M. M. Gandotra and Narayan Das

Some Basic Age Patterns of Indian Women in a Family Planning Programme

THE pattern of age at acceptance of a family planning programme and their relative variations are fundamental in the calculations of potential number of births averted and in the estimation of possible reduction in the fertility level due to a family planning programme.

Like age-specific fertility rates, the pattern of age at acceptance of a family planning method, in general, is a bell shaped, unimodal curve which first rises slowly, then sharply to attain its modal value and declines thereafter first slowly and then steeply till it approaches zero. The modal value may however differ with the use of different methods of family planning. The modal age of acceptance of terminal methods is found to be higher than the modal age of acceptance of non-terminal methods (Gandotra, Das, 1973). The age patterns under a regular family planning programme may also have different modal value than that under its intensive campaign phase through camps.

One may expect that acceptance of family planning may be related to the order of live birth. It may therefore be possible to understand the variations in age at acceptance of family planning by studying the age patterns by order of live birth.

This study is thus an attempt to examine some basic age patterns of wives when their husbands got vasectomised, in a campaign of 1971-72, in an Indian community, by order of live birth.

Data

To study the age patterns by order of live birth, of the wives of the acceptors of vasectomy, the data were obtained from Mass Vasectomy Camp Evalu-

ation Study conducted by the Demographic Research Centre Baroda in 1972. In this evaluation study, fertility histories, of a sample of 810 wives of vasectomy acceptors living in the rural and urban areas of Baroda District, were obtained. The study also collected data on age of the woman (i) at marriage, (ii) at first cohabitation and (iii) at the point of sterilisation of her husband. Besides, details about the socio-economic characteristics and the religion of the respondent were also obtained.

The bulk of the population comprised agricultural, factory workers and labourers, and was of poor economic status. Most women in the rural and urban area were literate but majority had education upto primary level only.

The age distribution of the wives of acceptors of vasectomy, by order of live birth was found to suffer from certain irregularaties particularly for the first three birth orders, because of the occurrence of certain percentage of ineligible cases in the population. Following types of ineligible cases were noticed : (i) the person or his wife was found to have been sterilised on a prior occasion, (ii) the wife of sterilised person had reached menopause, (iii) the couple was found to be secondarily sterile, (i-v) sterilised person was either found to be unmarried, widower, divorced or separated, and (v) some sterilised men had wives in the age group 45 and over. Though these wives had neither reached menopause nor the couple was found to be secondarily sterile, the chances for reproduction of these wives are expected to be very low. Therefore, fresh tabulations were done by dropping those ineligible cases for the present analysis (see Table 1). These tabulations are used in this paper to examine the age distribution of the wife at the time of sterilisation of her husband by birth order under mass vasectomy campaign.

Age Patterns of Wives by Order of Live Birth

Pearsonian curves (Elderton, 1938) were used to fit the data on the age distribution of the wives, when their husbands got sterilised in mass vasectomy camp, at each birth order up to the sixth and seven and over. Because of the small number of cases and almost same age patterns in the first three birth orders they were grouped together. Similarly, women with birth order seven and over were grouped together. The Pearsonian curves thus fitted and their statistical constants are given in Table 2. The observed and the expected frequencies based on the fitted Pearsonian curves are compared in Table 3. Use of Chi-square test indicate that the Pearsonian system of curves provide a good fit to the observed data.

It was thus observed that Type 1 Pearsonian curves fit the distribution of wives' ages when their husbands got sterilised, at various birth orders with an obvious shift in the mean and modal value of the curves. The standard deviations, as given in Table 2, showed a tendency to increase with the order of

TABLE 1—FREQUENCY DISTRIBUTION OF 556 WIVES WHOSE HUSBANDS GOT STERILISED DURING MASS VASECTOMY CAMP, 1971-72, ACCORDING TO THE AGE OF THE WIFE AND ORDER OF LIVE BIRTH

Age group	*No. of Women by birth order*										*Total*
	1	*2*	*3*	*4*	5	*6*	*7*	*8*	9	*10*	
20-24	1	11	13	8	2	1	—	—	—	—	36
25-29	—	14	41	50	25	18	5	2	—	—	155
30-34	1	4	10	36	54	36	15	14	4	4	178
35-39	–	2	2	14	17	19	24	20	5	7	110
40-44	–	1	2	2	5	13	11	4	14	7	59
45-49	—	—	—	2	5	2	2	2	1	3	18*
Total	2	32	68	112	108	89	57	42	24	21	556*

*For one case information is not available by birth order.

