

How well do women of different socioeconomic status use oral contraceptives? Is use-effectiveness lower among women in low socioeconomic groups? Data gathered for the years 1962-1967 on 2,000 women were analyzed to answer such questions. Findings show that use is equally effective for middle- and low-income women, but that motivations may differ and that alternatives to oral contraceptives require consideration.

PATTERNS AND PURPOSES OF ORAL CONTRACEPTIVE USE BY ECONOMIC STATUS

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THE widespread acceptance of the necessity for family planning in recent years has led to extensive use of oral contraceptives to limit family size. How successfully women use this method of contraception is currently of great interest. "Use-effectiveness" relates to the experience with contraception of a human population at risk to pregnancy.

For the first time, growing numbers of women from the low socioeconomic strata have the means and information available to practice birth control. Most studies of the use-effectiveness of oral contraceptives tend to conclude that less educated and lower-income women do not use the pill as effectively as do other women.¹⁻³

Data gathered from the Buffalo Planned Parenthood Center on the use of the pill by 2,000 women for the years 1962-1967 permitted an analysis of its use-effectiveness by economic status.⁴

Method

The determination of economic status was based upon per capita family in-

come. Because of the limited income range of most women attending the Planned Parenthood Center, it was only possible to obtain data for three economic classes: low, low-middle and middle. The economic classes were determined by relating income and family size as shown in Table 1. In general, the low-income group corresponded to the federal poverty guidelines for 1968 and the low-middle income group to the original New York State Medicaid eligibility levels. According to these criteria, 54 per cent of the women in this analysis were classified in the low-income group, 36 per cent were classified in the low-middle group and 10 per cent were classified in the middle-income group.

Synthetic cohort life tables were compiled for women from each of the three income groupings following procedures developed by Tietze.⁵ The life table technique consists of determining the probability that a woman will be using contraceptives after a given number of months have elapsed. This probability is obtained by following cohorts of women on a monthly basis and obtaining

Table 1—Classification of economic status based on income level and family size, Buffalo, New York

No. of family members	Net family income	
	Low Less than \$	Middle More than \$
1	1,600	3,000
2	2,000	3,750
3	2,500	4,687
4	3,200	6,000
5	3,800	7,140
6	4,200	7,889
7	4,700	8,835
8	5,300	9,983
9	5,800	10,921
9+	6,800	11,907

monthly probabilities which are combined to arrive at a joint probability or cumulative continuation rate. The tables utilize the experience of women during all segments or episodes of pill use throughout the study period. If a woman ceases oral contraception for any reason during the study period she is counted as a termination. If a woman does not recommence oral contraception during the study period she is also counted as a closure. If the woman does begin oral contraception again, she is considered as an active case from the time she reentered the study until the next termination.

Findings

Age and Parity

The average age at which the 2,000 women in the study first used an oral contraceptive was 24.9 years. The average age at which oral contraceptives were begun for middle-income women was 24.1 years, which was less than a year younger than low-income women, who were 24.9 years, or low-middle-income women, who were 25.1 years.

There were great differences in parity (the number of children) at the begin-

ning of contraception among women from the three economic classes. Low-income women had an average of 3.1 living children; low-middle-income women had an average of 2.1 children; and middle-income women had an average of 0.8 living children. The differences in parity, when related to the average age of the women in the three income classes, indicate that women from the low-income class began childbearing earlier in life and that the interval between children was relatively short.

Continuation Rates

A comparison of estimates of one-year continuation rates for a number of studies in a variety of locales indicates that the continuation rate of 82 per cent in Buffalo is most similar to the rates in studies done in Los Angeles.^{6,7} The continuation rate of 68 per 100 for the 2,000 Buffalo women at the end of two years' experience was somewhat higher than rates reported in most other studies. Continuation rates at the end of two years were 58 per 100 in Charlotte, North Carolina,⁸ 53 per 100 in the United States sample survey,² and 37 per 100 in Humacao, Puerto Rico.⁹ Continuation rates reported by Frank and Tietze in Chicago are similar to those in Buffalo.¹⁰

Table 2 and Figure 1 present continuation rates by income group in the Buffalo study over a five-year period. The rate varied after one year from 83.2 per 100 women in the low-income group to 79.0 per 100 women from the middle-income group. At the end of three years the continuation rates decreased to 58 per cent among low-income women to 51 per cent among low-middle-income women, and to 46 per cent among middle-income women. The difference between low- and middle-income women in the rate of continuation after three years of observation was 12 per 100.

