2	74.3
Pakistan	5.40	11.8	18.9	19.8	6.3	4.1	91
Phillipines	4.09	40	21.8	14.1	4.73	3.2	33.6
Sri Lanka	2.67	61.7	23.2	20.8	4.03	3	32.5
Thailand	2.23	65.5	21	15	3.91	2.9	38.5
Bolivia	4.93	30.3	20	16	5.43	2.8	90.6
Brazil	3.37	66.2	21.1	5.5	4.65	3	84
Columbia	3.17	64.8	20.8	8.4	4.87	3	38.7
Domi. Republic	3.64	49.8	19.3	7	5.5	3.6	70.1
Ecuador	4.13	44.3	19.8	13.4	5.4	3.3	65.2
El Salvador	4.27	47.3	18.7	2.6	-	-	70.9
Guatemala	5.50	23.2	18.5	20.3	5.87	4.1	79.2
Mexico	3.99	52.7	20.2	8.1	5.43	3.3	56.4
Peru	4.04	45.8	21	15.5	5.73	2.9	79.1
Tri. and Tobago	3.05	52.7	19.8	6.3	3.9	2.9	30.5
Average	4.49	35.70	19.27	17.75	5.43	3.96	71.48
Std. Deviation	1.44	19.20	2.12	5.68	1.36	1.51	29.64

Annex - III

REPORTING OF CPR VERSUS TFR IN WFS COUNTRIES

Countries	TFR Ft	CPR Cp	Adjusted Ft	Deviation (3)-(1)	Adjusted Cp	Deviation (5)-(2)
	(1)	(2)	(3)	(4)	(5)	(6)
Under Reported CPR						
Nigeria	5.7	6	6.71	1.01	25.41	19.41
Lesotho	5.8	5	6.76	0.96	24.34	19.34
Nepal	6.2	2	6.92	0.72	20.03	18.03
Muaritania	6.3	1	6.97	0.67	18.95	17.95
Cameroon	6.4	2	6.92	0.52	17.88	15.88
Sudan (North)	6	8	6.60	0.60	22.18	14.18
Pakistan	6.3	5	6.76	0.46	18.95	13.95
Sri Lanka	3.8	32	5.31	1.51	45.87	13.87
Bangladesh	6.1	8	6.60	0.50	21.11	13.11
Indonesia	4.7	26	5.63	0.93	36.18	10.18
Ghana	6.5	10	6.49	-0.01	16.80	6.80
Egypt	5.3	24	5.74	0.44	29.72	5.72
Korea, Rep. Of	4.3	35	5.15	0.85	40.49	5.49
Ivory Coast	7.4	2	6.92	-0.48	7.11	5.11
Senegal	7.2	5	6.76	-0.44	9.26	4.26
Morocco	5.9	19	6.01	0.11	23.26	4.26
Thailand	4.6	33	5.26	0.66	37.26	4.26
Malaysia	4.7	33	5.26	0.56	36.18	3.18
Haiti	5.5	25	5.69	0.19	27.57	2.57
Correctly Reported CPR						
Guyana	5	32	5.31	0.31	32.95	0.95
Fiji	4.2	41	4.83	0.63	41.56	0.56

Countries	TFR Ft	CPR Cp	Adjusted Ft	Deviation (3)-(1)	Adjusted Cp	Deviation (5)-(2)
	(1)	(2)	(3)	(4)	(5)	(6)
Over Reported CPR						
Peru	5.6	31	5.37	-0.23	26.49	-4.51
Phillipines	5.2	36	5.10	-0.10	30.80	-5.20
Ecuador	5.4	34	5.21	-0.19	28.64	-5.36
Yemen A.R.	8.5	1	6.97	-1.53	-4.73	-5.73
Jamaica	5	39	4.94	-0.06	32.95	-6.05
Dominican Rep.	5.7	32	5.31	-0.39	25.41	-6.59
Columbia	4.7	43	4.72	0.02	36.18	-6.82
Panama	3.8	54	4.13	0.33	45.87	-8.13
Tunisia	5.9	32	5.31	-0.59	23.26	-8.74
Trin. and Tob.	3.3	60	3.81	0.51	51.25	-8.75
Turkey	4.3	50	4.35	0.05	40.49	-9.51
Benin	7.1	20	5.96	-1.14	10.34	-9.66
Mexico	6.2	30	5.42	-0.78	20.03	-9.97
Kenya	8.3	9	6.55	-1.75	-2.58	-11.58
Costa Rica	3.3	64	3.60	0.30	51.25	-12.75
Paraguay	5	47	4.51	-0.49	32.95	-14.05
Jordon	7.6	25	5.69	-1.91	4.96	-20.04
Venezuala	4.5	60	3.81	-0.69	38.33	-21.67
Syria	7.5	30	5.42	-2.08	6.04	-23.96

Annex - IV

REPORTING OF CPR VERSUS TFR IN DHS COUNTRIES

Countries and Sub-National Areas	TFR Ft	CPR Cp	Adjusted Ft	Deviation (3)-(1)	Adjusted Cp	Deviation (5)-(2)
	(1)	(2)	(3)	(4)	(5)	(6)
Under Reported CPR						
Sudan	4.74	8.7	6.25	1.51	32.85	24.15
Bihar	4	19.9	5.52	1.52	41.44	21.54
Goa	1.9	47.8	3.71	1.81	65.79	17.99
Rajasthan	3.63	31.8	4.75	1.12	45.73	13.93
Ondo St., Nigeria	5.89	6.1	6.41	0.52	19.52	13.42
Pakistan	5.40	11.8	6.04	0.64	25.20	13.40
Liberia	6.35	6.4	6.39	0.04	14.18	7.78
Karnataka	2.85	49.4	3.61	0.76	54.77	5.37
Indonesia	3.03	47.7	3.72	0.69	52.69	4.99
Tanzania	6.25	10.4	6.13	-0.12	15.34	4.94
Senegal	6.21	11.3	6.08	-0.13	15.80	4.50
Ghana	6.10	12.9	5.97	-0.13	17.08	4.18
Assam	3.53	43	4.02	0.49	46.89	3.89
Gujarat	2.99	49.3	3.61	0.62	53.15	3.85
Burundi	6.54	8.7	6.25	-0.29	11.98	3.28
Mali	6.94	4.7	6.50	-0.44	7.34	2.64
Kerala	2	63.3	2.70	0.70	64.63	1.33
Correctly Reported CPR						
Guatemala	5.50	23.2	5.30	-0.20	24.04	0.84
Botswana	4.68	33.0	4.67	-0.01	33.55	0.55
Morocco	4.45	35.8	4.49	0.04	36.22	0.42
Philippines	4.09	40	4.22	0.13	40.39	0.39
Bolivia	4.93	30.3	4.84	-0.09	30.65	0.35

Countries and Sub-National Areas	TFR Ft	CPR Cp	Adjusted Ft	Deviation (3)-(1)	Adjusted Cp	Deviation (5)-(2)
	(1)	(2)	(3)	(4)	(5)	(6)
Uttar Pardesh	4.82	32.0	4.73	-0.09	31.93	-0.07
Tri. and Tobago	3.05	52.7	3.39	0.34	52.45	-0.25
Uganda	7.20	4.9	6.49	-0.71	4.32	-0.58
Over Reported CPR						
Egypt	4.51	37.8	4.36	-0.15	35.52	-2.28
Malawi	6.73	13	5.97	-0.76	9.77	-3.23
Thailand	2.23	65.5	2.56	0.33	61.96	-3.54
Namibia	5.4	28.9	4.94	-0.46	25.20	-3.70
Domi. Republic	3.64	49.8	3.58	-0.06	45.61	-4.19
Ecuador	4.13	44.3	3.94	-0.19	39.93	-4.37
Peru	4.04	45.8	3.84	-0.20	40.97	-4.83
Sri Lanka	2.67	61.7	2.81	0.14	56.86	-4.84
Himachal Pardesh	2.97	58.4	3.02	0.05	53.38	-5.02
Delhi	3.02	60.3	2.90	-0.12	52.80	-7.50
El Salvador	4.27	47.3	3.74	-0.53	38.30	-9.00
Tunisia	4.13	49.8	3.58	-0.55	39.93	-9.87
Mexico	3.99	52.7	3.39	-0.60	41.55	-11.15
Columbia	3.17	64.8	2.61	-0.56	51.06	-13.74
Kenya	6.52	26.9	5.07	-1.45	12.21	-14.69
Zimbabwe	5.27	43.1	4.01	-1.26	26.71	-16.39
Togo	6.12	33.9	4.61	-1.51	16.85	-17.05
Brazil	3.37	66.2	2.52	-0.85	48.74	-17.46

FERTILITY DESIRES IN PAKISTAN

The Influence of Husbands in Decision-Making

NAUSHIN MAHMOOD*
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This study is based on the data selected and retabulated from the Pakistan Demographic and Health Survey, (PDHS) 1990/91. The two separate questionnaires of husbands and wives used in the PDHS provided necessary data. These were used for measuring the desired fertility of wives and husbands independently and for observing the influence of husbands on wives fertility. The analysis shows that fertility desires are determined differently in response to the urban-rural context. But husbands desired fertility is strongly and positively related with their wives and they continue to exert influence on wives fertility.

I. INTRODUCTION

It has been increasingly recognized in the literature that a couple's stated desire for children is important for assessing the actual demand for children, for measuring the motivation for fertility limitation and for predicting future prospects of fertility change [1,pp.619-637], [2,pp.359-376], [3,pp.519-542], [4], [5], [6, pp.437-456]. Recent research evidence shows that the desire for no more children is strongly and inversely associated with total fertility rate [7,pp.84-89] and nearly all (roughly 90 per cent) of the differences between countries in actual fertility are accounted for solely by differences in desired fertility [8,pp.1-55]. The strongly held view that desired fertility is paramount in determining actual fertility is a question of great relevance for Pakistan where fertility levels have remained high and desire for large families still exists among a majority of couples. In this regard, it is also argued that a husband plays a significant role in determining a wife's desired fertility and a couple's fertility outcome at household level [9,pp.481-495], [10, pp.109-127], [11,pp.579-584], [12,pp.163-174]. In order to anticipate changes in reproductive behaviour, it is, therefore important to study the processes

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This research was funded by a Small Grant from MACRO International which is supported by the United States Agency for International Development. Permission to use the DHS data was granted by the National Institute of Population Studies. We thank Alain Pinol of WHO and Mohammad Rafiq of PIDE for computer assistance.

that are likely to influence the fertility preference and choice of both husband and wife, who are conditioned and constrained by the social, educational, cultural and economic conditions they live in.

In recognition of this, we focus on factors affecting the desire for children of women and their husbands in Pakistan, a society which is experiencing the onset of fertility transition by many accounts [13, pp.81-112], [14, pp.1081-1093]. The objective of studying fertility desires of both women and their husbands is to see whether it differs and to what extent there are variations in the factors that influence the reproductive choices of couples. An examination of gender differences in desired fertility is important in the socio-cultural context of Pakistan where a husband's demand for children may be influential in affecting women's desired fertility and the total fertility outcome. Such an analysis will be useful for specifying effective policy measures that can influence these underlying fertility determinants.

II. THE SOCIO-CULTURAL CONTEXT

Pakistan is a traditional patriarchal society in respect of its family structure and fertility behaviour. A population growth rate of nearly 3 per cent has been sustained by falling mortality and persistence of high fertility. Based on the evidence from surveys conducted over the 1968-69 to 1990-91 period, it is revealed that changes in total fertility rates and contraceptive use have been modest. [15, pp.215-229], [16, pp.1-9], [17, pp.119-144], [14, pp.1081-1093]. Recent reanalysis of demographic surveys, however, suggests that a modest fall in fertility did begin in the 1980's among women who are now in their 40's or more and that fertility limiting behaviour can be expected to spread more to younger cohorts [18]. More recently, the results of the two contraceptive prevalence surveys for the years 1993 and 1994-95 have indicated a rise in the proportion of women using contraceptives [19, P.84], [20, P.18].² How rapidly the adoption

² The results from the two recently released national level Contraceptive prevalence Surveys in Pakistan indicate a rise in current contraceptive use to 21.9 per cent (1993) and 18.7 per cent (1994-95).

of fertility regulation will spread depends on couples' desires for children as well as on their ability to meet reproductive goals through access to family planning either for limiting or spacing births. The results of Pakistan Demographic and Health Survey of 1990-91 show that despite an expressed desire for no more children on the part of nearly 40 per cent of currently married women and about 30 per cent of husbands, couples who both reported knowledge of contraception is about 62 per cent and current use of modern methods only 10 per cent [21, pp.169-187]. This apparent unmet need among couples reflects the fact that the official family planning programme aimed at enhancing the availability of services has had limited success in increasing contraceptive choice and improving access and utilization of services over the past years. [22, pp.85-92], [23, pp.109-121].

Apart from the inadequacies of the programme in terms of providing efficient services, the socio-economic milieu and the traditional notions of couples about family planning have been constraining women to make effective use of the limited family planning services that do exist, particularly in rural areas. The available evidence suggests that nearly two-thirds of Pakistani women have no formal education at all, and only 10 to 14 per cent have attained secondary and higher levels of education. More than 60 per cent of all marriages are between first and second cousins and the ideal family size, on average, is about four children [24, p.90&105].³ Although singulate mean age at marriage for females has risen considerably and is nearly 22 years of age, about 57 per cent of women get married at or before the ages of 20 years. Early and rapid child bearing affects the survival of both infants and mother contributing to an infant mortality rate close to 90 per thousand live births [24, pp.114]. All such conditions are conducive to desiring large number of children and avoiding use of fertility control methods.

Based on the 1990-91 Pakistan Demographic and Health Survey results, about 62 per cent of couples (both wives and husbands) stated their ideal number of children as 'upto Allah' or as a non-numeric response.

There are, however, signs of rapid social change, particularly in the urban areas. The initiation of various development programmes in the public and private sectors has recently increased awareness about family planning and enhanced the availability of health and family planning services. However, the progress achieved so far is much below the needs of the rapidly growing population. The apparent modernization occurring mostly in the urban sector of the economy has resulted in substantial difference between rural and urban levels of development in terms of availability of educational facilities, exposure to media and access to health and family planning services.

Since rapid social change and economic development have been associated with dramatic increases in contraceptive use and declines in fertility in many developing countries [25, pp.37-57], forces of social change may perhaps be operating in Pakistan that will influence fertility desires of couples. Although Pakistan has gained some economic strength over the past years, research evidence suggests that a latent demand to control fertility exists in all population strata, particularly among the most educated and urban women [26, pp.119-144], [27, pp.1104]. It is, therefore, expected that in response to such forces of social changes as the spread of education, urbanization, exposure to media and a wage economy, women may seek alternative family roles and have higher life aspirations, which may indeed be important factors in the acquisition of smaller family norms.

As such, it is important to examine both traditional values and practices as well as indicators of more modern influences on desired fertility in order to judge variations in the demand for children across the urban and rural settings. Further, a focus on gender differences in desired fertility presents us with the opportunity to document empirically an aspect of the relationship between women's and their husbands' reproductive choices, which is an important but largely uninvestigated question in the context of Pakistan.

The main objective of this research, therefore, is to examine the fertility choices of women and their husbands in terms of their expressed desires for no additional children as a measure of latent demand for fertility control. More specifically, the paper addresses three questions.

