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PAKISTAN POPULATION REVIEW

VOL. 2.

SPRING 1991

NO. 1

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From Editor-in-Chief's Desk

This is the first issue of the 1991 series which is mainly based on the further analysis of the 1984/1985 Pakistan Contraceptive Prevalence Survey (PCPS) data. This analysis was undertaken at the National Institute of Population Studies as a part of its work plan in order to disseminate the results of the PCPS.

Another similar survey called Pakistan Demographic and Health Survey (PDHS) was undertaken by NIPS during 1990/1991 the results of which have been published in a report. Further analysis of PDHS data has also been started and will be published in some of the future issues of this journal.

The focus of first two articles "In Search of the Silent Users" and "Analysis of Variations in Contraceptive Use, Non-Use and Knowledge" and the rejoinder "Shy/Silent Users" is on shy/silent users of contraception. This concept of shy/silent users was coined by Sultan S. Hashmi when he had prepared the report on PCPS. The extent of shyness was measured by using the "binary technique". In my view the element of shyness in reporting the knowledge and use of contraception does exist among the women as sexuality related matters are not discussed openly and freely in the society. It is also possible that, as argued in the rejoinder, under reporting of contraceptive use would be higher than the under reporting of births. This issue will be further investigated using the PDHS data.

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IN SEARCH OF THE SILENT USER: THE RELIABILITY OF REPORTED USE AND NON-USE OF CONTRACEPTION IN PAKISTAN

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M. NASEEM IQBAL FAROOQUI

The 1984-85 Pakistan Contraceptive Prevalence Survey (PCPS) reported 16.1 percent total current users out of which 7 percent were indicated as shy users. Shy users are those who do not admit past use due to religious belief and social pressures. Since interviews in surveys are not conducted in private, women do not discuss contraception with strangers. This paper attempts to determine with the help of PCPS data whether shy users in Pakistan do not admit contraceptive use and whether reported use is effective. Both these approaches have utilized open interval for both the stated users and non-users of contraceptives.

Contraceptive use was found to be lowest among women in Balochistan and those with no education. Controlling for duration of breast-feeding and age no statistically significant variation in the length of open interval for never users across provinces and educational level was found indicating thereby no evidence of shy users among never users category. Effectiveness of stable use from the PCPS data cannot therefore be properly measured. The next PCPS in Pakistan should make special efforts to have privacy during the interview, should include information on the presence of other persons, and should include more questions on whether women believe contraception is acceptable in her reference group.

INTRODUCTION

In the main report on the Pakistan Contraceptive Prevalence Survey (PCPS) [1] it was speculated that a substantial portion (43 per cent) of the respondents who were actually using contraception did not admit to such use in the survey. These women were referred to as "shy" or "silent" users. They were identified as currently married and premenopausal women who claimed not to be using contraception but not to have had a child in at least five years. It was presumed that such women were in fact users but were reluctant to admit to use, perhaps out of shyness.

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In a subsequent analysis of the PCPS reported in this issue, Hassan and Rukanuddin examined in more detail the logic by which these silent users had been identified. They found, for example, that women who stated no knowledge of contraception, and women who stated that they had such knowledge, were equally likely to be counted as silent users in the PCPS approach. (Hassan and Rukanuddin considered it implausible that stated knowledge should have no relation to shyness). They also examined the age distribution of the alleged silent users, finding that 74 percent of them (unweighted) were aged 40-49. It is known that such women often have long intervals without a birth, regardless of whether they are using contraception. They concluded that it is indeed possible that silent users exist, but that a method for identifying them required further elaboration.

Completely independently, in comparing levels of fertility and contraception in the Pakistan Fertility Survey, 1974 (PFS) [2] and the Population, Labour force, and Migration Survey, 1979 (PLM)[3], Pullum, Casterline, and Shah [4] suspected an underreporting of current use in the PLM because of the increasing religious conservatism in Pakistan. Their conclusion was based on the fact that fertility was virtually the same in the two surveys, but reported contraceptive use was lower in the PLM. In fact a genuine decline in use would have led to an increase in fertility. It was also observed that several birth cohorts of women reported lower levels of ever-use at the time of the PLM than at the time of the PFS. Since it is logically impossible for ever-use to decline over the life course of a group of women, it appeared that some genuine ever-users were not admitting to past use. These authors did not develop a specific estimate of the level of underreporting, but observed that in any case the demographic impact of contraceptive use in Pakistan was low.

This paper will explore the evidence of such under-reporting. It will also consider the opposite side of the coin: the possibility that some reported use is, in fact, ineffective and may be regarded as over reporting. Together, these two topics comprise an investigation into the reliability of reports on the use and non-use of effective contraception as evidenced by the apparent impact on fertility.

CULTURAL REASONS FOR THE POSSIBLY INACCURATE REPORTING OF CONTRACEPTIVE USE IN PAKISTAN

Quite apart from the demographic evidence, several aspects of Pakistan's culture lend support to the concept of shy or silent users. For example, some Pakistanis believe that contraception is in conflict with Islamic principles, because of the Islamic emphasis on marriage and the family. Perhaps partly because of illiteracy, some women may not be aware that religious scholars do not believe there is such a conflict. Of all the women in the survey [1], 11.8 percent gave religious reasons for not currently using family planning, and 6.1 percent gave a non-numeric response for their ideal number of children (such as "as many as Allah wills.") In such a climate, a woman may be reluctant to admit that she is a user, even if she herself believes that contraception is not a sin.

Apart from perceived religious judgments, a woman may regard contraception as highly personal and not an appropriate subject to discuss with a stranger, namely the interviewer. Although the interviewer was always a woman and she was often much younger than the respondent. Sexuality and contraception are not approved topics of conversation, particularly between different generations, not even between mothers and daughters.

Perhaps the most serious potential source of shyness is the fact that the interview was really not conducted in private. The interview often occurred in the presence of in-laws, neighbours, children, or even the husband. The respondent could be reluctant to admit use of contraception in the presence of people who might disapprove of its use, such as the mother-in-law or husband, or to whom it might cause embarrassment, such as adolescent children. If a woman has been using contraception without the consent of her husband, then she would not want him to know of this behaviour. (of the women in the PCPS who were not current users and were asked whether their husbands would approve of use, 36 per cent responded that their husbands would not approve.) Although it is obviously desirable to conduct interviews in private, it is not always practical. Also, in a traditional setting, too much emphasis on privacy and confidentiality can arouse suspicions in those who would like to be present.

To counter-balance these possible influences, it should be noted that they have been hypothesized in many other settings and found not to be important. Before the first fertility and KAP surveys were conducted in Asia and the United States in the 1950s, it was argued that women would not discuss sexual activity and contraception with a stranger (the interviewer). There was concern that women would not only give inaccurate responses, but would refuse to be interviewed at all. But when the surveys were conducted, it was found that most women were eager to discuss these matters. Certain topics, however, such as whether a woman has had any induced abortions, always tend to be under reported.

The surveys conducted with the World Fertility Survey, including the Pakistan Fertility survey, required that the interviewers indicate the presence of other persons at two or three critical points in the interview. As an international generalization, it was often the case that children and neighbours were present, but rarely the husband because he would be away working during the day. Very few analyses actually tried to correlate the presence of other persons with the responses on contraceptive use, and we are aware of no such analyses using the PFS data [2].

The very factors which would hypothetically lead to shyness would also lead to genuine non-use. For example, if the husband disapproves of family planning then the wife will not only want her clandestine use to be kept from him, she is also unlikely to be a user in the first place. And if she lives in a religiously conservative area, then she is herself likely to be religiously conservative; or, if desirous of using contraception, is unable to obtain contraceptive supplies without the knowledge of her in-laws and neighbours.

ATTEMPTS TO REPLICATE THE ANALYSIS IN THE MAIN REPORT ON THE PCPS

We have attempted to reproduce the exact data processing steps by which the silent users were identified in the main report and will now review those efforts.

The main report stated on page 86 and in several tables and charts that 9.1 percent of the respondents (currently married women aged 15-49) were stated current users of some form of family planning. This figure has been widely quoted as the reported prevalence of contraception at the time of the survey. An additional

7.0 percent were imputed to be shy or silent users, so the total prevalence given in some tables of the report is 16.1 percent.

Our first finding concerns the stated users rather than the silent users: the reported prevalence is in fact 7.6 per cent rather than 9.1 percent. This is confirmed within the main report in two places. In the diagram on page 86 the numerator and denominator of the prevalence rate are given as 908,050 and 11,893,917, respectively (these are inflated cases, weighted up to the total population of Pakistan); the ratio of these two numbers is .0763. The bottom left entry in the table on page 97 is 7.63 percent. In addition, reanalysis of the computer file shows clearly that the current users comprise 7.63 per cent of the women in the survey. The source of the 9.1 percent estimate is unclear, but it should be abandoned in favour of 7.63 percent. The estimates for subgroups should be revised in a future analysis. Similarly, the percentage who claim to be ever-users is actually 10.5 percent rather than the 11.8 percent given in the report. This percentage is not obtainable directly from the questionnaire, but can only be calculated as the percentage of the sample who have used any one of ten specific methods (including "other").

We were able to replicate the chart on page 86 of the report down to the cell labelled "Had no birth in five years," finding 345 weighted cases which met the criteria of (a) not being current users, (b) not being pregnant, (c) wanting no more children, (d) having had no births in the past five years, and (e) being premenopausal. These cases comprise 345 women or 4.65 percent of the entire sample. All of these women had some knowledge of family planning; otherwise they would never have been asked if they were current users. As determined by Hassan and Rukanuddin, the figure of 7.0 percent in the report was obtained by assuming that 4.65 percent of the women who reported no knowledge were also silent users. When those women, who might also be labelled "silent knowers," are added to the 4.65 per cent, the sum is approximately 7.0 percent. We agree with Hassan and Rukanuddin that it is difficult to justify the step which incorporates "silent knowers"; the report itself never mentioned this step.

Consider the 345 women for whom the clearest case could be made. Their characteristics are far from those of the ideal users, silent or otherwise. They are relatively old: 65 percent are aged 40 and above, 84 percent are aged 35 and above. They have already had many children; 74 percent have had five or more births. The

majority of them have gone not just five years without a birth, but in fact have gone ten or more years. They are inconsistent in their approval of family planning: 36 percent favour it, 35 percent do not, and the remainder are not sure or are not reported. Similarly, 27 percent say that their husband approves of family planning, 32 percent say that he does not; the rest give a conditional response or no response. Of those women who disapprove, 92 percent give religious reasons or state that "children are Allah's will." Among all non-users who disapprove of family planning, 88 percent give these two reasons for not using, which is not significantly different from the percentage (92 percent) for alleged silent users. In other ways, the silent users do not differ substantially from the women who are accepted as legitimate non-users.

The original approach to identifying silent users thus rests almost totally upon the behavioural fact that the woman is premenopausal and has gone at least five years without a birth. The attitudes of these women do not suggest that they are predisposed to be silent users. If one wished to identify a group of women who were premenopausal but had become secondary sterile after a large number of births, or were sexually inactive, probably exactly the same women would be identified as the alleged silent users.

NEW APPROACHES TO DETERMINING USE AND NON-USE OF CONTRACEPTION: ISSUES AND STRATEGIES

We will now propose alternative approaches to the dual questions of (1) whether some women apparently are (or have been) using contraception but are not admitting to such use, and (2) whether some women report use but give no evidence that this use has been effective.

Most of this analysis will deal with ever-use of contraception rather than current use. All current users are included as ever-users, and the great majority of the ever users are current users; 7.6 percent of the women in the PCPS (all of whom are currently married and aged 15-49) are stated current users and 10.5 percent are stated ever-users. It is reasonable to assume that the determinants and consequences of ever-use are virtually the same as those of current use, and it is

preferable to combine those women who have used in the past with those who are currently using, rather than with those who have never used contraception.

The basic question is whether reported use and recent fertility are consistent with one another. Evaluating the degree of consistency is problematic for at least three reasons. The first is that we have no objective measure of the woman's current fertility other than an actual pregnancy. If a woman does not conceive, it is impossible to be sure whether this is because she is infertile (or subfertile) or because she is a silent user of family planning. It is possible that she is neither, but that she and her husband have a low frequency of sexual relations; it is also possible that chance alone is the explanation. The length of time to conception, just like the gender of child, has a large random component.

The second complication is that the sequence of fertility and contraception observed in a survey is exactly the reverse of the true causal sequence. It is obvious that the use or non-use of contraception precedes fertility or its prevention in the life history of individual woman. However, in the PCPS, as in most contraceptive prevalence surveys, use was evaluated at the time of the survey, whereas fertility is always evaluated in the past.

A third and related difficulty is that it is the women with higher fertility who are generally most motivated to use family planning. Only after use has begun might we expect the rate of childbearing to be reduced. If the causal and temporal sequence is not recognized, one is liable to reach the spurious conclusion that current use lead to higher past fertility, or some more subtle form of the same fallacy.

If a woman is currently married, fertile, and not pregnant, her risk of conceiving is affected by three major factors obtained in the PCPS: first, her age; second, whether she is breast-feeding, and the number of months she has been doing so; and third, her use of contraception, including the method used. Statistical controls for age and breast-feeding will be employed because of their relation to fertility, leaving use of contraception as the main hypothesized determinant of fertility. We will not control for current pregnancy-status; if a woman is pregnant she cannot be a current user, but she can still be a past user.

Ideally, we would group together women who' are homogeneous with respect to risk, observe them for a period of time as conceptions occurred, and then assess the importance of their factors. With the data at hand, it is impossible to do this, because all of the fertility information comes from the past and there is not an integrated history of use and fertility.

Therefore, we will look backwards and relate the length of the open interval to the duration of current use. (The open interval is the number of months since the woman's last childbirth) Women with no births will be omitted, as this is not a serious omission in Pakistan because virtually no woman will use contraception to delay or prevent the first birth. The length of the open interval is to some degree a reflection of the timing of the survey in relation to the woman's birth history, so in individual cases it is not a good index of fertility; however, it is still the case that a group of women with lower fertility will have longer open birth intervals, and vice versa.

In relating the length of the open interval to the stated use or non-use of contraception, the random component due to both the randomness of the timing of the survey with respect to the woman's life course and the randomness in the time it takes a woman to conceive, will be recognized with the use of statistical tests. The approach of the main report was essentially deterministic. Just by chance, some women have quite long intervals, particularly as they get older, and it is fallacious to impute contraceptive use to such women by some process of elimination. Similarly, some women who have used contraception will have long intervals, but there is always the possibility that without use their intervals would have been just as long, so one cannot immediately conclude that their use was effective. It is necessary to look for differences in means while taking account of the extent of dispersion, as will be illustrated in the test to be made below.

EVIDENCE OF SILENT USERS

If some of the stated never-users are in fact past or current users of contraception, and if such use has been at all effective, then we would expect these

silent users to have somewhat longer intervals since their last birth than the women who are genuine never-users.

In order to be reasonably sure that the respondent is fertile, women who have gone 60 months or longer without a birth will be dropped. It is recognized that this 60-month rule of thumb is somewhat arbitrary and will include some women who are actually infertile, but it is frequently invoked and was used in the main report. Self-reports of fertility are known to be biased in the direction of being too high; for example, even if an older, premenopausal woman believes she is able to have children, she has a much lower probability of conceiving than a younger women.

Age is, of course, a major determinant of fertility and will be controlled very simply by grouping women into ages 15-24, 25-34, and 35-49. It is also desirable to adjust for variation in the duration of breastfeeding the last child, because that is a major determinant of the woman's fertility and time to the next conception. This analysis will simply drop all women whose open interval is less than 18 months, regardless of their responses to the breastfeeding questions. After 18 months the risk of conception is not seriously affected by whether the woman is or is not breastfeeding, so all women are on equal basis with respect to that factor.

In order to obtain some leverage, the critical assumption is made that differentials in silent ever-use probably correspond closely with the differentials in stated ever-use. Sub-populations with low stated ever-use can, therefore, be taken as reference groups.

The Table 1 gives the percentage of stated ever-users in each age group, by province and level of education, the two most important measured socio-economic determinants of use in Pakistan. It shows that stated ever-use is lowest in Balochistan and lowest among the women with no education.

We now reason that if the stated never-users in Punjab, for example, actually include some silent (and effective) users, then the entire group of stated never-users will have a somewhat higher mean open interval in that province than in Balochistan, reflecting the hypothesized mix of silent users and genuine non-users

(similarly for Sindh and NWFP). We also reason that the stated never-users with primary and secondary education should have a somewhat longer mean open interval than the women with no education, because the better educated groups (according to the hypothesis) will contain some women who are silent users. If such an increase in means is detected, relative to the reference groups, then the mixture of silent users and genuine never-users can be estimated.

Table 1

PERCENTAGE OF WOMEN WHO STATED THEY WERE EVER-USERS OF CONTRACEPTION IN EACH PROVINCE AND EDUCATIONAL LEVEL, BY AGE: PAKISTAN, PCPS 1984-85

PANEL 1. PROVINCE

Province	AGE GROUP			Total
	15-24	25-34	35-49	
Punjab	7.22	14.37	16.14	12.98
Sindh	6.63	13.21	15.32	11.99
NWFP*	7.26	8.07	16.60	10.07
Balochistan	2.61	5.37	6.75	5.22

PANEL 2. LEVEL OF EDUCATION

Level of Education	AGE GROUP			Total
	15-24	25-34	35-49	
None	4.03	7.26	13.33	8.24
Primary	8.54	23.89	32.97	20.62
Secondary+	34.69	55.19	47.80	47.97

* NORTHWEST FRONTIER PROVINCE

This assumption is contrary to that in the main report, which states that silent users are located mainly in the most traditional areas. We would argue that Punjab and Sindh are the provinces where most silent users would be found, rather than

Age	13180.2486	2	6590.12429	73.18	0.0000
Education	73.1157847	2	36.5578924	0.41	0.6664
Residual	171914.718	1909	90.0548551		
Total	185115.015	1913	96.7668663		

Panel 1 of Table 3 shows that once duration of breastfeeding has been controlled by eliminating women with open intervals of 0-18 months, and age has been controlled with three crude groupings, there is no statistically significant variation in the length of the open interval for never-users across provinces. The F statistic for region is only 0.36. Panel 2 shows the same for level of education, with an F statistic of only 0.41.

The working hypothesis rejected by these F tests is substantially more general than the hypothesis in question (which includes an ordering of the means, not just differences between them). Thus, even if one held to the hypothesis in the main report that silent users are concentrated in NWFP and Balochistan, and among the least educated women, the conclusion would still be that there is no evidence of silent users. The only hypothesis that could survive this analysis is that silent users are equally likely to occur in all provinces and in all educational groups, so that all groups would have the same mixture of silent users and genuine never-users. We do not believe that such a working hypothesis has ever been suggested.

We thus find no evidence that the never-user category contains a subgroup of women who are silent but effective users. There is a good deal of variation in the length of the open interval, but that variation is indistinguishable across provinces and educational levels. The heterogeneity appears to be random rather than systematic.

EVIDENCE OF INEFFECTIVE USE OF CONTRACEPTION

Finding no conclusive evidence that Pakistan has a group of silent but effective users, we now turn to the other side of the coin: an evaluation of the effectiveness of use by those women who claim to be ever-users.

This will be examined in two steps: the measurable aggregate impact of use upon fertility, and the degree to which the recent fertility of users can be distinguished from that of non-users.

First, consider the proposition that use of contraception should tend to extend the interval to the next birth and, therefore, should extend the length of the open interval. How substantial has the extension been in Pakistan?

The likely effectiveness of ever use (some of which is current use, and some of which was possibly prior to the current open interval) is indicated by a scale with the following categories:

- 0: Never used any contraceptive
- 1: Used withdrawal or rhythm or other (not specified)
- 2: Used condom, vaginal methods, or combinations with lesser methods
- 3: Used pill, or combinations with lesser methods
- 4: Used injection or IUD, or combinations with lesser methods
- 5: Used sterilization, or combinations with lesser methods

Because each method on the scale has a somewhat greater use-effectiveness than the one before it, the initial expectation is that the length of the open interval will tend to increase steadily from codes 0 through 5.

Consider the 5239.6 weighted cases with a birth in the last five years, i.e., with an open interval of 0-59 months. Table 4 gives the apparent effect of ever-use upon the length of the interval for these women. (All calculations were done with more decimal places than are shown here and, as a result, some subtotals may not agree.)

NWFP and Balochistan, and that they would also be more likely to be better educated and directly reflecting, in other words, the characteristics of stated users.

The Table 2, in two panels, presents the mean length of the open interval for stated never-users with intervals from 19 through 59 months, within combinations of province and age combinations of education and age. The purpose of the tables is to allow the comparisons just described between Balochistan and other provinces and between women with no education and those with primary and secondary education.

Table 2

MEAN LENGTH OF THE OPEN INTERVAL OF STATED NEVER-USERS IN EACH PROVINCE AND EDUCATIONAL LEVEL, BY AGE OF WOMEN WITH LENGTH OF OPEN INTERVAL BETWEEN 19 AND 59 MONTHS INCLUSIVE:
PAKISTAN, PCPS 1984-85

PANEL 1. PROVINCE

Province	AGE GROUP		
	15-24	25-34	35-49
Punjab	28.36	31.52	35.92
	7.07	9.24	10.83
	190.9	503.8	419.4
Sindh	27.33	31.62	35.80
	7.19	9.64	10.87
	85.0	206.1	144.1
NWFP	28.50	31.76	33.43
	7.36	8.89	10.11
	50.0	183.8	93.9
Balochistan	27.33	32.67	34.78
	8.63	8.87	10.17
	13.3	45.9	33.6

PANEL 2. LEVEL OF EDUCATION

Level of Education	AGE GROUP		
	15-24	25-34	35-49
None	28.13	31.51	35.50
	7.32	9.12	10.84
	287.4	826.1	644.4

Primary	27.74	32.92	36.26
	6.80	10.50	10.16
	42.6	72.1	29.3
Secondary and above	28.04	32.15	34.33
	5.09	9.21	7.08
	9.0	41.4	17.2

N.B:- SECOND AND THIRD ROWS INDICATE STANDARD DEVIATIONS AND WEIGHTED CASES.

According to the table, the mean length of the open interval is not systematically greater outside of Balochistan than it is within Balochistan, and not systematically greater for women with education than for women with no education. In order to verify that there are no statistically significant differences in the length of the open interval (within the indicated range) between regions, or between levels of education once age has been controlled, the following analysis of variance has been calculated.