TABLE 2—STATISTICAL CONSTANTS AND PEARSONIAN TYPE OF THE FREQUENCY DISTRIBUTION OF THE WIVES ACCORDING TO AGES AND BIRTH-ORDERS AT WHICH THEIR HUSBANDS GOT STERILISED DURING CAMP, 1971-72

Order of live birth	*Statistical Constants*						*Pearsonian Type*
	Mean	*Mode*	*S.D.*	*Skewness*	*Kurtosis*	*K*	
1 to 3	27.84	23.95	4.26	1.36	5.26	*-1.96*	Type-1
4	30.54	29.09	4.37	0.68	3.08	-1.28	Type-1
5	32.87	31.31	4.31	0.52	2.99	-0.26	Type—1
6	34.24	34.08	5.31	0.04	2.54	—.0014	Type-1
7+	37.53	37.63	4.79	0.04	2.60	-.00004	Type-1

TABLE—3 OBSERVED AND EXPECTED NUMBER OF WIVES WHOSE HUSBANDS GOT STERILISED DURING 1971-72 CAMP ACCORDING TO AGE AND BIRTH ORDERS COUPLED WITH CHI SQUARE VALUES FOR TESTING GOODNESS OF FIT OF THE PEARSONIAN CURVES

Age-group	*Birth order*											
	1, 2 and 3		*4*		*5*		*6*		*7+*		*All birth order*	
	O	*E*	*O*	*E*	*O*	*E*	*O*	*E*	*O*	*E*	*O*	*E*
20-24	25	28	8	9	2	1	1	3	—	—	36	38
25-29	55	48	50	48	25	27	18	17	7	5	155	157
30-34	15	19	36	37	54	51	36	31	37	34	178	171
35-39	4	6	14	15	17	23	19	27	56	57	110	118
40-44	3	1	4*	3	10*	6	15*	11	36	38	59	56
45-49									8	10	18	61
Total	102		112		108		89		144		556	
Chi-Square Value (χ^2)	6.85		0.70		5.57		6.47		1.59		1.37	
Test of Significance at 5% level	ns		ns		ns		ns		ns		ns	

*Because of the small number of cases in the age group 45-49, they were added to the age group 40-44.
ns-Not significant.

birth, indicating thereby a higher variability in the curves of higher birth-orders. However, for the birth orders 7 and over, a slight decline in the standard deviation was noticed. The values of B_1(skewness) illustrated that asymmetry remains comparatively at high level for birth orders one to three. It then diminishes and approaches near to zero for birth order 6 and over. Though skewness is positive for all the birth order, the right tail of the curve gets truncated for higher birth orders. The reason for such truncation could be attributed to the finiteness of the reproductive span of a women. As the birth order increases, the probability of persons reaching the end of their reproductive life also increases. This may probably be precluding persons to accept sterilisation as a method of contraception beyond a certain age.

Table 2 reveals that the value of B_2 (kurtosis) for the first three birth orders is far higher than 3. In other words, the form of curve for these birth orders is more peaked than the normal curve. On the other hand, the values of B_2 for the fourth and fifth birth orders are found to be closer to 3 resulting thereby in the flattening of curve approximately to that of the level of normal curve. The curves of birth order 6 and over are even flatter than the normal curve.

