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Effects Of Child Loss Experience On Subsequent Fertility In Nepal

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INTRODUCTION

The fertility rate in Nepal in 1996 is estimated at 4.6 the NFHS 1996 and, wich is used to shape the future suggests a decline of TFR from 6.4 in 1986 (NFPMCH 1987) to 5.1 in 1992 (NPC 1992) and to 4.6 in 1996 (Pradhan et al. 1996), a decline of about 31 percent between past 10 years. During the same span of time the contraceptive prevalence rate increased from 15.1 to 24.1 and 28.8 (Pradhan et al. 1996). In this situation it is imperative to question whether the fertility in Nepal has declined during recent past, and if yes, the magnitude of decline is real or not.

Answer to these questions do not seem far away if one examines the trends in fertility rates based on the indirect technique (Annexure Figure 1). The examination clearly reveals that the TFR in the country has declined from 6.3 in 1971 to 5.3 in 1996. The TFR at 5.3 is indirectly estimated using the NFHS 1996 data which is quite close to the TFR at 5.1 and 5.4 estimated using the two independent surveys, the NLSS (1996) conducted by CBS and the MEBDC (1996) conducted by the CDPS. Besides, while using the hypothetical cohort 1991-96 fitting relational Gompertz Model to average parities, the conclusion was also arrived at the TFR of 5.4. The discussion so far indicates that the most plausible figure of TFR for Nepal for the year 1996 is at around 5.4. This also suggests that the fertility rate in Nepal has started to fall moderately but not at the magnitude which gives a TFR figure of 4.6.

Even if the TFR of 5.4 is considered as the most plausible figure for Nepal, it is one of the highest in the South Asian region, Bangladesh 4.3, India 3.7, Pakistan 6.1, SriLanka 2.4. Moreover, the indirectly estimated infant mortality rate based on the NFHS (1996) appears to be 98 per 1000 live birth suggesting poor child survival prospect in Nepal as compared to

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other South Asian regions, Bangladesh 106, India 80, Maldives 57.8, Pakistan 88; Srilanka 17 (CBS 1996). These fertility mortality phenomena suggest that there is wide scope to study the effect of child loss experience of women on the probability of subsequent birth, which is considered as one of the most significant areas of policy oriented research to shape population policy.

The relationship between child loss experience among women and its influence on subsequent fertility has been an important theoretical as well as practical problem among demographers (Preston 1997, Chowdhery et al. 1976, Suchindran and Adlakha 1984). The link between mortality and fertility is hypothesised to be that mortality declines are eventually followed by fertility declines (Scrimshaw 1978). Among explanations for the continuing high fertility in developing countries that particularly need clarification is the influence of high infant and child mortality (Taylor et al. 1976). The authors further argued that until parents expect most of their children survive, it is unreasonable to expect them to be interested in fertility reduction. Rather the situation may be such that parents with the fear of loosing their child may continued to have additional children to replace those who have already died or as insurance against expected deaths. This link is most frequently stated as *replacement* hypothesis (Scrimshaw 1978).

This paper examines the effect of child loss experience on the probability of subsequent birth in Nepal not to test that the understood fertility reduction is attributable to increased child survival expectation but to understand the importance of replacement effect in maintaining the high level of fertility in varied conditions. The influence of the child loss experience on fertility in Nepal can be expected to be significant because universal breast feeding practice among women may expose them to conception as a consequence of shorten post-partum amenorrhoea resulted from interrupted due to the death of child at early ages.

DATA AND METHODS

The Nepal Family Health Survey 1996, conducted by the Family Health Division under the Ministry of Health, is a part of the worldwide Demographic and Health Surveys (DHS). This survey collected data on respondent's socio-economic background information, birth history, pregnancy history, child health, material mortality, household characteristics and information of household members form 8429 ever

married women aged 15-49 years in 8082 households. For each reported live birth, date of birth and deaths, sex of the child and survival status of the child were collected in detail.