1. What are the important correlates of the desire to stop child bearing in a society in which a significant proportion of men and women say that the ideal family size is "up to God"?
2. Is the role of son preference and other factors in influencing fertility desires of women and their husbands different in urban and rural settings?
3. How and to what extent do husbands influence their wives' desired fertility after controlling for their socio-economic background.

III. DATA AND METHODS

The data for this study are drawn from the Pakistan Demographic and Health Survey (PDHS) of 1990-91. The survey is based on two stage stratified, systematically selected sample of households in both urban and rural areas of Pakistan covering the four provinces which contain 96 per cent of population. The survey yielded information on 6,611 ever-married women, aged 15-49 years and a subsample of 1,354 of their husbands.⁴ For our analysis, the sample selected for female consists of 5717 currently married and fecund women between the ages 15-44 years, whereas for men, the entire age range is included to cover the responses of husbands on desired fertility. Since the effect of socio-economic and demographic factors on desired fertility is expected to operate differently in urban and rural areas, we conduct this analysis separately for urban and rural samples of women and their husbands.

⁴ We may note that the sample of husbands represents 77 per cent of the eligible sample. Non-response of husbands was high in urban areas and in Sind and was due to eligible husbands not being at home during repeated visits. Only husbands who had spent the previous night in the same households as the wife were interviewed.

III.1 Dependent Variable

Desired additional fertility is measured as the dependent variable which is taken directly from a question in the survey that asks both the women and their husbands separately whether the respondent would like to have a (another) child or would prefer not to have any (more) children? The variable has three categories of responses, indicating "have a (another) child", "no more (none)", and "up to God/undecided". Because our theoretical concern is to focus on demand for additional children, we measure the dependent variable as a dichotomous variable that takes the value of one if the respondent does not want any more children, and that is zero otherwise. The responses in 'up to God'/undecided category⁵ have been included in 'all others' under the assumption that the respondents do not wish to stop childbearing and could be counted as effectively wanting more children.⁶

III.2 Independent Variables

The explanatory variables used in predicting the desire for no more children are measured from separate questionnaires of wives and husbands. The two separate samples reflect the desired fertility of women and men independently, and hence, preclude the perceptions of a couple with regard to how they define their demand for children. Rather, we are examining the determining factors of the desired additional fertility of women and their husbands, and then seeing if husbands exert some influence on wives' fertility desires. The measurement of independent variables and their hypothesized relationships with the dependent variable are as follows:

Current age and living children, representing the life cycle stage of either partner are expected to be positively related to the desire for no additional children, because the desire to stop childbearing increases with age and attainment of a certain family size.

⁵ In the sample under study, nearly 20 per cent of both wives and husbands gave up to God/undecided responses.

⁶ This classification has also been supported by Lightbourne (1988) in his recent model for estimating the demand for children. Others argue that women in the 'undecided' category of response could be viewed as wanting to space the next birth, until they make up their mind, implying that they might want one later (Lightbourne and McDonald, 1982).

Wife's or husband's education is measured as a three category dummy variable representing 'no education', 'primary and middle' and 'secondary or higher' levels of education. The expectation is that attaining some level of schooling, higher education in particular, may be critical in being able to articulate a desire for no additional children.

Place of residence is used in the total sample only, and is measured from the questions on current and childhood place of residence as a three category variable to see whether the respondent is a lifetime urban resident, a migrant to the urban area or a rural resident. It is expected that lifetime urban exposure will increase the likelihood of desiring no more children, followed by migrants to the city.

Other variables of interest are child schooling aspirations, cousin marriage and female autonomy. The Pakistan Demographic and Health Survey (PDHS) did not collect information about actual schooling of children, which is a direct measure of schooling costs and investments; however, it did inquire about ideal levels of education desired for sons and daughters by both women and men. Aspirations for children's schooling, which are more likely to lead to actual schooling, are assumed to affect desire for children by introducing constraint on the household resources available for each child's education and development. For women's sample, a binary variable indicating desires of mothers to attain 'some education' for their children is used against 'no education', to capture the effects of assumed child schooling costs on desired fertility. For husbands, two separate dichotomous variables are used to compare education aspirations for daughters 'beyond primary level' and for sons 'beyond middle level' to the reference category of no schooling aspirations.

The fact that most of marriages in Pakistani society are consanguineous marriages to first or second cousins (nearly 60 per cent in the sample), it is expected that the desire for children may be higher among those couples married within the family than those married to non-

relatives due to the presumed influence of kin alliances and old family members on having large number of children. It is likely that the type of kinship relations may differentially affect the timing of marriage as Fricke, et al., [28, pp.489-508] found marriage between patrilineal cousins to occur somewhat later than marriages between unrelated individuals but earlier than marriage between those who are matrilineally related. On the other hand, Bittles, et al., [29] using data for Muslims in South India found a strong relationship between consanguineous union, lower age at marriage and higher fertility. We, however, hypothesize a negative relationship of marriage between cousins and desire for no more children with the expectation that consanguineous married couples would be less likely to want no more children.

Additional variables include the number of living sons/daughters and infant/child mortality. Son preference is addressed through the inclusion of number of living sons and its comparison with the effect of living sons and living daughters on desire for no more children. Child mortality experience is evaluated for those women or men with 'one or more' child deaths versus those with 'none', with the expectation that infant/child deaths will decrease the desire for no future births.

A measure of female autonomy has been used in the analysis using the question whether the wife would be able to go to the hospital alone or would need to be accompanied. A positive relationship between female autonomy and the dependent variable is hypothesized because women who can move outside alone are likely to be more independent and are expected to have lower demand for children.

Land ownership is used in the rural sample only with the expectation that farmers/landowners would have high value of children, particularly sons, and hence are less likely to desire no more children. Region of residence is included in the model under the expectation that residents of more urbanized and developed regions will, in the aggregate

context, have lower fertility desires than those in the less developed regions. Sind, North West Frontier Province and Baluchistan are expected to indicate lower desired fertility than Punjab which is agriculturally the most developed of the four regions.

III.3 Method of Analysis

The investigation uses logistic regression, an appropriate functional form for the analysis of dichotomous dependent variables [30]. The logistic analysis provides the natural logarithm of the odds of desiring no more children as a function of a set of predictor variables. In the generic case, the logistic regression model is written as:

$$\text{Log } (P/1-P) = \alpha + \sum B_i X_i$$

where P is the probability of the desire for no more children, X_i represents the given characteristics of women and men, and B_i indicates the change in the odds ratio of desiring no more children for each unit change in X . The B coefficient, therefore, represents the magnitude of the increment in the log-odds of desiring no more children with a unit increase in the predictor variables.

IV. RESULTS

Table 1 shows the ages of currently married women (15-44 years) and a subsample of their husbands who want no more children by selected background characteristics for total, urban and rural samples. In all, 36 per cent of women and 28.8 per cent of husbands stated their desire for no more children. The proportions are higher in urban areas, 41.2 per cent for women and 30.5 per cent for men, indicating greater desire among urban couples to limit future births.

TABLE 1

**AGES OF CURRENTLY MARRIED FECUND WOMEN (15-44 YEARS) AND A
SUBSAMPLE OF THEIR HUSBANDS WHO WANT NO MORE CHILDREN BY
SELECTED BACKGROUND CHARACTERISTICS, PAKISTAN 1990-91**

Characteristics	Wives			Husbands		
	Total	Urban	Rural	Total	Urban	Rural
Total	36.0	41.2	30.7	28.8	30.5	25.1
<u>Current Age</u>						
<25	8.2	8.2	8.2	1.9	4.1	.4
25-34	42.8	46.2	37.8	22.0	24.7	20.1
35-44	49.0	45.5	54.0	30.8	31.2	30.6
45+	-	-	-	45.2	40.0	48.9
<u>Living Children</u>						
0	0.8	0.6	1.2	1.0	.7	1.1
1	2.5	2.7	2.2	1.2	2.0	0.7
2	7.4	8.2	6.2	6.0	8.4	4.3
3	14.2	15.9	11.6	14.7	17.8	12.6
4	17.7	17.2	18.6	18.3	20.1	17.2
5+	57.4	55.3	60.3	58.8	51.0	64.2
<u>Education</u>						
None	69.1	55.9	88.5	43.9	22.0	59.2
Primary+Middle	16.7	21.7	9.4	30.6	31.7	29.8
Secondary+	14.2	22.4	2.1	25.5	46.3	11.0
<u>Region of Residence</u>						
Punjab	40.5	35.6	47.7	69.2	64.5	72.5
Sindh	28.2	34.3	19.1	22.4	30.5	16.7
NWFP	25.5	21.6	31.3	7.6	4.5	9.8
Baluchistan	5.8	8.5	1.9	.7	.4	1.0
Total(N)	(1918)	(1142)	(776)	(393)	(162)	(231)

As expected, a larger proportion of older and high parity women and their husbands want no more children as compared to couples in younger ages (with wife < 25 years) and at low parities (< four children).

As Table 1 shows, there are substantial variations in desired fertility by education and regional affiliation. For example, 69 per cent of women with no education want no more children as compared to 43.9 per cent of husbands. As for regional variations, the proportion of both women and husband with the desire for no future birth is the highest in Punjab and the lowest in Balochistan. This could be an important basis for identifying the potential demand for fertility control and selecting target groups for family planning programme objectives.

In order to determine the net effect of each predictor variable included in the analysis on desired fertility, the logistic regression results are presented in Tables 2,3 and 4 for both wives and husbands. These tables present two basic models⁷: Model 1 shows the coefficients for selected socio-economic variables⁸ such as wife's and husband's education, residence, living sons, child mortality and their schooling aspirations net of parity and age; and Model 2 takes into account all other predictor variables to indicate the net direct effect of each variable on desired fertility. Tables 2 and 3 show the results for urban and rural areas, respectively, to see if desired fertility is determined differently across two types of settings, while Table 4 shows the results for the total sample including the effect of urban residence on additional children wanted. The interpretation of the regression results indicates that with each unit change in an explanatory variable, a positive coefficient increases the likelihood to limit future births and a negative coefficient reduces the probability of wanting no more children.

⁷. Other sets of equations were also estimated to see how the explanatory variables are related to each other and affect the dependent variable. We have presented only two models for parsimony and convenience in interpretation.

⁸. Husband's occupation classified into six major categories were also included in one of the equations, but did not emerge as an important predictor of additional children wanted and the results are not presented here.

Looking at the results in Table 2 for the urban sample of wives and husbands, we find that wives' age and living children are significant in increasing the likelihood of wanting no more children, confirming the hypothesis that fertility desires are strongly affected by the life cycle stage of a woman, whereas for husbands, age and living children are not significantly associated with desired fertility. This implies that in the urban environment, even younger men may also have the desire to limit births. However, the number of living sons is important in determining husbands' desired additional fertility, (Model 1). It may be noted that the coefficient of the number of living sons is large and significant for both men and women (.556 vs .566 in Model 2), whereas for living daughters, it is insignificant for men and smaller in magnitude in case of women (.374). This may be reflective of a strong preference for sons among women also in determining their future desire for children.

Wife's levels of education is a more powerful predictor of her desire for no future births than is her husband's. The effect of education is strong and consistent in both models. For husbands, only secondary and higher education can influence their desired fertility in an urban living, while wife's education does not affect her desire for future births.

As for the effect of parental aspirations of children schooling on desired fertility, the results indicate a significant positive relationship for women. This may be interpreted to mean that women who want to educate their children are more likely want to have fewer children when compared with those who have no educational pursuits for their sons and daughters. This finding conforms well with Caldwell's theoretical argument that exposure to a more modern environment and child schooling costs affect the costs and benefits of children and hence desired fertility in a society in transition [31,pp.25-51]. For husbands, neither the aspirations for son's or daughter's education are significant in determining future desire for children.

TABLE 2

**LOGISTIC REGRESSION COEFFICIENTS OF THE EFFECT OF SELECTED
PREDICTOR VARIABLES ON THE DESIRE FOR NO MORE CHILDREN
(CURRENTLY MARRIED FECUND WOMEN AND SUBSAMPLE OF HUSBANDS)**

URBAN AREAS

Predictor Variables	Wives		Husbands	
	Model 1	Model 2	Model 1	Model 2
Constant	-3.463(.32)***	3.318(.36)***	-2.731(.69)***	-2.256(.76)**
Current Age	.031(.01)***	.022(.02)***	.014(.01)	.015(.01)
Living Children	.357(.03)***		.051(.07)	
Wife's Education				
None ^a				
Primary	.632(.11)***	.392(.12)***	.762(.29)**	.566(.31)
Secondary	1.236(.12)***	.883(.14)***	.753(.29)**	.338(.34)
Husband's Education				
None ^a				
Primary		-.165(.12)		.559(.32)
Secondary		.119(.12)		.733(.32)
Living Sons	.170(.04)***	.556(.04)***	.464(.10)***	.566(.08)***
Living Daughters		.374(.03)***		-.022(.07)
Child Death				
None ^a				
One or more	.201(.10)	.164(.11)	.021(.26)	.116(.28)
Child Education Aspirations				
None ^a				
Some	.674(.25)**	.481(.26)*		
Beyond Primary (Daughters)			.737(.44)	.312(.47)
Beyond Middle (Sons)			.507(.46)	-.470(.49)
Cousin Marriage				
Unrelated ^a				
1st or 2nd Cousin		-.085(.10)		-.271(.23)
Female Autonomy				
Accompanied ^a		.151(.09)*		.111(.24)
Could go to hospital alone				
Own Land				
Region of Residence				
Punjab ^a				
Sindh		-.180(.11)*		-.834(.25)***
NWFP		-.291(.12)**		-.997(.52)***
Baluchistan		-1.393(.16)***		-2.385(1.48)***
Model Chi Square	803.1(7df)	908.3(15df)	79.9(8df)	104.0(15df)
(N)		(2917)		(691)

* Significant at .05 level; ** at .01 level; *** at .001 level.

Figures in parentheses are standard errors.

^a: Reference category

Even though, consanguineous marriages are negatively associated with desired fertility both for women and men as was hypothesized, the coefficients are not significant. This may be because in the urban context, family and kinship ties may not be strong enough to influence fertility desires of couples. The measure of female autonomy represented by the ability of a woman to go to a hospital alone is important in increasing the likelihood of wanting no more children, while it is not significant for husbands. The effect of living in urban parts of various regions is confirming the hypothesis that region of residence has a macro effect on desired fertility in the expected direction. The coefficient for Balochistan is the strongest indicating that Balochi women are least likely to want no more children when compared with Punjabi women.

The results in Table 3 for the rural sample show that age of husband and wife is a significant predictor of the desire for no future births. Number of living sons and daughters are both significant predictors for wives and the coefficients for sons are much higher than those for daughters. As we can see in Model 2, for each living son a woman has, her log-odds of desiring no more children are increased by .59 as compared to .26 for living daughters. For men, the coefficient is large and significant (.717) for living sons only. This suggests that preference for sons is even stronger among rural residents both for women and their husbands.

Wife's education is important for defining her own fertility desires but not of her husband's. Same is true for husbands' sample where highly educated husbands (secondary plus) indicate a reduced desire for additional births, while their wife's education is not predictive of their desired fertility. As we found for urban women, child education aspirations are again important in influencing rural women's desire for additional children, while for husband schooling aspirations do not affect their desire for future births.