It was only possible to compare the experience of low- and low-middle eco-

conomic class women after three years of pill use because of the limited numbers of middle-income women in the study. After four years, there were 48 per 100 low-income women compared to 45 per 100 low-middle-income women continuing on the pill. After five years, the longest period for which data from the Buffalo Planned Parenthood Center were available, 41 per 100 low-income women and 38 per 100 low-middle-income women were still taking the oral contraceptive.

The higher continuation rate after three years among low-income women was significantly greater than the rate among other women ($P < .01$). On the basis of the United States sample survey, Westoff and Ryder found that "the probability of discontinuation revealed a consistent tendency for women with the least education to experience the highest drop-

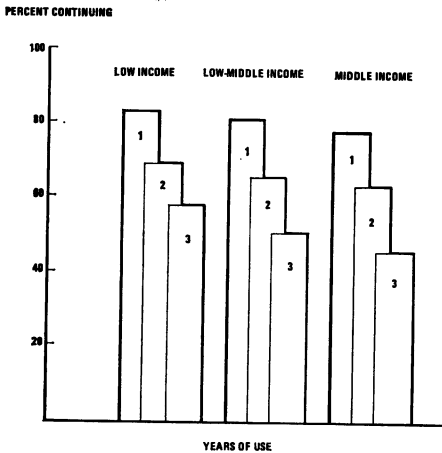
out rates."² Unfortunately, there are no known published American studies evaluating the use-effectiveness of oral contraception among women from differing economic levels. Kanitkar's study in India supports Westoff and Ryder's finding in that he found a lower probability of discontinuation of pill use among women at either high-income or high-educational levels.¹¹ In a Chicago study, which analyzed continuation rates by women's level of education, Frank and Tietze found that women with the least and those with the most education had lower continuation rates than women with intermediate levels of education.¹⁰ On the other hand, Rao's study conducted in Ceylon under very special circumstances recorded very high continuation rates among a group of women, more than three-quarters of whom were illiterate.¹² The lack of con-

Table 2—Closure and continuation rates per 100 women using oral contraceptives, over a five-year period, by economic status, Buffalo, New York, 1962-1967

	Oral contraceptive use				
	One yr	Two yr	Three yr	Four yr	Five yr
Closures by economic status					
Low	16.8	30.3	41.9	51.8	59.5
Low-middle	18.7	34.8	49.4	55.0	62.1
Middle	21.0	36.5	57.7	*	*
Total	18.0	32.4	45.9	54.3	62.0
Continuations by economic status					
Low	83.2	69.8	58.0	48.2	40.5
Low-middle	81.3	65.2	50.6	45.0	37.9
Middle	79.0	63.5	46.2	*	*
Total	82.0	67.5	54.2	45.7	38.0
Woman—months by economic status					
Low	11,228	20,122	26,037	29,540	31,270
Low-middle	7,502	13,162	16,818	18,889	19,779
Middle	1,955	3,403	4,224	*	*
Total	20,802	36,893	47,349	53,331	56,073

* Because of the small number of middle-income women this group was not followed beyond three years.

Figure 1—Continuation rates per 100 women using oral contraceptives, over a three-year period by economic status, Buffalo, New York, 1962-1967



sistency in the findings of these studies suggests that the local culture, social structure, and motivation have a considerable influence on the rate of oral contraceptive utilization.

Closures

Unintended pregnancies among women seen at the Buffalo Planned Parenthood Center varied only slightly by income group as shown in Table 3. The cumulative termination rate, because of unintended pregnancy after three years was 2.2 per 100 for both low- and low-middle-income women and 2.3 per 100 middle-class women. After five years, unintended pregnancies accounted for 3.6 terminations per 100 low-income women compared to 3.4 per 100 low-middle-income women.

Closure rates by reason for termination are presented in Table 4. Although the rate of unintended pregnancy was similar by income groups, all the middle-income women returned to Planned Parenthood again after their unintended pregnancies whereas some of the low- and low-middle-income women, who had unintended pregnancies, did not return.