Table 3

ANALYSIS OF VARIANCE OF THE LENGTH OF THE OPEN INTERVAL FOR STATED NEVER-USERS BY PROVINCE AND AGE, AND BY EDUCATION AND AGE OF WOMEN WITH OPEN INTERVAL IN THE RANGE 19 TO 59 MONTHS INCLUSIVE: PAKISTAN, PCPS 1984-85

PANEL 1: AGE AND PROVINCE

Source	Sum of Squares	df	Mean Square	F	Prob > F
Model	13223.8455	5	2644.7691	29.36	0.0000
Age	12996.9773	2	6498.48863	72.13	0.0000
Province	96.6644853	3	32.2214951	0.36	0.7864
Residual	171891.17	1908	90.0897116		
Total	185115.015	1913	96.7668663		

PANEL 2. LEVEL OF EDUCATION AND AGE

Source	Sum of Squares	df	Mean Square	F	Prob > F
Model	13200.2968	4	3300.0742	36.65	0.0000

Table 4

ESTIMATED EFFECT OF STATED EVER-USE OF CONTRACEPTION ON
THE LENGTH OF THE OPEN INTERVAL CALCULATED SEPARATELY
WITHIN AGE GROUPS FOR WOMEN WITH INTERVALS OF 0-59
MONTHS: PAKISTAN, PCPS 1984-85

PANEL 1. AGE GROUP 15-24

Ever Use Category	Number of Women	Mean Open Interval	Increased Length	Total Increase	Percent for Category
0	1266.9	13.3	----	----	----
1	10.4	19.4	6.1	63	17
2	25.6	17.3	4.0	102	28
3	37.6	16.6	3.3	123	34
4	19.5	16.9	3.6	69	19
5	1.2	18.0	4.7	6	2
Total	1361.3	13.6	3.8	363	100

PANEL 2. AGE GROUP 25-34

Ever-use Category	Number of Women	Mean Open Interval	Increased Length	Total Increase	Percent for Category
0	2131.7	18.8	----	----	----
1	29.3	23.8	5.0	148	12
2	78.0	20.9	2.1	167	14
3	91.2	22.3	3.5	317	26
4	76.5	21.9	3.1	236	19
5	34.5	29.0	10.2	353	29
Total	2441.1	19.3	3.9	1220	100

PANEL 3. AGE GROUP 25-34

Ever-use Category	Number of Women	Mean Open Interval	Increased Length	Total Increase Category	Percent for
0	1213.5	24.0	----	----	----
1	17.7	33.3	9.3	164	24
2	38.8	24.9	0.9	36	5
3	69.4	23.5	0.0	0	9
4	52.5	27.7	3.7	193	28
5	45.5	30.5	6.5	294	43
Total	1437.5	24.4	3.1	688	100

PANEL 4. SUMMARY

- (1) NUMBER OF WOMEN
- (2) NUMBER OF REPORTED EVER-USERS
- (3) MEAN OPEN INTERVAL OF NEVER-USERS
- (4) MEAN INCREMENT FOR EVER-USERS
- (5) NET OVERALL INCREASE DUE TO USE: $100X(2)X(4)/((1)X(3))$

AGE GROUP	(1)	(2)	(3)	(4)	(5)
15-24	1361.3	94.9	13.3	3.8	2.0%
25-34	2441.1	309.4	18.8	3.9	2.7%
35-49	1437.5	224.0	24.0	3.1	2.0%

We will describe this table in terms of Panel 1, which refers to ages 15-24. Panels 2 and 3 are similar but refer to ages 25-34 and 35-49. Some summary calculations are presented in Panel 4.

The first two columns of Panel 1 refer to all 1361.3 women in the age group with a birth in the last five years, and the last three columns consist of comparisons of ever-user category 0, which is taken as a point of reference. Only 94.4, or 7.0 per cent, of the women aged 15-24 are in the ever-use categories. The panel shows that the mean open interval is 13.6 months for all women and 13.3 months for the never-users (column 3). Overall, users have an open interval which is 3.8 months longer than never-users (bottom of column 4). Column 5 is obtained as the product of columns 2 and 4 and is the total additional months attributable to ever-use in each category, adding up to 363 months. This increase is divided across the five categories of ever-use in the final column.

If there were no use at all, and we are willing to assume that in such a hypothetical situation all women would have the same mean open interval as the never-users observed here (13.3 months in the first age group) then the total women-months of open interval in this age group would be $1361.3 \times 13.3 = 18,105$ months. Compared to this hypothetical figure, ever-use has added 363 months without births, i.e., an increase of 2.0 per cent in the mean length of the open interval and therefore a reduction of 2.0 per cent in the fertility rate. Parallel calculations indicate that contraception extends the open interval by an average of 2.7 per cent and 2.0 per cent in the second and third age groups, respectively. Such a calculation implicitly uses a number of assumptions, the most important of which

that the "potential" fertility of ever-users is the same as that of observed never-users. Although duration of breastfeeding has not been controlled in any way here it is probably a good indicator of the very small demographic impact of contraceptive use in Pakistan. If some of the reported never-users were in fact silent users, then the preceding logic would be flawed. The mean open interval for reported never-users would be too high, because it would include some silent ever-users. However, because the never-user category includes 89.5 per cent of the women in this table, it can be shown that even under the estimate of unstated use in the main report (which was rejected in the earlier section of this paper) the picture would not look very different.

Proceeding to the next major question of this section, we have developed an estimate of the net reduction in fertility which can be attributed to stated use, but is it possible to infer how much of the stated use has been effective? In other words, only a small number of women are ever-users, so their impact is necessarily small; do we have reason to suspect that they have overstated their use? In approaching an answer to this question, it will be assumed that ever-users have used during the current open interval. The questionnaire does not allow a distinction between ever-use in the open interval or earlier, but it is likely that if a woman used in an earlier interval, and then had a birth, her motivation would be even higher after that birth and she would resume use.

Table 5, which consists of four panels, looks into the statistical significance of the difference between ever-users and never-users, in terms of the length of their irrespective open intervals (restricted to open intervals less than 60 months long). The table has a panel with all ages combined, and three separate panels for the age groups 15-24, 25-34, and 35-49. The caption for each panel gives the mean length of the open interval and the standard error of that mean. Then the respective panel contains the increase in the mean length for women in each of the five ever-use categories; the standard error of that increase; the *t* statistic for the null hypothesis that the category is not distinguishable from the never-use reference group; and the statistical significance of that statistic.

If the difference between two means is large, relative to their standard errors, then the *t* statistic will be large (in absolute value) and will tend to imply that the difference in means is genuine and that it holds in the population as well as the

sample, and is not simply a consequence of random sampling variation. The number in the last column of each panel, the significance level, gives the probability that a larger *t* than that calculated could arise just from sampling variability. With a 0.05 test, we will accept an increase in the mean as "genuine" if the level of significance is smaller than 0.05. A single asterisk (*) is attached to differences at this level. A double asterisk (**) is attached to differences which are significant at the more stringent 0.01 level.

Table 5

TESTS OF THE DIFFERENCE BETWEEN THE MEAN LENGTH OF THE OPEN INTERVAL FOR FIVE DIFFERENT CATEGORIES OF EVER-USE, AND THE MEAN LENGTH OF THE OPEN INTERVAL FOR NEVER-USERS, FOR WOMEN WITH INTERVALS OF 0-59 MONTHS: PAKISTAN, PCPS 1984-85

PANEL 1. ALL AGES COMBINED. FOR NEVER-USERS, MEAN OPEN INTERVAL IS 18.66 MONTHS, WITH STANDARD ERROR 0.21 MONTHS

Ever-use Category	Increase in mean	Standard Error	t value	significance level
1	7.28**	1.89	3.845	0.000
2	2.70*	1.21	2.229	0.026
3	2.98**	1.03	2.880	0.004
4	4.60**	1.19	3.870	0.000
5	11.00**	1.60	6.896	0.000

PANEL 2. AGE GROUP 15-24. FOR NEVER-USERS, MEAN OPEN INTERVAL IS 13.32 MONTHS, WITH STANDARD ERROR 0.31 MONTHS

Ever-use Category	Increase in mean	Standard Error	t value	significance level
1	6.05	3.44	1.756	0.079
2	3.98	2.21	1.801	0.072
3	3.27	1.83	1.785	0.074
4	3.55	2.53	1.404	0.161
5	4.68	10.03	0.466	0.641

PANEL 3. AGE GROUP 25-34. FOR NEVER-USERS, MEAN OPEN INTERVAL IS 18.79 MONTHS, WITH STANDARD ERROR 0.29 MONTHS

Ever-use Category	Increase in mean	Standard Error	t value	significance level
1	5.04*	2.53	1.989	0.047
2	2.13*	1.57	1.359	0.174
3	3.47*	1.46	2.387	0.017
4	3.07*	1.58	1.940	0.053
5	10.23**	2.34	4.380	0.000

PANEL 4. AGE GROUP 35-49. FOR NEVER-USERS, MEAN OPEN INTERVAL IS 23.98 MONTHS, WITH STANDARD ERROR 0.46 MONTHS

Ever-use Category	Increase in mean	Standard Error	t value	significance level
1	9.29*	3.84	2.421	0.016
2	0.92	2.61	0.353	0.724
3	-0.44	1.98	-0.224	0.823
4	3.67*	2.26	1.624	0.105
5	6.47**	2.42	2.671	0.008

** SIGNIFICANT AT ONE PER CENT LEVEL
* SIGNIFICANT AT FIVE PER CENT LEVEL

We conclude from Panel 1 that when all ages are combined, each of the five ever-use categories has a significantly longer open interval than the never-users. In percentage terms, the increase ranges from a minimum of an extra 14 per cent ($100 \times 2.70/18.66$) for ever-use category 2, condom or vaginal methods, to a maximum of an extra 59 per cent ($100 \times 11.00/18.66$) for category 5, sterilization.

This would seem to be a clear indication that stated use is indeed effective. It is well known, however, that the users of contraception tend to be older, and older women would have longer birth intervals, and in particular a longer open interval, whether or not they used contraception. For that reason the table presents the relationship between ever-use and the length of the open interval within the three crude groupings of ages.

Panels 2-4 give a much different impression of the effectiveness of use. The open interval increases steadily in length from 13.32 to 18.79 to 23.98 months (as was presented also in Table 4) and the increase attributable to ever-use goes down substantially. In the youngest age group, Panel 2, there is no category of ever-use with a significant increase. (There is only one sterilized woman in this age group, and even her sterilization was recent enough, apparently, that she has only gone 4.68 months longer without a birth than expected.) In panels 3 and 4, the increase due to sterilization is highly significant and the increase due to putatively less effective methods, withdrawal and rhythm, is also significant. Otherwise, only one increment in these two panels achieves significance for the pill in the middle age group.

It is not surprising that women who are sterilized show an impact in terms of the length of the open interval. But it is unexpected that (1) there is no consistent impact from any of the other program methods, and (2) withdrawal and rhythm do show an impact.

If the sample were further subdivided according to age, parity, and other determinants of the length of the open interval, it is likely that the increment due to ever-use would become progressively less and less significant, because the control for age with just three categories is very crude. However, we will not proceed in this direction, because the open interval is not the ideal measure of effectiveness and a more complete analysis should be performed after more appropriate data become available. We stop with the qualitative conclusion that a high but undetermined proportion of stated use does not have a perceptible impact.

CONCLUSIONS AND RECOMMENDATIONS

This paper has investigated the hypothesis that a substantial fraction of users of contraception in Pakistan are shy or silent and declined to mention such use to the PCPS interviewers. A brief review of cultural factors has lent support to the plausibility of this hypothesis, but it was pointed out that factors which mitigate against the admission of contraceptive use are likely to mitigate against actual use itself.

As in the main report, the length of the open interval was taken here as the main potential indicator of silent use, but it was argued that any search for silent

users should take account of the random or stochastic variability in the length of the interval. Statistical tests replaced the deterministic categorization of respondents.

It was argued that silent but effective use would be manifested by an increase in the open interval for stated users in certain subgroups, relative to two reference groups. The reference groups were women in Balochistan and women with no education, where stated use is lowest and by assumption silent use would also be lowest. The absence of statistically significant differentials between other groups and the reference groups was interpreted as an absence of measurable amounts of use which is both silent and effective.

Next, the effectiveness of stated use was treated as a parallel issue, with parallel procedures. Ever-use was credited with a net increase of 2 percent to 3 percent in the length of the open interval; but there is so much overlap in the length of this interval of never-users and ever-users that ever-use cannot generally be characterized as effective. Whether it is ineffective because of incorrect use, or brief use, or inaccurate self-reporting, cannot be calculated with the data at hand. However, the proportion of stated use that does not result in measurable reductions in fertility is substantial. We do not rule out the possibility that shy or silent users actually exist. Arguments for shyness were presented in the first two sections of the paper. It would be useful if these arguments could be extended, leading to specific hypotheses about the probable characteristics of silent users and to methods for identifying them. The PFS could be reanalyzed, correlating information on the presence of other person during the interview with patterns of non-use. The next CPS could make a special effort to ensure privacy during the interview, could include information on the presence of other persons, and could include more questions on whether the women believes contraception is acceptable in her reference group.

Hypotheses should also be advanced as to the reasons why most categories of ever-users are having children at a rate which is indistinguishable from never-users, once age has been controlled. A study which would focus upon adopters, monitoring them for a year or so after adoption, would be helpful. It is also possible that the subgroup who shows surprisingly effective use of withdrawal and rhythm would turn to other methods, including sterilization, if they were more readily available.

Future surveys should be considered which would include integrated retrospective histories of fertility and contraceptive use for the five years prior to the interview. However, it is possible that data from such surveys would be fatally flawed by the poor reporting of dates and durations which has been observed in all retrospective surveys in Pakistan. If at all possible, the adoption, continuation, and effectiveness of contraception, as well as fertility and child health and survival should be monitored with a prospective study in several sample areas in Pakistan. Such a project would yield valuable data going far beyond the questions raised in this paper.

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ANALYSIS OF VARIATIONS IN CONTRACEPTIVE USE, NON-USE AND KNOWLEDGE: PAKISTAN CONTRACEPTIVE PREVALENCE SURVEY 1984-85

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There appear to be four socio-philosophical basis underlying the state intervention in family planning. These are Deontic, Environmentalist, Development Distributivists, and Family Planning. In Pakistan the last two appear to be the basis of population planning and population welfare policies of the successive governments since 1960s. Aggregate level data from Pakistan Contraceptive Prevalence Survey (PCPS) 1984-85 revealed significant variation in contraceptive use and knowledge across the districts in Pakistan. Moreover contraceptive use was also observed to be positively related to the level of socio-economic development at district level. The concept of shy users developed by the author of PCPS report is further investigated in this study. It generally shows that the shy users are older than both users and nonusers of contraception, are more educated than the nonusers but less than the current and ever users and are equally divided in terms of their rural-urban residence. They have the largest mean number of children ever born and their husbands tend to be mostly unemployed. Further analysis of current use of contraceptive methods indicate that female sterilization, pill, injection and IUD were used by relatively less literate and more rural respondents and withdrawal and condoms were used by more literate and urban respondents. More educated couples commence use of non-permanent methods earlier in married life but with increased duration of married years, use shifts to more or less permanent methods.

INTRODUCTION

There appear to be four socio-philosophical considerations underlying state intervention in the domain of population and family planning. These are Deontic, Environmentalists, Development Distributivists and Family Planners. According to Deontic theory [1] the present generation in addition to its own, has a moral duty and obligation for the welfare of future generation. Couples are therefore obliged to ensure that children brought into existence should enjoy a reasonably good life. The proponents of Environmentalist thesis [2] view population growth as the cause of

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famine, environmental pollution and destruction, resource depletion etc. and argue that survival of human being depends only on strict population control. The developmental distributivists [3] theorize that lower birth rates are related to the processes of modernization and the factors responsible for significantly lowering fertility are more equitable distribution and generally higher income levels and increased access to social security services and education. The Family Planners [4] hold that parents have the right to decide freely and responsibly about the number and spacing of their children. Resolution of UN General Assembly and World Population Plan of Action also affirm family planners view [5]. In general for population policy the advanced capitalist free economies follow the rationale underlying the Family Planning perspectives whereas socialist countries tend to prefer the rationale underlying the Developmental Distributivists and Deontic perspectives. In South and South East Asian countries population policies are justified and explained in terms of Deontic, Developmental Distributivists and Family Planning rationales.

PAKISTAN'S POPULATION WELFARE PROGRAMME

In Pakistan the Developmental Distributivists and Family Planning rationales appear to be the basis of population planning and welfare programme and policies. The programme activities began in 1950s under the aegis of Family Planning Association which provided services through its clinics located in urban areas [6]. An ambitious programme at national level was launched in 1965 as part of Third Five Year Plan [7]. It was administered through a centralized structure and supported in the provinces and districts by an extensive publicity campaign. The family planning services, clinical and advisory were provided by about 20000 village midwives working under the supervision of about 1000 family planning officers. This programme ended in 1969 with significant personnel and organizational changes .

Subsequently new plan called Continuous Motivation Scheme was launched during 1970-73 [6]. According to this programme a male-female motivators team was assigned to roughly 8000-12000 population. The plan envisaged the teams to contact all fecund couples to motivate them to accept a family planning method, then to supply them with the necessary contraceptives and to remain in regular contact with them in order to supply relevant information and family planning material.

In 1973 Contraceptive Inundation Scheme [6] was planned under which various forms of contraceptive devices were to be distributed throughout the country to a network of 50,000 shopkeepers and local agents as well as to hospitals, clinics and field-workers. The 1974-75 Pakistan Fertility Survey [8], however, revealed that the programme was not very successful in delivering family planning services to the eligible couples and as such this scheme was abandoned in 1977.

Until 1970s the programme followed a single purpose vertical family planning approach [6] which sought to persuade eligible couples to have smaller families and practise birth control. In 1980s this approach was changed to multisectoral and multidimensional approach which integrated the population and family planning with socio-economic development planning process. The population policy of Pakistan is designed to reduce the rate of population growth affecting the fertility, mortality, migration, distribution and structure of population. The policy particularly focuses on creating demand for family planning through Information, Education and Communication campaign and effecting matching supply of family planning services through service outlets. The service outlets provide contraceptives to eligible couples alongwith mother and child health care and general development of women. Notably a greater emphasis has been placed on provision of services through Non-governmental Organizations [6] and Social Marketing of Contraceptives in private sector [6]. The family planning programme now is more clearly established on the rationales underlying the Developmental Distributivists and Family Planning perspectives discussed earlier.

OBJECTIVE OF THE STUDY

In order to assess the socio-economic and demographic impact of the programme, several national level surveys have been undertaken in the country. One such survey called National Impact Survey (NIS) was conducted during 1968-69 [9], the second called Pakistan Fertility Survey (PFS) was conducted during 1974-75 [8], the third called Pakistan Labour Force and Migration Survey [PLM] was conducted during 1979-80 [10] and the recent one called Pakistan Contraceptive Prevalence Survey [PCPS] was conducted during 1984-85 [11].

In the main report of PCPS [11] weighted data of 7405 currently married women were analyzed by major characteristics of these women and by major urban,

other urban and rural areas. 62 percent of currently married women aged 15-49 reported knowledge of at least one contraceptive method. In the provinces of Punjab, Sindh, NWFP and Balochistan these percentages were 68,51,58 and 30 respectively. The respondents in major urban areas were more knowledgeable (71 percent) as compared to other urban (64 percent) and rural areas (59 percent). Current use of contraceptives among non-pregnant women was 9.1 percent with women residing in Punjab, Sindh, NWFP and Balochistan reporting current use rates of 9.3, 9.6, 9.4 and 4.3 per cent respectively. The rates for major urban areas, other urban areas and rural areas were reported at 25, 10.8 and 5.4 percent respectively. The present study, unlike the PCPS main report, proposes to undertake the analysis of use, non-use and knowledge of contraceptive of these women at district level. Besides an attempt has also been made here to re-examine the measure of shy users developed by the author of the main PCPS report. In addition the study proposes to examine as to what kinds of programme incentives and disincentives have important bearing on the types of contraceptive used by clients of family planning programme.

VARIATIONS IN CONTRACEPTIVE USE AND KNOWLEDGE BY DISTRICTS IN PAKISTAN

For undertaking present analysis the data pertaining to sample clusters in PCPS survey lying in each district were accumulated separately at district level. Although there are technical problems pertaining to this cumulated sample size at the district level but given the overall sample size and methodology of sampling applied in the survey, it should be possible to obtain reasonably reliable results. These results can be further refined through data manipulation but this was not done in this analysis. In order to maintain representativeness of areal data at district level the analysis undertaken for the purpose of this study was limited to calculation of percentages of currently married 15-49 years old women who (a) were currently practising contraceptive, (b) had previously used contraceptive (excluding current users), (c) were nonusers with contraceptive knowledge and (d) nonusers who had no contraceptive knowledge. Pregnancy was not used as a control in order not to reduce the district sample sizes. This can be easily done in future exercises, but since in this analysis the objective was to obtain a general overview of the use, non-use and knowledge of contraceptive, the total sample size for the district was used as the base for computing rates. Such an analysis, it is hoped, would serve as a useful benchmark for evaluating the work of family welfare activities of the District Family

Welfare Centres as well as the work of NGO's and other related public and private organizations.

The results of this analysis are reported in Table 1. In the table the districts have been ranked on the basis of high to low current use of contraceptive. The results are self-evident. According to PCPS 1984-85 data, 7.63 per cent of all currently married women in reproductive ages were current users of contraceptive. This means only 19 out of 55 districts had current use rates about or above the national level. In fact about 25 districts had the prevalence rate which was less than half the national rate. Furthermore, only 10 districts namely Rawalpindi, Islamabad, Lahore, Faisalabad, Jhang, Multan, Karachi, Quetta, Swat, and Peshawar accounted for 63 per cent of current users. All these districts, excepting Swat, happen to contain large urban centres and are indicative of the fact that Pakistan's Population Welfare Programme has been mostly successful in urban areas.

This ranking, however, does not correspond to other aspects of contraceptive use, namely 'past-users' and non-users with and without knowledge. However, by and large the districts with high prevalence rates were also those which had higher rate of past users as well as non-users with knowledge. There are, however, several exception to this and as we did not undertake a correlational analysis it is not possible to state whether or not the current use rate is a statistically significant indicator of other dimensions of contraceptive use and non-use. How can the differences showed in the table be explained? There are at least two ways of explaining them. Firstly, by using the Family Planning perspective as described in the introductory section of this paper and secondly by using the Developmental perspective also outlined in the same section. The family Planning perspective would require information about the family planning services and other programme in-puts to explain the variations reported in the table and the Developmental perspective would require some indicators relevant to measure the degree of socio-economic development of the districts.

Unfortunately due to the time constraints it was not possible to obtain all available family planning input data except one, the number of Family Welfare Centres in the District in 1980. This information was obtained from the Monitoring and Statistics Wing of the Ministry of Population Welfare. Using 1981 population census [12] figures an index of Population per Family Welfare Centre' was

computed. This is reported in the last column of Table 1. There appears to be no significant correspondence in the values of Population per Family Welfare Centre and other aspects of use and non-use of contraception at the district level. This, however does not mean that there is no real impact of the "programme inputs". The reasons being that the sampled area of the districts may have been far from the Family Welfare Centres. In other words had the sampled areas been closer to the Family Welfare Centre the results may have been different for the district. Secondly, there may be other programme inputs which may explain the variations reported in Table 1, and as we did not have access to them it is not possible to comment on their impact on various aspects of contraceptive use and knowledge. Hopefully this lacuna will be rectified in a follow-up research.

The second approach to explain the variation is to use development indicators as implied in the Developmental Distributivists perspective which suggests that best family planning is economic development. It was possible to do this indirectly. In a well-known paper entitled "Development Ranking of Districts in Pakistan" Pasha and Hasan applying the ZSUM and Weighted Factor Score techniques used twenty seven indicators to quantify the levels of development in the districts of Pakistan in the 1970's [13].