TABLE 3

**LOGISTIC REGRESSION COEFFICIENTS OF THE EFFECT OF SELECTED
PREDICTOR VARIABLES ON THE DESIRE FOR NO MORE CHILDREN
(CURRENTLY MARRIED FECUND WOMEN AND SUBSAMPLE OF HUSBANDS)**

RURAL AREAS

Predictor Variables	Wives		Husbands	
	Model 1	Model 2	Model 1	Model 2
Constant	-4.766(.31)***	-3.805(.32)***	-4.553(.51)***	-4.397(.58)***
Current Age	.057(.01)***	.049(.01)***	.036(.01)***	.034(.01)***
Living Children	.234(.03)***		.089(.06)	
Wife's Education				
None ^a				
Primary	.714(.17)***	.409(.19)***	.699(.31)*	.235(.33)
Secondary	1.316(.35)***	.884(.39)***	.964(.81)	.263(.86)
Husband's Education				
None ^a				
Primary		.093(.12)		.342(.23)
Secondary		.132(.15)		.835(.34)**
Living Sons	.271(.05)***	.594(.04)***	.586(.09)***	.717(.07)***
Living Daughters		.260(.04)***		.166(.06)
Child Death				
None ^a				
One or more	-.157(.11)	.009(.11)	.436(.19)*	.344(.20)
Child Education Aspirations				
None ^a				
Some	.499(.20)**	.271(.21)*		
Beyond Primary (Daughters)			.078(.23)	-.209(.25)
Beyond Middle (Sons)			-.118(.24)	-.129(.26)
Consanguine Marriage				
Unrelated ^a				
1st or 2nd Cousin		-.263(.11)**		.297(.32)
Female Autonomy				
Accompanied ^a				
Could go to hospital alone		.141(.14)		.509(.25)*
Own Land		-.085(.13)		-.021(.21)
Region of Residence				
Punjab ^a				
Sindh		-.917(.14)***		-.563(.27)*
NWFP		-.325(.12)***		-1.018(.31)***
Baluchistan		-2.908(.30)***		-2.518(.84)**
Model Chi Square	735.4(7df)	923.5(15df)	248.7(8df)	293.1(17df)
(N)		(2800)		(663)

Significant at .05 level; ** at .01 level; *** at .001 level.

Figures in parentheses are standard errors.

^a:Reference category

Marriages among cousins and relatives are significant in explaining desired additional fertility of rural women only, but not their husbands. The negative coefficient indicates that women married within the family are less likely to want no more children than those married outside their kins/families. This is, as expected, as family ties may be strong in the rural set up and influence of other family member may be operative in the process of fertility decision making.

The measure of female autonomy is strong and positive for husbands only, and no longer for rural women, even though the positive relationship is in the expected direction. This suggests that rural husbands whose wives have the ability and the independence to go outside alone have relatively lower demand for children than those whose wives cannot go alone.

Child mortality is generally not significant in determining desired additional fertility of both women and their husbands when all predictor variables are taken into account (Model 2).

Ownership of land is used as an indicator of farming status in the rural sample only to see if the argument of the demand for more children operates among landholders. The results indicate that land ownership has no predictive effect for both women and men. As hypothesized, region of residence, again, has a negative effect, indicating that in the aggregate context, couples residing in less developed regions are less likely to reduce their fertility desires than those living in a more developed regions.

Table 4 shows the results for the total sample in which place of residence is included as a predictor to see how strongly women's and men's future desired fertility is related with urban residence. The table shows that exposure to urban environment is conducive to a reduced desire for children among women, as the log-odds of desiring no more children increase by .49 for lifetime urban residents and .31 for rural to urban migrants when compared with rural residents (Model 2). For husbands, urban residence is not related to their desired fertility when controlled for all predictor variables. The urban effect remains significant for women even with the

addition of regions in Model 2, whereas for men, only always urban residence is a significant category in model 1, which becomes insignificant when all predictor variables are taken into account in Model 2.

TABLE 4

LOGISTIC REGRESSION COEFFICIENTS OF THE EFFECT OF SELECTED PREDICTOR VARIABLES ON THE DESIRE FOR NO MORE CHILDREN (CURRENTLY MARRIED FECUND WOMEN AND SUB-SAMPLE OF HUSBANDS),

ALL AREAS

Predictor Variables	Wives		Husbands	
	Model 1	Model 2	Model 1	Model 2
Constant	-3.888(.23)***	-3.711(.24)***	3.975(.39)***	-3.539(.43)***
Current Age	.036(.01)***	.033(.01)***	.029(.01)***	.027(.01)***
Living Children	.326(.02)***		.074(.04)	
Residence				
Rural ^a				
Always Urban	.550(.09)***	.489(.09)***	.408(.19)*	.356(.20)
Rural-Urban Migrant	.349(.10)***	.309(.10)***	.273(.22)	.106(.23)
Wife's Education				
None ^a				
Primary	.420(.01)***	.378(.12)***	-.822(.21)***	.409(.22)
Secondary	.937(.12)***	.771(.13)***	1.133(.26)***	.532(.29)
Husband's Education				
None ^a				
Primary		-.137(.09)		.409(.18)*
Secondary		.122(.09)		.792(.22)***
Living Sons	.238(.03)***	.568(.03)***	.531(.06)***	.645(.05)***
Living Daughters		.325(.02)***		.088(.05)
Child Death				
None ^a				
One or more	.096(.08)	.109(.08)	.263(.15)	.204(.16)
Child Education Aspirations				
None ^a				
Some	.405(.16)**	.388(.16)**		
Beyond Primary (Daughters)			.234(.20)	-.141(.21)
Beyond Middle (Sons)			-.191(.21)	-.212(.22)
Cousin Marriage				
Unrelated ^a				
1st or 2nd Cousin		-.156(.07)**		-.148(.15)
Female Autonomy				
Accompanied ^a		.156(.08)**		.372(1.7)*
Could go to hospital alone				
Region of Residence				
Punjab ^a				
Sindh		-.493(.09)***		-.687(.18)***
NWFP		-.299(.09)**		-.976(.26)***
Baluchistan		-1.832(.13)***		-2.375(.70)***
(N)		(5717)		(1354)

Significant at .05 level; ** at .01 level; *** at .001 level.

Figures in parentheses are standard errors.

^a:Reference category

As for the effect of living sons and living daughters (Model 2), it appears that once the husbands have achieved the number of sons desired, the number of daughters is not relevant to their future fertility desires. For wives, both the number of sons and daughters have a significant effect on their desire for future births. This means that husbands' desired fertility is affected more by the number of sons, while wives' desire for no more children is strongly associated with the number of living children, including both sons and daughters.

Women's education, (primary and secondary) also stands out as a significant factor in increasing the likelihood of wanting no more children in both the models in Table 4, while husband's education is not a powerful net predictor of women's desired fertility. Our results indicate that most of the effect of husband's secondary and higher education is accounted for by wife's education. In the husband's sample, the net predictive power of wife's education is reduced by husband's education and female autonomy. Husband's own education, however, is significantly related to his desired fertility.

Examining the net effect of each explanatory variable in the total sample (Table 4, Model 2), we find that for wives, except for child mortality and husband's education, all the other predictors show a significant effect while for husbands, his age, education, living sons and female autonomy are important in predicting his additional desired fertility.

Gender Differences in the Variables Predicting Desired Fertility

To assess whether there are gender differences in the predictors of desire for additional children, we compare the results for husbands and wives in the related tables. In general, across all models, the level of the wife's education is more strongly related to her fertility desires than the level of her husband's education. For husband's the reverse is true. The husband's level of education is a better predictor of his desire for no additional children than is his wife's. This may indicate that among women with little or no education, fertility desires are dominated by

the husband and his family, whereas male fertility desires are strongly associated with their own levels of education whether or not the wife is educated.

The number of living children is generally much more strongly associated with the desire for no additional children for women than for men, while for men, the coefficients for number of living sons, particularly in the rural sample are often larger than for wives, indicating the greater relative contribution of having a satisfactory number of sons to fathers as compared to mothers. Coefficients for daughters in the wife's models are generally larger than in the husband's model implying that daughters are more important as predictors of women's future desire for births. Childhood educational aspirations influence the fertility desires of women but are unrelated to husbands' desire for future births. Cousin marriages are important as predictors of only rural women's fertility desires, while female autonomy shows a significant impact for urban women and rural husbands. Region of residence is important for both men and women across all models.

Relationship Between Husband's and Wife's Desired Fertility

Table 5 shows the complete models with the addition of the husband's desired fertility as one of the predictors of wife's desire for no additional children. We expect that in Pakistan's context, where the majority of women have no education, the cognitive ability of women to articulate a desire to stop having children may be extremely limited. The influence of the husband's desired fertility may well determine the women's fertility desires. This hypothesis is indeed borne out by the results shown in Table-5, where husband's desire for no additional births is strongly related with wife's desire in both urban and rural areas⁹. As we can see, the log-odds of desiring no more children among women increase by 1.3 when their husbands want no additional births. The relationship is consistent for both urban and rural women, implying that

There is a high correlation ($r=7$) between wife's and husband's desire for children.

TABLE 5

**LOGISTIC REGRESSION MODELS SHOWING THE NET EFFECT OF SELECTED
PREDICTORS INCLUDING HUSBAND'S DESIRE FOR CHILDREN
ON WOMEN'S DESIRE FOR NO MORE CHILDREN:
(TOTAL, URBAN AND RURAL AREAS)**

Predictor Variables	Total	Urban	Rural
Constant	-4.152(.55)***	-3.372(.84)***	-5.156(.81)***
Current Age	.040(.01)**	.022(.02)	.81(.02)***
<u>Residence</u>			
Rural ^a			
Always Urban	.434(.19)**		
Rural to Urban	.302(.22)		
<u>Wife's Education</u>			
None ^a			
Primary	.123(.25)	.091(.31)	-.214(.44)
Secondary	.787(.03)**	.904(.33)**	1.147(.80)
<u>Husband's Education</u>			
None ^a			
Primary	.009(.19)	.357(.28)	.295(.31)
Secondary Plus	.279(.22)	.365(.28)	.497(.39)
<u>Child Deaths</u>			
None ^a			
At Least One	.202(.17)	.482(.24)**	-.229(.27)
Living Sons	.403(.06)***	.388(.08)***	.427(.09)***
Living Daughters	.314(.05)***	.339(.07)***	.252(.09)***
<u>Child Education</u>			
None ^a			
Some	.391(.37)	.224(.61)	.523(.49)
<u>Cousin Marriage</u>			
No ^a			
Yes	-.064(.16)	-.024(.21)	-.19(.26)
<u>Female Autonomy</u>			
Accompanied ^a			
Can go to hospital alone	.149(.18)	-.129(.23)	.795(.32)**
<u>Husband's Desire for Children</u>			
Want More ^a			
Want No More	1.331(.17)***	1.367(.23)***	1.335(.27)***
<u>Region of Residence</u>			
Punjab ^a			
Sindh	-.330(.20)	.049(.26)	-.856(.34)
NWFP	-.407(.21)**	-.474(.29)	-.288(.29)
Baluchistan	-1.677(.29)***	-1.153(.34)***	-3.506(.87)***
<u>Model Chi Square</u>	475.1(17df)	233.3(15df)	256.4(15df)
Total(N)	(1206)	(619)	(587)

Significant at .05 level; ** at .01 level; *** at .001 level.

Figures in parentheses are standard errors.

^a:Reference category

men's dominant role with regard to family size decision-making is obvious in the Pakistani context, irrespective of the urban or rural context where women are living. We may also note that with the addition of husband's desire for future fertility to the models, the effect of child educational aspirations for wives is no longer significant and the effect of wife's education is also greatly reduced, keeping only secondary and higher education as significant. This implies that the impact of wife's education and child education on her desired fertility are partly accounted for by husband's desire for children. Region of residence continues to indicate significant variations in desired fertility among Pakistani couples.

V. CONCLUSIONS AND DISCUSSION

The findings of our analysis bear useful implications in terms of the social and demographic concerns of Pakistan. Our results indicate that a large proportion of currently married women and a significant minority of men have the potential desire to stop childbearing in all subgroups of population, especially those with at least three children and with secondary or higher education. In a situation of persistent high fertility and low contraceptive use (a major concern for development planners and policy makers), these findings are important for selecting target groups for family limitation, and for expanding and strengthening the service delivery system, particularly in rural areas where majority of population lives. The presumption, however, is that improved status of women, particularly through education, and a strong national commitment to family planning are the keys to achieving fertility reduction as the government's decades-old family planning programme, has had limited success in reaching more women, and has largely ignored men.

Our analysis has also revealed that besides the strong and pervasive effects of age and living children, particularly sons, fertility desires of wives and husbands are determined differently in response to the urban-rural context of the setting, and that there are important differentials in the effect of explanatory variables for women and men. For urban women, her own level of

education (both primary and secondary), aspirations for child education and level of autonomy are critical for wanting no more children. For rural women, besides the significant effects of education, cousin marriage is important in influencing desired additional fertility, a factor unrelated to urban women fertility desires. For men, on the other hand, the achievement of at least secondary education and number of living sons are strongly related with their desired fertility both in urban and rural areas, while child education aspirations and cousin marriage are not related to husbands' demand for children. It is important to note that impact of education on desired fertility differs by gender in this analysis. We found that the level of wife's education is more strongly related to her own fertility desires than the level of her husband's education. The reverse is true for husbands, indicating that men's fertility desires are associated with his own level of education, whether or not the wife is educated. Nevertheless, our findings suggest that educational opportunities for women as well as their children should be expanded, which in turn have their effects on desired fertility.

The fact that husbands' desired fertility is strongly and positively related with their wives', it is implied that an exclusive focus on women may seriously jeopardize the success of the programme by ignoring the strong influence of husbands on family decision-making. Robinson, et al. [22, pp.85-92] concluded that the dynamics of a male-dominated society in which women who bear the children may desire to have fewer, but men who reap the benefits want more, was fundamental to a lack of demand for contraception. The current analysis shows that a substantial minority of men also express a desire to have no additional children. When combined with the proportion of men who expressed a desire to delay the next birth, latent demand for family planning among men is nearly 50 per cent. Furthermore, men do not appear to be as opposed to the use of contraception as might be expected, as 56 per cent of husbands said they approved of family planning [21,p.181].

In a strongly patriarchal society where a small proportion of women are literate, continuing exclusion of men from family planning programme efforts could be a fatal flaw in the policy. Evidence of latent demand for fertility control is an indication that the programme could have considerably greater success than it is having in bringing about a fertility decline if couples were motivated and reached to implement their fertility desires through contraceptive use. Among husbands, 64 per cent believed that it was acceptable to have family planning messages on the radio or television, but only 40 per cent had heard such a message in the last month. [21, p.182].

We conclude that husbands continue to exert a strong influence on wife's fertility desires, and that women with little or no education are not easily reached with health education messages, particularly those that address the complex issue of small family and fertility control. While education of women and expansion and improvement of the services are clearly necessary, the importance of educating husbands in the advantages of adopting a small family should no longer be ignored in the population planning programme of Pakistan.

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1. INTRODUCTION

The purpose of this study is to investigate the effects of the proposed system on the performance of the system.

The study is organized as follows. Section 2 describes the system architecture. Section 3 describes the experimental setup.

Section 4 presents the results of the experiments. Section 5 discusses the conclusions and future work.