Data in this study relate mainly to the selected socio-economic and demographic background characteristics of the individual women, household characteristics and birth intervals. Most of the observed birth intervals are both the open and closed. To minimise the bias due to truncation and to use both the completed as well as incomplete reproductive experience of the women in the analysis, this study uses the life table technique. Moreover, the analysis includes all live births that occurred to women who had their first birth during first five years of their marriage so that the effects due to selectivity can be minimised. The life tables for both the closed as well as open birth intervals are constructed for the selected subgroups classified according to the selected background characteristics of the individual women. The focus of the analysis is on two summary measures from the life tables. First, the party progression ratio which indicates the probability that a woman in a given parity moves to next parity and measures the extent of voluntary or involuntary termination of childbearing. Second, the life-table median birth interval, which measures the child spacing. The findings of the preliminary analysis based on these two measures are further examined by using the proportional hazard model. This model helps analysing the effect of child loss on the life table probability of birth controlling for a number of selected socio-economic and demographic background characteristics of the mother. The approach of analysis adopted in this paper is based on the paper on similar topic in Jordan (Suchindran and Adlakha 1984).

RESULTS

Before proceeding with the analysis, let us examine the general pregnancy experience of the women upto tenth order births of total sample. Table 1 reveals that 85 percent of the women who had their first birth continued to the second birth. The dropout rate after the third birth becomes sharper, for example only five out of ten continued to their fourth birth and only four out of ten continued to their fifth birth. About 91 percent of the women had reached the end of their reproductive cycle after their seventh childbirth.

Table 1

Number And Percentage Distribution Of Pregnancy Outcomes And Number Of Women Who Had Next Pregnancy By Last Pregnancy Outcome

Birth Order Number	Number Having Birth	Percentage	Outcome of Birth	Number	Percentage	Number Proceed to Next Birth	Percentage Proceeded
1	7479	100.0	Live born lived	6081	81.3	5021	82.6
			Live born died	1398	18.7	1314	94.0
2	6335	84.7	Live born lived	5242	82.7	3964	75.6
			Live born died	1093	17.3	1026	93.9
3	4990	66.7	Live born lived	4133	82.8	2891	69.9
			Live born died	857	17.2	789	92.1
4	3680	49.2	Live born lived	3050	82.9	2019	66.2
			Live born died	630	17.1	516	81.9
5	2850	38.1	Live born lived	2109	74.0	1335	63.3
			Live born died	741	26.0	409	55.2
6	1744	23.3	Live born lived	1425	81.7	840	58.9
			Live born died	319	18.3	235	73.7
7	1093	14.6	Live born lived	909	83.2	849	93.4
			Live born died	184	16.8	141	76.6
8	639	8.5	Live born lived	515	80.6	259	50.3
			Live born died	124	19.4	84	67.7
9	343	4.6	Live born lived	281	81.9	122	43.4
			Live born died	62	18.1	50	80.6
10	172	2.3	Live born lived	142	82.6	44	31.0
			Live born died	30	17.4	20	66.7

Source : NFHS 1996, Data Tape.

Table 1 also reveals that the proportion of pregnancy that resulted in wastage, except for the fifth order birth, varies with only small margin, ranges from 17 to 19 percent. However, the probability of continuing to another pregnancy is much higher in the case of wastage than in the case where the pregnancy resulted in a live birth that survived. This differential for the first four pregnancies is substantial indicating that women who have experiences a child loss are more likely to proceed to next pregnancy as compared to that whose pregnancy resulted in a live birth that survived. This result provides sufficient evidence of replacement attempts among those who have lost a child.

