

# BIRTH CONTROL IN A MIDWESTERN CITY

## A STUDY OF THE CLINICS OF THE CINCINNATI COMMITTEE ON MATERNAL HEALTH

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### I. CONTRACEPTION AND FERTILITY BEFORE CLINIC ATTENDANCE

#### INTRODUCTION

TWO important trends in birth rates have been carefully studied within the past decade. They are (1) the rapid decline in the birth rates of the population as a whole, and (2) the differentials in the birth rates of various social and occupational groups. Urban families have lower birth rates than rural families, and among urban families white-collar workers are reproducing at a lower rate than manual laborers.<sup>2</sup>

Within the past five years a number of studies have demonstrated clearly the importance of contraception as a factor in both trends. Several studies have been published which show the prevalence and effectiveness of contraception in selected groups of urban families,<sup>3</sup> but it is necessary to have more information about differently

<sup>1</sup> From the Milbank Memorial Fund.

The author wishes to acknowledge with appreciation the work of Florence G. Lindquist, R.N., who conducted the interviews, and the cooperation of the Medical Director, the Executive Secretary and the Executive Board and staff of the Cincinnati Committee on Maternal Health.

<sup>2</sup> Griffin, H. C. and Perrott, G. St.J.: Urban Differential Fertility During the Depression. The Milbank Memorial Fund *Quarterly*, January, 1937, xv, No. 1, pp. 75-89.

Kiser, Clyde V.: Variations in Birth Rates According to Occupational Status, Family Income, and Educational Attainment. The Milbank Memorial Fund *Quarterly*, January, 1938, xvi, No. 1, pp. 39-56.

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Notestein, Frank W.: Differential Fertility in the East North Central States. The Milbank Memorial Fund *Quarterly*, January, 1938, xvi, No. 2, pp. 173-191.

Sydenstricker, Edgar and Notestein, Frank W.: Differential Fertility According to Social Class. *Journal of the American Statistical Association*, March, 1930, pp. 10-32.

<sup>3</sup> Beebe, Gilbert and Gamble, Clarence: The Effect of Contraception Upon Human Fertility. *Human Biology*, September, 1938, x, No. 3, pp. 372-387.

(Continued on page 70)

selected groups, both urban and rural, before it is possible to estimate the extent to which contraception is practiced in broad regions of the United States. Studies of patients of birth control clinics offer one approach to the problem, but even these have been limited to clinic patients in a few eastern cities, and the results cannot be assumed to be typical of those which might be obtained from similarly selected groups of women living in less cosmopolitan sections of the country.

For these reasons the Milbank Memorial Fund initiated a study of the patients of the clinics of the Cincinnati Committee on Maternal Health, in the spring of 1935. Its object, like that of the study made previously of the Birth Control Clinical Research Bureau in New York,<sup>4</sup> was to assess the prevalence and effectiveness of the contraception in use before the women attended the clinic, and the acceptability and effectiveness of clinically prescribed contraceptives.<sup>5</sup>

#### THE CLINICS

The Cincinnati Committee on Maternal Health opened its first clinic in November, 1929 and has since opened several additional clinics. They have been operated under the sponsorship of the local Academy of Medicine as referral clinics for women who could not

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Pearl, Raymond: Contraception and Fertility in 2,000 Women. *Human Biology*, September, 1932, iv, No. 3, pp. 363-407; Contraception and Fertility in 4,945 Married Women. *Human Biology*, May, 1934, vi, No. 2, pp. 355-401; Fertility and Contraception in Urban Whites and Negroes. *Science*, May 22, 1936, lxxxiii, No. 2160; Third Progress Report on a Study of Family Limitation. The Milbank Memorial Fund *Quarterly*, July, 1936, xiv, No. 3, pp. 258-284; Fertility and Contraception in New York and Chicago. *Journal of the American Medical Association*, April 24, 1937, cviii, pp. 1385-1390; Specific Fertility and Contraceptive Rates in New York City and Chicago. *American Journal of Hygiene*, May, 1937, xxv, No. 3, pp. 507-519.

Stix, Regine K. and Notestein, Frank W.: Effectiveness of Birth Control. The Milbank Memorial Fund *Quarterly* (I.), January, 1934, xii, No. 1, pp. 57-68; (II.), April, 1935, xiii, No. 2, pp. 162-178.

<sup>4</sup> *Ibid*: Stix, Regine K. and Notestein, Frank W.