Using Pasha and Hasan ranking of the districts by level of development attempt is made to assess the pattern of various aspects of use and non-use of contraception at the district level. The results are reported in Table 2. They show that contraceptive use and knowledge are highly associated with the level of development of the districts. In foregoing discussion besides providing ranking of the districts by current use of contraceptives we have also made an attempt to explain the variation in contraceptive use and non-use by using a Family Planning input measure and through the levels of development of the districts. The results suggest that both family planning services and economic development are needed to increase contraceptive use and knowledge in Pakistan. Before concluding a short observation on the biases introduced by field work and research practice warrants mentioning. In Table 1 district of Swat ranked second in contraceptive use. It was also one of the five districts which had less than 10 percent non-users without knowledge. Unfortunately it was not ranked in Pasha and Hasan district ranking so

Table 1

CURRENT USE, PAST USE AND KNOWLEDGE AMONG CURRENTLY MARRIED 15-49 YEARS OLD WOMEN BY DISTRICT: PAKISTAN PCPS, 1984-85

Rank Order	District	Current Users (Perc- ent)	Past Users (Perc- ent)	NON USERS			Population per FWC
				With Knowl. (Perc- ent)	Without Knowl. (Perc- ent)	Total (Perc- ent)	
1.	LAHORE	28.88	16.61	33.21	21.30	100	277
2.	SWAT	28.67	6.00	57.33	8.00	100	150
3.	KARACHI*	18.80	9.69	53.10	18.41	100	516
4.	ISLAMABAD	18.42	10.53	36.84	34.21	100	38
5.	PESHAWAR**	14.12	3.68	18.36	63.84	100	354
6.	JHANG*	12.94	2.94	7.65	76.47	100	170
7.	MARDAN	12.50	3.95	12.50	71.05	100	152
8.	QUETTA*	12.15	9.28	36.07	42.50	100	280
9.	FAISALABAD	11.64	4.31	5.17	78.88	100	232
10.	TOBA TEK SINGH	10.00	1.11	6.67	82.22	100	90
11.	GUJRANWALA**	8.82	2.95	31.76	56.47	100	170
12.	MULTAN*	8.78	9.72	70.22	11.28	100	319
13.	D.G.KHAN	8.69	4.35	84.78	2.18	100	92
14.	KASUR	8.63	6.47	55.40	29.50	100	139
15.	HYDERABAD	8.63	1.44	30.93	58.99	100	139
16.	SHEIKHUPURA*	8.28	6.37	40.13	45.22	100	157
17.	JACOBABAD	7.81	0.00	40.63	51.56	100	64
18.	THARPARKAR*	7.77	0.00	26.21	66.02	100	103
19.	RAWALPINDI	7.74	6.55	47.02	38.69	100	168
20.	KHUSHAB	7.55	1.89	56.60	33.96	100	53
21.	LAYYA	7.40	2.47	82.72	7.41	100	81
22.	ATTOCK	7.07	3.03	63.64	26.26	100	99
23.	VEHARI	7.00	3.00	80.00	10.00	100	100
24.	SIALKOT	6.85	5.24	74.60	13.31	100	248
25.	SAHIWAL	6.45	3.23	76.13	14.19	100	155
26.	BADIN	4.84	0.00	12.90	82.26	100	62
27.	SARGODHA	4.48	3.73	45.52	46.27	100	134
28.	ABBOTABAD	3.90	2.16	69.70	24.24	100	231
29.	THATTA	3.85	2.56	15.39	78.20	100	78
30.	SIBI*	3.79	1.52	32.57	62.12	100	132
31.	GUJRAT	3.78	2.51	52.20	41.51	100	159
32.	DIR	3.70	3.70	7.41	85.19	100	54
33.	OKARA	3.33	4.17	89.17	3.33	100	120
34.	RAHIMYAR KHAN	3.28	5.74	78.69	12.29	100	122
35.	SUKKUR*	3.26	0.00	10.87	85.87	100	92
36.	MAINWALI	3.16	2.10	62.11	32.63	100	95
37.	NAWABSHAH**	2.94	0.00	49.02	48.04	100	102
38.	D.I.KHAN	2.70	0.00	74.32	22.98	100	74
39.	BANNU*	2.66	10.67	78.67	8.00	100	75
40.	LARKANA	2.04	0.00	69.39	28.57	100	98

41. BAHAWALPUR	2.00	4.00	75.00	19.00	100	100	72,672
42. SANGHAR	1.72	1.72	32.76	63.80	100	58	-
43. MANSEHRA*	1.68	2.81	69.67	25.84	100	178	71,106
44. MUZAFFARGHAR	1.44	3.60	84.17	10.79	100	139	-
45. RAJANPUR	1.39	4.17	77.78	16.66	100	72	-
46. SHIKARPUR	1.31	0.00	25.00	73.69	100	76	61,958
47. BAHAWALNAGAR	1.28	0.00	96.16	2.56	100	78	80,809
48. JHELUM	1.26	8.86	72.15	17.73	100	79	61,433
49. BHAKKAR	1.20	4.83	63.85	30.12	100	83	-
50. DADU	1.16	0.00	55.82	43.02	100	86	76,932
51. KOHAT	1.13	0.00	85.39	13.48	100	89	84,308
52. KHAIRPUR	1.12	0.00	29.21	69.67	100	89	89,199
53. KARAK	0.00	5.13	79.49	15.38	100	39	-
54. KALAT	0.00	3.21	32.69	64.10	100	156	113,731
55. MAKRAK	0.00	0.00	5.50	94.50	100	109	-

FWC = Family Welfare Centre

* Denotes World Bank Districts.

** Denotes UNFPA Districts.

Table 2

DISTRIBUTION OF DISTRICTS, BY LEVEL OF DEVELOPMENT (ACCORDING TO WEIGHTED FACTOR SCORE) AND CONTRACEPTIVE USE: PAKISTAN PCPS, 1984-85

(TOP QUARTILE OF POPULATION	CURRENT USER (PER CENT)	PAST USER (PER CENT)	NEVER USER	
			WITH KNOWLEDGE (PER CENT)	WITHOUT KNOWLEDGE (PER CENT)
RELATIVELY DEVELOPED DISTRICTS				
KARACHI	18.8	9.7	53.1	18.4
LAHORE	28.9	16.6	33.2	21.3
RAWALPINDI	7.7	6.6	47.0	38.7
ISLAMABAD	18.4	10.5	36.9	34.2
QUETTA a	12.1	9.3	36.1	42.5
PESHAWAR	14.1	3.7	18.4	63.8
HYDERABAD a	8.6	1.5	30.9	59.0
(SECOND QUARTILE OF POPULATION)	DISTRICTS AT INTERMEDIATE LEVEL OF DEVELOPM			
FAISALABAD b	11.6	4.3	5.2	78.9
GUJRANWALA	8.8	2.9	31.8	56.5
MULTAN	8.8	9.7	70.2	11.3
SIALKOT	6.9	5.2	74.6	13.3
D.I.KHAN c	2.7	0.0	74.3	23.0
SHEIKHUPURA	8.3	6.4	40.1	45.2

(THIRD QUARTILE
OF POPULATION)

DISTRICTS AT INTERMEDIATE LEVEL OF DEVELOPMENT

MARDAN	12.5	4.0	12.5	71.0
SAHIWAL	6.5	3.2	76.1	14.2
RAHIM YAR KHAN	3.3	5.7	78.7	12.3
JHELM d	1.3	8.9	72.1	17.7
BAHAWALPUR	2.0	4.0	75.0	19.0
SANGHAR	1.7	1.7	32.8	63.8
THARPARKAR	7.8	0.0	26.2	66.0
SARGODHA d	4.5	3.7	45.5	46.3
SUKKUR	3.2	0.0	10.9	12.3
NAWABSHAH	3.0	0.0	49.0	48.0
GUJRAT	3.8	2.5	52.2	41.5
JHANG e	12.9	2.9	7.7	76.5
DADU e	1.2	0.0	55.8	43.0
KHAIRPUR	1.1	0.0	29.2	69.7
LARKANA	2.0	0.0	69.4	28.6
BAHAWAL NAGAR	1.3	0.0	96.1	2.6
BANNU	2.6	10.7	78.7	8.0
THATTA	3.8	2.6	15.4	78.2
MUZAFFARGARH	1.4	3.6	84.2	10.8
KOHAT	1.1	0.0	85.4	13.5
ATTOCK	7.1	3.0	63.6	26.3
MIANWALI	3.2	2.1	62.1	32.6
D.G.KHAN	8.7	4.3	84.8	2.2
HAZARA	-	-	-	-
JACOBABAD	7.8	0.0	40.6	51.6
ZHOB	-	-	-	-
LORALAI	-	-	-	-
CHAGAI	-	-	-	-
SIBI	3.8	1.5	32.6	62.1
MEKRAH	0.0	0.0	5.5	94.5
KALAT	0.0	3.2	32.7	64.1
KHARAN	-	-	-	-
LASBELA	-	-	-	-
KACCHI	-	-	-	-

* Name of districts in each quartile is given in descending order of level of development.

- According to the ZSUM ranking this district is in the second quartile
- According to the ZSUM ranking this district is in the first quartile.
- According to the ZSUM ranking this district is in the third quartile.
- According to the ZSUM ranking this district is in the second quartile.
- According to the ZSUM ranking this district is in the second quartile.

it is not possible to comment on the relation between its ranking in Table 1 and its development level. But information obtained from the responsible officers involved in the field work organization for PCPS data collection revealed that Swat was one district in which 'programme personnel' were used for field work as it was difficult

to recruit interviewers from independent sources. It is, therefore, possible that high ranking of Swat in Table 1 was partially due to this bias in data collection. This clearly illustrated the kind of biases which can influence contraceptive prevalence survey, against which future designers of such surveys need to take due care.

REANALYSIS OF SHY CONTRACEPTIVE USERS

In the PCPS report shy users were only identified through a logico-deductive method which was based on certain theoretical and methodological assumptions but again no systematic and in-depth analysis of any aspect of this group was undertaken. In the report an impression has been given that because of the shy users the contraceptive use was not 9.1 percent as the PCPS data show but 16.1 percent which included 7 percent shy users. A shy user was defined as a person who did not report use of contraceptive, did not want more children, was fecund and had no birth in the past five years. In this research exercise an attempt is made to develop a comparative socio-economic and demographic profile of these groups in order to know how these groups differed from one another. But before presenting these findings it seems appropriate to describe the methodology applied to filter shy users. The Diagram A describes the logic of this methodology adopted by the author of PCPS report.

When this methodology was applied, the number of shy users turned out to be only 4.1 per cent of the respondents. This percentage was derived from those who were either current or past users or non-users with knowledge. Together these respondents constituted about 57 per cent of the sample [11;p.97]. It was then assumed but not clearly articulated in the report that just as there were 4.1 per cent shy users in 57 per cent of those who admitted contraceptive knowledge, there would also be the same proportion among the no knowledge shy respondents who comprised 43 per cent of the sample. The proportion of shy users was then increased correspondingly on prorata basis to arrive at a figure of 7 per cent who were assumed to be the shy users of contraceptives.

The first part of the methodology for arriving at the proportion of shy users seems plausible but it still required some additional information to provide at least indirect support for the methodology and its underlying assumptions such as the age structure of the shy users. This, however, was not done in the PCPS Report. But to

assume that there may be a similar percentage of shy users among those who even refused to acknowledge knowledge of contraception seemed to be even less plausible without some additional analysis and supporting evidence. The whole concept is interesting but it required some further analysis and support. An attempt was made to do some additional analysis of the sub-sample of 4.1 percent of the respondents who were identified as the shy users.

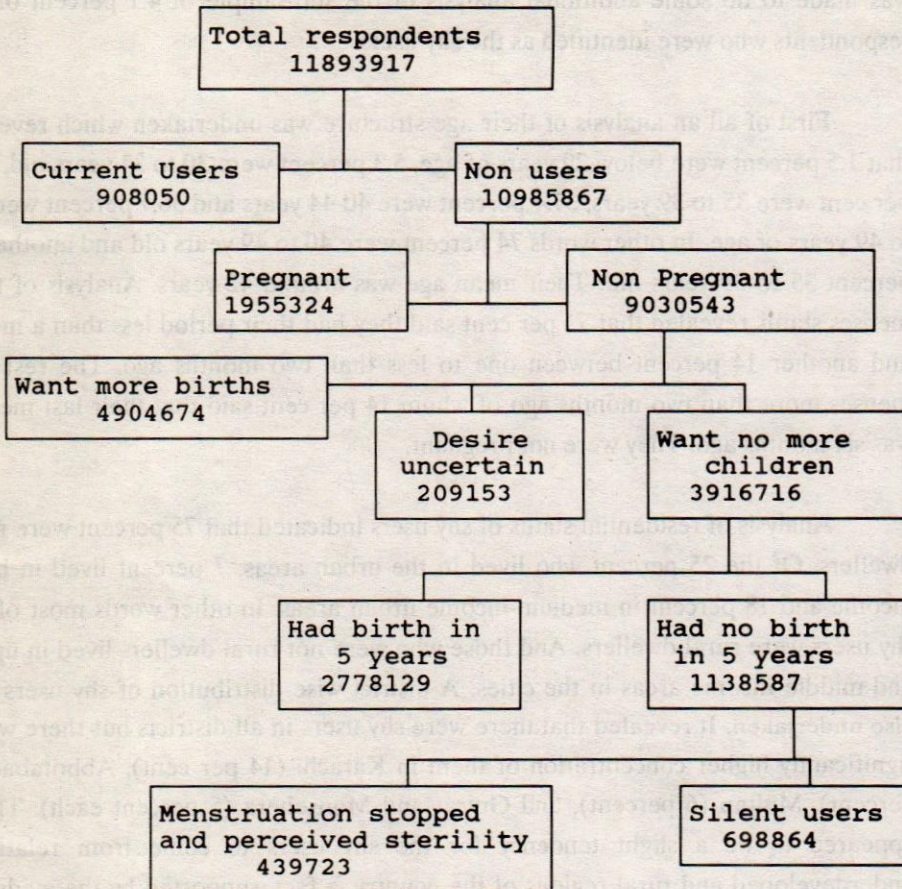
First of all an analysis of their age structure was undertaken which revealed that 1.5 percent were below 29 years of age, 5.3 percent were 30 to 34 years old, 19.2 per cent were 35 to 39 years, 37.4 percent were 40-44 years and 36.7 percent were 45 to 49 years of age. In other words 74 percent were 40 to 49 years old and another 19 percent 35 to 39 years old. Their mean age was around 42 years. Analysis of their menses status revealed that 71 per cent said they had their period less than a month and another 14 percent between one to less than two months ago. The rest had menses more than two months ago of whom 14 per cent said that their last menses was six months ago. They were not pregnant.

Analysis of residential status of shy users indicated that 75 percent were rural dwellers. Of the 25 percent who lived in the urban areas, 7 percent lived in high-income and 18 percent in medium-income urban areas. In other words most of the shy users were rural dwellers. And those who were not rural dwellers lived in upper and middle income areas in the cities. A district wise distribution of shy users was also undertaken. It revealed that there were shy users in all districts but there was a significantly higher concentration of them in Karachi (14 per cent), Abbottabad (8 percent), Multan (6 percent), and Gujrat and Monsehera (5 percent each). There appeared to be a slight tendency for the shy users to come from relatively underdeveloped and rural regions of the country, a fact, supported by the evidence about the place of residence which showed that 75 percent were from rural areas.

The age profile of this group raises two interesting questions, firstly were they really fertile? And secondly given their age why would they be shy of admitting use of contraceptive? It is plausible that this group in reality does consist of shy users and that their shyness was a function of micro-sociological situational factors involved in the interviewing setting. For example they were older women who did

Diagram - A

METHODOLOGY FOR ARRIVING AT THE NUMBER OF SHY USERS,
PCPS, 1984-85



Source: [11,p.86]

not like admitting use of contraceptive to interviewers who were much younger as well as possibly unmarried. It would be interesting to re-interview these respondents to find out exactly who they were and what factors contributed to their shyness. Until such an analysis is undertaken it would be theoretically and epidemiologically doubtful to claim the "reality" of their existence or at least their actual size in the population. There is also the additional possibility that given their age composition most of them were physiologically unable to bear children any more.

Table 3 provides a broad comparative profiles of five various groups of PCPS respondents including shy users. The main differences and similarities between these groups are highlighted in the following paragraphs. There are significant differences in the mean age of five groups. Current and ever users tend to be older whereas the non users tend to be younger. The shy users have the highest mean age as noted in the preceding section. The implications of mean age comparison points to the need of extending knowledge and use of family planning to the two non-users groups. Success in doing so would have important impact on the overall fertility levels.

Current and past contraceptive users tend to be primarily urban residents. Easier access to family planning services in urban areas may be one factor in greater propensity among them to use contraceptives. The non users tend to be predominantly rural dwellers and the shy users are equally divided between urban and rural areas. The rural-urban difference in contraceptive use are, among other things, a function of differential access to family planning services in the two areas. The findings suggest that greater emphasis should be placed on rectifying this inequality in access.

The comparison clearly shows that an overwhelming percentage of non-users of contraceptive tend to be illiterate and without any formal education. These comparisons point to the need not only for greater investment in female education but also in female adult literacy. Literacy, as a development variable is the single most important variable influencing the practice of family planning. Educational and literacy levels of husbands also appear to be associated with the use and non-use of contraceptions.

Comparison of employment/work status of respondents and their husbands shows that contraceptive use tends to be significantly more prevalent among those who are employees (wage workers) and least prevalent among agricultural workers. The number of female employees (wage workers) although is very small but it appears to be important factor in contraceptive use.

Table 3

SOCIO ECONOMIC AND DEMOGRAPHIC CHARACTERISTICS OF VARIOUS GROUPS OF RESPONDENTS INTERVIEWED: PAKISTAN PCPS, 1984-85

SL. NO (1)	CHARACTERISTICS OF RESPONDENTS AND HUSBANDS (2)	NON USERS				
		Current Users (3)	Ever Users (4)	With Knowl. (5)	Without Knowl. (6)	Shy Users (7)
1.	<u>MEAN AGE</u>	34.4	33.7	30.1	30.0	41.69
2.	<u>AVERAGE AGE AT FIRST MARRIAGE</u>	17.3	17.7	17.8	17.8	17.16
3.	<u>PLACE OF RESIDENCE</u>					
	URBAN	70.4	69.9	37.7	30.7	49.8
	RURAL	29.6	30.1	62.3	69.3	50.2
4.	<u>EDUCATIONAL LEVEL-RESPONDENT</u>					
	NEVER WENT TO SCHOOL	55.9	57.9	82.2	92.4	78.3
	UPTO 9TH CLASS	25.2	23.9	14.1	6.0	15.7
	MATRIC	12.0	11.7	2.6	1.1	3.9
	COLLEGE	6.9	6.5	1.3	0.5	2.1
5.	<u>EDUCATIONAL LEVEL OF HUSBAND</u>					
	NEVER WENT TO SCHOOL	31.5	32.6	48.3	60.9	46.6
	UPTO 9TH CLASS	23.0	24.9	30.5	25.6	29.5
	MATRIC	20.4	20.5	13.4	9.2	16.4
	COLLEGE	25.1	22.1	7.9	4.3	7.5
6.	<u>LITERATE (PER CENT)</u>					
	RESPONDENT	42.0	40.1	15.5	6.6	19.6
	HUSBAND	68.2	67.5	49.7	37.7	52.7

Variations in Contraceptive Use, Nonuse and Knowledge

7.	<u>WORK STATUS - RESPONDENT</u>					
	WORK FOR AN EMPLOYER	3.2	3.1	1.4	1.3	1.8
	FOR FAMILY BUSINESS	9.1	8.8	17.0	14.8	13.9
	DO NOT WORK OUTSIDE HOME	87.7	88.1	81.6	83.8	84.3
8.	<u>WORK STATUS - HUSBAND</u>					
	AGRI/LIVESTOCK/FISHING/FORESTRY	16.3	15.9	29.1	38.6	29.9
	SALARIED EMPLOYEE	45.5	44.8	33.3	31.1	31.7
	SELF EMPLOYED	34.5	35.7	32.8	25.9	29.2
	UNEMPLOYED	3.2	3.3	4.6	4.2	8.9
	NOT SURE	0.2	0.1	0.1	0.1	0.4
	NOT REPORTED	0.3	0.2	0.1	0.1	-
9.	<u>MEAN CHILDREN EVER BORN</u>	5.8	5.7	4.1	4.0	6.48
10.	<u>MEAN LIVING CHILDREN</u>	5.1	4.9	3.3	3.2	4.95
11.	<u>IDEAL FAMILY SIZE</u>	4.8	4.8	4.8	5.3	4.59
12.	<u>REASONS FOR NOT USING CONTRACEPTIVES</u>					
	1. SOCIO CULTURAL	-	11.5	59.4	-	75.4
	2. PROGRAMME RELATED	-	6.9	8.4	-	13.5
	3. EXPOSURE RISK FACTORS	-	6.7	11.2	-	4.3
	4. OTHERS	-	0.8	1.1	-	3.9
	5. NOT SURE	-	0.4	1.2	-	2.8
	6. NOT APPLICABLE	-	73.7	18.7	100.0	-
13.	<u>RESPONDENT'S APPROVAL FOR FAMILY PLANNING</u>	100.0	26.0	39.5	-	33.5
14.	<u>HUSBAND'S APPROVAL FOR F.P.</u>	100.0	21.0	26.8	-	26.0
15.	<u>WHY APPROVE?</u>					
	1. CHILDREN COSTLY/ FEWER MEANS BETTER LIFE	-	5.9	6.8	-	7.8
	2. SMALLER FAMILY BETTER LIFE	-	9.9	18.5	-	13.2
	3. POPULATION PROBLEM	-	0.8	1.1	-	0.7
	4. TOO MANY CHILDREN ARE NOT GOOD	-	4.9	7.0	-	5.3
	5. HEALTH REASONS	-	3.6	4.2	-	5.3

	6. SPACING IS GOOD	-	0.9	1.9	-	1.1
	7. OTHERS	-	-	0.0	-	-
	8. NOT APPLICABLE	-	74.0	60.5	-	66.5
16.	<u>WHY DISAPPROVE?</u>					
	1. RELIGIOUS OBJEC- TIONS	-	0.7	9.7	-	17.1
	2. CHILDREN ARE ALLAH'S WILL	-	1.0	15.4	-	15.7
	3. EXPERIENCE WITH SIDE EFFECTS	-	1.1	0.4	-	0.4
	4. FAMILY PLANNING IS INEFFECTIVE	-	0.3	0.7	-	0.4
	5. F.P. CAUSES HEALTH PROBLEMS	-	0.4	1.2	-	1.4
	6. OTHERS	-	-	0.4	-	-
	7. NOT APPLICABLE	-	96.4	72.3	100.0	65.1
17.	<u>DESIRE OF CHILDREN IN FUTURE</u>	2.3	2.4	3.0	3.6	-
18.	<u>MEAN NUMBER OF LIVING SONS</u>	2.8	2.6	1.7	1.7	2.65

Self employment has a mixed pattern with slightly greater prevalence of self-employed husbands in the two user groups but it is reverse in the case of female self-employed. Domestic work status seems equally prevalent among the five groups.

The shy users have the highest mean children ever born followed by the current users and ever users. The lowest means are for the non-user groups with presence or absence of knowledge about contraceptive. Smaller value of the means for the non-user groups most likely is a function of their younger ages. The evidence suggests that larger the number of children ever-born the greater the likelihood of the person to use contraceptives. The case of shy user, however, would suggest that they are probably not a very effective users of contraceptives.

The values of means for living children are very similar for the current users, ever users and shy users, and, considerably lower for the non user groups suggesting greater potential fertility among them in future. The ideal family size desired by these groups would appear to confirm this tendency. There is also much more pronounced difference in the number of children ever born and ideal family size among the shy users. They are followed by the current users. This would suggest that

shy users are probably prompted to use contraceptives like the current users because of greater distinction between the ideal of their desired fertility and realized fertility.

The shy users are overwhelmingly not in favour of contraceptive use because of socio-cultural factors and the same holds for the non-users. The socio-cultural reasons include those reasons which relate to the cultural milieu and include reasons as religious prohibitions, opposition by the husband or the family, indifference to family size and fertility regulation, 'natural' ability to space children. Programme related factors represent the limitations of service delivery system and technical drawbacks of specific methods of contraception; such as non-availability of services and past experience or fear of side effects of specific method. Exposure risk factors include such reasons as being currently pregnant, perceived as sterile, husband's absence, protected by breast-feeding, etc. The programme and exposure risk factors seem to be less important. The evidence, therefore, suggested that greater emphasis should be placed on reducing socio-cultural barriers to contraceptive use especially among the non-user groups.

More respondents approve of family planning than their husbands in all groups. The reasons for approval, although they vary from group to group, generally tend to be for the following main reasons: preference for smaller families, cost of children, undesirability of having too many children and health reasons. All these reasons should be emphasized in the communication for family welfare in the media in order to reinforce these norms and extend their coverage and influence among the eligible couples. The reason for disapproval of family planning primarily reaffirms the earlier findings that among non users socio-cultural factors appear to be the major reasons for non use of contraceptive.