The analysis here after is limited to the births between third and seventh order because the first two births have to be dropped due to the use of survival status of the two preceding children and the higher order births are dropped due to the small number of cases. Table 2 gives the parity progression ratios and the median births intervals by the survival status of the previous births. The analysis reveals that the PPR is higher and the median birth intervals are shorter where the previous child has died than where the previous child survived. This result indicates that women who have lost their previous child are more likely to proceed to next birth to replace the loss than those who have their live birth surviving. The median birth interval is on average 10 -11 months shorter where the previous child had died as compared to those where the previous child has died. This pattern persists irrespective of the order of birth. The prolonging of births by those who have their child survived has markedly affected the eventual birth of children in all order of births which in turn could have contributed in lowering the overall fertility situation of the country to some extent.

Table 2

Parity Progression Ratios (PPR) By Survival Status Of Preceding Child And Birth Order And Median Length Of Birth Interval

	Preceding Child Dead			Preceding Child Alive		
Birth order	Number	PPR	Median	Number	PPR	Median
2 - 3	2139	0.9682	26.5	9625	0.8790	35.2
3 - 4	1452	0.9534	26.4	6395	0.8571	35.6
4 - 5	939	0.9411	25.7	4081	0.8311	36.9
5 - 6	576	0.8866	27.0	2480	0.7956	38.3
6 - 7	322	0.82627	29.0	1421	0.7513	39.1

Source : NFHS 1996, Data Tape.

The result in Table 2 suggests that child loss experience among women have a significant effect on women's reproductive behaviour where the loss of a child shortens the succeeding birth interval with increased probability of women going on to have an additional child. However, this analysis so far has not examined the share of the effects of physiological factors such as the early interruption of lactation, the replacement motivation or of some other mechanisms in the observed effect. Besides, as noted by Suchindran and Adlakha (1984), women in this study who experienced infant death are also likely to be a selected group of women with higher fecundity and thus have shorter intervals between births. In such a situation further analysis considering these factors is important to understand the mechanisms of the mortality-fertility relationship.

The examination of the physiological effect as against the replacement effects of infant mortality on fertility is not an easy exercise. This study uses the approach suggested by Knodel (1968) that compares the birth interval distribution classified by the survival status of the two preceding children to differentiate the physiological and replacement effects as used by Suchindran and Adlakha (1984) in a study in Jordan. The proposition for the analysis is that, of the four possible sequences of the survival status of the preceding child, the survived-survived sequence will correspond with the lowest PPR and longest median birth interval in a situation where both effects : prolonged post-partum amenorrhoea due to lactation and less motivation among parents to have additional child, will be operating. Second, in the died-died sequence, if the parity progression ratio is found to be highest motivation among parents to have another child soon as possible where the effect of post-partum amenorrhoea due to interruption of lactation will be working. Third, the difference between the died-survived and survived-died measures the strength of motivation to replace the lost child. It is because if a couple falls in the died-survived group they may more likely to replace the earlier child who has died than those who have not experienced the child loss event. Fourth, the difference in the died-survived and survived-died sequence measures the lactation effect because in both cases parents may have equal motivation to have another child (Suchindran and Adlakha 1984).

The result in the Table 3 for the dead-dead sequence, except for the birth order 6 - 7, consistently yields highest PPR with lowest median interval suggesting that the motivation among parents in Nepal to replace

the dead child is strong. The relatively shorter median interval corresponding to the dead-survived sequence as against the survived dead further supports the operation of the replacement effects in determining the fertility of a woman in Nepal. The higher PPR for the survived - dead sequence as against the dead-survived sequence noted in Table 3 indicates that the prolonged lactational amenorrhoea effects, as in Nepal the NFHS 1996 has noted the universal breast feeding practice with an estimated 28 months median duration of lactation, for these groups of women in delaying their wishes to replace the dead child and have produced a relatively longer median interval. Moreover, the noted shorter median interval for the dead-survived sequence as against the survived-survived sequence again supports the operation of the replacement effect in the society. All these evidences found in the analysis indicate that the effect of child loss experience among women is influential in determing the fertility level in the society.