<sup>5</sup> The present report will be limited to a discussion of the preclinic prevalence and effectiveness of the contraception used by patients of the Cincinnati clinics. Comparisons of the findings with those reported in other studies will be published later.

afford the services of private physicians and who needed contraceptive advice because of illness or poor social and economic conditions.<sup>6</sup> Patients have been accepted only on the recommendation of physicians, ministers, social service agencies, or other clinics. Charges for clinic services have been based on the ability of the patient to pay. All charges have been small and many cases have been handled without fees. During the period covered by the study the Committee on Maternal Health operated two clinics: one in the Children's Hospital and one in the parish house of a centrally located Episcopal church.

For the present study an attempt was made to follow up all the white patients who attended the clinics in the five-year period between November, 1929 and December 31, 1934, who were living in metropolitan Cincinnati<sup>7</sup> in the spring of 1935. A new record was obtained from each patient by a trained nurse who conducted all interviews. Each record contained a complete history of fertility from marriage to the date of interview, including the date and type of termination of each pregnancy and the type of contraceptive practice that preceded it. Most patients were seen in their own homes, but a few were interviewed when they returned to the clinic for semi-annual check-up visits. Exhaustive efforts were made to trace all patients, regardless of case status, in order to secure an unbiased series of records. The patients were interested and cooperative, and there is every reason to believe that the records are as accurate as any obtained in a series of medical histories taken by a trained interviewer who has secured the confidence of the patients interviewed.

<sup>6</sup> From the beginning, the clinics dealt with all the aspects of maternal health. Although most of the patients were referred for advice on contraception, many of them were given ambulatory care in the gynecological clinic operated by the committee and some had advice on problems of marital adjustment. Each year a small number of patients has been treated for sterility. The gynecological records of all cases treated in the gynecological clinic were available for the present study.

<sup>7</sup> Metropolitan Cincinnati, as defined for this study, includes those areas shown on Cram's "Official Indexed Street Map of the Cincinnati Area, Including Northern Kentucky Cities." J. Louis Motz News Co., 918 East Court Street, Cincinnati, Ohio, 1936.

## THE GROUP STUDIED

The total number of white women who sought contraceptive advice in the first five years of the clinics' existence was 2,439. When the present study was undertaken, it was found that 114 women had never been prescribed for; 21 had died; 221 were living away from Cincinnati; 6 records had been lost, and 54 cases were not available for interview.<sup>8</sup> The exclusion of these cases left 2,023 available for study, of whom 1,621, or 80.1 per cent, were interviewed.

They were predominantly native-born Protestants who were the wives of manual workers. Nearly 85 per cent were native born of native parentage, and only 6 per cent were foreign born. Both husband and wife were Protestant in nearly 75 per cent of the cases; in 11 per cent the husband and wife had differing religious affiliations; in 12 per cent both were Catholic, and in less than 4 per cent both were Jewish.

About 85 per cent of the couples had spent all of their married lives in cities. The others had lived in villages or rural areas for periods ranging from less than a year to ten or more years. All of them were living either in Cincinnati or very near it at the time of record.

Twenty-five per cent of all the families interviewed were the recipients of relief at the time of record. About one-fourth of the men were employed on work relief projects, but most of the families were receiving direct relief from public funds or private charitable organizations. The median income of nonrelief families was under \$1,100 per year. At the time of record only about 5 per cent of the interviewed families had incomes of \$2,000 per year or more.

The usual occupation of more than 80 per cent of the husbands was manual labor. Table 1 shows the occupational distributions separately for relief and nonrelief families. Nearly 90 per cent of the families on relief were those of unemployed manual workers.

<sup>8</sup> These were private patients who had attended the original clinic once or twice, when it was first started, in order to demonstrate their willingness to support it. The Executive Secretary felt that it would be unwise to attempt to include them in the study.

OCCUPATIONAL CLASS	PER CENT			NUMBER		
	Total	Nonrelief	Relief	Total	Nonrelief	Relief
TOTAL	100.0	100.0	100.0	1,621	1,217	404
Manual Workers	80.9	78.1	89.4	1,312	951	361
Skilled	28.1	27.3	30.4	455	332	123
Semi-skilled	31.8	31.1	34.2	516	378	138
Unskilled <sup>1</sup>	21.0	19.8	24.8	341 <sup>1</sup>	241	100
White-Collar Workers <sup>2</sup>	19.1	21.9	10.6	309 <sup>2</sup>	266	43

<sup>1</sup> Includes twenty-five men engaged in agricultural pursuits.