The mean number of children desired suggests that users of family planning, current and past, want fewer children in future and perhaps this is one underlying motivating factor for using family planning. Whereas, the non users tend to want more children in future and hence less motivated to use contraceptives. The evidence also suggests that on average the current users, ever users and shy users have about one more son than the non users. The desire for more sons may be one factor in their not using contraceptive.

COMPARATIVE PROFILES OF RESPONDENTS USING DIFFERENT TYPE OF CONTRACEPTIVE METHODS

In family planning literature it is often mentioned that different kinds of programme incentives and disincentives have an important bearing on the types of contraceptive used by clients of family welfare programme. A comparative socio-economic and demographic profile was prepared for the current users of various kinds of contraceptives to ascertain whether there was such a tendency among the current users of contraceptives in Pakistan.

According to PCPS 1984-85 data 9.1 percent of the interviewed respondents were current users of contraceptive. They used 12 types of contraceptives. The results of PCPS data pertaining to the use of different types of contraceptives are given in Table 4, which shows six commonly used methods in descending orders namely female sterilization (2.6 percent), condom (2.1 percent), pill (1.4 percent), withdrawal (0.9 percent), IUD (0.8 percent), and injection (0.6 percent). The other six methods were used by about 0.7 per cent of the respondents. The discussion about the profiles, therefore, will be limited only to the groups of respondents using six most common methods of contraception. The results are given in Table 5.

First point which needs to be mentioned is that all current users of contraceptive had much higher level of educational and literacy levels compared to the corresponding national statistics reported in PCPS Report [11,p.31-32]. Oral Pill was used by respondents with the lowest mean age of marriage (16.2 years) and IUD by those with the highest (18.7 years). Among the respondents condom and withdrawal were used by the most educated respondents whereas oral pill, injection, IUD and female sterilization were used by mostly uneducated and illiterate respondents. The respondents who worked outside the home more frequently used IUD, oral pill and female sterilization. Comparison by husband's occupational status reveals that husbands of the majority of respondents who reported using condom and withdrawal methods were wage workers (employees). There were also significant number of respondents who used oral pill, injection, IUD and female sterilization.

Table 4

PERCENTAGE DISTRIBUTION OF DIFFERENT METHODS OF CONTRACEPTIVES USED BY CURRENT USERS, PAKISTAN, 1984-85

METHOD	PERCENT
ALL	9.1
PILL	1.4
CONDOM	2.1
VAGINAL METHOD	0.1
INJECTION	0.6
I.U.D	0.8
FEMALE STERILIZATION	2.6
MALE STERILIZATION	0.0
RHYTHM	0.1
WITHDRAWAL	0.9
OTHERS	0.5

Source: [1]

Mean children ever born was highest (7) among users of female sterilization and lowest among those who used condom followed by oral pill and withdrawal. The data about mean living children follows a similar pattern.

Table 5

SOCIO-ECONOMIC AND DEMOGRAPHIC PROFILE OF CURRENT* USERS BY SPECIFIC METHOD USED: PAKISTAN PCPS, 1984-85

SL. No.	CHARACTERISTICS OF RESPONDENTS AND HUSBANDS	METHODS					
		PILL	CONDOMS	INJECTION	IUD	FEMALE STERILIZATION	WITHDRAWAL
1.	<u>MEAN AGE AT MARRIAGE</u>	16.20	17.97	16.93	18.72	17.52	18.16
2.	<u>EDUCATION LEVEL OF RESPONDENT</u>						
	NEVER WENT TO SCHOOL	63.3	29.2	72.1	66.0	68.9	41.9
	UPTO 9TH CLASS	26.5	31.3	16.3	20.8	25.0	27.4
	MATRIC	6.1	22.9	11.6	11.3	3.9	19.4
	COLLEGE	4.1	16.7	-	1.9	2.2	11.3

3. <u>LITERACY OF RESPONDENTS</u>						
LITERATE	35.7	69.4	30.2	26.4	27.2	56.5
4. <u>LITERACY OF HUSBANDS</u>						
LITERATE	61.2	88.9	55.8	47.2	63.9	67.7
5. <u>WORK STATUS OF RESPONDENTS</u>						
WORK FOR AN EMPLOYER	-	4.2	7.0	3.8	1.7	8.1
WORK FOR A FAMILY BUSINESS	13.3	4.9	4.7	15.1	12.2	4.8
DO NOT WORK OUTSIDE THE HOME	86.7	91.0	88.4	81.1	86.1	87.1
6. <u>WORK STATUS OF HUSBANDS</u>						
AGRICULT. /LIVESTOCK/ FISHING/FORESTRY	29.6	5.6	23.3	24.5	16.7	6.5
SALARIED EMPLOYEE	39.8	53.5	34.9	39.6	43.9	54.8
SELF EMPLOYED	29.6	39.6	34.9	30.2	33.9	32.3
UNEMPLOYED	1.0	1.4	7.1	3.8	4.4	6.5
NOT SURE	-	-	-	-	0.6	-
DO NOT KNOW	-	-	-	1.9	0.6	-
7. <u>MEAN CHILDREN EVER BORN</u>	5.35	4.91	5.58	5.75	7.03	5.47
8. <u>MEAN LIVING CHILDREN</u>	4.81	4.41	4.93	5.04	6.04	4.60
9. <u>IDEAL FAMILY SIZE</u>	5.05	4.30	4.83	4.72	5.11	5.58
10. <u>DESIRE OF CHILDREN IN FUTURE</u>	2.81	1.79	3.33	1.67	-	2.31
11. WHEN COMMENCED TO USE METHOD(IN MONTHS)	21.47	30.79	20.79	28.45	46.66	31.97
12. <u>AGE AT THE TIME OF USING METHOD</u>	29.93	29.86	30.43	32.72	33.82	31.66

If we generalize from the data about the nature of contraceptive used (whether it is permanent or not), age at which the use commenced and the period of contraception practice, the following pattern of various contraceptive users emerges. Among the more educated couples (and in which husband works as an employee), husband and/or wife commence use of non permanent methods earlier in their married lives. The methods they use place the onus more on the husbands (e.g.

all current users of contraception had much higher level of educational and literacy levels. Female sterilization, oral pill, injection and IUD were used by relatively less literate and more rural respondents and withdrawal and condom were used by more literate and urban respondents.

If we generalize from the data about the nature of contraceptive used, age at which the use commenced and the period of contraception practice, the following pattern emerges. Among the more educated couples husband and/or wife commence use of non-permanent methods earlier in their married lives. The methods they use places more onus on the husbands. But as the duration of married years increases the responsibility of contraceptive use shifts to women who tend to use more or less permanent method of female sterilization or clinical method of IUD. The analysis also suggests that given the age at which female sterilization, the most commonly used contraceptive method in Pakistan, commences and the realized fertility of those who use this method, it is not likely to have significant impact on the overall fertility patterns.

SOME RECOMMENDATIONS FOR FUTURE RESEARCH

In the course of carrying out our analysis of PCPS data we became aware of several research possibilities some of which we would like to mention here, albeit briefly:

1. Future surveys of contraceptive prevalence should include a complete record of all live births. This information would make it possible to ascertain the changes in fertility behaviour and patterns in Pakistan. The simplest and possibly the most effective way of doing this will be to undertake cohort analysis of total live births in the first 10 years of marriage. For example a matrix which shows cohorts of women married in 1955, 1965 and 1985 and the total live births in the first 10 years of married life of each cohort should provide valuable information about the changes in fertility pattern over the past 30 years. Such data should be of great value in assessing the success of population welfare programme.
2. The shy-users appear to be a distinct sub-group of PCPS respondents. It warrants further research to determine the extent to which shyness is a

methodological, physiological or cultural artifact. A re-survey of shy users should enable us to determine this.

3. Given the similarities among the groups who use withdrawal and condom, an ethnographic/sociological study may be desirable to ascertain whether or not the persons using these methods really differentiate between the two methods. This information should be useful for the marketing of condoms.

4. Fertility research requires some basic understanding of the sexual behaviour patterns of married couples. An indepth study into fertility and sexual beliefs and practices should provide useful benchmarks for understanding resistance to contraceptive use in Pakistan.

5. In PCPS questionnaires' data were collected about the interview visits and interview time. It is recommend that in all future PCPS data information about the length of interview, interviewers' age and affiliation should be coded. This would enable researchers to ascertain the methodological biases in data collection. For example in the instance of Swat high current use rate may be a function of the fact that the interviewers were also the programme personnel. All future surveys should have data to assess the field work, interview and coding biases. This will not only enable us to assess the survey results more accurately but can also be used for training future interviewers and integrated with the professional training programme on research methodology.

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condom and withdrawal). But as the duration of years married increases onus of contraceptive use shifts to women who tend to prefer more or less permanent methods such as female sterilization or IUD. Female sterilization method, the most commonly used contraceptive method in Pakistan according to PCPS data, given the age at which it is commenced and the realized fertility, is not likely to have significant impact on the overall fertility patterns. It may be that there is a higher tendency among older women with large families to go for sterilization than younger women who have not attained the desired number of children and for social and cultural reasons.

CONCLUSIONS

There appear to be four socio-philosophical bases underlying the state intervention in population planning and family planning. These are Deontic, Environmentalist, Development Distributivists, and Family Planning. In Pakistan the Development Distributivists and Family Planning rationales appear to be the basis of population planning and population welfare policies of the successive governments since 1960s. The primary means through which governments in the developing countries seek to reduce fertility is the use of contraception. There appears to be an emerging consensus that both family planning and economic development contribute to fertility decline and the two have a synergistic effect.

One of the objectives of this research study was to undertake further analysis of the Pakistan Contraceptive Prevalence Survey data to investigate patterns of variations in contraceptive use, non-use and knowledge in the country at the district level. The result of this analysis reveals significant variation in contraceptive use and knowledge among the districts in Pakistan. Of the 55 districts in Pakistan only 19 had current use rates about or above the national norm. About 25 districts had the prevalence rates which were less than half of the national rate. Ten districts - Rawalpindi, Islamabad, Lahore, Faisalabad, Jhang, Multan, Karachi, Quetta, Swat and Peshawar account for 63 percent of all current users. The contraceptive use at the district level is positively related to its level of socio-economic development.

The PCPS Report had identified shy users of contraceptive and claimed their proportion to be around 7 percent in the country thus claiming that the real level of contraceptive use in the country among the non-pregnant 15-49 years old women

was 16.1 percent and not 9.1 percent. An analysis of the methodological assumptions underlying the methodology to identify shy users raises some serious questions about the real size of shy users in Pakistan.

Analysis of comparative socio-economic and demographic profiles of current users, ever-users, non-users with knowledge, non-users without knowledge and shy users revealed that in socio-economic and demographic attributes current users and ever users are similar to each other. They are mainly urban residents, more educated and literate and married to more educated and literate men who are working as employees (wage workers). The differences between their ideal family sizes and realized fertility is similar and they also are similar in terms of mean number of male children.

Slightly more non-users with knowledge than without knowledge of contraceptive reside in urban areas. They are also more literate and educated and married to more literate and educated men. There is a slight concentration of the husbands of non-users without knowledge in the rural occupations. This group also has larger ideal family size than the non-users with knowledge. The non-users of contraceptives with knowledge primarily do so because of socio-cultural reasons. Both groups have the same number of living male off-springs and tended to be younger than the other groups.

The shy users appear to have their own distinctive profile. They are much older than the other groups and are equally divided in terms of urban-rural residence. They are more educated than non-users but less than the current and ever users of contraceptives. They fall into a similar position in terms of their own and their husband's educational and literacy levels. They are also the group whose husbands are likely to be most unemployed. Those who are working are roughly equally distributed in agricultural, wage work and self-employed occupations. The shy users have the largest number of mean children ever born (6.5) and consequently greatest distinction between the ideal and actual fertility. Their main reasons for disapproving family planning are socio-cultural. They also had about the same number of living male children as the current and ever users.

Analysis of socio-economic and demographic profiles of groups of respondents using six main types of contraceptive methods in Pakistan showed that

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CORRELATES OF FERTILITY BEHAVIOUR IN PAKISTAN: SOME EVIDENCE FROM PAKISTAN CONTRACEPTIVE PREVALENCE SURVEY 1984-85

FARHAT YUSUF*
A. RAZZAQUE RUKANUDDIN

The study was designed to examine the correlates of fertility behaviour from the socio-economic, demographic and programme related data collected through interviewing 7405 currently married women in Pakistan Contraceptive Prevalence Survey 1984-85. The study showed that education of wife had much greater impact on reproductive behaviour than education of the husband alone. On the other hand women who reported no child mortality had substantially lower level of fertility. It was also noted that the higher parity women were more likely to have knowledge of methods and a favourable attitude towards family planning. These women had also experienced higher use of contraception. The findings have important implications for Pakistan's Population Welfare Programme which has the prime objective of reducing fertility through reduction in infant and childhood mortality and recruitment of younger and lower parity women in the programme.

INTRODUCTION

This study is part of a series of in-depth analyses undertaken at the National Institute of Population Studies (NIPS), using data from the 1984-1985 Pakistan Contraceptive Prevalence Survey (PCPS) [1]. In this article attempt is made to analyse the data on demographic, socio-economic and KAP (Knowledge, attitude and practice of family planning) as correlates of fertility in Pakistan.

Although data on both the current and cumulative fertility were collected in the PCPS, the scope of this study is limited to the latter, since it provided sufficiently large and statistically stable numerators for the computation of age specific indices of fertility.

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Average parity, being the most commonly used indicator of cumulative fertility and calculated in terms of the total children ever born per woman, was taken as the dependent variable. Given that the age of a woman has a high positive correlation with her fertility ($r = +0.69$), the effects of all the independent variables (demographic, socio-economic and KAP) have been studied after controlling for differences in the age distributions of women belonging to various categories of these variables. Finally, an attempt has been made to fit a series of multiple regression models in order to study the impact of selected independent variables on the cumulative fertility levels, separately for the rural and urban segments of the national population.

DATA AND METHODS

The statistical information presented in this study pertains to 7,405 currently married female respondents aged 15 to 49, who were interviewed in the PCPS. These women were selected using a two-stage stratified probability sample of 7,398 households, of which 98 percent were successfully interviewed in the survey. Female interviewers were used for the field work, which was undertaken over a period of 5 months beginning October 1984. For more details about the methodology, the reader may refer to the main PCPS report [1].

The data file made available to the authors contained information on individual respondents, along with a weighting factor which was the reciprocal of an individual woman's probability of selection in the sample. Although the main survey report presents weighted estimates in terms of the 11,893,916 women which the sampled respondents were representing, for ease of calculation and comprehension of the data, it was decided to scale down the weighting factors to the base figure of 7,405. This was achieved by multiplying the weighting factor for each respondent by a constant equal to $7,405/11,893,916$. Total number of children ever born was taken as the dependent variable. A list of independent variables is given below:

DEMOGRAPHIC VARIABLES

1. Age at marriage of the respondent.
2. Percentage of children ever born who were alive at the time of the survey.

3. Number of living sons.
4. Ideal family size.
5. Difference in ideal family size and the surviving number of children.

SOCIO-ECONOMIC VARIABLES

1. Education of the respondent.
2. Education of the husband.
3. Work status of the respondent.
4. Urban-rural residence.

KAP VARIABLES

1. Respondent's knowledge of family planning.
2. Respondent's attitude towards family planning.
3. Husband's attitude towards family planning.
4. Ever use of family planning methods.
5. Current use of family planning methods.

It may be noted that throughout this study, age of the respondent was used as a control variable. Indirect standardisation procedure [2] was used in order to calculate the standardised fertility ratio (SFR) for various groups of women. These were defined as the ratio of actual (A) to expected (E) number of children ever born to women in the particular group. The denominator of SFR (*i.e.* E) was computed under the assumption that the age specific average parities for the whole sample were applicable to women belonging to the group for which the SFR was being calculated.

Standard errors were computed using the formula $(A)^{1/2}/E$, so as to test the statistical significance of SFRs [3]. Thus, if the observed SFR was within the limits $100 \pm K$ times the standard error of SFR, the null hypothesis, *i.e.* that the observed SFR was not statistically different from 100, was accepted. The values of K were set at 1.96 and 2.58 for five percent and one percent levels of significance respectively.

The age standardised average parities, for various groups of women were derived as the product of the average parity of the standard population (in this case the total sample) and the SFR for the particular group. Finally, the step-wise regression technique was used to estimate the parameters of various multiple regression models presented in this report.

OVERALL LEVELS OF CUMULATIVE FERTILITY

The 7,405 female respondents reported a total of 31,702 children. Although 11 percent (821 women) were childless at the time of the survey (Table 1), nearly three-quarters of these were younger than 25 and had probably not been married long enough to have children. In a society like Pakistan, where the average age at marriage is low [4] and an early start to childbearing is encouraged, one could assume that a woman who has remained childless by the age of 30 is most probably sterile; such women were around 3 percent of all respondents aged 30 and over.

Average parity for all women was 4.3 children and, as expected, there was a positive age gradient in the schedule of average parity. Figure 1 shows the age specific average parities in the PCPS alongwith fertility rates for all and for married women cumulated to specified ages. Under the conditions of constant age specific fertility and, to a lesser extent, the age specific mortality rates, one would expect the lower two curves, drawn in Figure 1, to be more or less identical. Any deviations could partly be due to changes in fertility but are more likely due to recall lapse, imprecise definition of the reference period used for obtaining data on current fertility and other response errors, which are commonly found in demographic sample surveys in developing countries such as Pakistan.

Finally, the cumulative age schedule of marital fertility, the top curve in Figure 1, shows that the current fertility levels of married women were probably even higher than those revealed by their average parities reported in the PCPS. It may, however, be noted that the cumulative fertility rates for all and for married women, as shown in

FIGURE 1
AVERAGE PARITIES AND CUMULATIVE FERTILITY RATES BY AGE:
PAKISTAN CONTRACEPTIVE PREVALENCE SURVEY, 1984-85

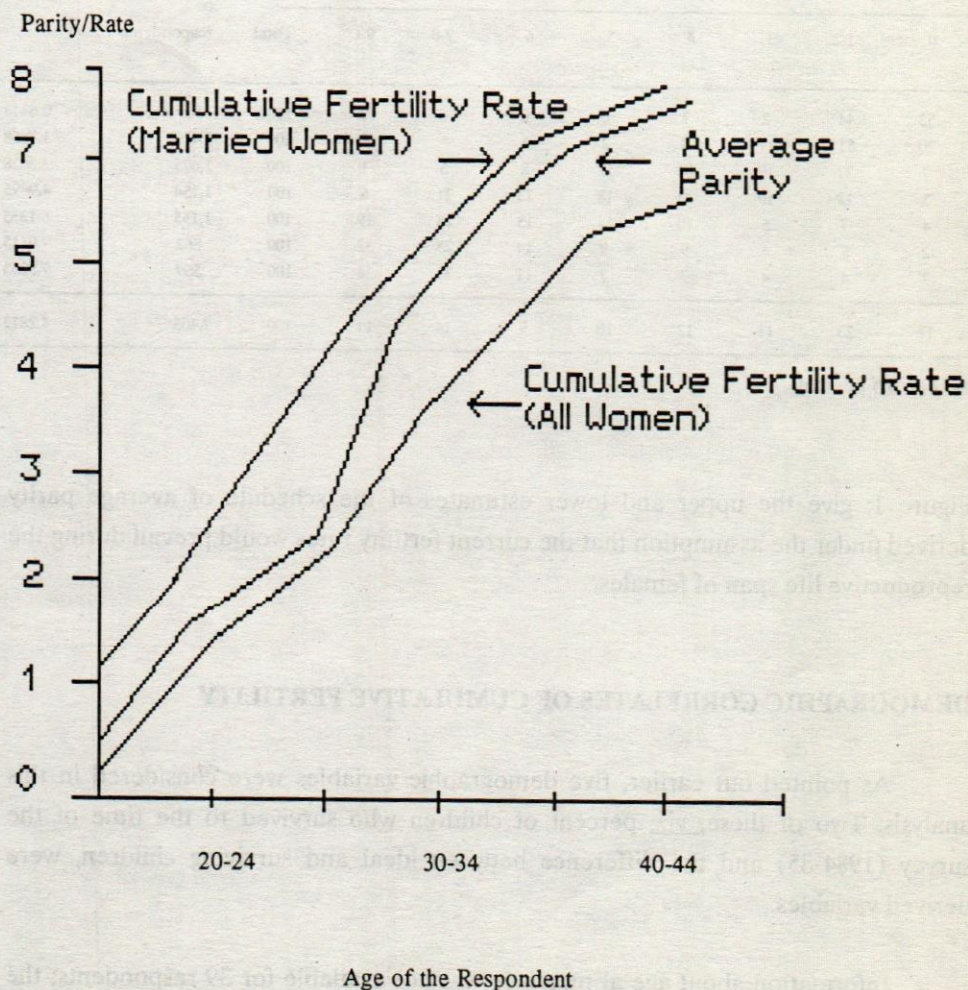


Table 1

AGE-SPECIFIC PERCENTAGE DISTRIBUTIONS OF RESPONDENTS BY PARITY:
PAKISTAN PCPS, 1984-85

Age of respondent	Parity									Weighted number of respondents	Average parity
	0	1-2	3	4	5	6	7-8	9+	Total		
15-19	53	44	2	1	0	0	0	0	100	569	0.6344
20-24	20	51	17	8	2	1	*	*	100	1,420	1.7858
25-29	7	27	19	20	12	8	5	1	100	1,675	3.3628
30-34	3	12	10	17	18	13	21	6	100	1,154	4.9895
35-39	4	7	6	10	14	13	28	19	100	1,155	6.1335
40-44	2	5	4	9	9	14	25	32	100	863	7.0115
45-49	2	4	4	7	7	11	31	34	100	569	7.5263
15-49	11	23	11	12	10	9	14	11	100	7,405	4.2812

* Less than 0.5 percent.

Figure 1, give the upper and lower estimates of the schedule of average parity derived under the assumption that the current fertility rates would prevail during the reproductive life span of females.

DEMOGRAPHIC CORRELATES OF CUMULATIVE FERTILITY

As pointed out earlier, five demographic variables were considered in this analysis. Two of these, viz. percent of children who survived to the time of the survey (1984-85) and the difference between ideal and surviving children, were derived variables.

Information about age at marriage was not available for 39 respondents; the median age at marriage for the remainder was 18.4 years. Contrary to the findings of

previous studies [5] which showed a trend of rising age at marriage, analysis of the PCPS data revealed very little change in average age at marriage for different birth cohorts of respondents. Indeed, the correlation coefficient between age and age at marriage of the respondent was +0.12. It is, however, interesting to note from Table 2 that the negative association between age at marriage and fertility, as found in previous studies, was confirmed by the PCPS data.

Percent of children who survived to 1984-85 was derived so as to get an indication of childhood mortality and its possible influence on cumulative fertility in Pakistan. Excluding the childless women, it was found that 44 percent of all respondents had experienced the death of one or more of their children. Overall, the average parity for women who reported child mortality was 6.4 compared to 3.6 for those who reported that all of their children were alive. Even after standardising for the confounding effect of age distribution of respondents on both their cumulative fertility and proportion of surviving children, it was noted that the fertility of the former group was about 40 percent higher than that of the latter group.

Number of living sons and ideal family size did reveal positive association with cumulative fertility, which persisted even after standardising for differences in age distributions. It is, however, interesting to note that the 489 women who did not give a numerical response to the question of ideal family size had exhibited reproductive behaviour more or less identical to the overall average for the sample.

Another derived variable was the difference between ideal and surviving children. It appears from the data presented in Table 2 that only 29 percent of the respondents, who give a numerical response to the question of ideal family size, reported ideal family size equal to their surviving children. On the other hand, a majority (57 percent) had an ideal family size greater than the number of their surviving children; this group had the lowest average parity.