Although there was little difference by economic status in the rate of discontinuance for either “personal” reasons or for cases lost to follow-up, there were very large differences for planned pregnancies. At the end of three years only 4.7 per 100 low-income women compared to 12.2 per 100 low-middle-class women and 15.2 per 100 middle-class women discontinued oral contraceptive use to become pregnant. This is more than a three-fold difference in the rates between low- and middle-class women. After five years only 7.2 per 100 low-income women compared to 16.2 low-middle-income women ceased oral contraception to become pregnant. Obviously, very few low-economic class women wanted more children.

The rates of termination of oral contraception for medical reasons was similar for the three income groups. Table 5, however, indicates a substantial difference by economic level in the proportion of women who, after terminating oral contraception for medical reasons, did not return to Planned Parenthood. Forty-four per cent of the low-economic class women, 42 per cent of the low-middle-class women and 29 per cent of the middle-class women terminating oral contraception for medical reasons after three years never returned to Planned Parenthood. After five years 48 per cent

Table 3—Cumulative unintended pregnancies per 100 women using oral contraceptives over a five-year period, for women by economic status, Buffalo, New York, 1962-1967

Year	Economic status		
	Low	Low-middle	Middle
First	1.4	1.0	1.6
Second	1.8	1.6	2.3
Third	2.2	2.2	2.3
Fourth	3.0	2.6	*
Fifth	3.6	3.4	*

* Because of the small number of middle-income women this group was not followed beyond three years.

of low-income women and 39 per cent of low-middle-income women terminating oral contraception for medical reasons did not go back to the contraceptive pill.

Comment

The data from Buffalo indicate that low-income women, who chose to use oral contraceptives, used them as effectively as middle-income women. The higher continuation rate of low-income women results largely from their greater parity at the onset of contraception. Adjusting for differences in parity among women from the three income classes eliminates most of the observed variation in the continuation rates. The larger proportion of low-

economic class women compared to middle-class women, who terminated oral contraception for medical reasons for an indefinite period of time, would suggest that the continuation rate for low-income women could be even higher with better knowledge about contraceptives. The finding that low-income women also begin childbearing when they are younger indicates that contraceptive information for teen-agers would be of great benefit.

Their greater parity and relatively few closures for planned pregnancies suggest that low-income women use oral contraceptives to prevent the birth of additional children rather than to space their children. Westoff and Ryder observed that

Table 4—Cumulative closures per 100 women using oral contraceptives, over a five-year period, by economic status and reason for closure, Buffalo, New York, 1962-1967

Reasons for closure	Oral contraceptive use				
	One yr	Two yr	Three yr	Four yr	Five yr
Unintended pregnancy					
Low	0.3	0.4	0.6	1.2	1.8
Low-middle	0.3	0.9	1.3	1.3	2.1
Middle	0.0	0.0	0.0	*	*
Medical					
Low	4.7	9.5	12.7	16.5	19.0
Low-middle	4.3	9.1	12.3	13.7	15.4
Middle	4.4	6.7	9.0	*	*
Planning pregnancy					
Low	0.9	2.9	4.7	5.9	7.2
Low-middle	1.7	6.6	12.2	14.8	16.2
Middle	3.9	9.1	15.2	*	*
Personal					
Low	3.7	5.1	7.1	8.8	9.8
Low-middle	4.9	6.9	9.6	9.9	11.0
Middle	3.3	5.7	10.0	*	*
Lost to follow-up					
Low	7.2	12.4	16.8	19.4	21.7
Low-middle	7.5	11.3	14.0	15.3	17.4
Middle	9.4	15.0	19.5	*	*

* Because of the small number of middle-income women this group was not followed beyond three years.