<sup>2</sup> Includes forty-four professional men and forty-seven proprietors.

Table 1. Usual occupational class of husbands of clinic patients.

For the analysis of pregnancy rates the sample has been divided into three broad socio-economic groups, according to the usual occupational status of the husband and the income status of the family at the time of interview, in an attempt to secure detailed information concerning the socio-economic differences in fertility within this selected sample. The groups are as follows: (1) relief recipients; (2) nonrelief manual workers; (3) nonrelief white-collar workers.<sup>9</sup>

About 75 per cent of the wives had worked before they were married, most of them as factory operatives, clerical workers, or domestic servants. At the time of record, only 7 per cent of them were gainfully employed outside of the home. Less than 40 per cent of them had had more than an elementary school education. Wives of white-collar workers were better educated than those of manual workers, while wives of men on relief had had less education than those of self-supporting manual workers. Among the white-collar workers, the husbands were better educated than the wives, but in the other groups the wives were a little better educated than their husbands.

<sup>9</sup> For convenience, families in the nonrelief categories will hereinafter be designated simply as "manual workers" and "white-collar workers."

The mean number of pregnancies per woman at the first clinic contact was 4.0 and the mean number of live births 3.3. The average woman was just under twenty when she was married, and had

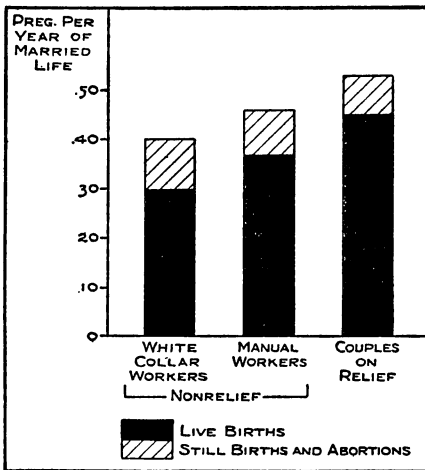


Fig. 1. Preclinic pregnancy rates per year of married life for three social classes.

been married less than nine years when she first attended the clinic. There was a wide range in the length of married life at clinic contact. Five per cent of the patients had been married less than a year when they first applied for advice on birth control, but another 5 per cent had been married for more than twenty years. The mean duration of marriage of families on relief was 9.9 years, that of manual workers 9.0 years, and

that of white collar workers 6.3 years.

The standardized birth and pregnancy rates per year of married life for the three social classes, before they sought contraceptive advice, are compared in Figure 1. White-collar workers had the lowest pregnancy and birth rates, and families on relief the highest.<sup>10</sup> In each instance the rates of the clinic patients were high, but the differentials were in the same direction as those reported in other studies.<sup>11</sup> The present investigation is an attempt to learn what factors determined these differences in fertility.

<sup>10</sup> There is a definite selection in this sample toward high birth rates, especially among families on relief, for two reasons: (1) Families with inadequate incomes and many children are those most likely to request and to receive assistance from charitable organizations; (2) families with exceptionally high birth rates are the ones most likely to be referred for contraceptive advice.

<sup>11</sup> Roughly comparable data collected in a field study conducted by the Milbank Memorial Fund in Columbus, Ohio in 1931-1932 yielded the following standardized birth rates per year of married life:

White-collar workers	.17
Skilled and semi-skilled manual workers	.19

THE PREVALENCE OF CONTRACEPTION BEFORE  
ATTENDANCE AT THE CLINIC

Contraception was not new to these women when they attended the birth control clinic. More than 90 per cent of them had made some attempt to limit their families by its use before they sought expert advice on birth control. They were comparatively slow to begin to use any contraceptive method. Only about 20 per cent of them had started to use contraception before the first pregnancy, and half of them had had two pregnancies before they made any attempt to limit the size of their families. The proportion of couples using contraception increased steadily as marriage lengthened. Table 2 and Figure 2 show in detail the proportion of contraception.