Table 2

**ANALYSIS OF CUMULATIVE FERTILITY BY SELECTED DEMOGRAPHIC
VARIABLES: PAKISTAN PCPS, 1984-85**

Variable	Weighted number of respondents	Average age	Average parity	SFR	SE	Age adjusted average parity
<u>AGE AT MARRIAGE OF THE RESPONDENT</u>						
<16	2,397	30.2	5.1	120	1.1	5.1
16-19	3,266	29.8	4.1	102	0.9	4.4
20-24	1,424	31.8	3.6	77	1.1	3.3
25+	279	35.7	2.8	50	1.8	2.1
<u>PERCENT OF CHILDREN WHO SURVIVED TO 1984-85</u>						
<51	703	30.7	4.8	133	1.9	4.8
51-75	1,194	34.8	6.7	124	1.4	5.3
76-99	959	36.5	7.4	127	1.5	5.4
100	3,728	29.3	3.6	89	0.8	3.8
Childless women	821	22.7	--	--	--	--
<u>NUMBER OF LIVING SONS</u>						
0	1,861	24.5	1.3	50	1.0	2.1
1	1,817	28.2	3.2	86	1.1	3.7
2	1,519	31.8	4.9	104	1.2	4.5
3	1,072	35.4	6.4	115	1.4	4.9
4+	1,137	37.7	8.0	132	1.4	5.6
<u>IDEAL FAMILY SIZE</u>						
<4	1,061	30.2	2.9	70	1.3	3.0
4	2,426	29.1	3.5	90	1.0	3.9
5	1,308	30.6	4.7	108	1.4	4.6
6	1,183	31.1	4.8	106	1.4	4.5
7+	939	34.4	6.9	129	1.6	5.5
God's will	489	29.6	4.0	101	2.3	4.3
<u>DIFFERENCE BETWEEN IDEAL (I) AND SURVIVING (S) CHILDREN</u>						
I = S	2,021	35.3	6.0	108	1.0	4.6
I > S	3,946	26.5	2.6	80	0.8	3.4
I < S	950	37.8	7.8	129	1.5	5.5

SFR : Standardised fertility ratio (%)

SE : Standard error of the SFR.

SOCIO-ECONOMIC CORRELATES OF CUMULATIVE FERTILITY

A substantial proportion of the respondents and their husbands (85 and 52 percent respectively) were illiterate. The literate and relatively more educated respondents were somewhat younger compared to the illiterate respondents. Similar conclusions could also be drawn in respect to the average age of women according to the education of their husbands. These findings do indicate the possibility of an increasing trend in literacy and educational levels.

As regards the analysis of fertility in relation to education, it is obvious from Table 3 that there was a strong negative association between fertility and education. The effect of respondent's education was indeed much more stronger than that of the husband. For example, while the level of fertility of 102 college educated respondents was only 58 percent of that of the whole sample, the corresponding figure for the 526 respondents married to college educated men was only 81 percent.

Nearly half of the couples consisted of both partners being illiterate. Conversely, only 14 percent of the couples were literate. It is interesting to note that while couples where both partners were literate, were nearly one-fifth less fertile compared to illiterate couples (SFRs were 84 and 103 respectively), for the remainder it was the literacy of the wife, rather than that of the husband, which had a depressing influence on fertility.

Female participation in the labour force was apparently minimal, as 98 percent of the respondents were either housewives or working for family businesses. Although the average parity of housewives was substantially lower than that of the working women, the differential was reduced to insignificance when age standardised average parities were calculated. These findings are quite similar to those reported by Shah and Shah [6] based on the analysis of the Pakistan Fertility Survey data.

Table 3

**ANALYSIS OF CUMULATIVE FERTILITY BY SELECTED SOCIO-ECONOMIC
VARIABLES: PAKISTAN PCPS, 1984-85**

Variable	Weighted number of respondents	Average age	Average parity	SFR	SE	Age adjusted average parity
<u>EDUCATION OF THE RESPONDENT</u>						
Illiterate	6,259	30.8	4.5	102	0.6	4.4
Primary	608	28.8	3.6	93	2.0	4.0
Secondary	436	28.9	3.2	84	2.2	3.6
College	102	29.3	2.3	58	3.8	2.5
<u>EDUCATION OF THE HUSBAND</u>						
Illiterate	3,821	31.5	4.7	104	0.8	4.5
Primary	1,190	30.1	4.4	105	1.5	4.5
Secondary	1,830	29.2	3.7	94	1.1	4.0
College	526	29.0	3.2	81	2.0	3.5
<u>LITERACY OF THE COUPLE</u>						
Both literate	1,016	28.8	3.3	84	1.5	3.6
Wife illiterate	2,538	29.7	4.1	100	1.0	4.3
Husband illiterate	129	29.2	3.8	97	4.3	4.2
Both illiterate	3,692	31.6	4.7	103	0.8	4.4
<u>WORK STATUS OF THE RESPONDENT</u>						
Home duties only	5,924	33.8	4.2	99	4.1	4.2
Works for employer	118	31.8	5.0	100	1.3	4.3
Work for family business	1,347	30.2	4.7	103	0.6	4.4
<u>OCCUPATION OF THE HUSBAND</u>						
Agricultural work	2,549	31.3	4.5	101	0.9	4.3
Salaried employee	2,313	29.5	3.9	96	1.0	4.1
Self employed	2,212	30.5	4.4	103	1.0	4.4
Unemployed	315	32.0	4.3	96	2.6	4.1
<u>PLACE OF RESIDENCE</u>						
Rural	5,284	30.3	4.2	100	0.7	4.3
Urban	2,121	31.0	4.4	100	1.0	4.3

SFR : Standardised fertility ratio (%).

SE : Standard error of the SFR.

Occupation of the husband was unfortunately precoded in categories which were not very meaningful. It appears that nearly one-third of the respondents were married to agricultural workers, and a similar proportion were married to salaried employees and self employed men. Given that nearly 70 percent of the population of Pakistan lives in villages, it is improbable that only one-third of the respondents were married to agricultural workers.

In terms of their fertility behaviour, respondents married to self employed men and those married to agricultural workers had higher fertility compared with wives of the salaried employees, many of whom were probably working and living in urban areas. This indication of somewhat lower fertility of urban people was negated by the analysis of fertility according to the urban-rural residence of the respondents, which showed that although the urban fertility was marginally higher, the differential disappeared when age standardisation was performed. These findings are similar to those based on the analysis of Pakistan Fertility Survey data [7].

KAP, CORRELATES OF CUMULATIVE FERTILITY

Slightly more than half of the respondents (54 percent) had knowledge of family planning (Table 4). This was in marked contrast to the much higher figures reported in the National Impact Survey and the Pakistan Fertility Survey [8] but substantially lower than those reported in the Population, Labour Force and Migration Project [9]. Obviously, some of these disparities could be explained by the methodological differences between the various surveys.

Overall, respondents who had knowledge of family planning were somewhat older and exhibited higher fertility compared to those who had no knowledge of family planning. Thus, apparently the message of family planning is not getting across to the younger, lower parity women in Pakistan.

Unfortunately, the information on approval of family planning was not available for 60 percent of the respondents or their husbands. For the remainder, a much higher proportion of women approved of family planning compared to their husbands. Those women who did approve of family planning were, on the average, younger. Although their fertility levels seemed to be somewhat lower in contrast to

those not approving family planning. The fertility differentials between the two groups disappeared when average parities were adjusted for differences in age distributions.

Table 4

ANALYSIS OF CUMULATIVE FERTILITY BY KAP VARIABLES: PAKISTAN PCPS, 1984-85

Variable	Weighted number of respondents	Average age	Average parity	SFR	SE	Age adjusted average parity
RESPONDENT'S KNOWLEDGE OF FAMILY PLANNING						
Has knowledge	3,980	31.0	4.5	103	0.8	4.4
No knowledge	3,425	30.0	4.0	97	0.8	4.2
RESPONDENT'S ATTITUDE TOWARDS FAMILY PLANNING						
Approves	1,682	30.2	4.3	104	1.2	4.5
Disapproves	1,024	31.6	4.6	104	1.5	4.5
No response/ not applicable	4,699	30.4	4.2	98	0.7	4.2
HUSBAND'S ATTITUDE TOWARDS FAMILY PLANNING						
Approves	1,158	30.0	4.3	104	1.5	4.5
Disapproves	1,025	31.4	4.7	105	1.5	4.5
Uncertain	230	31.9	4.3	96	3.0	4.1
No response/ not applicable	4,992	30.4	4.2	98	0.7	4.2
EVER USE OF FAMILY PLANNING METHODS						
Ever used	877	33.8	5.7	112	1.6	4.8
Never used	6,528	30.1	4.1	98	0.6	4.2
CURRENT USE OF FAMILY PLANNING METHODS						
Using	565	34.5	5.8	110	1.9	4.7
Not using	6,840	30.4	4.2	100	0.6	4.3

SFR : Standardised fertility ratio (%).

SE : Standard error of the SFR.

While 12 percent of the respondents had ever used one or more family planning methods, only 8 percent were current users. The proportion of women who had ever used contraception was of a similar order of magnitude to that found in the National Impact Survey and the Pakistan Fertility Survey. However, the proportion of current users was substantially higher than that reported in the above mentioned studies [8].

On the whole, the users were much older and of higher parity as compared to the non-users. Even after age standardisation the average parity of the former was 10-12 percent higher than that of the latter.

MULTIPLE REGRESSION MODELS OF CUMULATIVE FERTILITY

On the basis of the analysis reported above, an attempt was made to fit multiple regression models in order to quantify the effect of some of the important independent variables. Since the purpose of this research study is not to test any hypothesis, therefore recourse has been taken to the selection of demographic variables as independent variables in the regression analysis. Two models each were estimated for Pakistan and its urban-rural components, using the step-wise regression technique. The only difference between the two sets of models was that age of the respondent was used as a predictor of fertility in one but not in the other model.

An examination of the explanatory powers of the two sets of models, as shown in Table 5, reveals that in Model 1 age of the respondent alone could explain about half of the variation in fertility and that the remaining three independent variables in the order of importance were:

- . proportion of children who survived to the time of the survey,
- . number of sons, and
- . age at marriage of the respondent.

Moreover, it is evident from Table 5 that the multiple regression models consisting of the four independent variables accounted for 69 percent of the variation in fertility in Pakistan as well as its urban and rural components. On the other hand, omitting the age of the respondent reduces their explanatory power to 50, 49 and 52 percent for the national, urban and rural models respectively.

Estimated values of coefficients of the various multiple regression models are shown in Table 6. It is interesting to note that age at marriage was the only factor which had a negative effect on fertility. The positive correlation between fertility and proportion of children who survived to 1984-85 was surprising, particularly in the light of previous findings. Further refinements of these models and application of other multivariate techniques are, indeed, most desirable. Specifically the models should focus on the effect of demographic, socioeconomic and programme variables on fertility at regional levels particularly for rural, urban, major urban and large provinces. Of particular importance are the multivariate models which could isolate the programme impact, socioeconomic impact and combined impact of the two on fertility levels.

Table 5

EXPLANATORY POWERS OF TWO MODELS ESTIMATED BY STEP-WISE REGRESSION TECHNIQUE: PAKISTAN PCPS, 1984-85

Variable added	Pakistan		Urban		Rural	
	R ² (%)	SE	R ² (%)	SE	R ² (%)	SE
<u>Model 1</u>						
AGE	48	2.27	47	2.32	48	2.24
PSURV	58	2.04	57	2.09	59	2.00
SONS	65	1.86	64	1.91	66	1.83
AGMAR	69	1.75	69	1.76	69	1.74
<u>Model 2</u>						
SONS	30	2.64	30	2.67	32	2.57
PSURV	49	2.24	48	2.30	51	2.19
AGMAR	50	2.22	49	2.27	52	2.17

AGE : Age of the respondent.
 PSURV: Proportion of children who survived to 1984-85.
 SONS: Number of living sons.
 AGMAR: Age at marriage of the respondent.
 R²: Coefficient of determination.
 SE: Standard error of the coefficient of determination.

Table 6

TWO MULTIPLE REGRESSION MODELS OF FERTILITY BEHAVIOUR:
PAKISTAN PCPS, 1984-85

Variable	Pakistan		Urban		Rural	
	B	SE	B	SE	B	SE
Model 1						
(Constant)	-0.263	0.130	-0.168	0.208	-0.262	0.167
AGE	0.192	0.003	0.202	0.005	0.185	0.004
PSURV	1.891	0.046	1.855	0.073	1.951	0.058
SONS	1.844	0.053	1.926	0.087	1.778	0.066
AGMAR	-0.196	0.007	-0.010	0.010	-0.188	0.009
Model 2						
(Constant)	2.480	0.155	2.912	0.251	2.282	0.198
SONS	3.238	0.061	3.400	0.103	3.101	0.076
PSURV	2.881	0.054	2.816	0.090	2.956	0.068
AGMAR	-0.098	0.008	-0.116	0.012	-0.090	0.011

AGE: Age of the respondent.
 PSURV: Proportion of children who survived to 1984-85.
 SONS: Number of living sons.
 AGMAR: Age at marriage of the respondent.
 B: Multiple regression coefficient.
 SE: Standard error of the multiple regression coefficient..

CONCLUSIONS

Many important conclusions could be drawn from the analysis of the PCPS data reported in this study.

As regards the demographic variables, age at marriage and survivorship of children were found to have a substantial depressing influence on fertility. While the effect of age at marriage is well documented in Pakistan, the finding that women who reported no childhood mortality had substantially lower fertility is rather new, and very significant. This is, indeed, a very important finding for both the population welfare and the public health sectors of Pakistan's development programme. Further research on the relationship between fertility and childhood mortality should be given a high priority.

Education was the only socio-economic variable which had a significant lowering effect on fertility. It was noted that education of the wife had a much greater impact on reproductive behaviour than education of the husband alone. Since the provision of educational facilities, particularly for females, are improving in Pakistan, such improvements in conjunction with the greater participation of females in the work force are likely to facilitate the decline in fertility.

In case of the KAP variables, it was noted that the higher parity women were more likely to have knowledge and a favourable attitude towards family planning. These women had also experienced higher prevalence of contraceptive use. Obviously, such women are willing to use contraception when they have achieved their desired family size. Given that the ideal family size in Pakistan is around four children, it is important for the success of the Population Welfare Programme that this be reduced. It could be achieved through the reduction of infant and childhood mortality, as well as a concerted programme to interest the younger and lower parity women in the desirability of a smaller family size, and the acceptability of contraception.

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SOME CORRELATES OF CHILDRENS' PARTICIPATION IN LABOUR FORCE IN PAKISTAN

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By utilizing child labour force data for age group 10-14 from decennial population censuses of Pakistan the study shows that male and female child labour force participation rates declined only slightly from 38 and 5 percent in 1961 to 35 and 3 percent respectively in 1981. Similarly in rural areas these rates also declined only slightly from 45 and 6 percent in 1961 to around 41 and 4 percent in 1981. However in urban areas the rates remained constant at about 18 and one percent respectively during the 20 years period under consideration. Multivariate analysis of the 1981 census data shows that socio-economic variables tended to explain greater variation in child labour force participation in Pakistan. Among the socio-economic variables enrollment ratios of children, literacy and educational attainment exerted depressing effect whereas fertility level exerted positive effect on children participation rates.

INTRODUCTION

According to the demographic transition theory the population growth in industrialized countries of Europe under-went changes in three distinct phases. Initially from the stable high birth and death rates, mortality in these countries started declining in response to increased socio-economic development, improved medical knowledge and health care [1]. Later on fertility also started declining in these countries and consequently both fertility and mortality continued to follow almost parallel downward trend with the decline of fertility lagging behind. In the end both these components of population growth reached the very low levels resulting in the prevalence of low risk of mortality and small family norms. A whole complex of interacting factors have been responsible for effecting the decline of fertility from its high level to the present low in those countries. However, one of the important factor which contributed to fertility decline was the increasing cost of rearing children [1, p.88]. Prevalence of child labour, a consequence of industrial revolution, was ultimately abolished and compulsory education laws for children

* The author is Senior Fellow in National Institute of Population Studies (NIPS), Islamabad. He is grateful to Dr. M.S. Jillani, Executive Director NIPS, for providing constant encouragement and guidance during the preparation of this study. Thanks are due to Dr. Sultan S. Hashmi and Dr. A. Razzaque Rukanuddin, Research Advisor and Director in NIPS, for providing comments on an earlier draft of this paper. Syed Imtiaz Hussain Shah cheerfully typed the whole manuscript.

were enacted. Thus children ceased to be a source of income for their parents and instead became liability in view of the increasing education expenditure incurred on them.

CHILDRENS' PARTICIPATION IN LABOUR FORCE

The phenomenon of child-work dates back to old times when all the members of a family used to work together to earn their livelihood. This phenomenon is still prevalent in most of the developing countries of the world, especially more so in the rural sectors of these countries. Children as members of the families tend to work within their family circles right from age six years onward. However the nature of work performed by children is usually light and free from harmful effects. Thus child-work is generated into child labour only when the work is imposed upon the child under conditions of exploitations and that the work calls for greater physical and mental resources than the exploited child possesses. In Western countries, after the industrial revolution, very young children used to work in factories under very inhuman working conditions. Children were ever found working in the coal mines of those countries in abysmal working conditions and without any insurance against the high risk [1, p.92].

Children usually start working at age 6 to 7, depending on the nature of work involved and the type of establishment such as the family tasks in and outside the field, commercial undertakings and industrial establishments. Entrants into labour force tend to increase with age and reach their maximum at age 14 and 15. Child labour is most commonly found in agriculture and to a lesser extent in services and industry. Wage earning children are, however, mostly concentrated in the informal sectors and usually in small enterprises which are not legally registered. In the agriculture sector children usually work in family farms, where they carry out light tasks such as carrying water, grazing of animals, drawing water, collecting fodder as well as collecting wood for home cooking. Grown-up children also help in weeding, spreading fertilizers, tending plants, sowing and reaping harvest. Due to high population pressure resulting from population growth, rural children migrate or are sent to cities in search of better economic opportunities. Here they are engaged in informal sector like carpet industries and also tend to perform varying jobs right from cleaning shoes to loading and unloading of goods and sometimes getting indulged in street begging [1, p.301].

It is usually in medium size and large size cities that children are observed to be working in non-familial undertakings in transport and manufacturing industry and it is here that the wage-earning children are exploited more. They are given low wages under poor working conditions and are treated poorly by their employers. The number of hours worked per day by children varies considerably according to the type of work and the needs of type of industry where they are working. In the agricultural sector seasonal work such as sowing and harvesting demands many young persons for long working hours. In the service sector however the working hours are usually long especially for females who are engaged as domestic servants. The period of daily rest provided to children in almost all types of activity is often not sufficient and nor are they granted the weekly holidays enjoyed by adults.

The working children remain at risk of accidents or diseases more than an adult worker mainly because of the prolific working conditions in industries where machineries are employed. Exposure to hostile weathers such as heat, light and infectious environment in the agriculture sector all contribute to endemic and parasitic diseases among children. Overcrowding is a usual phenomenon in the urban areas of developing countries where sizeable number of persons continue to live under the same roof, in poverty and in insanitary living conditions. Children living under these conditions are deprived from education, proper clothing, parental care and supervision. They are usually under-nourished, their diet mostly remains poor and they suffer from poor health.

The growing size of young population resulting from the high growth rate of population in developing countries gives rise to tremendous pressure on existing educational facilities. There exists acute shortage of schools, especially in rural areas, which cannot accommodate the growing young population. Shortage of schools, absence of compulsory education and non-implementation of laws forbidding child labour are the main reasons for children's entrance into the labour force. Besides, poor income level of the parents prevents children from going to school and instead forces them to become an earning member of the household from an early age.

OBJECTIVE, DATA SOURCE AND LIMITATION

The objective of the present study is to examine the levels and trends of childrens' participation in labour force in Pakistan as well as to examine some of its determinants at cross-sectional level. Data on childrens' participation in labour force can be made available from micro level surveys as well as from macro level data obtained from population censuses and labour force surveys. In the absence of any micro level data obtained from surveys, attempt has been made here to utilize the 1981 census survey data available at district level. It may be pointed out that 'no worthwhile study on child labour involving time budget data at household level has been carried out in Pakistan. In Pakistani censuses [2; 3; 4; 5] no direct question on childrens' involvement in economic activity has been asked. Instead the general question on economic activity had been directed towards persons 10 years old and over at the time of censuses [3;5;6]. Since the lower limit for employment in Pakistan, has been fixed at age 15 [7] population aged 10-14 reported as engaged in economic activity is considered as child labour. This study is, however, limited in scope as it excludes children 6-9 years of age who, in one way or the other, might be engaged in economic activities.

LEVELS AND TRENDS IN CHILD LABOUR

The phenomenon of child labour in Pakistan is not different from that prevalent in other developing countries of the world. The two distinct areas of the country namely rural and urban are dominated by two different kinds of child labour activities. In rural areas of Pakistan children start taking part in household maintenance activities right from an early age. Depending on age and the physical strength, they start performing useful tasks such as gathering fuel, fetching water, and caring for younger children etc. Girls on the other hand are involved in sweeping, cleaning utensils, tending chickens and washing clothes. With increasing age boys become active in agricultural activities such as grazing animals, ploughing, weeding etc. In urban areas as well, children do help their parents around the household but there are others who for reasons of poverty are engaged mostly as wage earners in non-agricultural activities.

Due to rapid decline in the level of mortality and nearly constant or slowly declining fertility, the young population has grown faster in numbers as well as in

proportion. Thus unbalanced demographic development has caused social and labour problems. In order to meet the requirements for education and employment opportunities of these young population, huge national resources are required.

The population under 15 years of age in the country has ranged between 40 to 45 percent of the total population. According to 1981 census of population [5], young population under 15 constituted about 44.5 percent of the total population of the country. This proportion was among the highest in the world indicating that heavy investment was needed to provide educational and then employment opportunities to this 36.5 million young population. Excluding the 15.4 million children (19 percent) in 0-5 age group, the remaining population of 21.1 million children (25.7 percent) pertains to age group 6-14. On the other hand after excluding those from 21.1 million who enjoy schooling facilities, the rest are exposed to the risk of child labour in the year 1981. Data on child labour in Pakistan are available only for age group 10-14 which constitutes about 51 percent of the total population in age group 6-14.

The data for this study is taken from population censuses where the framing of questions on labour force and the employment of reference period tend to become the prime determinant of the size of labour force. For economic activity, in 1951 census [2] questions were asked of all persons of 12 years of age and over who were self-supporting or partly self supporting or were seeking a job with a reference period of one month preceding the enumeration date. In the 1961 census [3] all persons 10 years and over were asked whether they were working or looking for work during the last one week (applicable to non-agricultural workers).

In 1973 sample survey [6] all persons 10 years of age and over were asked whether they did any work at all in the week prior to the survey either for pay or profit, or if they worked for a minimum of 15 hours as unpaid family workers.

In 1981 census [5] persons 10 years and over were asked as to whether they did something and if not; were they looking for work. No reference period was however employed in the 1981 census.

Tables 1 through 3 display the size of child labour force for the years 1961, 1973 and 1981 alongwith its variation by rural-urban breakdown and sex. The

corresponding total population and its variation by rural-urban breakdown and sex alongwith labour force participation rates are also presented in these tables.