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SEASONALITY OF BIRTHS IN PAKISTAN

MUHAMMAD AFZAL AND A. RAZZAQUE RUKANUDDIN*

On the basis of data on births by month of occurrence, the seasonality in fertility is studied for the period of 1962 to 1986. The monthly distribution shows significant seasonal variation with peaks during the months of September, December and January and troughs during the months of April, May and June. Regarding the residential and other demographic variables, the urban rural categories did not exhibit significant difference from each other in seasonality of births. The births by each order revealed similar seasonality pattern as the total births i.e., the first order births indicate a similar pattern to the second or higher order births. The younger (15-19) and older (45-49) cohorts of mothers show different pattern of births as compared to other reproductive age groups. Considering the employment status of father, those employed in the government and private organizations and self employed categories show similar pattern of seasonality in births, whereas the unpaid family workers and employers have revealed no trend.

INTRODUCTION

In several countries, the occurrence of demographic events such as birth and death have been related to the seasonal variations [1,p.614], [2,p.135], [3,p.249]. These studies were made to understand the effects of environmental, biological and social factors on fertility and mortality. In Pakistan, no such study appears to have been made to examine this phenomenon. In 1962 to 1965 a question about the month of births was asked in a survey named as Population Growth Estimation Experiment (PGE). Also information on month of birth was made available from Population Growth Surveys undertaken during 1976-79 and 1984 to 1986. In the present analysis an attempt is made to explore, whether the variation in births is seasonal or occurrence is randomly distributed. In this article seasonality in births is examined by urban and rural residence, birth order, age of mother and activity status of father.

METHODS AND MATERIALS

The data were obtained from the yearly reports of the Population Growth Estimation Experiment (PGE;1962-65), Population Growth Survey (PGS; 1976-79) and Pakistan Demographic Survey (PDS;1984-86) in which live births are classified by month of occurrence. These series are based on the cross-sectional surveys conducted by the Pakistan Federal Bureau of Statistics [4], [5] and [6].

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First, the monthly totals were adjusted to the mean length of a month, multiplied by 30.4 (365/12) or 30.5 (366/12 for the leap year) and divided by the number of days in a particular month. These births are shown as a percentage of the total number of births by each month for each year given in table 1, which show almost similar pattern in different months; there are fewer births from the month of February through June with lowest number in April-May. Then there is an increasing trend from July onward which is maintained with minor fluctuation up to January. It is noted that, more births are observed for September skewed by December and January.

TABLE 1
PERCENTAGE DISTRIBUTION OF BIRTHS BY MONTHS OF
OCCURRENCE, PAKISTAN (1962-86)

Months	Years										
	1962	1963	1964	1965	1976	1977	1978	1979	1984	1985	1986
Jan.	8.04	6.94	10.12	9.57	9.13	9.01	9.82	8.71	10.75	9.31	9.71
Feb	8.04	7.93	9.13	8.02	8.53	8.10	7.60	6.72	8.25	8.47	7.80
March	7.56	7.08	7.25	6.82	7.31	7.32	7.04	7.10	6.58	7.99	7.83
April	5.28	6.86	5.87	5.48	5.63	8.04	6.10	6.84	6.83	6.93	5.76
May	5.86	6.61	6.05	5.06	5.43	5.67	5.38	6.03	6.53	7.25	7.15
June	6.98	7.51	7.59	5.94	6.52	6.52	6.40	7.54	8.05	8.00	7.01
July	9.21	8.26	7.72	7.89	7.69	8.02	9.54	9.61	8.32	8.00	7.46
August	8.96	7.79	8.88	9.79	9.89	9.12	10.70	9.76	8.67	8.70	8.82
Sept	10.47	9.92	8.66	11.18	11.26	9.54	10.51	8.73	9.59	10.28	10.46
Oct	11.39	9.92	8.70	9.23	8.92	8.74	8.64	8.85	8.28	7.43	9.59
Nov	9.21	10.43	10.16	9.51	8.51	10.95	8.70	9.51	7.85	8.30	8.34
Dec	9.01	10.76	10.86	11.51	11.19	8.96	9.58	9.69	10.30	9.34	10.07
CV	20.3	17.4	16.8	24.0	22.1	16.1	20.6	14.6	15.6	11.1	15.6
Chi-Square	48.11	37.12	34.79	71.99	58.62	31.02	50.91	25.41	29.33	14.75	32.14

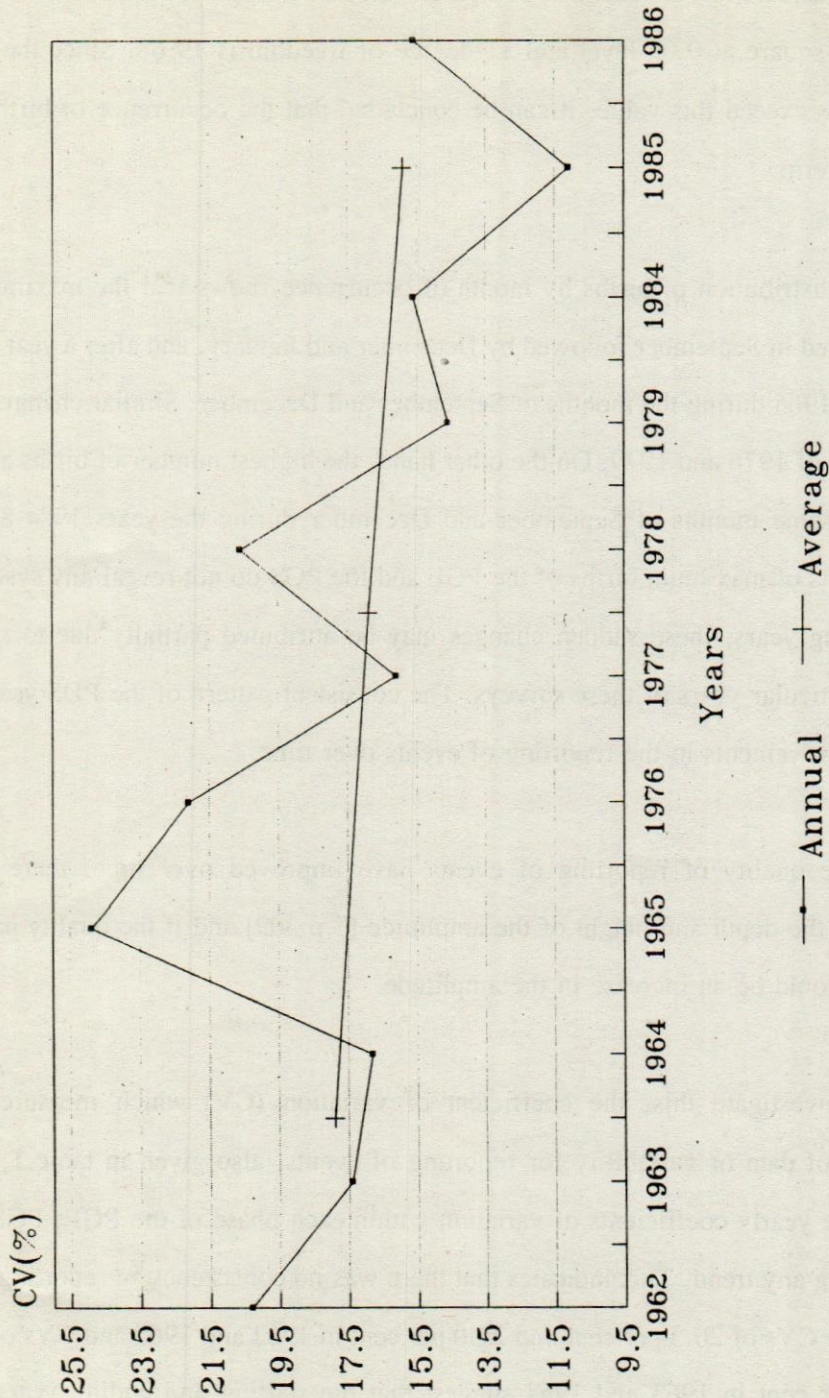
To find out whether these monthly births are significantly different from the expected ones, the chi-square test is used. The computed value of chi-square are presented in table 1. The value of chi-square at 0.05 level and 11 degree of freedom is 19.68. Since the observed chi-square values exceed this value, it can be concluded that the occurrence of births do exhibit a seasonal pattern.

The distribution of births by month of occurrence shows that the maximum number of births occurred in September followed by December and January, and after a year this maximum appeared in 1965 during the months of September and December. Similar changes are also seen for the years of 1976 and 1979. On the other hand, the highest number of births are consistently seen in the same months of September and December during the years 1984-86. Since these monthly shifts of maximum births of the PGE and the PGS do not reveal any systematic pattern in the coming years, these sudden changes may be attributed partially due to some reporting errors in particular years of these surveys. The consistent pattern of the PDS years may be due to some improvements in the reporting of events over time.

If the quality of reporting of events have improved over time, there will be some reduction in the depth and height of the amplitude [7,p.309] and if the quality has deteriorated then there would be an increase in the amplitude.

To investigate this, the coefficient of variation (CV) which measures the internal consistency of data or variability for reporting of events, also given in table 1, are plotted in figure I. The yearly coefficients of variation within each phase of the PGE, PGS and PDS are not exhibiting any trend. This indicates that there was no consistency in reporting of births. For example, the CVs of 20.3 per cent and 24.0 per cent in 1962 and 1965 and CVs of 17.4 per cent and 16.8 per cent in 1963 and 1964 suggest that the starting and ending years of this phase exhibit more variability than the other years of this phase. Similarly, the births reporting

Fig.1: COEFFICIENTS OF VARIATIONS (CVs) IN THE MONTHLY NUMBER OF BIRTHS PER YEAR, PAKISTAN 1962-86.



Source: PGE(1962-65), PGS(1976-79)
PDS(1984-86)

variability was fluctuating in the years of 1976-79. The lower values of CVs for the PDS than the PGS and PGE suggest (although there is some variability within the PDS years) that this phase showed better reporting as compared to its predecessors.

If we examine the overall trend from 1962 to 1986, the CVs showed downward trend, this becomes more clearer, when plotting the average coefficients of variation for each data sets on similar scale (see Figure I). The figure I reveals a declining tendency from 1962 to 1986. This suggests that reporting of births has improved in the recent years and to minimize the yearly fluctuations for each series of PGE, PGS and PDS, further improvement and reduction in terms of averages is required. this analysis is made by taking the mean value of monthly births for each of the PGE 1962-65, PGS 1976-79 and PDS 1984-86 in table 2.

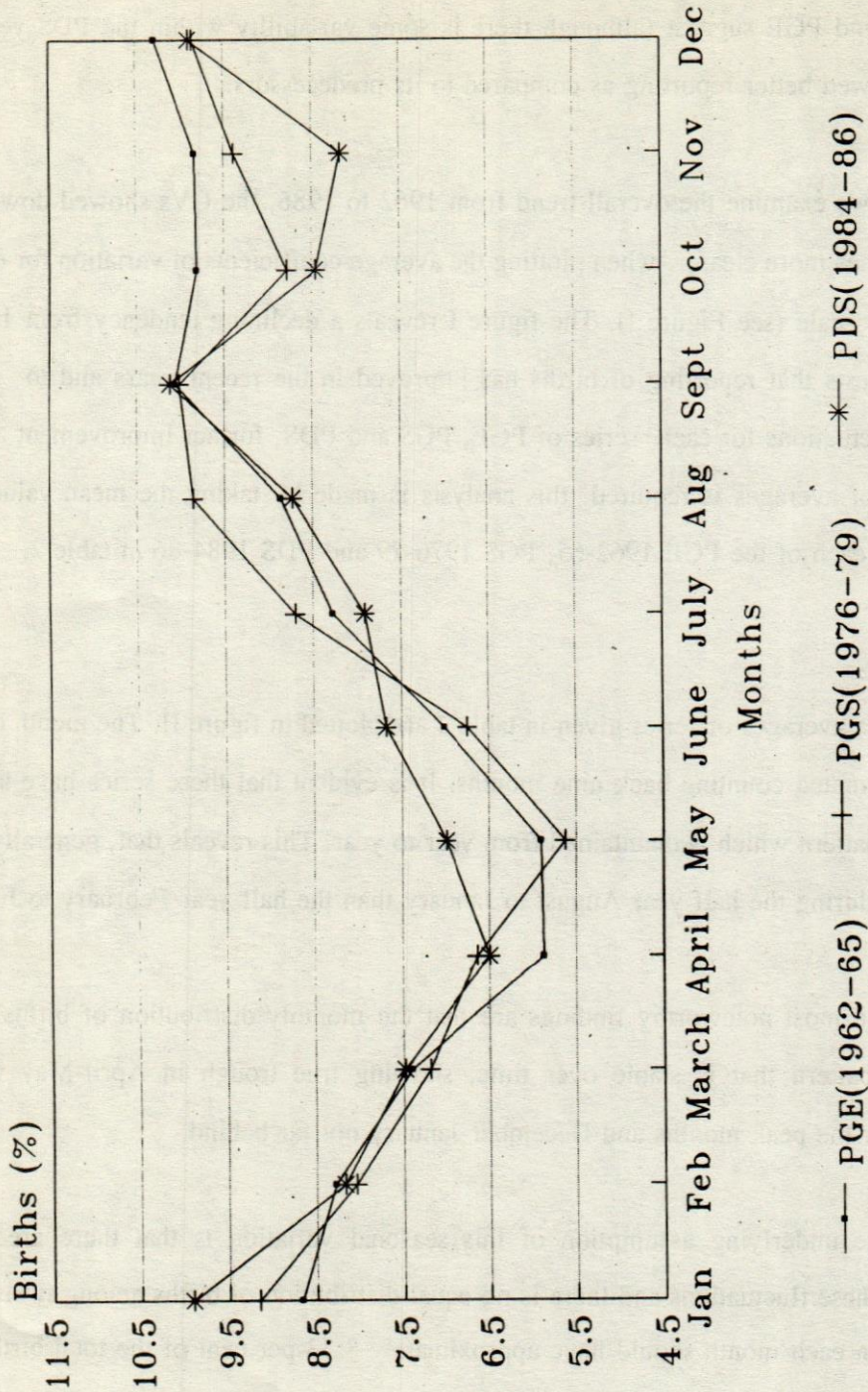
RESULTS

The averages of series given in table 2 are plotted in figure II. The month of conception is approximated counting back nine months. It is evident that these series have an underlying seasonal pattern which is maintained from year to year. This reveals that, generally more births occurred during the half year August to January than the half year February to July.

The most noteworthy findings are that the monthly distribution of births, displayed a seasonal pattern that is stable over time, showing true trough in April-May with August-September the peak months and December-January not far behind.

The underlying assumption of this seasonal variation is that there are reasons that generate these fluctuations and there is no equal distribution of births among twelve months. If it was, then each month should have approximately 8.33 per cent of the total births in a given year.

Fig.II: DISTRIBUTION OF BIRTHS BY MONTH
OF OCCURRENCE, PAKISTAN 1962-86.