Table 3

Parity Progression Ratios (PPR) By Survival Status Of Preceding Two Children Birth Order And Median Length Of Birth Interval

Parity Progession From i - (i+1)	Birth				
	i-1	i	NUMBER	PPR	Median
2 - 3	Dead	Dead	294	0.9719	25.28
	Survived	Dead	1030	0.9607	36.75
	Dead	Survived	1179	0.8597	25.75
	Survived	Survived	9261	0.8897	34.00
3 - 4	Dead	Dead	197	0.9702	23.93
	Survived	Dead	714	0.9425	3574
	Dead	Survived	810	0.8397	25.14
	Survived	Survived	6126	0.8682	34.60
4 - 5	Dead	Dead	134	0.9541	24.65
	Survived	Dead	468	0.9363	41.34
	Dead	Survived	521	0.7966	25.42
	Survived	Survived	3897	0.8451	35.28
5 - 6	Dead	Dead	79	0.9403	25.25
	Survived	Dead	292	0.86883	41.36
	Dead	Survived	318	0.7382	28.19
	Survived	Survived	2367	0.8114	36.03
6 - 7	Dead	Dead	51	0.8605	27.84
	Survived	Dead	162	0.8700	41.27
	Dead	Survived	180	0.7436	23.95
	Survived	Survived	1350	0.7599	36.08

Source : NFHS 1996, Data Tape.

The duration of live birth interval can be divided into three component - post-partum amenorrhoea following a live birth; waiting time to conception and non-susceptible periods, gestation and amenorrhoea, following a child loss. This suggests that the observed differentials in the median birth interval by survival outcome need not be due to post-partum amenorrhoea *per se* but also could be due to the differences in other two components (Suchindran and Adlakha 1984). For example, women with high fecundity if lose a child will have shorter waiting time to conception leading to shorter birth interval than those with low fecundity. It is, therefore, imperative to examine the fecundability, a measure of fecundity that indicates the probability that conception will take place within a particular menstrual cycle, of the two groups of women. While doing this, the use of contraception, which is likely to reduce the fecundability prolonging the time of conception, can not be ignored.

Table 4 examines the fecundity of the mother according to their child loss experience and contraceptive use status assuming that these women have not used any contraception before their first birth. The calculation is based on the method suggested by Vincent (1961, cited in Gray 1988). The analyses do not show any significant differences in fecundity of women who have experienced a child loss as against who have not experienced a child loss. This result holds good for both the contraceptive use and non-use group. It is, therefore, the fertility differentials observed in the birth interval in Table 4 by survival status of the preceding child do not seem to be due to the fecundity differentials between these two groups of women.

Table 4

Estimates of Fecundity By Survival Status Of The Child And Contraceptive Use

Contraception	First Birth	
	Dead	Survived
Never Used	0.045	0.0447
Ever Used	0.0494	0.0495

Source : NFHS 1996, Data Tape.

MULTIVARIATE ANALYSIS

The effects of mortality on fertility examined so far are only at gross level and are limited by lack of adequate control over other confounding factors. Therefore, a multivariate analysis of life table probabilities using the proportional hazard model suggested by Cox (1972) is used in the following section to examine the net influence of child loss experience of women on fertility controlling for the selected socio-economic and demographic variables. The model is fitted to data from all birth intervals of order 2 and above of those women who had a child within first five years of marriage. In this paper only the main effect model is examined.

Table 5 shows the beta coefficients and the standard errors of the selected variables showing their net effects on the probability of additional births. The result reveals increased probability of births with rural residence as against the urban. In contrast, mothers with some education, husband's education of secondary and over and fourth and higher order births are associated with lower probability of births. This analysis also establishes the negative relationship between mother's age at childbirth and the probability of having additional birth. The effects of sex of the preceding child, status of contraception use, mother's education and religion did not show statistical significance on the probability of births.