Table 5—Cumulative terminations and closures for medical reasons per 100 women using oral contraceptives over a five-year period, Buffalo, New York, 1962-1967

	Oral contraceptive use				
	One yr	Two yr	Three yr	Four yr	Five yr
Low-income					
Medical terminations	11.8	21.5	28.8	36.4	40.0
Medical closures	4.7	9.5	12.7	16.5	19.0
Per cent of medical terminations not returning to Planned Parenthood	39.8	44.2	44.1	45.3	47.5
Low-middle-income					
Medical terminations	11.4	21.5	29.5	33.1	39.9
Medical closures	4.3	9.1	12.3	13.7	15.4
Per cent of medical terminations not returning to Planned Parenthood	37.7	42.3	41.7	41.4	38.6
Middle-income					
Medical terminations	14.9	23.2	31.0	*	*
Medical closures	4.4	6.7	9.0	*	*
Per cent of medical terminations not returning to Planned Parenthood	29.5	28.9	29.0	*	*

* Because of the small number of middle-income women this group was not followed beyond three years.

Negroes use oral contraception at a later stage in their marriages than whites, presumably to terminate reproduction rather than to space births. Since a patient's race is not recorded at the Buffalo Planned Parenthood Center, it was not possible to confirm that observation. The Buffalo findings indicate that low-income women, regardless of race, are similarly motivated. It is more impressive that significant differences were found in patterns and purposes of oral contraceptive use by economic class within a relatively limited income range. If data for women from a wider range of income categories were available, the differences might have been even greater.

Since parity rather than income is the deciding factor in continued use of oral

contraceptives, women seeking contraceptive counseling after completing their families can be expected to use contraceptives for an extended period of time. Recently, a great deal of attention has been focused on the possibly adverse effects of long-term use of the pill. If a woman's reason for using oral contraceptives is termination of childbearing and she has many years of fertility before her, she might be best advised to use some other means of prevention with less risk from long-term use. For these women, consideration might be given to intra-uterine devices, long-term injectables or medicated silastic implants, or voluntary sterilization—all of which provide long-term contraception more effectively and more economically.

REFERENCES

1. Shaw, D. C. "Barriers to Fertility Control with Special Reference to Low Income People." In: *Family Planning—An Option for All People?* Proc. Conference of the National Federation of Settlements and Neighborhood Centers (June 3-13), 1969.
2. Westoff, C. F., and Ryder, N. R. Duration of Use of Oral Contraception in the United States, 1960-1965. *Pub. Health Rep.* 83,4: 277-287 (Apr.), 1968.
3. Jones, G. W., and Mauldin, W. P. Use of Oral Contraceptives: With Special Reference to Developing Countries. *Studies in Family Planning* (publication of the Population Council) 24,1:1-13 (Dec.), 1967.
4. Lippes, J., and Ogra, S. S. Comparative Study of Loops and Orals. Proc. of Sixth Annual Meeting, American Association of Planned Parenthood Physicians. *Excerpta Medica International Congress Ser. No. 177:67-72* (Apr.), 1968.
5. Tietze, C. Intra-uterine Contraception: Recommended Procedures for Data Analysis. *Studies in Family Planning* 18:1-6 (Apr.), 1967.
6. Holmstrom, E. G. "The Use of Ovulen in Clinical Practice." In: *Recent Advances in Ovarian and Synthetic Steroids*. R. P. Shearman (ed.). Sydney, Australia: Globe Commercial Pty., 1965, pp. 158-163.
7. Tyler, E. T., et al. Oral Contraception by Sequential Approach. *J.A.M.A.* 197:113-118 (Sept. 19), 1966.
8. Corkey, E. "Health Department Program in a Small City." In: *Advances in Planned Parenthood*. A. J. Sobrero and S. Lewit (eds.). Cambridge, Mass.: Schenkman Publishing, 1965, pp. 73-84.
9. Satherthwaite, A. P. "Oral Contraceptives." In: *Family Planning and Population Programs*. B. Berelson, et al. (eds.). Chicago: University of Chicago Press, 1966, p. 411.
10. Frank, R., and Tietze, C. Acceptance of an Oral Contraceptive Program in a Large Metropolitan Area. *Am. J. Obst. & Gynec.* 93:122-127 (Sept.), 1965.
11. Kanitkar, S. D. Some Observations on the First Pill Trial in Bombay. Presented at the International Symposium on Oral Gestogen and Their Uses in General Medicine and Public Health, Folkestone, (Oct. 29-30), 1966 (unpublished data).
12. Rao, P. V. Reduction in the Birthrate of a Community Through the Use of Oral Contraceptives. Presented at the Seminar on Modern Contraception, Bombay, (July 17-19), 1965 (unpublished data).

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