Source: PGE(1962-65), PGS(1976-79)
PDS(1984-86)

TABLE 2
PERCENTAGE DISTRIBUTION OF BIRTHS BY MONTH OF
OCCURRENCE, PAKISTAN 1962-86

Months	1962-65	1976-79	1984-86
Jan	8.67	9.16	9.91
Feb	8.28	8.04	8.17
March	7.18	7.19	7.48
April	5.87	6.63	6.49
May	5.90	5.62	6.99
June	7.01	6.74	7.67
July	8.27	8.70	7.91
August	8.86	9.86	8.73
Sept	10.06	10.01	10.12
Oct	9.81	8.78	8.45
Nov	9.83	9.39	8.17
Dec	10.29	9.86	9.90
CV	17.91	16.92	15.93

The peak in December-January may be related to conception, occurring in March-April, the spring months of the year during which more marriages occur and stimulate sexual activities. August-September, the second peak of the year may be associated with conceptions occurring during November-December, the cooler months of the winter season, when the people tend to sleep together to keep warm, which enhances the chance of conception [8,p.367]. The trough of April-May, may be related to the conception in July-August months of the summer season, when it is usual for couples to sleep separately and for male partner especially in rural settings to sleep outside the house during these hot and humid months. Thus conceptions may be less [9,p.108]. The other reason for the drop in April-May can be linked to the peak time for the sowing of rice during the months of July-August.

To see whether the seasonal pattern of births observed the country also exists in urban and rural areas. The Kruskal-Wallis Rank test [10,pp.504-507] is used, to compare the seasonality between population of these areas.

The monthly distribution of births (Table 3) by residence status is examined in figure III. Which indicates that peaks and troughs are exhibiting similar pattern by residence. This corresponds to the peaks and troughs observed in figure II for the country as a whole. The calculated value of 0.03 of Kruskal-Wallis test, against the value of 3.84 (tabulated) at 0.05 level and degree of freedom 1, suggests that there is no significant difference in seasonality of births in urban and rural settings of the country.

Note: Kruskal-Wallis test is a procedure for use on data measured on an ordinal scale. The assumptions made in using this test are that the sample data are drawn from the population with similar distribution. The test statistics used follows Chi-Square distribution with k-1 degree of freedom. The test statistic is given by the formula:

$$H = \frac{12}{n(n+1)} \left(\frac{R_1^2}{n_1} + \frac{R_2^2}{n_2} + \dots + \frac{R_k^2}{n_k} \right) - 3n(n+1)$$

Where n = the number of cases in all the samples combined.

R_1 :sum of ranks for n_1 observations in sample 1 .

R_2 :sum of ranks for n_2 observations in sample 2.

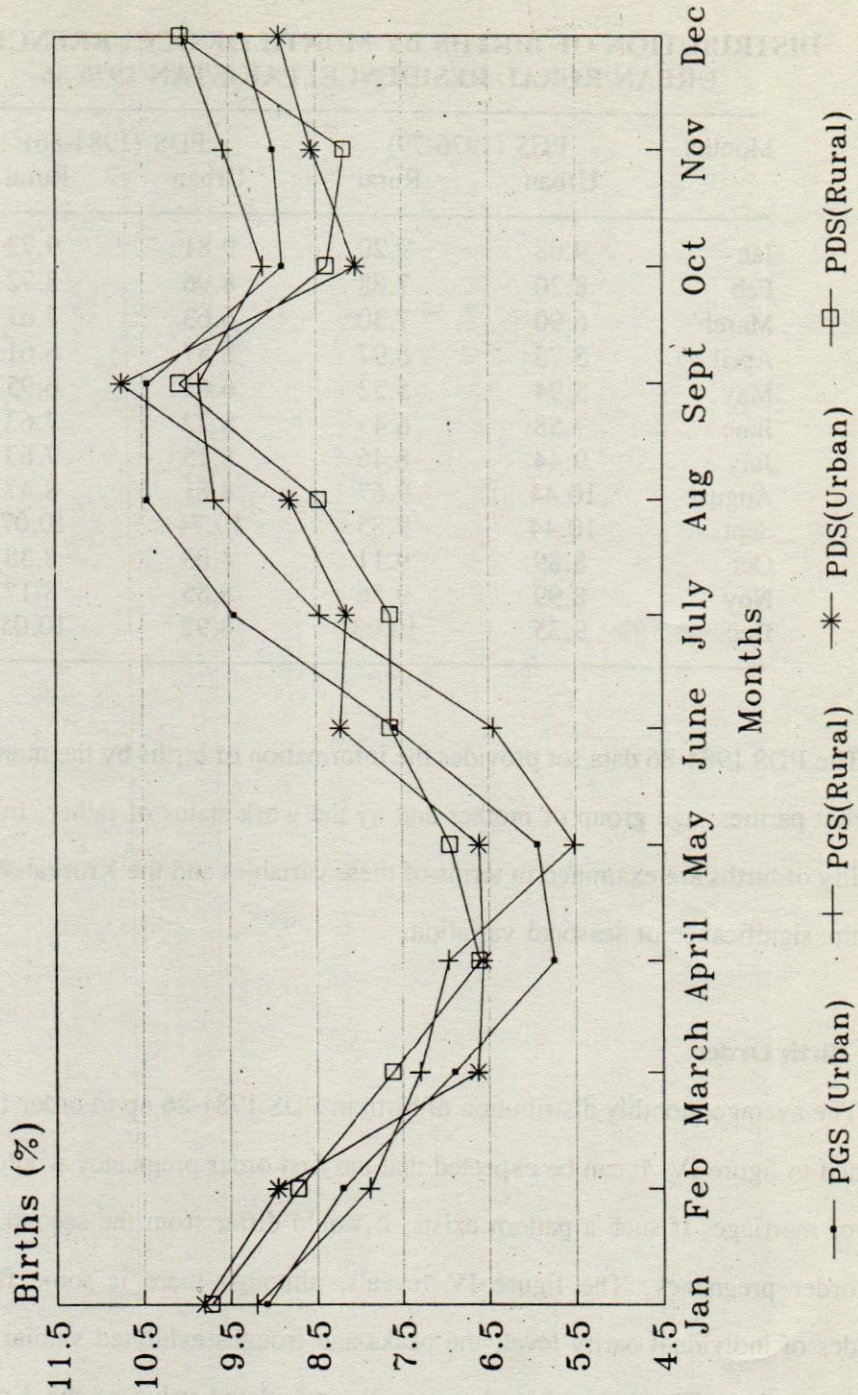
⋮

⋮

⋮

R_k :sum of ranks for n_k observations in sample k.

Fig.III: DISTRIBUTION OF BIRTHS BY MONTH
OF OCCURRENCE, AT URBAN RURAL RESIDENCE
PAKISTAN, 1976-86.



Source: PGS(1976-79), PDS(1984-86)

TABLE 3

**DISTRIBUTION OF BIRTHS BY MONTH OF OCCURRENCE AT
URBAN RURAL RESIDENCE, PAKISTAN 1976-86**

Months	PGS (1976-79)		PDS (1984-86)	
	Urban	Rural	Urban	Rural
Jan	9.08	9.20	9.81	9.72
Feb	8.20	7.88	8.96	8.72
March	6.90	7.30	6.63	7.61
April	5.75	6.97	6.57	6.61
May	5.94	5.52	6.62	6.95
June	7.58	6.45	8.22	7.63
July	9.44	8.46	8.15	7.63
August	10.44	9.67	8.81	8.47
Sept	10.44	9.85	10.74	10.07
Oct	8.89	9.11	8.03	8.38
Nov	8.99	9.56	8.55	8.17
Dec	9.35	10.03	8.92	10.05

The PDS 1984-86 data set provides the information of births by the month of occurrence at different parities, age group of mother and by the work status of father. In this section, the seasonality of births are examined in terms of these variables and the Kruskal-Wallis test is used to find the significance of seasonal variation.

i) Birth Order

The average monthly distribution of birth in PDS 1984-86 up to order five (see Table:4) are plotted in figure IV. It can be expected that the first order pregnancy would reflect seasonal pattern of marriage. If such a pattern exists, it would differ from the second, third, fourth or higher order pregnancy. The figure IV reveals, although there is some fluctuation in the amplitudes of individual parity level, the peaks and troughs exhibited similar seasonal pattern at all birth orders. The comparison between the calculated value of the Kruskal-Wallis test ($H=0.6$) and tabulated value of 9.48 at 0.05 level with d.f. =4, strongly suggest that seasonality in pregnancy is not significantly different at different birth order.

Fig.IV: DISTRIBUTION OF BIRTHS BY MONTH
OF OCCURRENCE AND PARITY OF MOTHER
PAKISTAN, 1984-86.

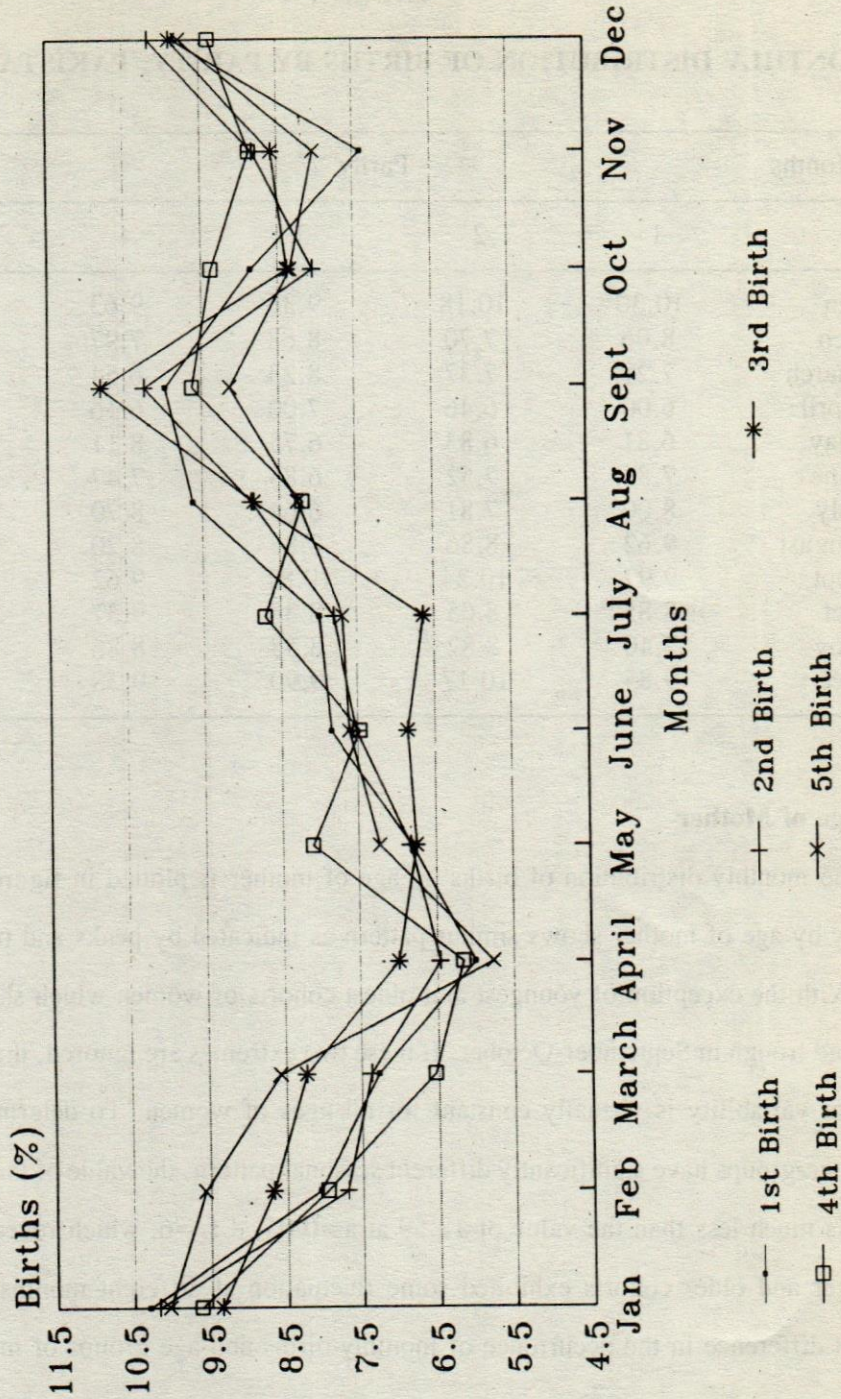


TABLE 4

MONTHLY DISTRIBUTION OF BIRTHS BY PARITY, PAKISTAN 1984-86

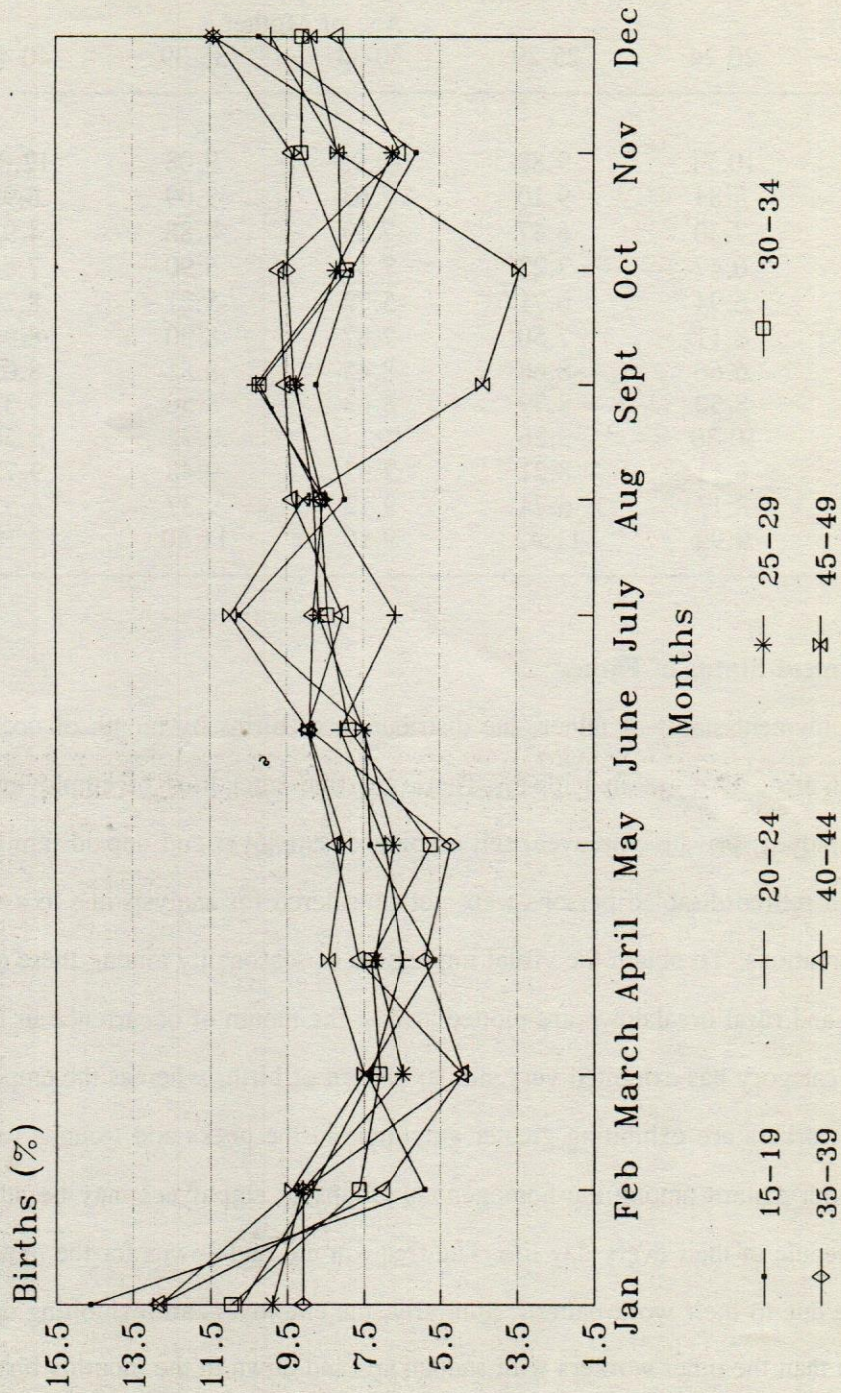
Months	Parity				
	1	2	3	4	5
Jan	10.30	10.18	9.36	9.63	10.04
Feb	8.06	7.70	8.68	7.97	9.57
March	7.27	7.37	8.23	6.54	8.57
April	6.00	6.46	7.00	6.16	5.76
May	6.81	6.83	6.75	8.11	7.23
June	7.86	7.52	6.85	7.47	7.61
July	8.00	7.81	6.64	8.70	7.69
August	9.62	8.86	8.83	8.20	8.26
Sept	9.97	10.24	10.81	9.62	9.13
Oct	8.85	8.05	8.38	9.37	8.34
Nov	7.40	8.82	8.58	8.86	8.03
Dec	9.85	10.17	9.90	9.38	9.77

ii) **Age of Mother**

The monthly distribution of births by age of mother is plotted in figure V. Seasonality of fertility by age of mother shows similar pattern as indicated by peaks and troughs at all age groups. With the exception of youngest and oldest cohorts of women which show amplitude in January and trough in September-October. If these two extremes are ignored, then the magnitude in seasonal variability is virtually constant for all ages of women. To determine whether the different age-groups have significantly different seasonal pattern, the value of the Kruskal-Wallis $H=0.18$ is much less than the value of 12.59 at $\alpha=0.05$, d.f.=6, which reveals that although the younger and older cohorts exhibited some fluctuation at different months but there is no significant difference in the occurrence of monthly births and age groups of mother.