Both the survival status of the preceding child and the survival status of the preceding two children emerge as important variables in influencing the fertility in Nepal confirming the findings of the bivariate analysis in the preceding section of this paper. This clearly indicates that the net effects of the survival status of the immediate preceding as well as preceding two children have sufficient influence in determining the fertility level in the country. For example, the influence of the survival status of two preceding children increases gradually in the sequence dead-alive to alive-dead and to alive-alive indicating mothers who have lost the preceding child are more likely to proceed to the next birth than those whose preceding or birth child has survived. The probability of proceeding to the next bith in the case where mother has lost her two preceding children is even worse. This result also documents the findings based on the bivariate level analysis in the preceding section of this paper.

Table 5

Effect On the Probability Of Additional Birth Of Selected Socio-Economic And Demographic Variables

Variables	B	S.E.
Place of Residence		
Urban	0.000	
Rural	0.106*	0.044
Birth Order of the Child		
3 - 4	0.000	
over 4	- 0.140*	0.032
Sex of the Preceding Child		
Male	0.000	
Female	0.015	0.023
Survival Status of the Preceding Child		
Dead	0.000	
Alive	- 0.804*	0.040
Survival Status of the Preceding Two Child		
Dead Dead	0.000	
Dead Alive	-0.335*	0.072
Alive Dead	-0.559*	0.082
Alive Alive	-0.449*	0.074
Mother's Age at Child Birth		
Below 10	0.000	
20 - 29	-0.277*	0.031
30 & Over	-0.772*	0.051
Ever Used Contraceptives		
Never Used	0.000	
Ever Used	0.031	0.024
Mother's Education		
None	0.000	
Some	-0.051	0.047
Father's Education		
None	0.000	
Primary	0.004	0.029
Secondary	-0.0149*	0.030
Religion		
Hindu	0.000	
Buddhist	0.066	0.043
Other	0.053	0.045

Source : NFHS 1996, Data Tape.

Since the effects of child loss experience on probability of additional birth in Nepal are important there is considerable potential to reduce the TFR through increased child survival prospects in the society. The population attributable risk (Table 6) associated with the alive category of the survival status of the preceding child indicates if women who have lost

Table 6
Population Attributable Risk For Probability Of Additional Birth By Selected Socio-Economic And Demographic Characteristics

Variables	RR	AR
Place of Residence		
Urban	1.00	0.00
Rural	1.11	0.09*
Birth Order of the Child		
3 - 4	1.00	0.00
over 4	0.87	-0.04*
Sex of the Preceding Child		
Male	1.00	0.00
Female	1.02	0.01
Survival Status of the Preceding Child		
Dead	1.00	0.00
Alive	0.45	-0.83*
Survival Status of the Preceding Two Child		
Dead Dead	1.00	0.00
Dead Alive	0.72	-0.02*
Alive Dead	0.57	-0.05*
Alive Alive	0.45	-0.40*
Mother's Age at Child Birth		
Below 10	1.00	0.00
20 - 29	0.76	-0.20*
30 & Over	0.46	-0.09*
Ever Used Contraceptives		
Never Used	1.00	0.00
Ever Used	1.03	0.01
Mother's Education		
None	1.00	0.00
Some	0.95	0.00
Father's Education		
None	1.00	0.00
Primary	1.00	0.00
Secondary	0.86	-0.04*
Religion		
Hindu	1.00	0.00
Buddhist	1.07	0.01
Other	1.05	0.00

Source : NFHS 1996, Data Tape.

Note : * indicate significant at 5 percent level. The population attributable risk is calculated as : AR = (p(rr-1)/(1+p(rr)) where p = prevalence of risk factor in the entire population and rr = relative risk. It is defined as the proportionate excess risk of death that is associated with exposure to a risk factor. It incorporates both the level of excess risk associated with a risk factor and the prevalence of risk factor in the population (Khan and Sempos 1989).

their previous child can be saved then 83 percent of these women have a fair chance of not having additional birth. Similarly, if the preceding two children of those who have lost had been alive 40 percent of these women had a fair chance of not having next birth. This result indicates that the effect of child loss experience among women in their reproductive behaviour is immense where improved child survival prospects implies considerable reduction in the overall fertility in the country.