Table 2. Proportion of total exposure to the risk of pregnancy before clinic attendance during which contraception was practiced, by couples married in different periods.<sup>1</sup>

NUMBER OF YEARS MARRIED AT CLINIC CONTACT	YEAR OF MARRIAGE	PROPORTION OF TOTAL EXPOSURE DURING WHICH CONTRACEPTION WAS PRACTICED					
		Total	Before First Pregnancies	After First Pregnancies by Period of Married Life			
				0-4	5-9	10-14	15-29
<b>TOTAL</b>		73.3	35.0	67.3	85.7	86.4	81.0
15-29	1900-1919	68.8	13.4	42.7	74.9	81.9	81.0
10-14	1915-1924	75.8	27.3	59.7	89.1	93.0	—
5-9	1920-1929	75.7	40.3	76.2	92.0	—	—
0-4	1925-1934	75.1	51.3	86.2	—	—	—
		EXPOSURE TO PREGNANCY IN YEARS, DURING WHICH CONTRACEPTION WAS PRACTICED					
<b>TOTAL</b>		6,498.4	360.7	2,031.9	2,332.9	1,233.8	539.1
15-29	1900-1919	2,089.2	22.7	241.1	590.2	696.1	539.1
10-14	1915-1924	2,149.4	74.0	473.9	1,063.8	537.7	—
5-9	1920-1929	1,705.8	143.7	883.2	678.9	—	—
0-4	1925-1934	554.0	120.3	433.7	—	—	—

<sup>1</sup> In this table, 9.8 years of exposure, during which contraception was temporarily interrupted in order to plan pregnancy, were omitted from the totals.

in the total exposure to the risk of pregnancy,<sup>12</sup> of women married different lengths of time when they sought expert advice on birth control. Each set of bars shows the proportion of contraceptive

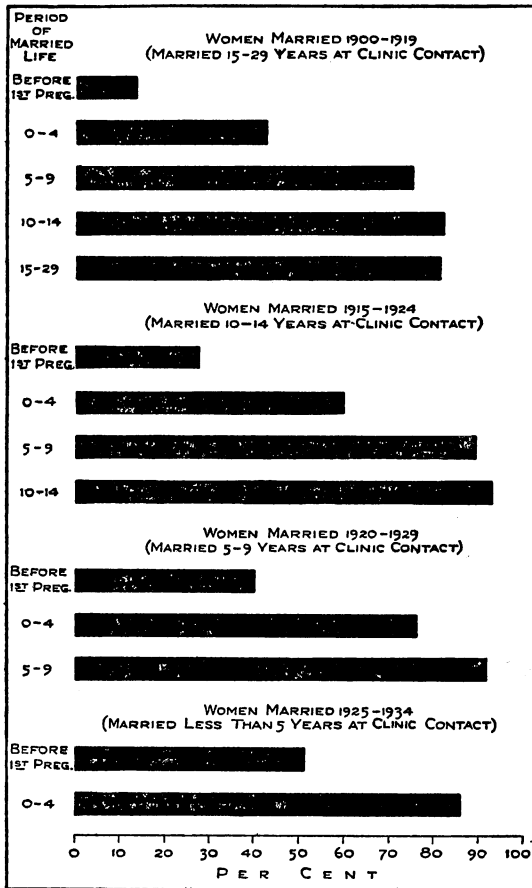


Fig. 2. Proportion of the total exposure to the risk of pregnancy before clinic attendance during which contraception was used by couples married in different periods.

class. Table 3 shows the proportion of exposure and of pregnancies occurring when contraception was used and when none was used,

practice in successive periods of married life of a single group of women. Each group practiced more and more contraception as marriage lengthened. In each period of married life contraception was least used by the oldest couples and most used by the youngest. In the period immediately preceding attendance at the clinic (represented by the lowest bar in each set), all couples practiced contraception for more than 80 per cent of the exposure to pregnancy, regardless of the length of their married life.

The use of contraception varied by social

<sup>12</sup> Exposure to the risk of pregnancy was that period during which each woman was living with her husband and not pregnant or in the puerperium. In each period of married life, the exposure and pregnancies were those of all women who were exposed to the risk of pregnancy within the period.



EXPOSURE AND PREGNANCIES	ALL COUPLES	COUPLES NOT ON RELIEF		COUPLES ON RELIEF
		White-Collar Workers	Manual Workers	
TOTAL YEARS EXPOSED TO RISK OF PREGNANCY	8,875.8	1,135.5	5,426.2	2,316.1
<i>Per Cent of Exposure</i>				
TOTAL	100.0	100.0	100.0	100.0
Contraception Used	73.2	82.4	74.8	64.9
No Contraception Used (Total)	26.8	17.6	25.2	35.1
Habitually	26.7	17.3	25.1	35.0
Temporarily <sup>1</sup>	0.1	0.3	0.1	0.1
TOTAL PREGNANCIES	6,409	691	3,751	1,967
<i>Per Cent of Pregnancies</i>				
TOTAL	100.0	100.0	100.0	100.0
Contraception Used	56.7	61.9	57.7	52.9
No Contraception Used (Total)	43.3	38.1	42.3	47.1
Habitually	42.2	33.9	41.4	46.6
Temporarily <sup>1</sup>	1.1	4.2	0.9	0.5

<sup>1</sup> Contraceptive practice deliberately interrupted in order to permit pregnancy to occur.