Above analysis illustrates that the changes in the standard deviation, skewness (B_1) and kurtosis, (B_2), over the order of live births, in the case of age distribution of the wives of acceptors of vasectomy follow almost a similar pattern as that observed in the case of the age-specific birth rate curves, by order of live birth (Chandrasekaran, Talwar, 1968). This happens despite the fact that the Pearsonian curves fitted in the former case follow only Type I, whereas they vary from Type I to Type VI in the latter case.

Parcentage age distributions of the fitted Pearsonian curves by each birth order are shown in Figure 1. This was done in order to facilities the visual comparison of skewness and kurtosis of the curves by order of live birth.

The interval between the mean ages of wives of consecutive birth orders at the time of sterilisation of their husband was found to be 2.70, 2.33, 1.37 and 3.29 years respectively with the increase in the birth order. There is thus a trend of narrowing down of the difference in mean ages between two consecutive birth orders excepting for the birth orders group of seven and over. This phenomenon of narrowing down of differences in the mean ages of the wives of acceptors of sterilisation between two consecutive birth orders, as the birth order increases, could be attributed, besides other factors, to the finiteness of reproductive span. This happens because the difference in the mean ages of the wives between two consecutive birth orders, with the increase in the birth order, gets narrowed down (Chandrasekaran, Talwar, 1968).