CONCLUSION

The influence of child loss experience on subsequent fertility in Nepal seems to be uniform among major groups of population and all parity groups. Child survival seems to have sufficient influence on the fertility among those who have lost a child. This effect seems to be further serious among women who have lost two children. Moreover, child survival seems to have significant influence on fertility irrespective of the women's education qualification, place of residence, her husband's educational qualification and status of contraceptive use. The apparent lower influence of child loss experience on the fertility of those with no education, rural residence and never used contraception, could be due to the reason that these women are already exposed to higher fertility leaving little room for further increase in fertility due to the child loss experience. The loss of child has significantly increased the probability of subsequent birth of women of all birth order despite that breast-feeding is universal and the use of contraception over the decade has increased. It is, therefore, the observed increased probability of birth after a child death can be attributed as a result of the motivation to replace the dead child. The prevalent higher infant mortality could have nullified the lactation amenorrhoea as a consequence of the child's death exposing such women toward increased fertility. This paper clearly indicates that improved child survival prospects in Nepal can significantly reduce the overall fertility.

ANNEXURE

Table 1

Parity Progression Ratios (PPR) By Mother's Education Survival Status Of Preceding Child And Birth Order

Birth Order	Number	Dead PPR	Median	Number	Alive PPR	Median
No Education						
2 - 3	2012	0.9733	25.9	8655	0.8977	36.9
3 - 4	1383	0.9572	26.5	5902	0.8721	34.6
4 - 5	903	0. 9414	26.6	3831	0.8350	35.2
5 - 6	555	0.8867	27.2	2343	0.8006	38.3
6 - 7	311	0.8580	28.6	1350	0.7497	39.5
Some Education						
2 - 3	127	0.8846	20.3	970	0.7111	37.8
3 - 4	69	0.8750	21.0	493	0.6810	37.8
4 - 5	36	0.9322	22.8	250	0.7712	42.5
5 - 6	21	0.8824	26.6	137	0.7119	41.3
6 - 7	11	1.0000	36.0	71	0.7833	33.5

Source : NFHS 1996, Data Tape.

Table 2

Parity Progression Ratios (PPR) By Father's Education Survival Status Of Preceding Child And Birth Order

Birth Order	Number	Dead PPR	Median	Number	Alive PPR	Median
No Education						
2 - 3	1309	0.9786	25.7	4869	0.9229	36.7
3 - 4	914	0.9163	26.9	3482	0.8981	35.6
4 - 5	605	0.9466	27.0	2368	0.8981	34.5
5 - 6	379	0.8986	28.0	1515	0.8248	37.4
6 - 7	220	0.8374	29.6	902	0.7796	37.0
Primary						
2 - 3	431	0.9616	23.8	2220	0.8789	39.6
3 - 4	285	0.9342	25.8	1457	0.8478	42.7
4 - 5	185	0.9486	26.0	899	0.8074	37.2
5 - 6	118	0.8743	26.3	518	0.7574	36.1
6 - 7	61	0.9200	27.2	286	0.7075	35.4
Secondary						
2 - 3	394	0.9398	23.2	2529	0,7932	39.4
3 - 4	250	0.9459	25.0	1451	0.7680	37.5
4 - 5	146	0.9060	26.2	812	0.7570	39.0
5 - 6	77	0.8425	27.0	446	0.7433	39.8
6 - 7	40	0.9412	28.6	233	0.6958	41.4

Source : NFHS 1996, Data Tape.