This also shows that like the parity, the age of the mother exhibited same pattern of seasonality of births.

Fig.V: DISTRIBUTION OF BIRTHS BY MONTH
OF OCCURRENCE AND AGE OF MOTHER
PAKISTAN, 1984-86.



Source:PDS(1984-86)

TABLE (V)

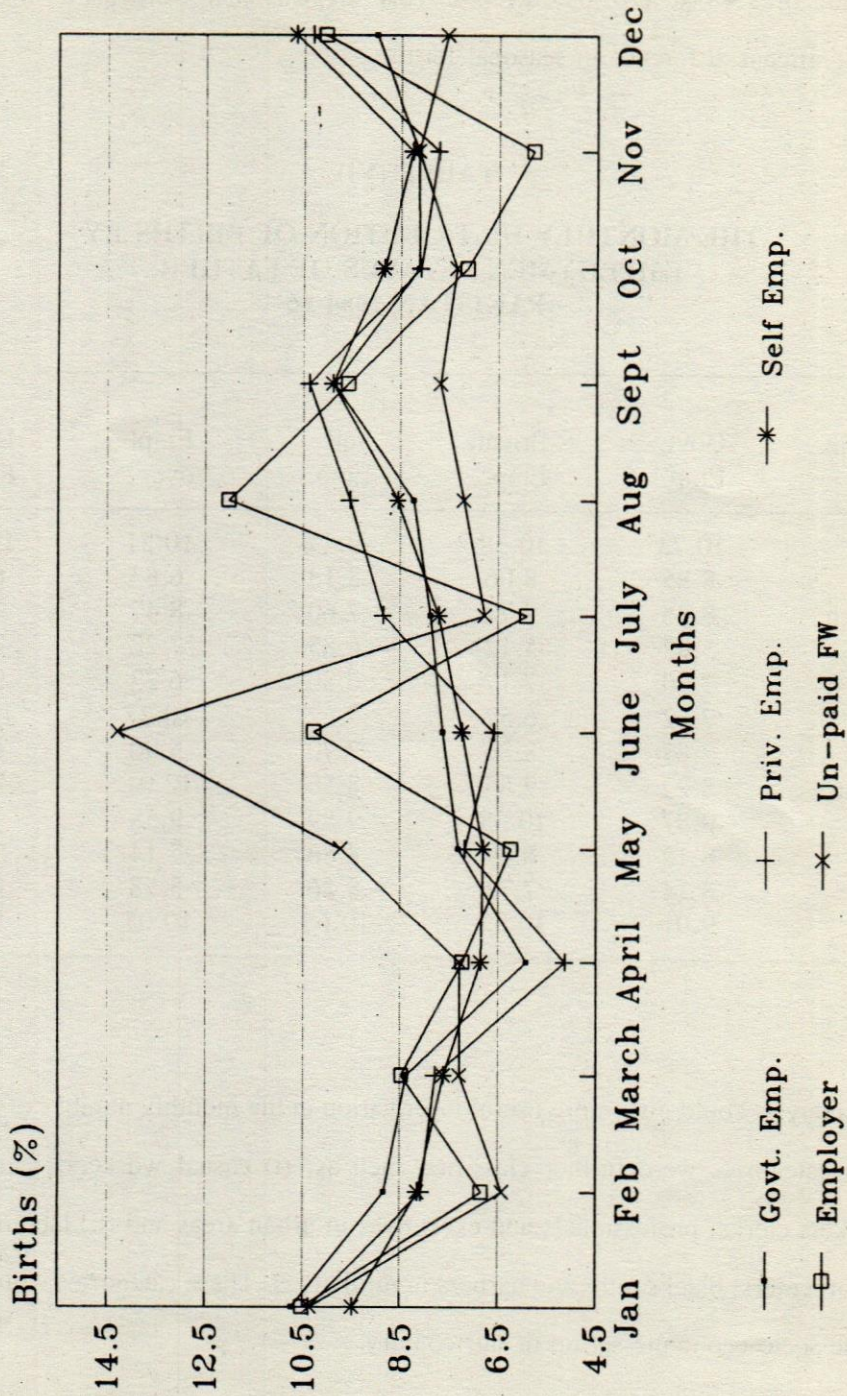
MONTHLY DISTRIBUTION OF BIRTHS BY AGE OF MOTHER, PAKISTAN 1984-86.

Months	Age of Mother						
	15-19	20-24	25-29	30-34	35-39	40-44	45-49
Jan	14.61	10.71	9.88	10.95	9.08	12.85	12.82
Feb	5.90	8.84	9.10	7.63	9.09	6.99	9.38
Mar	7.43	7.30	6.47	7.09	4.88	4.92	7.51
April	5.64	6.47	7.22	7.31	5.90	7.64	8.43
May	7.32	6.94	6.71	5.72	5.21	8.25	7.99
June	7.46	8.11	7.50	7.87	8.90	8.96	8.93
July	10.75	6.66	8.68	8.45	8.81	8.05	10.98
Aug	8.00	8.50	8.79	8.63	8.56	9.37	9.07
Sept	8.73	10.30	9.26	10.21	9.32	9.54	4.38
Oct	7.81	8.11	8.21	7.93	9.48	9.72	3.43
Nov	6.10	8.13	6.74	9.12	9.37	6.53	8.18
Dec	10.22	9.92	11.42	9.10	11.40	8.18	8.89

iii) **Employment Status of Father**

For employment status of father, the distribution of births by month of occurrence in urban and rural areas is given in table 6. There are five categories of employment status: government employee, private employee, self employed, employer and unpaid family worker. The students and retired/disabled persons were not considered for analysis due to a very small number of observations. To obtain the visual impression of seasonality among these categories, births by urban and rural breakdown are plotted against the month of occurrence in Figure VI. The employees category has exhibited very similar pattern of births whereas the employers and un-paid family workers are exhibiting greater amplitude in the peaks and troughs without any trend. The smooth pattern among the homogenous groups of employees may be attributed to very similar schedule of their every day life. The frequent ups and downs for the unpaid family workers may be due to their work pattern. Similarly, the employers are exhibiting much more different pattern than the other workers with sudden ups and down in the monthly births. Again

Fig.VI: DISTRIBUTION OF BIRTHS BY MONTH
OF OCCURRENCE AND ACTIVITY STATUS OF
FATHER, PAKISTAN, 1984-86.



Source:PDS(1984-86)

the Kruskal-Wallis test is used to see whether the monthly occurrence of births depends on the work status of father. The computed value of the Kruskal Wallis test: $H=1.11$ is much lower than the value of 9.48 at $\alpha=0.05$, d.f.=4. This suggests that work status of father is not exhibiting significant difference in seasonal fertility.

TABLE (VI)
THE MONTHLY DISTRIBUTION OF BIRTHS BY
EMPLOYMENT STATUS OF FATHER,
PAKISTAN 1984-86

Month	Govt. Emp.	Private Emp.	Self Emp.	Empl- oyer	Unpaid F.W
Jan	10.73	10.38	9.49	10.51	10.35
Feb	8.85	8.06	8.13	6.83	6.41
March	8.36	7.77	7.60	8.47	7.28
April	5.92	5.12	6.85	7.22	7.28
May	7.30	7.17	6.80	6.23	9.73
June	7.62	6.57	7.22	10.27	14.27
July	7.87	8.86	7.70	5.90	6.76
August	8.22	9.55	8.56	12.01	7.20
Sept	9.87	10.38	9.89	9.58	7.68
Oct	8.12	8.09	8.86	7.14	7.35
Nov	8.14	7.73	8.26	5.78	8.14
Dec	9.01	10.32	10.65	10.05	7.54

The analysis could give more useful information in the monthly number of births if these employment categories were further classified such as, (i) casual workers, factory workers, manual workers clerks, professionals and executives in urban areas and (ii) labourers, farmers, landlords, carpenters, blacksmiths and barbers in rural areas. These categories would have better explained the socio-economic set up of our country.

DISCUSSIONS:-

Like many populations, there is a marked seasonality of births in Pakistan. The seasonal pattern is strong with peaks during August-September, December-January and trough during April-May. Since the conceptions happened nine months earlier, these peaks and troughs can be related to the cooler months of winter and hot and humid months of summer. The spring peak in conceptions can also be related with the post-harvest period when the cash inflow is high, the temperature is moderate and the people have free time when they might be sexually more active and also prefer to get their marriages in these months.

Therefore, the need is to understand the monthly birth pattern which could provide important clues for the effective implementation of family planning programme in the country. This could be achieved by increasing the supply of contraception and vigorous counselling about fertility control, particularly during the spring seasons when the chances of conceptions are high.

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A NOTE ON EVALUATION STUDY OF INFORMATION, EDUCATION AND COMMUNICATION (IEC) COMPONENT OF POPULATION WELFARE PROGRAMME OF PAKISTAN, 1988-93

ABDUL HAKIM*

INTRODUCTION

Information, Education and Communication (IEC) is an important component of the Population Welfare Programme (PWP) of Pakistan and the National Institute of Population Studies (NIPS) attempts to evaluate this and other components of the programme.

The National Institute of Population Studies (NIPS) undertook an evaluation of this component included in the Sixth Five Year Plan 1983-88. The report of this evaluation was published in 1991 [1]. The object of the present study is to evaluate the IEC component of the programme included in the Seventh Five Year Plan, 1988-93 [2].

During the Seventh Plan (1988-93) about Rs.75 millions were spent on IEC and all channels of mass media TV, Radio, Press and other print media were utilized [3]. The main objectives were to narrow the gap between knowledge and practice and motivate couples for small families.

The mass media projected following six themes:

1. Breast feeding;
2. Lactation and weaning;
3. Late marriage;
4. Responsible parenthood;
5. Status of women, and
6. Health of mother, child and nutritional needs.

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The immediate objectives of the evaluation were:

1. To find out about the access to electronic media and knowledge of communication media conveying population welfare messages;
2. To determine the attitude of respondents towards the population welfare messages conveyed through different media; and
3. To assess the effectiveness of the communication strategy in creating awareness and promoting use of family planning methods.

SAMPLE:

A national sample of 3300 households was selected from the country covering Punjab, Sindh, NWFP and Balochistan. The sample design for the survey was developed by the Federal Bureau of Statistics (FBS), Government of Pakistan. The universe consisted of all urban and rural areas of four provinces of Pakistan as defined in 1981 Population Census excluding FATA and military restricted areas, consisting four per cent of the total population.

The sample design was selected in two stages. In the first stage 99 Primary Sampling Units (PSUs) were selected from Urban blocks of urban domain and 121 PSUs from villages of rural domain. From each selected PSU a systematic random sample of 15 households was selected. Thus there were 3300 sampled households as secondary sampling units in 220 sampled clusters.

From 3300 households 3544 currently married women aged 15-49 were identified. Out of these 3308 women were successfully interviewed who formed the sampled respondents of this study. Thus coverage was 93.3 per cent. Weighting factor for every cluster was applied as obtained from FBS to get reliable estimates at 95 per cent confidence level for the national, provincial and urban/rural areas.

QUESTIONNAIRE:

The questionnaire included:-

1. Household composition;

2. Background Characteristics;
3. Fertility;
4. Knowledge and attitude towards IEC component; and
5. Knowledge, attitude and practice of family planning.

The questionnaire was discussed at length, pretested and approved by the Technical Advisory Committee set up for this survey.

RECRUITMENT AND TRAINING OF STAFF:

Five teams were constituted for the field work in Pakistan. Each team had one supervisor and 3 female interviewers. Two teams conducted the survey in Punjab, one team each conducted the survey in Sindh, NWFP and Balochistan.

A fifteen days training programme was conducted for the field staff in May, 1994.

FIELD OPERATION:

The survey was conducted from June to the end of October, 1994. All the completed questionnaires were checked by the Supervisors in the field before transmitting to NIPS for further checking, coding, data entry and processing.

MAIN FINDINGS

Age:

Median Age of currently Married Women (CMW) was 31.9 years, with 32.7 in urban and 31.6 in rural areas. There has been consistent slight shift, from younger ages to older age groups as compared to the previous surveys.

Education:

The percentage of CMW who had no education continued to be high. The survey showed that there were 76.1 per cent CMW who had no education. Literacy

rate for CMW was 22 per cent with 12.8 per cent in rural and 44.7 per cent urban areas.

Work Status:

Majority of Women (76.6 per cent) worked as house wives and 13.5 per cent were gainfully employed whereas 9.9 per cent worked as unpaid family workers.

Fertility:

Mean Number of children ever born was 4.4 whereas mean number of living children was 3.76.

Mean Age at Marriage:

Mean age at Marriage was noted as 17.76 years for the country, 18.09 years for urban and 17.63 years for rural areas.

It has been noted that the mean age at marriage for girls as perceived by CMW was 20.64 years for Pakistan, 21.10 years for urban and 20.67 years for rural areas, which indicate a change in the attitude of CMW for higher age at marriage for future generation.

Pregnancy Status:

The survey showed that 13.6 per cent of CMW were pregnant which is a significant decline from previous inquiries. For example, corresponding pregnancy rate obtained in the Pakistan Contraceptive Prevalence Survey undertaken in 1984-85 was 15.8 per cent [4].

Ideal Number of Children:

Mean ideal number of children indicated was obtained as 3.94 with 3.59 in urban and 4.08 for rural areas.

Desire for More Children:

In Pakistan 59.4 per cent women did not want more children, with 69.2 per cent in urban and 55.4 per cent in rural areas.