Age Specific Birth Rate Versus Age Patterns of Wives of Acceptors of Vasectomy

Since the women under each parity comes from different cohorts, the age

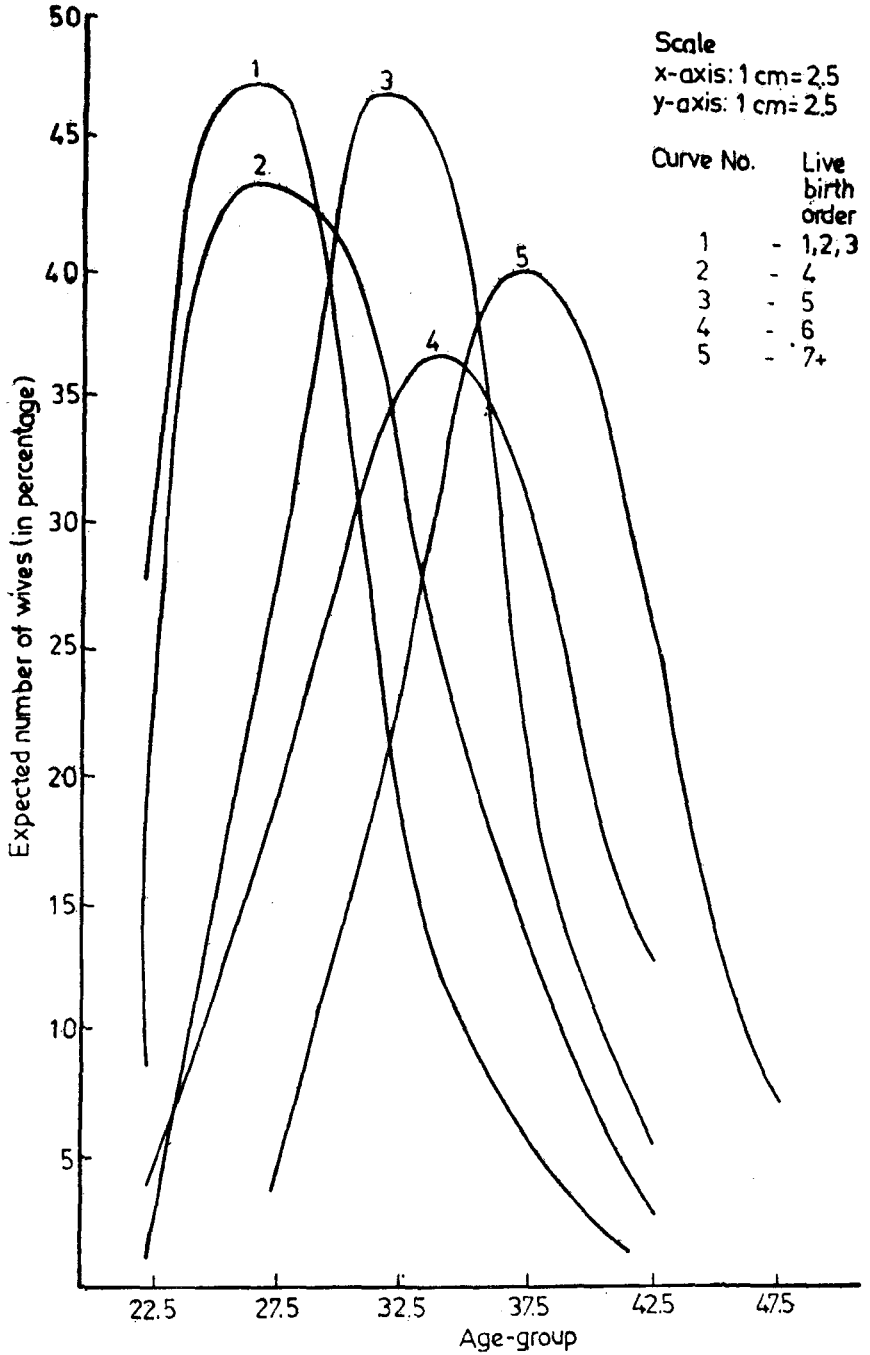

Fig. 1. Comparision of the forms of Pearsonian curves fitted to the age-specific acceptance rates of vasectomy by order of live birth, keeping the same area under each curve.

patterns of wives of acceptors of vasectomy for any birth order would depend on (i) the age of women at which last live birth occurred and (ii) the distribution of the interval between last live birth and date of sterilisation.

An attempt was, therefore, made to see if the spacing between age at last live birth, of the wife, and her age when the husband accepted sterilisation is constant irrespective of the age at which last live birth occurred for each birth order. A linear relationship was assumed between x and y and a regression line of the form was fitted,

$$y = \bar{y} + b\,(x - \bar{x})$$

where $\bar{y}$ and $\bar{x}$ are the means of y and x which are the ages of wives at which last live birth occurred and her husband got sterilised respectively and b is a regression co-efficient of x on y. The estimated values of b given in Table 4 were not found to be significantly greater than unity except for the fourth parity (where it still remains quite close to unity). This implies that the spacing between the termination of last live birth and the acceptance of sterilisation remains almost constant for any birth order and is not dependent on the age of the woman at which the last live birth occurred.

TABLE 4—THE STATISTICAL CONSTANTS OF THE REGRESSION LINE FITTED TO THE BIVARIATE DISTRIBUTION OF THE AGES AT LAST LIVE BIRTH AND THE TIME OF THEIR HUSBAND'S STERILISATION BY SUCCESSIVE BIRTH ORDERS

*Statistical Constants**	*Successive Birth orders*				
	1, 2 and 3	*4*	*5*	*6*	*7+*
Number	101	112	105	89	146
$\bar{x}$	25.29	28.08	29.97	31.83	34.73
$\bar{y}$	27.00	29.83	31.80	33.49	36.63
b	1.01	1.08++	1.07	0.98	0.98

*As defined in the text. The figures are rounded up with two decimals.

++This estimated value of b was found to be significantly greater than unity whereas the others were not found to be significantly different from unity.

The distribution of the interval between the termination of pregnancy of any order and the acceptance of the family planning method depends on the decision making procedure of the couple. This decision making procedure about the acceptance of the method depends to a large extent upon the socio-economic, psychological and cultural background and also on the fecundity components of the couple. It has been observed in this study that the men who accepted vasectomy

were more or less homogeneous with regard to their socio-economic psychological and cultural background. This probably is the reason as to why the interval between the termination of pregnancy and the acceptance of vasectomy is more or less constant irrespective of the age. This may be making the age patterns of the wives of the acceptors of vasectomy by order of live birth to resemble more or less with the forms of the age-specific fertility rates by order of live birth (Chandrasekaran, Talwar, 1968) except that the curves of the former may be shifting in its location by almost a constant distance.

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