Table 3
Parity Progression Ratios (PPR) By Place Residence Survival Status Of Preceding Child And Birth Order

Birth Order	Number	Dead PPR	Median	Number	Alive PPR	Median
Urban Residence						
2 - 3	132	0.9391	17.1	878	0.7946	57.8
3 - 4	91	0.9178	23.7	494	0.7658	34.5
4 - 5	49	0.9500	23.7	275	0.7595	40.5
5 - 6	29	0.8261	24.3	142	0.6414	37.9
6 - 7	13	1.0000	29.6	64	0.5763	43.4
Rural Residence						
2 - 3	2007	0.9702	25.8	8747	0.8873	37.2
3 - 4	1361	0.9557	26.6	5901	0.8648	35.3
4 - 5	890	0.9406	26.7	3806	0.8362	36.3
5 - 6	547	0.8896	26.8	2338	0.8051	38.2
6 - 7	309	0.8585	29.6	1357	0.7601	38.5

Source : NFHS 1996, Data Tape.

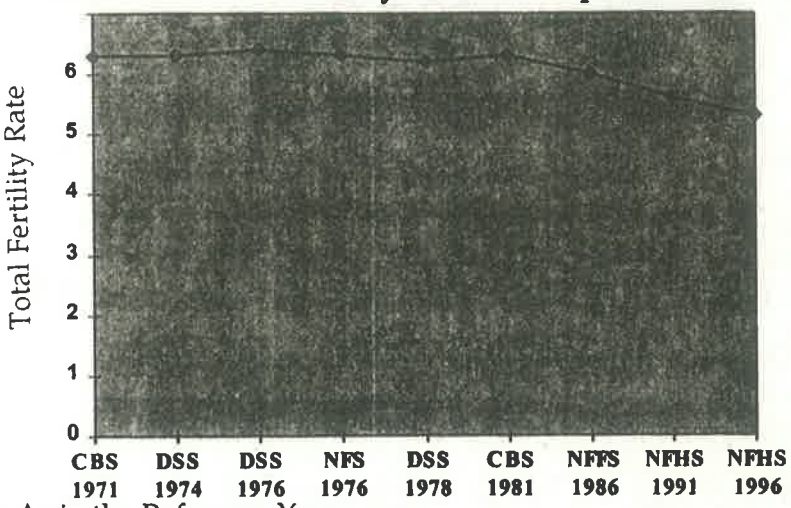
Table 4
Parity Progression Ratios (PPR) By Ever Used Contraception, Survival Status Of Preceding Child And Birth Order

Birth Order	Number	Dead PPR	Median	Number	Alive PPR	Median
Never Used Contraceptive						
2 - 3	1390	0.9741	25.7	5091	0.8870	37.0
3 - 4	969	0.9553	27.2	3475	0.8747	37.7
4 - 5	650	0.9628	27.2	2301	0.8647	36.5
5 - 6	405	0.8979	27.3	1476	0.8150	39.5
6 - 7	227	0.8438	30.6	878	0.7699	39.7
Ever Used Contraceptive						
2 - 3	749	0.9571	22.6	4534	0.8698	38.2
3 - 4	483	0.9495	25.0	2920	0.8359	34.9
4 - 5	289	0.8930	25.5	1780	0.7875	35.2
5 - 6	171	0.8601	25.5	1004	0.7670	36.9
6 - 7	95	0.9097	26.1	543	0.7212	36.1

Source : NFHS 1996, Data Tape.