It may be noted that both size of population and of labour force show unexpected trends perhaps due to problems of 1973 sample survey. It will be worthwhile to point out that the 1972 census of population was undertaken just after the 1971 Indo-Pakistan war which resulted in subsequent separation of East Pakistan and supposedly its quality of enumeration was affected both due to the prevailing political disturbances and the untimely floods. Since the 1973 HED survey was based on the framework of 1972 census of population, there is every likelihood that the 1973 HED survey inherited all the peculiarities and inaccuracies of the 1972 census of population. As such not only the resulting size of the 1973 survey population but also the size of 1973 labour force has increased rather unexpectedly. The larger size of 1973 labour force may have been not only due to the inherited peculiarities and inaccuracies but also because of the inclusion of unpaid family workers which were required to be reported through the 1973 HED definition of labour force. Therefore first row of each sex category of tables 1 through 3 indicates much larger increases of population and labour force during the period 1961-73 as compared to (second row of each sex category of tables 1-3) 1973-81. If the figures for 1973 are disregarded, then it could be seen from table 1 that the population of age group 10-14 for both sexes and males grew at an average annual growth rate of 3.5 percent per annum during the period 1961-81 whereas the corresponding growth rate of labour force during the same period of time was 3.1 percent. Similarly the female labour force grew at an average annual growth rate of 2.3 percent as compared to the corresponding population growth of 3.6 percent. What this means is that the child labour force in Pakistan during the two intercensal decades has grown much less as compared to the growth of corresponding population. Moreover the growth of female labour force during this time was even less as compared to the growth of male labour force. In other words the total growth of child labour force had declined during these two decades with growth of female labour force declining much faster as compared to the growth of male labour force. Similar phenomenon is also prevalent in the rural areas of Pakistan (table 2), where corresponding growth rates for both the population and labour force are slightly lower. Regarding the situation in urban areas (tables 3), it can be seen that the growth rates in urban areas for both the population and labour force are

Table 1

Growth of Total Population and Economically Active Population For Age Group 10-14 By Sex:
Pakistan 1961, 1973 and 1981

Year	Population 10-14	Child Labour	Activity Rate	Period	Percent Increase		Annual Growth rate	
					Population	Labour	Population	Labour Force
BOTH SEXES								
1961	3,808,462	885,887	23.3	1961-73	111.2	141.7	6.1	7.3
1973	8,044,794	2,140,872	26.6	1973-81	34.3	2.4	4.0	0.3
1981	10,808,048	2,193,429	20.3	1961-81	183.6	148.0	3.5	3.1
MALES								
1961	2,097,595	805,476	38.4	1961-73	114.1	120.1	6.2	6.5
1973	4,490,914	1,773,226	39.5	1973-81	30.4	14.7	3.6	1.8
1981	5,856,744	2,034,363	34.7	1961-81	179.2	152.6	3.5	3.1
FEMALES								
1961	1,710,867	80,411	4.7	1961-73	107.7	357.2	6.0	12.8
1973	3,553,880	367,646	10.3	1973-81	39.2	-56.7	4.5	-10.5
1981	4,946,304	159,066	3.2	1961-81	189.1	97.8	3.6	2.3

Table 2

Growth of Total Population and Economically Active Population For Age Group 10-14: Pakistan
Rural 1961, 1973 and 1981

Year	Population 10-14	Child Labour	Activity Rate	Period	Percent Increase		Annual Growth rate	
					Population	Labour	Population	Labour Force
BOTH SEXES								
1961	2,795,203	779,968	27.9	1961-73	103.4	117.6	5.8	6.4
1973	5,686,910	1,697,159	27.8	1973-81	35.1	10.7	4.1	1.3
1981	7,683,590	1,878,092	24.4	1961-81	174.9	140.8	3.4	3.0
MALES								
1961	1,550,016	705,257	45.5	1961-73	107.5	104.2	6.0	5.8
1973	3,215,653	1,440,047	44.8	1973-81	30.7	20.8	3.6	2.5
1981	4,203,791	1,740,046	41.4	1961-81	171.2	146.7	3.4	3.0
FEMALES								

1961	1,245,187	74,711	6.0	1961-73	98.5	244.1	5.6	10.3
1973	2,471,257	257,112	10.4	1973-81	40.8	-46.3	4.6	8.6
1981	3,479,799	138,046	4.0	1961-81	179.5	84.8	3.5	2.1

Table 3

Growth of Total Population and Economically Active Population For Age Group 10-14: Pakistan Rural 1961, 1973 and 1981

Year	Population 10-14	Child Labour	Activity Rate	Period	Percent Increase		Annual Growth rate	
					Population	Labour	Population	Labour Force
BOTH SEXES								
1961	1,013,259	106,261	10.5	1961-73	132.7	317.6	6.9	12.0
1973	2,357,884	443,713	18.8	1973-81	32.3	-28.9	3.8	-4.4
1981	3,119,458	315,337	10.1	1961-81	207.9	196.7	5.7	5.5
MALES								
1961	547,579	100,207	18.3	1961-73	132.9	232.5	6.9	10.1
1973	1,275,261	333,179	26.1	1973-81	29.7	-11.7	3.5	-1.6
1981	1,652,953	294,317	17.8	1961-81	202.0	193.7	5.6	5.5
FEMALES								
1961	465,680	6,054	1.3	1961-73	132.5	1725.8	6.9	25.9
1973	1,082,623	110,534	10.2	1973-81	35.5	-81.0	4.1	-19.7
1981	1,466,505	21,020	1.4	1961-81	215.0	247.2	5.9	6.4

comparatively higher as compared to the growth rates prevalent in Pakistan and its rural areas. The one exception in urban area is the much higher growth of female labour force (6.4 percent) as against the growth of male labour force (5.5 percent) during the two decades under consideration. What is apparent from tables 2 and 3 is that the total growth of labour force for each sex declined in both the urban and rural areas during the decades excepting the female labour force in urban areas whose growth was larger as compared to the growth of the corresponding population.

Twenty three percent of children in 1961 were involved in labour activity with 27.9 percent being in rural areas and 10.5 percent in urban areas. In 1981, however, these percentages declined to respectively 20.3, 24.4 and 10.1 per cent. The

decline in activity rates during the 20 years period was only 3 percentage points at national level, comparatively slightly greater decline in rural areas (3.5 percentage points) and very small decline in urban areas (0.4 percentage points). Sex-wise differentials in activity rates were however more pronounced at all levels. In 1961 male and female activity rates were 38.4 percent and 4.7 percent respectively. In rural areas these were 45.5 and 6.0 percent and in urban areas 18.3 and 1.3 percent respectively. Sex-wise decline in male activity rates during 1961-81 were about 4 percentage points at national and rural level with corresponding decline in urban areas being negligible. Similarly sex-wise decline in female activity rates were about 2 percentage points during 1961-81 at both national and rural level with similar decline in urban areas being quite negligible. What is indicative of the given statistics is that childrens' labour activity rates in Pakistan are quite high, more so for males which are about two and a half times higher in rural than urban areas. Female rates are only about 7 to 12 percent of male rates and these too are 3 to 5 times higher in rural areas as compared to urban areas. Most of the decline (but very little) in activity rates during the last twenty years has occurred in rural areas probably because of rural-urban migration and because of socio-economic changes taking place in rural areas.

Table 4 yields the activity rates for the four provinces of Pakistan by sex. The only drawback of the table is that it does not provide the comparable figures for 1961. Mere concentration on 1981 data reveals the near stability of female rates across the provinces and their rural areas with rural rates being about 2 to 3 times higher than urban rates. Considerable variations across the regions exist within the male rates. Comparatively high male rates of the order of 51 to 54 percent are prevalent in the rural areas of Sindh and Balochistan, probably because young females due to observance of purdah, do not appear to work there in the field.

CORRELATES OF CHILDRENS' PARTICIPATION IN LABOUR FORCE

Having studied the levels and trends of childrens' participation in labour force in Pakistan it would be appropriate to study some of its correlates at the macro level. Usually the methodology for undertaking such type of analysis involves the collection of micro level data through a survey and subsequently subjecting it to a rigorous statistical analysis. Although the micro level data is quite useful for

highlighting some of the determinants of child labour in a society yet it remains incapable of unfolding the main determinants which are quite essential from the point of view of planning and policy-making. In fact the main purpose of this section is to test, among others, the following hypotheses in regard to the incidence of child labour in Pakistan.

Table 4
Labour Force Participation Rates of Children Aged
10 - 14 for the Four Provinces of Pakistan and their
Rural and Urban Areas : Pakistan 1973 and 1981

Province/Sex/Census Year	Total		Rural		Urban	
	1973	1981	1973	1981	1973	1981
PUNJAB						
Both Sexes	27.4	18.8	29.5	21.9	21.4	11.2
Male	40.6	32.1	44.3	36.8	29.5	19.7
Female	11.0	3.5	10.7	4.3	11.7	1.6
SINDH						
Both Sexes	24.6	21.3	34.0	31.5	14.4	8.5
Male	37.0	37.0	50.6	53.7	20.4	15.0
Female	8.4	2.6	9.4	3.8	7.5	1.2
N.W.F.P.						
Both Sexes	24.1	21.4	25.3	23.3	18.8	9.8
Male	35.9	36.7	37.9	39.8	26.6	17.0
Female	9.4	3.0	9.4	3.2	9.5	1.6
BALUCHISTAN						
Both Sexes	30.7	28.4	31.5	31.5	26.8	9.4
Male	44.8	46.7	47.0	51.4	33.2	16.3
Female	12.7	3.5	11.4	3.9	18.9	1.1

1. Areas where inadequate schooling facilities exist for young children, children in those areas tend to take more part in labour force activities.
2. Areas with higher incidence of poverty are likely to experience higher incidence of child labour force activities.

3. Areas where literacy rate is high, parents tend to send children to school for investments in old age security, economic benefits and enhancement of social status.
4. Areas with high fertility tend to be associated with higher activity of child labour.
5. Areas with higher activity in agriculture tend to experience higher activity of child labour.

In order to test the above quoted hypotheses, set of variables representing various characteristics of the unit of observations have been extracted from the 1981 district population census reports. The eleven variables consist of labour force participation rates of children for both sexes and males, percent of houses with one room, percent of houses with piped water, percent of houses with electricity, percent of population urban, child-women ratio, percent of population literate, enrollment ratio [5-9 grades], percent of population with primary and secondary education, percent of population in labour force and percent of population in agricultural labour force. The techniques of analysis used here are the Pearson's correlation and multiple regression [8].

Bivariate Correlation Analysis

As a first step Pearson's correlation coefficients among independent and dependent variables quoted above have been examined to determine the direction and strength of relationship among the variables. These bivariate relationships will help primarily in testing rather crudely the set of hypothesized relationships enumerated earlier. Later on the set of relationships will be examined in a broader framework of least square regression model.

Table 5 represents a matrix of Pearson's correlation coefficients for variables under consideration. It may be observed that enrollment ratio, which represents schooling facilities in the areas, is significantly negatively associated ($r = -0.642, -0.629$) with childrens' participation in labour force in those areas. This phenomenon can be more readily visible in rural areas where very few schooling facilities exist. Villages are mostly scattered in the rural sector where children,

especially females, cannot travel long distances to reach their schools for want of transport. Female children usually remain at home and help the adult members of the household in day to day household activities.

Table 5
Pearson Correlation Coefficient Matrix of Variables Used in Regression

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1. % Houses with One Room	1.000	-0.261	-0.404	-0.179	0.578	-0.340	-0.351	-0.329	0.672	0.675	0.660	0.633
2. -do- With Piped Water		1.000	0.821	0.917	-0.080	0.719	0.631	0.621	-0.147	-0.406	-0.398	-0.605
3. -do- With Electricity			1.000	0.823	-0.120	0.797	0.749	0.730	-0.191	-0.533	-0.513	-0.664
4. % population urban				1.000	-0.066	0.778	0.694	0.697	-0.084	-0.400	-0.399	-0.600
5. Child-women ratio					1.000	-0.160	0.176	-0.159	0.637	0.465	0.452	0.382
6. PerCent Literate						1.000	0.929	0.983	-0.142	-0.589	-0.570	-0.647
7. Enrollment Ratio							1.000	0.920	-0.211	-0.642	-0.629	-0.635
8. Percent Population Literate (Primary and Secondary)								1.000	-0.125	-0.579	-0.563	-0.608
9. Percent in Labour Force									1.000	0.799	0.803	0.725
10. Children Participation Rate (Both Sexes)										1.000	0.991	0.897
11. Children Participation Rate (Male)											1.000	0.901
12. Percent in Agriculture Labour Force												1.000

Percent of houses with one room signifies an important aspect of the population of Pakistan. In 1980 about 51 per cent of total houses in Pakistan consisted of one room houses and about 45 percent of the total population of

Pakistan in 1980 lived in one room houses [5]. This state of affairs not only indicates the extreme shortage of housing facilities for the rapidly growing population but indicates as well the intensity of population pressure under insanitary living conditions. Persons with low income group are the ones who are supposed to be living in those one room houses. Therefore, percent of houses with one room can very conveniently be taken to represent the extent of poverty in an area. Percent of houses with one room are significantly positively associated with children participation rate ($r = 0.65, 0.660$) across the districts. This shows that greater the extent of poverty in an area, the greater the probability of childrens' going into the labour force in that area.

Two variables, percent literate and percent of population with primary and secondary education are indicative of the level of education of that area. These two variables are significantly negatively associated with childrens' participation rates ($r = -0.589, -0.570, -0.579, -0.563$) indicating thereby that with increasing educational level of parents, children's entry into the labour market starts declining.

Child-women ratio, which represents the fertility level of an area, is significantly positively associated with childrens' participation rate ($r = 0.465, 0.452$). During a period of declining mortality and persistently near constant high fertility, family size continues growing due to large improvement in child survival. Associated with high fertility is the worsening income distribution and the concentration of the benefits of development within few hands. In order to feed so many mouths, all the members of the family, including children, have to contribute to family earning. As such the higher the fertility level of an area, the higher the probability of young children entering into labour force.

Percent of population urban is significantly negatively associated with child labour ($r = -0.400, -0.399$). This points to the fact that with increased urbanization coupled with modernization and development, childrens entry into labour force tends to decline.

Percent of population in agriculture labour force is significantly positively correlated with child labour ($r = 0.897, 0.901$). This is because in rural areas children are a source of help both in the field and at home. Positive relationship as usual is also evident between size of total labour force and child labour force. Higher level

of socio-economic development discourages childrens' involvement in labour force. This is what is evident from significantly negative correlation between percent of houses with piped water and electricity and child labour. This implies that correlation or association among all other development variables are significantly in expected direction as can be seen from table 5.

Multivariate Analysis

The hypotheses set forth in the earlier section seem to have been confirmed to a greater extent by the bivariate correlation analysis which involves only the relationship between two variables irrespective of the direction of causation. There are in fact other variables which have to be taken into account while analysing the effect of a particular variable on child labour force participation rate. Tables 6 and 7 present a set of least square regression equations where ten independent variables are regressed against the two dependent variables i.e. labour force participation of children for both sexes and males. All the equations represent a good fit of the data. Independent variables explain about 84 to 90 percent of the variance in the dependent variables and all the variances are statistically significant at usual level of significance.

It may be apparent from Tables 6 and 7 that, in order to minimize the effect of multicorrelation among macro variables, in both sets of six equations not more than 6 or 7 independent variables have been employed. Some relevant variables such as those representing the extent of poverty, urbanization, fertility and schooling facilities in the areas under consideration have been included in both sets of equations. Specifically the high positive correlation among the socio-economic independent variables like houses with piped water, electricity, urbanization and literacy and education have tended to depress the significance of these variables. Similarly high negative correlation between per cent of houses with one room and socio-economic variables have also tended to depress the significance of poverty and socio-economic development.

To the extent possible the minimization of multi-correlation has successfully yielded the significantly negative effect of enrollment ratio on child labour in both sets of equations. This tends to prove that, keeping other things constant, areas with high school enrollment ratio continue to have depressing effect on child labour in

those areas. On the other hand areas with higher literacy rates are observed to discourage child labour in their areas. Similarly in 4 out of 6 regression equations the significant positive beta coefficients indicate that areas with high fertility encourage child labour in these areas. In the context of Pakistan where major portion of labour force is engaged in agriculture, areas with higher labour force participation tend to be associated with child labour activity. Beta coefficients of poverty and larger involvement of labour force in agriculture also confirm that areas with higher incidence of poverty and more involvement of labour force in agriculture tend to increase child labour. On the whole hypotheses linking child labour with socio-economic and demographic factors tend to be confirmed to a considerable extent in the context of Pakistan.

Table 6
Standardized Regression Coefficients of Independent Variables on Labour
Force Participation Rate of Children (Both Sexes): Pakistan, 1981

Independent Variables		Regression Equations					
		1	2	3	4	5	6
1.	Percent Houses with One Room	0.428* (3.79)	0.089 (1.27)	0.093 (1.32)	0.061 (0.81)	0.061 (0.82)	0.060 (0.78)
2.	Percent Houses with Piped Water	0.066 (0.64)	0.124 (1.03)	0.084 (0.69)			
3.	Percent Houses with Electricity				-0.046 (0.46)	-0.066 (0.66)	0.048 (0.47)
4.	Percent Population Urban	-0.015 (0.06)	-0.028 (0.21)	-0.046 (0.35)	0.112 (1.18)	0.073 (0.82)	0.292* (3.04)
5.	Child-Women Ratio	0.138 (1.34)	0.155* (2.49)	0.154* (2.46)	0.141* (2.23)	0.141* (2.24)	0.079 (1.32)
6.	Percent Population Literate		-0.327* (2.19)		-0.311* (2.06)		
7.	Enrollment Ratio (Primary & Secondary)	-0.552* (2.53)	-0.233* (1.81)	-0.261* (2.11)	-0.241* (1.85)	-0.242* (1.91)	-0.389* (3.05)
8.	Percent Population Literate (Primary and Secondary)	-0.183* (2.83)		-0.257* (2.06)	0.754* (10.63)	-0.266* (2.13)	0.084 (0.68)
9.	Percent Population in Labour Force		0.759* (10.76)	0.756* (10.67)		0.757* (10.66)	

10.	Percent in Agricultural Labour Force					0.841*	(10.23)
	R ²	0.8613*	0.8975*	0.8964*	0.8957*	0.8963*	0.8901*

* Significant at P = 0.05

NB : Figures in parentheses indicate t-value associated with beta coefficient.

Table 7
Standardized Regression Coefficients of Independent Variables on
Labour Force Participation Rate of Children (Male): Pakistan, 1981

Independent variables		Regression Equations					
		1	2	3	4	5	6
1.	Percent Houses with One Room	0.426* (3.63)	0.078 (1.07)	0.077 (1.07)	0.060 (0.77)	0.057 (0.74)	0.049 (0.64)
2.	Percent Houses with Piped Water	0.117 (0.51)	0.167 (1.34)	0.132 (1.07)			
3.	Percent Houses with Electricity				0.009 (0.09)	-0.007 (0.07)	0.113 (1.10)
4.	Percent Population Urban	-0.074 (0.30)	-0.100 (0.73)	-0.108 (0.79)	0.047 (0.48)	0.022 (0.24)	0.254* (2.64)
5.	Child-Women Ratio	0.131 (1.23)	0.174* (2.69)	0.174* (2.71)	0.163* (2.45)	0.165* (2.52)	0.063 (1.05)
6.	Percent Population Literate		-0.256* (1.65)		-0.244* (1.55)		
7.	Enrollment Ratio (Primary & Secondary)	-0.559* (2.47)	-0.265* (1.98)	-0.255* (2.01)	-0.285* (2.09)	-0.251* (1.91)	-0.401* (3.13)
8.	Percent Population (Primary and Secondary)	-0.186* (2.51)		-0.239* (1.86)		-0.252* (1.95)	0.112 (0.90)
9.	Percent Population in Labour Force		0.785* (10.72)	0.789* (10.85)	0.777* (10.46)	0.786* (10.66)	
10.	Percent in Agricultural Labour Force						0.886* (10.76)

R²

0.8363* 0.8894* 0.8909* 0.8854* 0.8884* 0.8897*

* Significant at P = 0.05

NB : Figures in Parentheses indicate t-value associated with beta coefficients.

CONCLUSIONS AND POLICY IMPLICATIONS

The study utilized child labour data (aged 10-14 years) at national and regional level and other socio-economic and demographic data from 1981 population census at district level, to study levels and trends of child labour and their determinants in Pakistan. The figures indicate that at national level in 1961, about 23 percent of total children, 38 percent of male children and 5 percent of female children, were engaged in labour force activities. In 1981 however these percentages declined to about 20, 35 and 3 percent respectively. These figures may still represent an underestimate of the true situation in Pakistan mainly because the child labour force data is an outcome of the labour force definitions employed in Pakistan census data for the persons aged 10 years and over. In 1961 the rural areas recorded about 28 percent total children in labour force, 45 percent among male children and 6 percent among female children. During a period of twenty years these rural participation rates declined to 24, 41 and 4 percent respectively. Moreover in 1961 the urban areas recorded about 10 percent children in labour force, 18 percent among male children and one percent among female children. During a period of twenty years the urban participation rates did not show any decline whereas rural participation rates showed only small decline.

In order to study the determinants of child labour in Pakistan recourse has been taken to the techniques of bivariate correlation and regression analysis. What emerges from the analysis is that socio-economic variables explain most of the variation in child labour force participation rates. Significant among these are the enrollment ratios, literacy, educational achievement, etc. Among the demographic variables, fertility is observed to be the significant determinant of child labour force.

A broad based population pyramid resulting from a very high population growth rate gives rise to an army of young children. High unemployment rate in

urban area, skewed distribution of land and income and population pressure in agriculture with high dependency ratio leads to the involvement of young children in labour force. As a consequence son preference becomes a dominant feature of such society. Pakistan being one such society needs some appropriate measures to alleviate the phenomenon of child labour. Advancement of education through opening up of more schools and a strong and effective population policy coupled with rapid growth of socio-economic development is likely to have a depressing effect on childrens' participation in labour force in Pakistan.

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RESEARCH NOTES AND COMMENTS

SHY/SILENT USERS: A REJOINDER

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This rejoinder is to clarify some of the issues and concerns raised by authors of the first two articles of this issue concerning the prevalence of shyness among married women to discuss or talk freely about contraception or its use. Due to this element of shyness some women do not report that they are users of contraception. It is hypothesized that in contraceptive prevalence or demographic and health surveys the knowledge and use of contraception is more under reported than the information on births and the discrepancy observed between the CPR and TFR is more due to the under reporting of the prevalence of contraceptive use.

While analyzing the data for the report on the Pakistan Contraceptive Prevalence Survey (PCPS) 1984/1985, the author felt that there was an element of shyness or cultural inhibition among the respondents to divulge information or talk openly about contraception or its use. This is reflected in the following excerpts from the report [1, pp.55 and 77].

The level of current contraceptive use reported so far has been in the range of 4.2 to 5.2 percent and the PCPS has shown the highest level of 9.1 percent. In order to be consistent with the observed level of fertility, the actual use rate should be around 15 percent. Although it needs further investigation, the interviewers in the PCPS came across certain cases in which respondents were shy to admit that they were users.

In this country women as well as men do not hide birth as it is a well known event in the community but they are culturally shy to declare that they are users of contraceptive methods. It appears that the use rate was under reported in the previous inquiries as well as in the PCPS. Some more evidence in this respect is given in chapter VIII. However, even if fertility rates are under estimated, the current use of contraceptions is more under estimated.

However, the possibility of under-reporting of condom ever use particularly in other urban and rural areas should not be ruled out. It is highly probable that the illiterate semi-urban and rural women felt shy in reporting the 'male method'. In order to obviate this problem further investigation should be made to determine factors associated with shyness.

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In this survey all interviewers were well qualified females who had at least bachelor's degree, were recruited locally, could speak the local language and were provided adequate training in the survey field work and techniques of interviewing. Stories revealed by some of these interviewers showed the prevalence of shyness and cultural inhibition among the respondents to talk freely about contraception or its use. The shyness was even greater when mother in-law, children and/or others were present at the time of interview. This generally happens in such surveys and is unavoidable as it is difficult for the interviewers to ask those people who live particularly in the rural setting and in the joint family system.

In some instances respondents had changed their response of "no knowledge" and "non use" to affirmative after others who were present had left.