IEC:

The exposure to radio was 31 per cent. Almost equal percentages were for both urban and rural areas, with slightly higher proportion for rural listeners.

The exposure to T.V. was high as compared to radio. There were 55 per cent CMW who ever watched television with 44 per cent in rural and nearly 82 per cent in the urban areas.

The possession of radio and T.V. seems to have been under reported compared to exposure due to the possibility of sharing with neighbors and others. Around 9.2 per cent CMW indicated possessing radio; 24.5 per cent having television and 23.0 per cent having both radio and T.V. Thus there were 43.3 per cent CMW possessing neither radio nor T.V. The possession of either item was around 57 per cent with 83 per cent in urban and 46 per cent in rural areas. As expected T.V. was more available in the urban than rural areas, although there was a sizeable rural population having T.V. Radio was more possessed in rural than urban areas.

As expected, newspaper was ever read only by 15.8 per cent with 34.2 per cent in urban and only 8.4 per cent in rural areas.

There are 88.3 per cent women who ever heard/watched/read about family planning programme with 96.4 per cent in urban and 85.1 per cent in rural areas.

The perception of those who ever heard/watched/read about Family Planning indicated that the messages of family planning according to them was

mainly to limit the number of children (68.4 per cent), followed by spacing of children (15.5 per cent), for welfare of family (7.0 per cent) and use of contraception (5.9 per cent). Almost similar pattern was observed in urban and rural areas.

Among those who listened to radio dramas about family planning 97.2 per cent indicated that the broadcasting was being done at suitable time and 67.8 per cent felt that frequency of the dramas was adequate.

Among those who watched T.V. dramas about family planning 91.2 per cent indicated that timing of the display was suitable. The perceived major messages conveyed were son preference and limiting the family. Various T.V. adds regarding family planning were found being telecast at suitable time (82.5 per cent) and with adequate frequency (68.4 per cent).

Visit to Baby Show was reported by only 2.6 per cent; those who had seen post cards/envelops were only 15.8 per cent and those who had seen family planning stall were only 1.5 per cent.

Knowledge and use of Family Planning:

The specific knowledge of any family planning method was 83.7 per cent with 93.9 per cent in urban and 79.6 per cent in rural areas. Most respondent (78.1 per cent) had knowledge of female sterilization, followed by injection 77.4 per cent, Pill by 76.4 per cent, IUD 74.3 per cent and condom 60.9 per cent.

Ever use of any contraceptive method was 29.8 per cent with 53.3 per cent in urban and 20.3 per cent in rural areas.

Current use of any contraceptive was 24.4 per cent with 44.6 per cent in urban and 16.3 per cent in rural areas. Highest method currently used was female sterilization followed by IUD and condom.

In urban areas highest methods currently used was female sterilization, followed by condom and IUD. In rural areas highest method currently used was female sterilization, followed by IUD and injection.

As expected current use was positively related with rising age and parity.

Similarly with enhanced education, the use of contraceptive increased. Listening to radio and watching television and reading newspapers also contribute to the knowledge and use of contraceptives. However, T.V. seems to be playing a vital role. Those who watched T.V. were more likely to use contraceptives (33.6 per cent), compared to those who never watched (13.0 per cent). These differentials were observed in both urban and rural areas.

Radio was contributing to the use of family planning in rural than urban areas.

Since newspaper reading is closely correlated with education level, its positive contribution to the use of family planning methods was understandable and was significant both in urban and rural areas.

In Pakistan neighbours, relatives and spouse communication were major sources of providing knowledge of family planning. Spouse appeared to be more important in urban areas followed by neighbours and relatives. However, in rural areas neighbours were more important followed by relatives and friends. Predominant motivation source for the ever use of family planning methods was the spouse followed by, family planning worker in urban as well as in rural areas.

Major reasons for never using family planning methods was want more children (31 per cent), followed by husband's opposition (10.8 per cent) and religion

(6.9 per cent). Similar pattern has been noted for rural areas. In urban areas "want more children" was followed by husbands opposition and fear of side effects.

Among those who had knowledge, there was a large proportion of CMW (61 per cent) who wanted to learn more about family planning. Similarly 54 per cent women wanted to use family planning methods if services were provided at their door steps.

CONCLUSIONS

There are indications of improvement in the knowledge and use of contraceptives in Pakistan. However, still there was a wide gap between knowledge and practice because knowledge was around 84 per cent while practice was around 24 per cent.

2. Other factor related to the programme indicated that family size although slightly declining, was still high. Ideal number of children was around four, while children ever born above (CEB) were above four.
3. The role of mass media is important. Radio exposure was low, yet it was important for rural population where its impact was noted clearly. It use should be encouraged for IEC purposes.
4. T.V. was noted as the most important media both in urban and rural areas, although coverage of this medium was more in the urban than rural areas. T.V. related messages should be strengthened and made more focussed.
5. Messages conveyed through radio and T.V. campaigns were properly understood by majority of the respondents which indicated that the messages conveyed were precise and clear for which the credit goes to the managers, producers and those who were involved in the IEC programme.

6. Timing selected for the dramas, slogans or adds also appeared suitable and their frequency was adequate.
7. The role of newspapers was very much related to educational level of the respondents. Education/Literacy itself was the most important factor contributing to the knowledge and use of family planning methods and this study has confirmed earlier findings of various studies in this area.
8. Fixed and other print material seems have not played much role and need consideration.
9. Inter personal communication was lagging behind, perhaps because there were only few workers in the programme prior to 1994. The new cadres of Village Based Family Planning and National Health Workers needed special skill in the interpersonal communication so that they could motivate eligible women for small family norms.
10. The contraceptive users were relatively older, had sufficiently large number of living children, which indicate that most of the users started using contraceptives for limiting their family size after they felt the pressure of number of children. There is a need to emphasis use of contraceptives for spacing as well as before the pressure starts.
11. Desire for more children was the most prominent reason for the non-use of contraceptives. The IEC programme need to emphasis spacing as well as appropriate number of children a couple should have.
12. Another important reason for the non-use of contraceptives, particularly in rural areas, was religion. This is an area where IEC need to play vital role in projecting the true picture of the religion.

13. Fear of side effects is another major reason for the non-use. The programme personnel should be more considerate in providing quality services and undertake follow up of respondents, especially of those using clinical methods.
14. Husband's opposition has also figured high among the reasons for non-use. This is important to provide appropriate counselling for family planning through IEC to husbands.
15. A large proportion of women (61 per cent) who had knowledge of at least one of the programme method, wanted to learn more about family planning. Similarly 54 per cent of such women wanted to use family planning methods if services were provided at their door steps. These are the healthy indications for the programme personnel to reach these women through appropriate IEC messages and contraceptive services.

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A NOTE ON
SURVEY ON MALES' ATTITUDES AND MOTIVATION
FOR FAMILY PLANNING IN PAKISTAN

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INTRODUCTION

In the Population Welfare Programme of the country there is a wide choice of contraception for females such as oral pills, vaginal methods, IUD, injectables and contraceptive sterilization. The only method available for males is condom while vasectomy is another method which is not included. Also, surveys indicate that due to the negative attitude of some husbands, their wives do not use contraceptives.

SAMPLE

In order to find out the attitude and motivation of currently married men for the use of contraceptives in general and vasectomy in particular a stratified random sample of clusters was selected from Punjab, Sindh, NWFP and Balochistan. The probability sample of 4,689 households was selected with the assistance of the Federal Bureau of Statistics, Government of Pakistan to interview males whose wives were in the reproductive age 15-49 years. The field work of the survey was undertaken from May to September 1994.

This national survey excluded the Federally Administrative areas, military restricted areas and protected areas of NWFP. The population of these areas which was excluded from the universe constitute about four per cent. The sample design was two-stages. In the first stage 73 Primary Sampling Units (PSUs) were selected from urban blocks and 95 PSUs from rural areas.

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In the second stage a cluster of 30 households was selected at random from each PSU. Prior to the field work two Focus Group Discussions were held in Rawalpindi and Mardan for the construction of questionnaire. The questionnaire finally included household composition, background characteristics, attitude toward family planning and ever and current use of contraception.

Out of the sample of 4,689 males there were 213 who were found as absent and 56 had refused to answer the questions. Thus the response rate was 94.3 per cent. The problems investigated through this survey besides fewer methods available for males, consisted of lack of service delivery outlets for males and the need for such outlets in the country.

There is no specific outlet of service delivery for males. All the service delivery outlets such as FWCs, Village Based Family Welfare Centres and RHS centres are available for females.

The interviews were conducted by six teams of male interviewers. Each team had one male supervisor and 2 male interviewers.

AGE AT FIRST MARRIAGE

The survey indicated that 40 per cent of males got married at the age of 20-24 years, 14 per cent got married in ages 15-19 years while 32 per cent got married at the age of 25-29 years. 14 per cent got married at age 30 years and over. The mean age at marriage was 24.4 years.

In the case of females 49 per cent got married at the age of 15-19 years, 36 per cent got married at the age of 20-24 years, 10 per cent got married after 24 years of age. The mean age at marriage for women was 19.6 years as compared to male age at marriage 24.4 years.

CHILDREN EVER BORN

As reported by husbands about 10 per cent women had no children ever born alive (CEB). About 21 per cent women had 1-2 CEB and 28 per cent had 3-4 CEB. The remaining 41 per cent women had more than 4 CEB.

LIVING CHILDREN

There were about 12 per cent women who had no living children. About 25 per cent women had 1-2 living children and 30 per cent had 3-4 living children. It shows that 67 per cent women had up to 4 living children whereas 33 per cent women had more than 4 living children. This shows that 33 per cent couples had no concept of benefits of small family norms.

CONTRACEPTIVE KNOWLEDGE

Specifically the knowledge of males about condom and female sterilisation was 74 per cent and 67 per cent respectively. The knowledge for oral pill, injection and IUD was 61 per cent, 57 per cent and 40 per cent respectively. It is interesting to note that knowledge for withdrawal was found as 36 per cent and this method is also persistently reported to be well known as noticed in previous surveys.

The knowledge about male sterilisation was only 12 per cent which requires serious attention of programme managers. It is imperative that IEC component of the family planning programme should also give attention to male sterilization so that more men know about vasectomy. It is likely that if males are motivated for vasectomy, considerable men may choose to undergo vasectomy which will increase overall prevalence of contraceptive use.

REASONS FOR PRACTICING CONTRACEPTION

Majority of men i.e. 57 per cent started contraception for spacing, while 38 per cent practiced contraceptive use for limiting family size. There is a need to closely follow up those

couples who practice contraception for spacing as such couples suspend contraception when they desire another child and then some of them are likely to drop-out permanently if they are not closely followed-up.

CURRENT USE OF CONTRACEPTION

The current use of condom was the highest i.e. 6 per cent. The current use of female sterilisation, injection and IUD was 5 per cent, 3 per cent and 2 per cent respectively. The current use of withdrawal was also 2 per cent whereas the current use of pill was about one per cent. The current use of vaginal methods, rhythm and male sterilization was below 1 per cent. This current use rate was reported by husbands.

It is imperative that due attention should be given to provide vasectomy services. Vasectomy has an edge over female sterilisation because this operation is comparatively much easier, quicker and safer. It is as effective and permanent as female sterilisation. And of course there is no effect on sexual performance.

ATTITUDES

The main objective of the survey was to find out the attitudes of males regarding family planning. A number of questions were added in the questionnaire which were thought to be closely related to the issue and use of contraception. Some analysis of data on attitudes of males for family planning and other related issues is presented..

Majority of respondents were of the view that age at marriage for a boy should be 25-29 years and for girls 20-24 years. Next largest group argued that age at marriage for a boy should be 20-24 years and for a girl, it should be 15-19 years.

There were 27 per cent males who favoured 2 boys and 2 girls for a couple, 18 per cent men favoured 2 boys and one girl and 11 per cent men favoured 3 boys and 2 girls. The family size of 2 boys and 2 girls has been considered ideal by the people as reported in this survey and also in Pakistan Contraceptive Prevalence Survey (PCPS), 1984-85 and in Pakistan Demographic and Health Survey (PDHS), 1990-91. Also son preference is clearly evident as observed in the findings. Son preference was observed in the previous studies also.

Vasectomy is one of the important contraceptive method for males. It is noted that 88 per cent respondents did not have any knowledge of vasectomy. This is serious weakness of IEC component of the family planning programme that such a large percentage of men did not know about vasectomy which is one of the important contraceptive method. However those who knew about vasectomy were asked to give their point of view regarding this method.

Out of those respondents who knew about vasectomy, 26 per cent said that vasectomy is good and 29 per cent were not sure and wanted to know more about it. It means that 55 per cent men should be the target group to be approached and convinced that vasectomy is good. The remaining 45 per cent men also need more and correct information about vasectomy as they considered vasectomy is bad.

It was encouraging to observe that 78 per cent respondents had the knowledge that repeated pregnancies badly affect health of mother and child. So this factor can be well based in IEC programme to motivate men for spacing and limiting family size.

About 43 per cent of respondents, indicated that spacing period between two births should be 2 years and 37 per cent stated that it should be 3 years. So 80 per cent of respondents were of the view that spacing period should be 2-3 years. But it needs further IEC efforts to inform and convince the people that spacing period should be at least 3 years.

The findings reveal that more than 60 per cent males desired separate centres for males whereas 40 per cent did not favour separate centres for males as they were not basically in favour of family planning. It appears that if separate centres for males are established, contraceptive prevalence is likely to increase considerably.

MANSOOR-UL-HASSAN BHATTI &
ABDUL HAKIM

THE DEMOGRAPHIC TRANSITION

Jean Claude Chesnais
Oxford University Press,
New York 1992,
PP.633 Price Rs.600/-

The book under review has been translated by Elizabeth & Philip Kreager. The author Chesnais has accumulated and arranged statistical material in the form of longitudinal study relating to sixty seven countries covering the period from 1720-1984. The author unfolds the mechanism of demographic transition by dividing the study into the stages, patterns and economic implications of the transition.

In the introduction, the theory of demographic transition connotes a "demographic revolution" whereby a population passes through one demographic state to another, the passage being brought about by processes of world wide modernization. The concept allows to study the traditional regime of demographic equilibrium with high mortality and fertility, to a modern regime of equilibrium, with low mortality and fertility. The theory of demographic transition is scholastically examined with a historical approach.

Chesnais has isolated himself from the traditional thought which reduces the theory of demographic transition to a theory of fertility. He argues that demographic transition is not the passage from "natural fertility" to controlled fertility. To him refuting this aspect means ignoring the decline in mortality, which counter balances the effect of fertility control. In the same fashion, a purely mechanical consequence of the drop in infant mortality is the decline in replacement fertility.

The author discovers and analyses the basic mechanism behind the modernisation of demographic behaviour, with a belief that only by relating the demographic transition, in all its ramifications to other phenomena, a true mechanism may be revealed.

With the help of information on the development and comparative states of mortality, the author has attempted to take stock of mortality transition in those countries which have advanced in demographic transition. Indeed this work is an outcome of an intensive study.

The author demonstrates with the help of an array of statistical figures and tables that, the mortality rates in Europe began to decline since the last years of the 18th century, and by the end of 19th century the trend was set in motion across whole of Europe. While in the developing countries, a sudden decline in mortality was witnessed in the wake of the first world war. He also illustrates the historical and geographical spread of mortality changes, and traces the decline in countries with advanced transition, with the help of data on infant mortality for 25 years period from 1850 to 1975 in Europe, 1925 to 1975 in Latin America and from 1950 to 1975 in East Asia. The author chooses the period 1921-30 to reflect the comparative pre-transitional situation of the less developed countries.