Figure 1

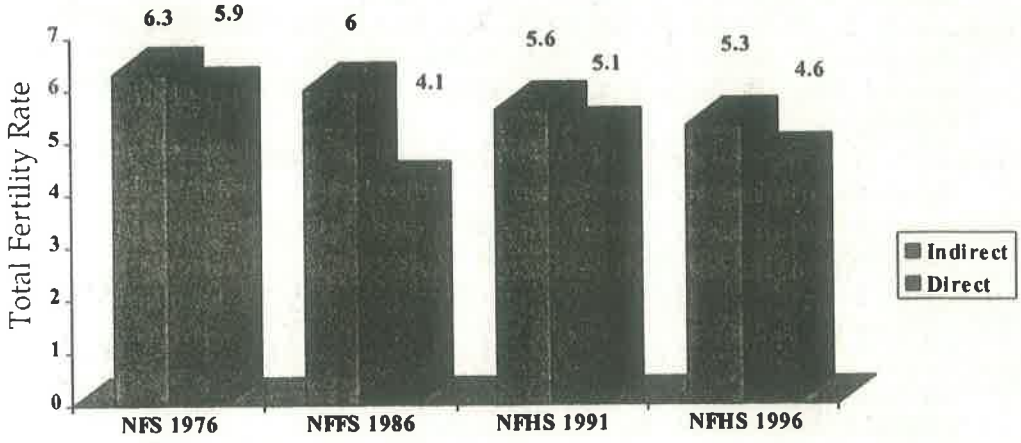
Trends In Total Fertility Rates In Nepal 1971-96



Source : As in the Reference Year.

Figure 2

Trends In Total Fertility Rates In Nepal Based On Direct Versus Indirect Estimates 1976-96



Source : As in the Reference Year.

SELECTED REFERENCES

Central Bureau of Statistics (CBS) (1996) *Statistical Year Book*, Kathmandu; Central Bureau of Statistics, His Majesty's Government of Nepal.

Central Bureau of Statistics (CBS) (1996a) *Nepal Living Staandards Survey Report 1996*, Central Bureau of Statistics, His Majesty's Government of Nepal, Kathmandu.

Chowdhery, A.K.M.; R.A. Khan and L.C. Chen (1976) "The Effect of Child Mortality Experience on Subsequent Fertility in Pakistan and Bangladesh", *Population Studies* 30(2): 249-261.

Cox, D.R (1972) "Regression Models and Life Tables", *Journal of the Royal Statistical Society*, B, 34:187-220.

Gray, A. (1988) *Demographic Analysis* , Teaching Materials Prepared for the Master Student in Demography, The Australian National University, Canberra.

Khan, H and C. Sempos (1989) *Statistical Methods in Epidemiology*, Oxford University Press, 72-81.

Knodel, J. (1968) 'Infant Mortality and Fertility in Three Bavarian Villages : An Analysis of Family Histories from the 19th Century', *PopulationStudies*, Vol. 22, pp. 297-318.

MOH (1996) *Nepal Family Health Survey*, Family Health Division, Ministry of Health/HMG, Nepal.

National Planning Commission (1992) *Eighth Five-Year Plan 1992-97*, National Planning Commission, His Majesty's Government of Nepal, Kathmandu.

Nepal Family Planning and Maternal Child Health Project (NFPMCH) (1987) *Nepal Fertility and Family Planning Survey Report* 1986, Ministry of Health, His Majesty's Government of Nepal, Kathmandu.

Pradhan, A; R. H. Aryal; G. Regmi; B. Ban and P. Govindasamy (1997) *Nepal Family Health Survey 1996*, Nepal and Calverton, Ministry of Health [Nepal], New Era, and Macro International, Maryland, Kathmandu.

Preston, S (1977) *The Effects of Infant and Child Mortality on Fertility*, Academic Press, New York.

Retherford D.R and M.K. Choe (1993) *Statistical Models for Causal Analysis*, John Wiley and Sons, Inc., New York.

Scrimshaw, S.C (1978) "Infant Mortality and Behaviour on the Regulation of Family Size" *Population Development Review*, 4(3): 383-403.

Suchindran, C. M. and A. L. Adlakha (1984) "Effects of Infant Mortality on Subseqent Fertility of Women in Jordan: A Life Table Analysis" *Journal of Bio-social Science*, 16: 219-229.

Taylor, C.E; J.S. Newman; A.N. Herrin And C. Tan (1976) " The Child Survival Hypothesis", *Population Studies* 30(2): 263-278.