In every society there are many personal matters about which men as well as women are shy or hesitant to talk about. For example, experience in many inquiries even in developed countries shows a tendency of hesitance on the part of women to give information about their ages or they under-state their ages. Similarly people are hesitant to divulge information about their income for what ever the reasons.

The knowledge and use of contraception is the most personal matter, although the intensity of this feeling may vary from one society to the other. Even communication between husband and wife on such matters in the country is minimal.

In spite of the element of shyness, there is strong motivation among the women to reduce the burden of childbearing. This is reflected in the larger difference between the mean number of children ever born and mean of ideal number of children of current users, ever users and shy users. This difference was of one child in the case of current and ever users and two children for shy users [3, table 3]. Also the difference between the mean number of living children and the mean number of desired children was greater in the case of shy users [3, table 3]. Ordinarily most women would tend to report the desired number the same as their actual number to rationalize their fertility behaviour or due to superstition. Reporting the desired number less than the actual number shows the urge for a small family norm which was greater among shy users.

The results of PCPS also indicated that most of the respondents in age group 30-49 years, did not want any more children and 58.6 percent of all respondents who were fecund, either wanted to space or limit births [1, pp.112, 118].

In view of these indications, the level of reported ever use and current use of 11.8 percent and 9.1 percent (based on non-pregnant currently married women 15-49 years of age) respectively, appeared to be quite low, given the reported level of TFR of 5.95. This strengthened the hypothesis that there was an element of shyness or hesitance in reporting the actual use of contraception.

In general, having knowledge of contraception may not be as strong a personal matter as its use, but it is likely that under the perceived social pressure, women who were shy to report use, were also shy to report having knowledge of it.

In the light of this background attempt was made to estimate the shy or silent users by using the binary technique as shown in the diagram VIII.I in the report [1] and reproduced in the article of this issue [3, Diagram A]. Those currently married women of reproductive age who were reported as non-users, non-pregnant, wanted no more children, had no birth during the past five years, were menstruating and had not perceived that they were sterile, were considered as shy/silent users.

The analysis provided an estimate of 7.0 percent of the total respondents who were considered as shy/silent users. Since they had no birth during the past five or more years, they also seemed to be effective users.

Some researchers who undertook further analysis of 1984/1985 PCPS data have raised a number of issues on the analysis presented in the report [1] and in particular on the determination of shy users. Two articles which have made several comments are included in this issue [2 and 3]. In this rejoinder attempt is made to clarify some of the specific issues.

One of the problems with these articles is that the analysis done is based on unweighted sample data [3] whereas the analysis in the report [1] is based on weighted estimates. Due to this lacuna, some differences between the indicators presented in the report and those presented in the articles are unavoidable. Also in one of the article indicators of current and past use and of knowledge of

contraception have been estimated for 55 districts of Pakistan [3], although the sample was too small and was not designed to provide estimates at such a micro level.

In one of these articles, it is shown that several cohorts of women who were reported as ever users in the 1975 Pakistan Fertility Survey (PFS), did not admit in the 1979/1980 Population, Labour Force and Migration Survey (PLM) that they ever used contraception [2]. This is reflected in the ever use rate of 10.5 percent obtained in the 1975 PFS [4] as compared to only 4.9 percent in the 1979/1980 PLM survey [5]. Although there might be other factors such as sampling variation and different focus of the two surveys, this comparison does provide an indication that there was an element of hesitancy in admitting the ever use.

Also, the same article cites several cultural factors which might have prompted shyness or hesitancy [1]. These include perception of religion, illiteracy, contraception being a personal matter, interviewing by a younger stranger women to obtain information about a personal matter and presence of others at the time of interview. After citing these factors and admitting the possibility of shyness, the author argue that such factors had been "hypothesized in many other settings and found not to be important" [2]. First, no specific reference is cited in support of these results and second, if it happened in other cultures it does not necessarily mean that the same should have been found in the PCPS.

The authors have also shown a concern for the two types of the current use rates presented in the report i.e. 9.1 percent and 7.6 percent [1, pp.84,84 and 97]. The authors after recalculation have verified 7.6 but the source of 9.1 percent "is unclear" to them, although it is clearly stated in the title of every table in which 9.1 percent is shown that it is based on "currently married non pregnant women 15-49 years" where as 7.6 percent is calculated by including the pregnant women. This has been done to compare the PCPS results with the past surveys undertaken in Pakistan such as 1968 National Impact Survey (NIS) [6], 1975 PFS and 1979/1980 PLM survey in which the current use rates are based on non-pregnant women. Also, this rate is more refined as it is based on the women who were at the "risk" or were eligible to use contraception. The second rate (7.6 percent) was presented for comparison with other countries in which rates are calculated by including pregnant women.

Another point raised is that the percentage of shy users also includes women whose position with regard to the knowledge was undetermined. In other words, it was assumed in the report that "silent users" were also "silent knowers". The authors believe that this is difficult to justify [2] but they do not give any concrete reason. Looking at it from another angle, it is justifiable to assume that shy users are also "knowers" and "shy knowers".

Ignoring "silent knowers" the authors calculate the age composition of the sample figure of those silent users who had the reported knowledge and they argue that the shy users were relatively old [2 and 3]:

65 percent were aged 40 and above and 84 percent were aged 35 and above. They already had many children and 74 percent have had five or more births. The majority of them have gone not just five years without birth, but in fact have gone ten or more years. They are inconsistent in their approval of family planning, 36 percent favour it, 35 percent do not and the remainder are not sure or are not reported.

As argued above it is a priori that silent users must be knowers or "silent knowers" and as such should not be excluded while calculating the indicators [2]. The shy users were relatively older as they started using contraception five or more years ago which resulted in "no birth" during the past five or more years from the date of the survey.

On the other hand, 85 percent of the current users had a birth during the past five years which indicates that they were more recent acceptors. Comparing the age at the time of start of use, the difference between the ages of reported current users and the shy users is reduced significantly. The authors point out that the shy users had more (6.5) live births as compared to (5.8) reported current users [2 and 3], but they do not highlight that shy users had less (4.95) mean number of living children and less (4.59) mean number of desired children than 5.1 and 4.8 respectively of the reported current users [3]. This difference in the desire is an indication that shy users were more motivated to use contraception.

Also, half of the shy users hailed from rural settings as compared to 30 percent of current users, 78 percent of shy users as compared to 56 percent of reported current users never went to school, more shy users than reported current users worked outside their homes and 65 percent of shy users either approved family

planning or showed their uncertainty about it and 68 percent reported that either their husbands approved family planning or gave a vague response [3].

Construing from these characteristics, it appears that silent users were more conservative, tradition bound and thus shy, not only to admit that they were users of contraception but also in reporting other related matters.

Wishing less than the actual number of children is not a good omen in a traditional society. Also women who experienced births more frequently are more motivated to use contraception. As overtly they reported that they were non-users, they had to give some reason to rationalize their shyness or hesitancy to admit that they were users. They randomly chose from the precoded responses that the major reasons for their non-use were religion and husband.

Also, those non-users who had the knowledge and wanted no more children gave such reasons for non-use as breast feeding (8.5 percent), post partum abstinence (1.7 percent) and "able to naturally space (12.5 percent) [1,p.86]. From these responses, it is implicit that some of these respondents, though did not admit that they were users, were using traditional methods. These methods do not need going to the source for acquiring the material and can be used more privately.

Another point raised in this context is that women though premenopausal had "become secondary sterile after a large number of births or were sexually inactive" [2]. This argument gains its strength from the earlier argument that shy users were older than the current users which has already been clarified. The shy users started using contraception much earlier than the current users and had demonstrated their fecundability.

In addition, it is pointed out that before calculating the number of shy users, women whose menses had stopped or they had perceived sterility were excluded. These women constituted 11.2 percent of the respondents who wanted no more children. This percentage is already higher than expected and does not justify the addition of "shy users" to this group.

No survey data are perfect and misreporting and other errors might have affected the calculation of shy users as well as of other indicators obtained from the

1984/1985 PCPS. Although, level of contraceptive use is the major determinant of the level of fertility the data on contraceptive prevalence suffer more from shyness and hesitancy to report than data on fertility. Thus the CPR is more under reported than TFR. This seems to be one of the main reason that the level of reported CPR is often less than expected from the level of TFR obtained from the same survey.

This has been shown by 1975 PFS (TFR 6.3, CPR 5.0), 1984/1985 PCPS (TFR 5.95, CPR 7.6) and 1990/1991 PDHS (TFR 5.2, CPR 11.8) [7] for Pakistan and for several other countries in which fertility surveys were undertaken under the initiative of World Fertility Survey [8,p.2]. This is logical as the circumstances for obtaining data are more favourable for fertility than contraceptive prevalence as there can be no shyness in reporting births.

The TFR is generally based on births reported for the year preceding the survey. Most of the survivors of these births (at least 90 percent) are present in the household and can be seen and verified by the interviewer. Of the remaining ten percent, most could be identified from the reported infant deaths. Also, unlike contraception, there are several rituals involved when a birth or a death occurs. Thus occurrence of birth is a well known fact which is difficult to hide.

However, there is a possibility that due to memory lapse and other reasons some births which resulted in infant deaths may escape from reporting which would affect both the numerator as well as the denominator for computing the infant mortality rate and the numerator for computing the TFR. On the other hand, some of this omission may be compensated by reporting of out of scope events.

From the above premise, it can be concluded that the discord between the TFR and CPR is more due to under reporting of the contraceptive prevalence than under reporting of births, indicating more need for the upward revision of the former than of the latter. In other words, in the 1984/1985 PCPS, given the reported level of TFR of 5.95, most of the short fall in the reported level of CPR of 7.6 or 9.1 was due to under reporting of contraceptive prevalence which among others can be attributed to shyness or hesitance to report.

More in-depth analysis based on carefully obtained data to test and refine further the hypothesis of shy users is needed in the light of the comments made by

the authors of two articles [2 and 3] and to refine the concept further. It is possible that as argued in the articles under reference, some women who reported that they were fecund might be infertile and the level of actual shy users may be somewhat less than the level reported in the PCPS, or it may be declining, but it does exist in the cultural settings of Pakistan in which sexuality is perceived as a private and a personal matter. This phenomenon was observed by the interviewers in the field, it is consistent with the expected cultural pattern and it has been substantiated by the data obtained in the 1984/1985 PCPS.

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MULTISTATE LIFE TABLE: AN OVERVIEW OF METHODOLOGY

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With the passage of time members of a cohort tend to move from one state to the other. These moves provide the bases for multistate life table. This life table can be applied in the analysis of nuptiality, migration, labour force and mortality. Multistate life table is a unistate model in which state space consists of all possible values where members of the cohort can rejoin the state they have withdrawn. In other words, multistate life tables include both decrement as well as increment tables in which probabilities of transition from one state to the other are estimated and a transition matrix is developed. The construction of the model is illustrated numerically.

INTRODUCTION

Vital events are the raw materials of demography. Data on births, deaths and migratory movements constitute series of observations commonly used in demographic analysis. Detailed information on these components enlarges the scope of analysis.

Observations on the occurrence of events could be considered from another perspective as well - the state transition perspective. Introduced by Rogers [1], this perspective means that with the passage of time (age), members of the cohort tend to move from one state to another. For instance, individuals move from the state of spinsterhood to the state of marriage, migrate from the place of origin to the place of chosen destination, change their employment status and so on. These moves or passages are necessary elements of multistate demography, which can be defined as the branch of demography that deals with the transitions (forward as well as backward including death) of members of the cohort/cohorts.

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Multistate demography has developed from multiregional demography introduced by Rogers [2] who constructed multiregional tables by incorporating the effects of migration in closed models of conventional demography. In a simulation exercise estimates of conventional demographic parameters have been compared [3] with those obtained according to multiregional analysis.

It is an emerging field of demography and has found its applications in nuptiality, mortality, mobility and labour force analysis, besides population projections and other fields of interest.

Multistate models are found to be useful in situations where data are available on the movements of individuals. The essence of multistate demography is the construction of multistate life table. It is only through various functions of the multistate life tables that one realizes the importance of multistate demography.

THE STATE SPACE

According to conventional demography, life table is known as an attrition or single decrement table. In the language of multistate demography, it is called a unistate model, since members of the cohort can join the state of death only. The state of death is called "absorbing state". Since we can conceive of only one state, the state space in a single decrement table is equal to one.

In mortality analysis, the set of state space could be increased by having additional information (data). We speak of double or multi decrement tables when data are available on the causes of death. In general the state space contains the set of all possible values that are of interest concerning the members of a cohort.

Conventional demographic analysis, however, does not fit into the general definition of the state space, because members of the cohort can never rejoin the state they have left. In multistate demography, state space consists of all possible values where members of the cohort can rejoin the state they have withdrawn. Tables that take account of such passage are known as increment - decrement tables and constitute the subject matter of multistate demography.

MULTISTATE LIFE TABLE

Consider several individuals who are born on the same date or atleast the same year - a cohort of individuals. Unlike the ordinary life table, where members of the cohort can enter the absorbing state only, the first problem in a multistate life table is the consolidation of various passages or moves from one state to another for the purpose of estimating transition probabilities. Mathematical expositions made by Rogers [1;2], Willegens and Rogers [5], Krishnamoorthy [6], Keyfitz [7] and Willegens [8], Ledent [4;9;10], show that these moves are represented by the force or intensity of the phenomenon in question. These forces or intensities are similar to the force of mortality $[U(x)]$ and denoted by $[U_{ij}(x)]$ indicating the instantaneous rate of moving from state i to state j at age x . Unlike $U(x)$ which is a scalar quantity consolidation of all possible $U_{ij}(x)$ form a matrix. In fact all functions related to multistate models are either vectors or matrices.

Instead of using instantaneous rates which are quite valuable for theoretical purposes, we shall deal with the observed occurrence/exposure rates of mortality and mobility with the following assumptions. Note that the observed rates are used as approximations to the forces or intensities of transition.

ASSUMPTIONS

1. Events are uniformly distributed over age interval under consideration;
2. The probability of dying or entering a particular state in general depends on age x only and remains independent of any other consideration such as age $x-1$ or presence in any other previous state/states. The assumption of such an independence from past positions is known as Markovian assumption;
3. Similar to the assumptions commonly made in ordinary life tables, it is assumed in multistate life tables that the observed age specific rates are equal to life table rates, so that the cross sectional data could provide adequate estimates of longitudinal rates usually needed for the construction of life tables;

4. The number of transitions in a given interval implies that within the given interval only one move or passage is taken into account. For the relaxation of this assumption see Schoen [11] and Rogers and Ledent [12].

ESTIMATION OF TRANSITION PROBABILITIES

Consider a cohort in the i th state, $i = 1, 2, \dots, n$. Let $k_i(x + 1)$ and $k_i(x)$ be the number of persons at exact ages $(x + 1)$ and x respectively. Denote by $D_i(x)$ the number of deaths between ages x and $x + 1$, and $M_{ij}(x)$ and $M_{ki}(x)$ stand for the number of emigrants and immigrants in the i th state. According to demographic balancing equation we have:

$$K_i(x + 1) = K_i(x) - D_i(x) - r_{ji} M_{ij}(x) + r_{ki} M_{ki}(x) \dots \dots \dots (1)$$

Assuming that $D_i(x)$, $M_{ij}(x)$ and $M_{ki}(x)$ are uniformly distributed over the interval, we may divide these numbers by the average number of cohort members (person years lived) between ages x and $x + 1$; i.e. $1/2 [K_i(x) + K_i(x + 1)]$ to obtain the occurrence/exposure rates. The following equation is obtained in terms of the occurrence/exposure rates.

$$\begin{aligned} & [1 + 1/2 d_{id}(x) + 1/2 r_{ji} m_{ij}(x)] k_i(x + 1) - 1/2 r_{ki} m_{ki}(x) K_k(x + 1) \\ & = [1 - 1/2 d_{id}(x) - 1/2 r_{ji} m_{ij}(x)] k_i(x) + 1/2 r_{ki} m_{ki}(x) K_k(x) \dots \dots \dots (2) \end{aligned}$$

Where

$$d_{id}(x) = \frac{D_i(x)}{1/2 [k_i(x) + k_i(x + 1)]}$$

$$m_{ij}(x) = \frac{M_{ij}(x)}{1/2 [k_i(x) + k_i(x + 1)]}$$

$$m_{ki}(x) = \frac{M_{ki}(x)}{1/2 [k_k(x) + k_k(x + 1)]}$$

Equation (2) may be written for all i and expressed in matrix form as follows. Note that dark bold letters stand for a matrix or vector.

$$[I + 1/2 \mathbf{m}(x)] \mathbf{K}(x + 1) = [I - 1/2 \mathbf{m}(x)] \mathbf{K}(x) \dots\dots\dots (3)$$

Where

I is an identity matrix, $\mathbf{K}(x)$ and $\mathbf{K}(x + 1)$ are vectors and $\mathbf{m}(x)$ is an $n \times n$ matrix. The elements of which are arranged as follows:

$$\mathbf{m}(x) = \begin{bmatrix} [(d_{1d}(x) + r_{j1} m_{1j}(x)) - m_{21}(x) \dots\dots\dots - m_{n1}(x)] \\ - m_{12}(x) [(d_{2d}(x) + r_{j2} m_{2j}(x)) \dots\dots\dots - m_{n2}(x)] \\ \vdots \\ - m_{1n}(x) - m_{2n}(x) \dots\dots\dots [d_{nd}(x) + r_{jn} m_{nj}(x)] \end{bmatrix} \dots\dots\dots (4)$$

When the age interval is n years (3) comes out to be

$$[I + n/2 \mathbf{m}(x)] \mathbf{K}(x+n) = [I - n/2 \mathbf{m}(x)] \mathbf{K}(x)$$

The matrix of transition probabilities

$P_{(x)}$ could be obtained from (3) as follows:

$$P_{(x)} = [I + 1/2 m_{(x)}]^{-1} [I - 1/2 m_{(x)}] \dots\dots\dots (5)$$

Note that in conventional life tables (5) reduces to:

$$p(x) = \frac{1 - 1/2 m_{(x)}}{1 + 1/2 m_{(x)}} \quad \text{so that}$$

$$q(x) = \frac{m_{(x)}}{1 + 1/2 m_{(x)}}$$

Each element of matrix $P_{(x)}$ - $P_{ji}(x)$ denotes the probabilities of a person being alive and making transition from state i to state j between age x and $x + 1$. In a two state system the elements of $P_{(x)}$ could be defined as follows:

$$P_{(x)} = \begin{bmatrix} P_{11}(x) & P_{21}(x) \\ P_{12}(x) & P_{22}(x) \end{bmatrix} \dots\dots\dots (6)$$

Note that the diagonal elements show the probabilities that individuals will be alive but have not made any transition during the age interval.

OTHER FUNCTIONS OF MULTISTATE LIFE TABLE

Given the transition matrix $P_{(x)}$, one may construct step by step other multistate table functions after having started from an arbitrary radix (10). If one starts from a single radix, the model is known as uniradix model. It is possible also to start from radices corresponding to the number of states. In this case the model is known as multiradix model.

Considering a uniradix model, the number of persons at exact age $x + 1$ is:

$$l_{(x+1)} = P_{(x)} l_{(x)} \dots\dots\dots (7)$$

Where $P_{(x)}$ is the probability of survival from exact age x to $x + 1$

In multistate demography these functions are represented by matrices, i.e.

$$l_{(x+1)} = P_{(x)} l_{(x)} \dots\dots\dots (8)$$

Where $P_{(x)}$ is the transition matrix and $l_{(x)}$ is a non singular matrix. In a two state model, for instance, $l_{(x+1)}$ is:

$$l_{(x+1)} = \begin{bmatrix} p_{11}(x+1) & p_{21}(x+1) \\ p_{12}(x+1) & p_{22}(x+1) \end{bmatrix} \begin{bmatrix} l_{11}(x) & l_{21}(x) \\ l_{12}(x) & l_{22}(x) \end{bmatrix} \dots\dots\dots (9)$$

When the elements of $1(x+1)$ are found according to (9), the person years lived matrix $L(x)$ is obtained according to the following approximate relationship.

$$L(x) = 1/2 [1(x) + 1(x+1)]$$

The $L(x)$ matrix so obtained is:

$$L(x) = \begin{bmatrix} L_{11}(x) & L_{21}(x) \\ L_{12}(x) & L_{22}(x) \end{bmatrix} \dots\dots\dots (10)$$

Note that

$$L(x) = n/2 (1_x + 1_{x+n}), \text{ if age interval is } n \text{ years.}$$

The operation of summing the L_x values from the end of the table to specified ages, yields the $T(x)$ matrix as follows:

$$T(x) = \begin{bmatrix} T_{11}(x) & T_{21}(x) \\ T_{12}(x) & T_{22}(x) \end{bmatrix} \dots\dots\dots (11)$$

$T(x)$ denotes the number of years lived by the members of a cohort beyond exact age x in the specified status.

In conventional analysis, since the expectation of life at age x , e_x , is equal to $T_x/1_x$, the multistate counterpart is obtained as follows:

$$e_x = T(x) (1(x))^{-1} \dots\dots\dots (12)$$

Considering the case of two states only, the elements of e_x are:

$$e(x) = \begin{bmatrix} e_{11}(x) & e_{21}(x) \\ e_{12}(x) & e_{22}(x) \end{bmatrix} \dots\dots\dots (13)$$

Thus unlike conventional demography, where one gets only one expectation of life at age x , in case of two states one gets four expectations of life at age x . These expectations could, however, be integrated to provide meaningful interpretation.

For example, if the two states are considered to be two regions of a country, sum of the 1st column of the $e(x)$ matrix (13), gives total years expected to be lived by the individuals of region 1. Out of these he is expected to live $e_{11}(x)$ in the same region and $e_{12}(x)$ in region 2. A similar interpretation could be made in case of region 2 by adding the elements of the 2nd column of $e(x)$ matrix.

NUMERICAL ILLUSTRATION

Although computer programmes are available for the construction of multistate life tables, a numerical illustration is presented here for the purpose of showing the mechanism of estimating transition probabilities, and the number of persons entering each state according to the estimated probabilities of the transition matrix.

Consider a uniraix model for constructing a table of working life. Denote by 1 the state of inactive and by 2 the state of active population. Assume that the death rates of active as well as inactive persons, accession and withdrawal (passages from 1 to 2 and 2 to 1) rates are available. Let 100,000 constitute the birth cohort. Assuming further, that the active life starts at the age of 16 and the probability of

surviving from birth to age 16 is 0.97562. The required rates of mortality and mobility are those given in working life tables of Willekens [8].

According to (4) the m_x matrix is

$$m(x) = \begin{bmatrix} (0.000733 + 0.339080) & -0.525690 \\ -0.339080 & (0.000733 + 0.525690) \end{bmatrix}$$

$$m(16) = \begin{bmatrix} 0.339813 & -0.525690 \\ -0.339080 & 0.526423 \end{bmatrix}$$

Using these values in (6) and a little extra calculation yields the transition matrix as follows:

$$P(16) = \begin{bmatrix} 0.762691 & 0.366774 \\ 0.36577 & 0.632492 \end{bmatrix}$$

According to the probability of survival 97562 individuals have reached exact age 16 out of 100,000.

According to (7), $l(17)$ is:

$$l(17) = \begin{bmatrix} 0.762691 & 0.366774 \\ 0.236577 & 0.632492 \end{bmatrix} \begin{bmatrix} 97562 & 0 \\ 0 & 0 \end{bmatrix}$$

$$= \begin{bmatrix} 74410 & 0 \\ 23081 & 0 \end{bmatrix}$$

Based on the interpretation of the elements of P_x , 74410 persons have reached exact age 17 at the inactive state; only 23081 have both survived and have found themselves in active state.

CONCLUSION

Conventional life tables are single or multidecrement tables. In these tables members of a single cohort decrease due to death and/or other causes - the absorbing state.