Elucidating the stages and tempo of the decline, the author schematically presents four great discontinuities, as a characteristic of the history of mortality. The stages include the second half of the 18th and beginning of the 19th centuries, which witness considerable agricultural advancements, the improvement of health condition and the discovery of pox vaccine. The last third decade of the 19th century, marked by prevention and treatment by vaccines. The first world war and the period immediately following it, characterised by an extension of medical techniques and the general diffusion of health education. The second world war and the period immediately following, which saw the discovery of penicillin, and emergence of antibiotics.

The author emphasises that the capacity to make use of medical innovation varies with cultural awareness and level of development. In the discussion on the fertility decline, the author complains that interrelation of fertility with other elements of the demographic system has rarely been analysed, over long term. Thus the author has shared responsibility to contribute to the

construction of a statistical basis for this kind of approach. By studying the onset of fertility decline in developed and less developed countries, the author concludes that in all countries the decline in fertility has resulted in the spread of smaller families. But the maintenance of a constant average level of births in a population may result from different distribution of couples by complete fertility.

The discussion on divergence and convergence' seems to have negated the past agreement that demographic equilibrium in traditional societies is characterised by the co-existence of a mortality which periodically wipes out surplus population. The book under scores the strong connection between international migration and the course of demographic transition. The author demonstrates that in the past migration helped Europe solve its social problems, and in the present age it relieves to a much lesser degree the poverty of certain poor countries having large demographic surpluses. The study does not subscribe to the hypothesis that post-transitional fertility oscillates cyclically around a level which ultimately guarantees the replacement of generation. The author finds it too premature to conclude that fertility conforms to cycles or even self-regulating mechanism. In developed countries the mortality rate began to decline since the last years of the 18th century and by the end of 19th century the mortality was set in motion across whole of Europe.

Second part of the book describes the forms and types of demographic transition. Forms of demographic transition explain that the modalities of development manifest in natural balance. As to the types of demographic transition, the author maintains that there is no single model of demographic transition. There is diversity in situations for the less developed countries, some occurs much more frequently than others. The European countries are classified by the period of highest population growth. For the less developed countries this contrast is less clear; it rests neither on geographical nor on historical criterion. Three groups have been identified by maximal growth i.e. 2 to 2.5 percent per year, 2.5 to 3 percent per year and over 3 percent per year.

Chesnais also describes the diagrammatic presentation combining the geographical diffusion of mortality decline with that of fertility. All figures conform to the same time scale. In the transition profiles the national cases of European countries and Japan are discussed. It was observed that, the more recent the transition, the shorter the over all duration and higher the level of natural increase tend to be. But the less developed countries differ by culture and economy from their counterparts with advanced transitions.

In chapter of chronology and topology of the ageing population, Chesnais describes that the development of an age pyramid depends on three factors in demographic transition. The factors are the initial potential of an age structure, the temporal pattern of mortality decline by age, the temporary development's in fertility.

The author on the basis of his analyses presents that mortality decline may contribute to either a reduction or an increase in the average age of a population. He writes that the first stage of decline entails eliminating contagious and parasitic diseases. Second stage of mortality decline contributes more to ageing than to rejuvenation of a population. Third stage represents that, when the residual mortality consists mostly of illness of old age, any improvement in mortality rates will benefit older age groups, thus acting in full sense of ageing. The author has considered a few representative cases of types of demographic transition presented for France, Sweden, Germany, Italy, USSR, the United States and three less developed countries (Egypt, Mexico and India). Thus it is concluded that there is diversity involved in types of demographic transition, characteristics of population vary by age across time and the changes in age distribution have economic implications.

The second part of the book also deals with the transitional multiplier of the population, along with industrial revolution and demographic revolution in the 18th century. In the contemporary transition, author confirms that there is an influence of socio-economic

development on demographic trends. He further adds that fertility decline differs from one case to another in developing as well as in industrialized world.

The third part of the book shows a reasonably complete picture of the economic implications of demographic transition. In the beginning of third part two falsely opposed models Economic Stagnation and Neo- Malthusian are taken into account. In the first model demographic growth is considered as a major hinderance to economic improvement where as in the second, it is perceived as an indispensable stimulant. Later on the author himself realizes that a definite answer to his questions relating to differential living standards occasioned by contrasting hypotheses of reduced fertility on continuing fertility can't be carved out from the history.

The various arguments are amply supported by examples from 30 countries. It also analyses the long experience of transition in poor countries as well. The author has explained the general trend, economic growth, synthesis, and limitations of these countries. He observed contradiction between paradigms prevailing in economic literature and historical reality, and thus advised to avoid focusing exclusively on single factor of demographic growth.

The important point of secular growth in industrial world has also been touched. The author has also focused on over looked aspects of demographic dynamic in rural migration to sectors of high productivity and the direct and indirect implication of mortality decline. The author has taken food, savings and per capita income into consideration to explain economic break through in poor countries.

The book is amalgamation of various experiences of sixty seven countries for the period of nearly two and half centuries. The writer sufficiently justifies on his arguments by elaborating various analysis, figures and graphical representations. The book is fluent, but at some places

too much data and comparisons make it cumbersome to read. On the whole it is a useful addition to demographic as well economic literature and provides adequate back ground material to researchers who are interested to study demographic transition.

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WOMEN IN MOVEMENT

**Sheila Rowbotham,
Routledge Press, New York 1992,
pp.370, Price Rs.500/-**

Women in Movement provides an historical account of economic, social and political movement all over the world, through which women have sought access to resources and more democratic control over their lives.

The book is one of the several studies emerging from the women's programme of the World Institute for Development Economics Research (WIDER), which is a part of the United Nations University. The book like its companions in the Revolutionary thoughts/Radical movements series challenges contemporary society and civilization.

The book originated in courses at Paris VIII, Kent University, and City Polytechnic. Some of the material was also used in seminars and classes at York University, Ontario, the Islington Sixth Form Centre, Kingsway College of Further Education, Northern College, the Institute of Contemporary Arts and the Open University.

The book is introductory text which is helpful for students to understand the concepts which played a significant role in economic theory: progress, development, modernization, tradition, equality, entitlement rights and needs in different social contexts.

The book is divided into six parts comprising 27 chapters. In the first part, the author described the pros and cons of arguments for women's emancipation based on universal rights, the significance of consciousness of social and economic entitlement in women's collective action and the link between self-emancipation and women's movements.

The author provides relation of women's emancipatory movements

with the French Revolution. She explains how French Revolution meant that individual rights, reasons, citizenship and sovereignty of the people were no longer simply ideas but, a part of absolute hereditary powers. The author explained the impact of such extra ordinary events. Power, which had seemed absolute, was overturned. The new dawn of reason and liberty brought a flavour of hope and disappointment. The author in support of her arguments narrated the events like a butcher's daughter turned play right, Olympe de Gouges's declaration of the rights of women and citizenship in 1791, women of the Third Estates march.

The author in her essay; "A New Moral World: Early Radicals, Cooperators, and Socialists", explained all the support rendered by the moralists, radical social reformers and others. In the second part of the book, "Changing Personal Life" the author highlighted the meaning of sexual emancipation and reproduction.

Focus, in this part, remained on the discussion about the ways to organize democratic life. The author questioned that, what kind of society would result from making the whole world homelike?

She concluded that the outcome of all egalitarian and democratic dreams are uncertain, for we all are in the profound reassessment of many nations that provided the framework for assumptions about how human could act to improve their lives and society. The author supported the view that "the kindest course is to do nothing at all but live our own personal lives as quietly and unpretentiously as we can" has gained an influential following.

Part three "Political Movement and Social Action" covered the difference between ideas for women's emancipation based on the individual and those based on the collective view-point of the nation, society, class or race. The author views that although women have been invoked politically by feminists and

others, it is important to be clear about who is being labelled and for what purposes. Instead of presenting "women" as an abstract category, it is better to see "women" as people, who within particular historical situation are continually lacking choices about how they see and align themselves.

In the fourth part, "Political Power, Reform and Revolution", the author explained how women's emancipation been linked to the transformation of society. She argues that by placing feminism alongside other forms of women's social protest and viewing both within and historical context, it becomes possible to show how various groups of women have striven to change their circumstances and how they had feared. This can indicate what kind of blocks are likely to occur again and help to reveal how a new political paradigm might emerge. History does not repeat itself; it can, nonetheless, provide some hints and clues.

"Identity and Difference", fifth part of the book explains implications of ideas about nature for women's sexuality, the creation of lesbian identity, the strategic consequences of a case for emancipation based on the assumption that women's needs differ from men's and that women require protection from the state.

Last part of the book deals with the "Recent Women's Movements an Social Protest". In this part, the author views between women's subordination by men and other forms of social oppressions. She suggests that what kind of society should be formed as a result of contemporary movements among women. She is of the view that women should have power to decide how they should live. One way of thinking, places individuals within the structure of the society, gender, race, and class. For instance another way is to focus on the individual telling people how to become more assertive, healthy, less emotionally dependent, in harmony with nature and how to enjoy more over what ever.

At the end, the author relates historical knowledge to the

contemporary social and economic policies significantly. This book is easily understandable as it is written in a very simple language. However, undue length of sentences at times irritates the reader.

The author being an activist of women's movements since late sixties has covered women issues of the whole world. The author is, frequently found digressing from the theme. Overall, it is an appreciable effort and a useful contribution to the literature on women issues.

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THE POVERTY CURTAIN: CHOICES FOR THE THIRD WORLD

**Mahbub-ul-Haq,
Ferozsons Ltd Lahore, 1983,
pp.247, Price Rs. 60.00**

The author in this book "The Poverty Curtain: Choices for the Third World" explains that a poverty curtain has descended right across the face of our world, divided it materially into two different worlds, one embarrassing rich and the other desperately poor. This invisible barrier exists within nations as well as between them, and it often provides a unity of thought and purpose to the Third World countries which otherwise have their own economic, political and cultural differences. The struggle to lift this curtain of poverty is certainly the most formidable challenge of today.

The book is divided into three parts which is divided into sub- parts. In the first part of the book the author tells that despite impressive economic progress over the past few decades mainly in the West many developing nations of the Third world have so far made no positive headway in the living conditions of their masses. Broader measures of well being confirm this picture of life expectancy, child mortality and educational attainment have all improved markedly in the advanced countries. Against this, it is all the more shameful that more than one billion people in the developing world today are living in poverty. This is also the number of people who are struggling to survive on less than US \$ 370 a year. The starkness of the facts like: life expectancy in sub-Saharan Africa just 50 as against 80 years in Japan: child mortality in South Asia 170 deaths per thousand whereas in Sweden fewer than 10, more than 110 million children in the developing countries not having access to primary education while less than university enrollment regarded as unacceptable in industrial countries, child labour, famine and many other issues attest to the continuing toll of human deprivation.

The close interdependence and interaction between mass poverty on the one hand, and the population growth in the countries of the Third World, the

destruction of natural resources, the existential threat from hunger and water shortages and the migratory movements caused by these phenomena on the other, mean that mass poverty is fast becoming a question of survival for us all. It is one of the global challenges of our time which must be met jointly by both poor and rich members of the community of nations.

The contemporary situation, as the author sees it, is a clear warning: either there is a voluntary decision to share resources more equitably, or the countries of the Third World, with their huge populations and supplies of raw materials, will join together to demand it. To avoid such an end, formulation of a new economic order is the crying need of time.

According to the conventional wisdom in development literature, as a country increases its income the benefits should trickle down to even the poorest segments of the society. This should happen through the creation of more jobs as the economy expands, better wages as the country earns more and higher prices for farm produce as towns grow. It may all take time and the distribution may not be equal but the incidence of poverty and starvation should reduce. This has, unfortunately, not occurred. Contrarily, world is witnessing a mass influx of poverty in the nook and corners of the third world including Pakistan.

The extent of poverty in Pakistan, even after 49 independent years, is still persisting and is not going away. Substantial poverty persists throughout Pakistan and a broad and sustained economic progress will be required to reduce poverty. According to a very recent report by the World Bank, Pakistan still lags far behind the averages for comparable low income economies, with a 6.5 percent higher fertility rate, a 130 per thousand higher infant mortality rate and a gross primary and secondary school ratios that are almost 50 percent lower. Report issued after a field survey of 71 under developed countries ranks Pakistan 50th in reducing infant mortality rates. It is ranked 35th out of 43 countries in terms of progress in increasing the primary enrollment rate.

Poverty means not having enough to eat, a high rate of infant mortality, a low life expectancy, low educational opportunities, poor drinking water, inadequate health care, limited housing facilities and a lack of active participation in decision making processes. On average, more than 40 percent of rural Pakistani people live below the poverty line. They earn an income less than sufficient to supply the basic needs of food, health, water, housing and education. Here, as everywhere else, it is the aged men and women, agricultural labourers, the landless and the near landless who form the core of mass poverty. Economic growth has failed to make significant impact in the fight against poverty. The process of growth has, in fact, catalysed the process of impoverishment.

Reversing such a process should be the fundamental objective of those involved in policy making. Despite the frustrating lack of information and intellectual framework, a consistent strategy have to be created into which new information may be fed and this information can be gathered by holding workshops, dialogues, debates among economists, policy makers, scholars and elites. In backdrop of such a situation, the book under review is a tremendous effort. It debates ways to curb poverty and stimulates new research.

The book clarifies that alleviation do not necessarily stand for elimination since in the deliberations on poverty oriented development policy, the concepts, alleviating poverty, "reducing poverty" and "eliminating poverty" are interchanged relatively freely. Whilst alleviating poverty comprises all those "humanitarian and development policy efforts aimed at providing direct support of the poor to satisfy basic needs inclusive of help to self help, the reduction or elimination of poverty encompasses those measures which contribute towards the creation of economic, political and social structures which permanently counteract the reproduction of poverty.

The author states that if governments are to reduce poverty or to judge how their economic policies affect poverty, they need to know a lot about the poor. On the whole, governments fail to reach the rural poor. In general, the poor have less access to publicly provided goods and infrastructure than do other groups.

Even in urban areas, poverty pockets in the neighbourhoods are less well supplied with services than well to do ones. They are set apart by cultural and educational barriers. They also play little part in politics and are often, in effect, disenfranchised.

The author tells that empirical evidence suggests that there lies an inherent link between poverty alleviation and a wide spectrum of other problematic areas that together form a profoundly organic causal relationship. For the probe of poverty reduction is closely associated with over population and family planning, education and investment in people, economic growth, aid, trade, the debt burden, the role of women, environmental conditions, the quality of governance, public management and political participation in developing countries. Steps urgently needed are: revival of economic growth; putting back life into agriculture; encouraging the economic structure to move towards greater equality in distribution of physical assets, particularly in land; decentralisation of government; providing basic education, primary health care and population control programme to all citizens.

Dr. Haq is the most persuasive spokesman of the Third World and needs no introduction. He served as Federal Minister for Planning and Development, Government of Pakistan and is an Ex-Director, Policy Planning and Programme Review Department of the World Bank, Washington, D.C. This book of the learned economist is a boon for economic policy makers, scholars, students and laymen alike and is easily understandable.

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NOTES TO CONTRIBUTORS

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