In multistate life tables members of the cohort/cohorts can enter or leave a specified state with the passage of time (age) until they reach the absorbing state. Such increment - decrement tables are known as multistate life tables.

In this paper an attempt is made to overview the construction of a multistate life table. The subject has been introduced by others.

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BOOK REVIEW

PAKISTAN DEMOGRAPHIC SURVEY 1988

Federal Bureau of Statistics

Statistics Division

Government of Pakistan

Karachi, 1990

p.206, Rs.70.00

After independence in 1947 information on vital events was asked in 1961 census yet it was too inadequate to give any meaningful estimates of fertility or mortality in the country. Similarly data on vital events from the official registration system was also found highly deficient in coverage. As such for estimating vital rates and the levels of fertility and mortality indirect techniques of stable and quasistable estimates were utilized using the 1951 and 1961 censuses data during the period 1951-61 and early 1961 but the uncertainty regarding the validity of the estimates continued to prevail.

Therefore for purposes of obtaining more authentic estimates of levels of fertility and mortality, Federal Bureau of Statistics (FBS) in collaboration with Pakistan Institute of Development Economics (PIDE) and The Population Council, New York, established a system of Population Growth Surveys called Population Growth Estimation experiment (PGE). These surveys provided estimates at national level as well as for then East and West Pakistan for vital events for the four consecutive years 1962 through 1965.

Subsequently FBS through its own national probability sample surveys called Population Growth Survey (PGS) estimated vital events and rates at national, then provincial and rural-urban level for the four consecutive years 1968 through 1971

The FBS continued its efforts after the separation of East Pakistan (Bangladesh) through another series of surveys undertaken from 1975 to 1979 which provided estimates at national, provincial and rural-urban levels for the four consecutive years. Following this series FBS made another effort through national probability surveys called Pakistan Demographic Surveys (PDS), which provided

estimates at national, provincial and rural-urban levels for the five consecutive years 1984 through 1988.

In PGE surveys vital events were collected in then West Pakistan simultaneously through longitudinal registration (LR) and cross sectional (CS) survey systems on defacto basis from twelve sample areas of about 5000 population each. Out of twelve sample areas eight were covered by both LR and CS systems where as in two only LR and in the remaining two only CS system were introduced. Vital events from CS system were obtained through four quarterly (later two half yearly) visits each year whereas vital events from registration system were obtained through continuous registration in each sample area.

Vital events from LR and CS systems so obtained were first matched mechanically and then manually in each sample areas and some non matched events were subsequently investigated in the field. This process yielded four categories of vital events namely (a) those caught by both the LR and the CS systems, (b) those caught by LR system but missed by CS system, (c) those caught by CS system but missed by LR system and, (d) those missed by both LR and CS systems.

Thus three estimates of vital events namely Chandrademing (CD), LR and CS were obtained for arriving at vital events and vital rates for the four consecutive years 1962-65.

For the years 1968 through 1971, data on vital events were collected on six monthly basis in the first week of July and January of each year with reference period of last six months. The information on base population was collected in the first week of July of each of these four years. For these surveys, 64 primary sampling units with 32 from rural clusters and 32 from urban areas served as the sample points. Although for the years 1968-71 only single system of data collection was employed yet there are indications in the report under review that vital events collected for the overlapping period from 1969 to 1971 through two different enumerators were matched but the results derived through the matching were not published by the Bureau.

For the years 1976-1979, 224 urban clusters and 292 rural clusters of 50 households were utilized as sample points. The base population in each sample area

was enumerated in January and July rounds of each year and were matched on individual basis whereas vital events in each sample area were enumerated on quarterly basis with a reference period of last six calendar months. Vital events of three monthly overlap period were matched and non-matched events so obtained were investigated in the field.

For the years 1984-88, 240 urban and 309 rural clusters of approximately 45 households served as sample points. Vital events in each sample area were enumerated on quarterly basis with a reference period of last six months. Vital events of overlap period were matched and non matched events investigated in the field. It is not clear whether the data on base population during 1984-88 in each sample area was also matched for arriving at base year estimates for each consecutive year under consideration.

On the other hand four national probability family planning impact surveys namely National Impact Survey (NIS) 1968-69, Pakistan Fertility Survey (PFS) 1974-75, Pakistan Contraceptive Prevalence Survey (PCPS) 1984-85 and Pakistan Demographic and Health Survey 1990-1991 have so far been undertaken yet as a by product these surveys in addition to family planning data, provided estimates of fertility at national and regional levels and very little information was provided to measure the level of mortality.

The Population Growth Surveys or Pakistan Demographic Surveys are the main sources to provide data for measuring both fertility as well as mortality levels in the country. Out of the 17 growth surveys so far undertaken, 13 were designed to estimate the vital events through matching of events from more than one source. However, only for four PGE surveys for the years 1962-65 detailed information on obtaining estimates of vital events through the matching procedure was provided for each sample area. For the remaining nine surveys although the methodology of matching procedures has been described, yet no details have been given about the estimates of matched and non matched events even at micro level such as urban-rural, province and country. As many problems were faced in matching events in the PGE experiment, it seemed essential from the point of view of determining the effectiveness of matching extent of matching as well as the efficiency of matching to provide detailed break down of the result of matching. This could also throw some light on the efficiency with which the enumerators had covered the vital events in

their respective areas during the given reference period. On the whole it is the efficiency of matching which determines the extent of reliability of estimates of vital events and or vital rates.

The 1988 Report of Pakistan Demographic Survey has given a crude birth rate of 40.5 per 1000 population which shows 2.8 points decline from its 1987 level of 43.3 per 1000 population. It is however surprising that the crude birth rate has remained constant at 43.3 during the period 1984-87 and only during 1988, it has experienced a sudden decline to 40.5. In terms of total fertility rates, the average number of children per woman has also remained almost constant at 6.9 from 1984-1987 and then experienced a sudden decline to 6.5 in 1988. The reason for this 0.4 children decline in TFR given by the author is the "short term fluctuation".

The most important indicator of fertility change happens to be the marital status changes. The marital status changes during 1984-88 and 1988 indicate increases in proportions never married of females in reproductive ages yet the singulate mean age at marriage of female shows no change during the period 1987-88. In fact the major changes in crude birth rate and general fertility rate are reported to have occurred in rural areas and for the investigation of this indepth analysis of rural data will have to be undertaken.

Some interesting findings emerge from the survey report. The extent of age misreporting resulting from rounding at ages 5.0 and even numbers, appears to be on the decline in Pakistan and that the quality of age reporting for females is found to be improving. Sex ratio at birth from the survey population stands at around 109 indicating thereby under-reporting of female live births. As compared to the 1981 population census, the survey population shows improvement in overall sex ratio both at national and rural and urban levels with rural-urban sex differentials narrowing down overtime.

The average household sizes for the total country (6.7) and its urban (6.9) and rural (6.6) areas continue to remain the same as those reported by the 1980 Housing census of Pakistan. However when compared with 1980 Housing Census, the report shows that percentage of households with 1 to 5 persons declined at national, rural and urban level whereas percentage of households with 6 and more persons increased overtime at all levels. This is an indication of the fact that

population growth, as a consequence of slow decline of fertility and moderate decline of mortality, has resulted in the increase of large household sizes.

The report has displayed 19 Tables, out of which five are based on household data, eight provide live birth schedule and the remaining six, death schedule. Most of the tables provide data cross classified by important characteristics by regions. For instance detailed tabulations in household numbers are provided by age, sex, marital status and relationship to head of household at national and provincial levels with rural and urban breakdown. One important table also provides respondent population by relationship to head of household at national and provincial level with rural and urban breakdown, age of father, age at first marriage, duration of marriage, sex and by additional information about fertility.

Data on deaths are presented by age, sex, marital status and also on infant deaths by age, sex and month of occurrence at all levels. One of the significant feature is the presentation of tabulation on age at death crossclassified by 50 causes of death which in the absence of representative data from other sources, could be quite useful for health planners, policy makers and researchers.

The survey in question has collected detailed data on various characteristics of household population. There is a need to include tabulations on various characteristics of population cross classified by educational achievement. Similarly cross classification of cumulative fertility by various characteristics of currently married women could give insight into the determinants of fertility at national and regional levels. In addition some tabulations separately on maternal deaths and breastfeeding should have been included in the report.

Since 1960s FBS has successfully presented information on fertility, mortality and vital rates first at national level through four consecutive surveys, then at national and rural-urban levels through four more consecutive surveys and at national, provincial and rural-urban levels through the remaining nine consecutive surveys. Since many social sector programmes such as Population Welfare Programme, Rural Development Programme, Educational Programme and Health Programme are being implemented at district level, there is a greater need of periodic availability of fertility and mortality estimates and of population characteristics at district level. These estimates are expected to be quite useful for

evaluating the impact and achievements of these programmes at district levels. FBS, being the leading and only organization in the country, has a network of field offices and the relevant expertise as well as trained manpower to develop a sampling frame which could yield representative estimates at district level.

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THE STATE OF WORLD'S CHILDREN 1992**Grant, James P.****UNICEF****London****p.100**

The focus on children as an issue takes its roots in the demographic transition of several societies, where due to high fertility and low mortality levels, the composition of young children in the overall population has increased and constitutes around 40 percent of the total population. The mortality level for children under five years of age for 1990 as indicated in the report under consideration, varied between 142 in India and 247 in Mozambique. This situation is both a cause and effect of poor quality of life, especially those of mothers and children. This report draws attention of politicians, planners and policy makers by presenting the deplorable status of children and illustrates a number of instances in specific countries where concerted efforts are being made to ensure enhanced quality of life for children.

The report undertakes an integrated approach to address the issue of children wherein low quality of life is taken as a consequence of high and rapid fertility pattern, national economic burdens and low priority given to social sectors. Betterment of children is seen integrally linked with quality of mother's life. The report presents a scenario of improvement of child life through immunisation, nutritional status, birth weight, and enhancement of mother's quality of life through birth spacing, and use of family planning methods which can also reduce child mortality.

The report is divided into a number of sections encompassing a set of propositions for enhancing quality of children life, identifying distress priority areas, need for aid, diversion of funds being saved due to disarmament towards education and other social sectors, and planning births to space and avoid high risk situations. These propositions are made in the light of the promises made during the 1990 World Summit for Children.

The basic objective of the report is to increase awareness about the issues for world's children among policy makers, and to help translate the commitment

exhibited by world leaders during the 1990 World Summit into action programmes and mobilizing resources to enhance the quality of life of the poor and powerless, i.e. the children. The report is released at a critical time when new geographical boundaries and new ties of world cooperation are emerging. UNICEF makes a plea to planners and policy makers for the inclusion of the issues of the poor, powerless, and neglected, for those who are silenced by the effect of malnutrition, and preventable diseases, for those who are silenced by being born female, and those many millions who are silenced by death almost before their lives have begun (p.3). The report very convincingly presents the case of children for building a new world order to reflect mankind's brightest hopes.

Over the years a few concerns on child quality of life have shaped the international consensus for developing concerted programmes to reduce high infant, child and maternal mortality, improve nutritional and educational status, and alleviate child labour participation. It was in 1980's that expanded programme on immunisation (EPI) was initiated in several countries on the basis of a highly ambitious action plan, with the aim of providing protection to at least 80 percent of infants and children against six preventable diseases. Simultaneously, the oral rehydration therapy (ORT) project was launched to educate people about easy and accessible ways to control complications of diarrhea. The decade of 1980s did show increased activity of EPI and ORT but had a mixed response from different countries. The decline in under 5 mortality was lower than expected because of inadequate immunisation coverage, for instance, measles vaccination could not reach the target of 90 percent and to have a desired effect on mortality due to measles. Although polio, DPT, and BCG coverage has increased tremendously over the years, but diarrhea and fever related mortality still remains the major cause of death in most countries. Moreover, child malnutrition, a significant complicating and immunity limiting factor, remained high, thus endorsing higher risk of mortality. Do findings like this substantiate the argument that EPI's progress is marked by other health related aspects which need to be dealt as a whole? The UNICEF report specially focuses on all these aspects and a set of goals for the year 2000 is to reduce maternal mortality and severe malnutrition by half, expansion of polio and measles vaccination to 95 percent of the children and providing access to clean water to all families.

Severe malnutrition is thought to be caused by lack of food and frequency of infections. The UNICEF report asserts on the later. Feeding practices during diarrheal ailment particularly, the frequency and quantity of feeding is important factor. Diarrheal incidence rate has been estimated to be 51 percent among children of age under 5 in Pakistan during summer season (Planning and Development Division 1984). The diarrhea occurs 6-7 times a year for at least 4-5 days among children less than age 2. In terms of feeding practices about 13 percent of mothers stop all foods during diarrhea, thereby exposing children to greater risk of mortality. This risk is more severe for infants and malnourished children. There is a need for greater indepth research to examine the morbidity pattern and feeding practices of high risk children.

Increasing infant and child survival is definitely a humanitarian goal but does survival of more children ensure a decline in the birth rate and population growth rate that is prevalent in many developing countries? The report vehemently sees causality working in this direction, especially when female education, income, and access to family planning also increases. The argument persuade here is that an increase in parental confidence in family building process reduces the need for many births (p.21). The report misses a point here that reduced under 5 mortality though prolongs spacing, may not be simultaneously translated into reduced birth rate because of the fertility pattern being persuaded by couples. In general, there is an empirical evidence that women tend to reproduce more than their desired number (Population Welfare Division 1986, National Institute of Population Studies 1992). This indicates lack of information, motivation and services.

The progress of various social sectors in developing countries is seriously inhibited by giving priority to expenditures on defence and repayment of debt and debt servicing. The low level of expenditure on health, nutrition, education and family planning only sustains the vicious circle of underdevelopment, while millions of children remain malnourished, thereby, producing less productive and inefficient class of labour at all levels. The future of a society obviously depends on its economic growth but significant investment in people for providing them with adequate primary education, nutrition, health, clean water, safe sanitation and family planning is essential to ensure full enrollment, continuity in schooling and producing health and able bodied manpower to sustain economic growth. The evidence produced by pioneer developing countries is quite glaring but the major

task for most others is the methodology to transfer funds and allocation away from defence and debt financing to social sectors. Given the political commitment to provide access to basic education to all children, the additional demand for funds may not be so high. Rather, the answer to immediate needs lies in re-appropriation of funds. Similar adjustment is a must for health and nutritional sectors, to make these services accessible to those who really want it. These are necessities that precede economic take off.

The report also focuses on wide dimensions of international aid to developing countries in the light of new world order, whereby donor agencies are suggested to help recipient governments in restructuring budgets in favour of services to the poor and powerless, and thereby linking aid to such a transition. Furthermore, the local budget cuts and reduction in aid must protect long term interests of children programmes. The report very correctly focuses on two basic concerns of developing countries, that of debt relief and expenditures on the purchase of armament. The report, however, totally ignores the blunt fact of 'fear of aggression' that lies at the base of huge arm buildup and the various means to reduce it in the new world order. Moreover, the debt situation and economic dependence on raw material export persists to hound both the economic and social programmes of most developing countries.

Can rich and powerful countries of the West write-off billions of dollars loans given to African or even to some Asian countries, so as to give them a breathing time to start afresh? Given that the donor agencies constitute various aid granting institutions of the West, the continuation of African financial shackles strengthen their neo-colonial goals, thereby subjecting African child or for that matter child of a developing country, to a subjugated future of dependency and uncertainty.

Apartheid of gender has very rightly been addressed as a significant factor playing its role in determining the status of woman. Male preference to some extent is explainable but not at the cost of females, which adds to their misery and overt discrimination resulting in more than a million female deaths in Bangladesh, India and Pakistan due to preventable diseases, birth injuries and problems and severe malnutrition. Female education, suggests the report, provides the major break through in a woman's life affecting reproductive behaviour, quality of life of both mother and child and in the reduction of infant and child mortality and adoption of

family planning methods. The report takes a simplistic approach here. The knowledge about gender bias and relegation of females to males is quite well known for south Asian countries and is found to be ingrained in the cultural norms and economic value of children. Unfortunately, not much headway has been made to protect the female child and to enhance their quality of life.

It is rightly contended in the report that use of family planning is essential to enhance the quality of life of both the child and the mother. The benefits include immunization of maternal deaths due to frequent childbearing and prevention of illegal abortions which is prerequisite for enhancing quality of women's life. By the eliminating too close and too many births, reduction in 'high risk births', increase in birth weight and, in general, nutritional status of children, and finally, with fewer births parents would be able to invest more time and energy in child rearing in a small family setting. These benefits alone would be sufficient to justify the claim of family planning for all, asserts the report. Adequate accessibility and proper use of contraception would eliminate unwanted births and gradually help women to understand the overall benefits of small family norm. Though the report deals with this issue in the final chapter but most issues concerning quality of child and mother life can substantially be addressed via use of family planning. The reduction of 1.3 billion of people by year 2025 due to reduced population growth rate through the use of family planning by women not wanting to become pregnant is purely a matter of wisdom and prosperity of future generations. The report argues that means of family planning should be placed at the disposal of all couples of childbearing ages before the end of the century which seems to be not an easy task for developing countries which do not have adequate structure or contraceptive supplies to fulfill such an enormous need. Moreover, all women with an 'unmet need' are also not necessarily motivated and educated to use contraception. Also there is a need for a contraception which has minimum side-effects so as to reduce the drop outs to the minimum.

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SURVEY OF DISABLED PERSONS 1984-85**Federal Bureau of Statistics****Government Of Pakistan****Karachi 1986****p.165, Rs.25.00**

The rapid growth of Pakistan's population being caused by very slow decline in fertility and moderate decline in mortality has given rise to various social and economic problems. These problems are the consequences of inadequate development in various social sectors of the economy. This incidence of under development caused by rapid population growth has resulted in the low coverage of population by the health sector giving rise to lack of sanitation, safe water facilities, nutritional requirement, availability of inexpensive modern medicines to the general public at large.

As more and more children and adults tend to survive due to rapid decline in infant, child and adult mortality, so does the disabled population which happens to be on the increase. The interest in the studies of disabled population in terms of its incidence, level, growth and determinants was developed in Pakistan in the fourth quarter of 1970s and the first half of 1980s. Social scientists, planners and policy makers paid due attention to the studies of disabled population mainly because of the special interest shown by the then President of Pakistan in the identification and treatment of disabled population. On the other hand the United Nations General Assembly adopted the World Programme of Action concerning disabled persons in 1982 and recommended measures for the collection of disability data for analytical treatment and comparison.

Before reviewing the survey report under consideration, it would be worth while to throw some light on the disability data already collected in censuses and surveys in the country. In the main 1961 Census a single question was asked on disability status and six disabled categories were identified by broad age groups and sex at national and subnational levels. These categories consisted of blind, deaf and dumb, crippled, mentally retarded, insane and others. In the census survey of 1973 called Housing, Education and Demographic Survey (HED) also a disability question was asked and four disability categories were identified by five year age groups and sex at national and provincial levels and by urban and rural areas. These

categories consisted of blind, deaf and dumb, crippled and others. Similarly in the main 1981 census disability question was asked and six disability categories were identified by five year age groups and sex at national, provincial, urban, rural and district levels. These categories consisted of blind, deaf and dumb, crippled, mentally retarded, insane and others. In addition, Directorate of Special Education also conducted a survey of disabled population in the cities of Rawalpindi and Islamabad in 1986. Since this was a pilot survey it does not merit detailed description for want of representativeness at national level.

The survey under review was conducted by Federal Bureau of Statistics (FBS) in 1984-85 by utilizing a national probability sampling frame of labour force surveys already developed by FBS. Single stage sample design was adopted for rural and urban areas and for urban areas separate strata had been formed of cities of 5 lacks and more population and of cities and towns for remaining urban areas. Only those sample households (5638) were enumerated which contained at least, one disabled person during the four quarters of 1984-85. The data were classified into nine different categories consisting of blind, deaf, dumb, deaf and dumb, lapper, retarded, handicapped, lame and others. The survey report displayed ten tabulations each of which presents cross-classified data for Pakistan, provinces and their rural and urban areas. The disabled categories have been cross-classified by five year age groups and sex, reasons of disabilities crossclassified by age and sex, reasons of disabilities crossclassified by nature of disability and sex, nature of disability crossclassified by treatment received, type of technical training received crossclassified by age, type of technical training received crossclassified by nature of disability, sources of livelihood crossclassified by nature of disability, employment status crossclassified by age and sex and employment status crossclassified by nature of disability.

Although a well designed survey questionnaire appears to have been used to collect data from the sampled households, it has not been attached to the report. Moreover, a large volume of data seems to have been collected on the socioeconomic and demographic characteristics of the household population and its size but neither the same have been included in the report nor any mention has been made therein. Tables are so designed as to give percentages in all cells with respect to total disabled population. What planners and researchers would desire are: a) the distribution of the actual size of disabled population across major regions

such as provinces, rural and urban areas etc. and b) age-sex specific disability rates for the country and its major regions.

Distribution of disabled population even in percentage form cannot be ascertained from the survey under review whereas in the absence of base population rates by age and sex cannot become available. It is observed from other Federal Bureau of Statistics (FBS) reports that there are 18252 secondary sample units or households at national level and 8424 and 9828 households at urban and rural levels. What emerges therefore is that about 31 percent of these households contain at least one disabled person whereas about 17 percent households in urban areas and 43 percent households in rural areas contain at least one disabled person. The urban-rural distribution of households across the provinces is more or less the same whereas in Balochistan province about nine percent households are enumerated in urban areas and eleven percent in rural areas. On the other hand, the calculation shows that the largest number of households (37 percent) are enumerated in NWFP followed by Punjab (33 percent), Sindh (29 percent) and Balochistan (ten percent).

Since the average household size in Pakistan is around 6.5 persons and if it is assumed that every enumerated household contains only one disabled person, then the disability rate for total Pakistan comes out to be 475 per 10,000 population whereas for urban and rural areas these rates stand at around 261 and 659 per 10,000 population respectively. Such high disability rates under the assumption of one disabled person per enumerated household is quite unimaginable. The 1961 census reported a disability rate of 34 per 10,000 population and 1981 census reported the disability rate of 45 per 10,000 population. On the other hand the disability rate from 1973 HED survey was 190 and from Rawalpindi-Islamabad survey the rate was 290 per 10,000 population. What is very strange is that the surveys report very high disability rates which continue to increase faster over time whereas population censuses report the disability rates which are much lower and seem to increase comparatively moderately. It appears that the collection of disability data from the sample surveys may not scientifically be appropriate probably because the disabled population is not uniformly distributed throughout the society. There is a need to develop a sampling methodology for estimating disabled population in Pakistan.

Another interesting observation from the survey report is that the sex ratio of disabled population for total Pakistan is 205 (males per 100 females) whereas for rural and urban areas the sex ratios 207 and 196 respectively. This means that males are observed to be twice as disabled as females from the survey report although comparatively more males than females in rural areas are disabled. These figures compare favourably with those reported from the 1973 (HED) survey where the sex ratios for Pakistan and its rural and urban areas are 208, 209 and 204 respectively. On the other hand, the 1981 census reports the sex ratios as 80, 76 and 96 for Pakistan and rural and urban areas respectively. Why the sex ratios are much higher from the surveys and much lower from the censuses. Probably in population censuses the enumerators are not so well trained, therefore within a short period of time at their disposal they tend to extract information from the male heads of households who tend to conceal the disability status of females mainly because of cultural reasons. On the other hand in controlled sample surveys the well trained enumerators with sufficient time at their disposal tend to extract more information from the households. But is the sex disparity so high, is an issue requiring further investigation.

The survey report prompts some serious questions about the disabled population. The foremost among these is whether the current sample methodology is more appropriate for measuring disability? Whether the incidence of disability is more common among males than females? Whether the disability rates from the census is more accurately reported than from the survey? Whether there exist definite curves of disability by age for various natures of disability? whether the age pattern of disability has undergone any changes during the last thirty years in Pakistan? These questions need to be investigated by researchers both in the field of population and medical sciences.

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