Table 3. Proportion of total exposure and pregnancies before clinic attendance during which contraception was used, and during which none was used, for three social classes.

for each social class and for the whole group. Figure 3 depicts graphically the differences in the proportions of contraception in the exposures of the three social classes. Couples who were being supported by relief agencies at the time of record had used contraception for less than 65 per cent of their total exposure before attending the clinic. Among the self-supporting couples, manual workers used contraception for nearly 75 per cent of the preclinic exposure to pregnancy, and white-collar workers for more than 80 per cent. These figures are in

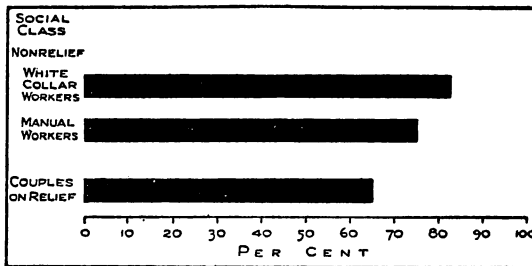


Fig. 3. Proportion of the total exposure to the risk of pregnancy before clinic attendance during which contraception was used by three social classes.

inverse ratio to the observed social class differentials in the birth rates. The differences were even greater than these proportions show, since white-collar workers had been married for a shorter time than either manual workers or couples on relief when they first attended the clinic. The number of deliberately planned pregnancies was small in all three groups, but the proportion of planned pregnancies was much higher among white-collar workers than among the couples in either of the other socio-economic groups.

Table 4. Preclinic pregnancy rates for three social classes when no contraception was used.

PERIOD OF MARRIED LIFE	ALL COUPLES	COUPLES NOT ON RELIEF		COUPLES ON RELIEF				
		White-Collar Workers	Manual Workers					
PREGNANCY RATES PER 100 YEARS' EXPOSURE								
First Pregnancies	167	136	162	199				
All Later Pregnancies	93	101	93	92				
Years Since Marriage								
0-4	99	108	96	102				
5-9	94	—*	101	87				
10-14	79	—*	71	88				
15-29	67	—*	70	64				
MEAN NUMBER OF MONTHS OF EXPOSURE PER PREGNANCY								
First Pregnancies	7.2	8.8	7.4	6.0				
All Later Pregnancies	12.9	11.8	12.9	13.0				
Years Since Marriage								
0-4	12.1	11.1	12.5	11.8				
5-9	12.7	—*	11.9	13.8				
10-14	15.3	—*	16.8	13.7				
15-29	17.8	—*	17.1	18.8				
NUMBER OF YEARS OF EXPOSURE AND NUMBER OF PREGNANCIES								
	Exp.	Preg.	Exp.	Preg.	Exp.	Preg.	Exp.	Preg.
First Pregnancies	670.9	1,121	100.4	137	414.3	673	156.2	311
All Later Pregnancies	1,696.4	1,583	95.7	97	945.3	880	655.3	606
Years Since Marriage								
0-4	987.7	980	80.4	87	566.8	546	340.5	347
5-9	387.7	365	11.0	7	216.5	219	160.2	139
10-14	194.6	153	3.4	2	102.2	73	88.9	78
15-29	126.4	85	0.9	1	59.7	42	65.7	42

\* Insufficient exposure.

THE UNCONTROLLED FERTILITY OF THE GROUP

Pregnancy rates were computed for three types of exposure to the risk of pregnancy: (1) exposures during which there was no attempt at contraception, (2) exposures during which contraception was used more or less regularly, and (3) exposures during which contraception was deliberately interrupted in order to permit pregnancy to occur.<sup>13</sup>

Pregnancy rates for periods when no contraception was used are shown in Table 4. The average woman in the group, who used no contraception, became pregnant for the first time about seven months after her marriage. The mean number of months of exposure for each later pregnancy varied from a year to a year and a half. The rates declined markedly immediately after the first pregnancy, probably because of periods of lactation and puerperal amenorrhea which followed each pregnancy, but could not precede the first. The subsequent decline was relatively small but consistent.

Exclusion of the exposure and pregnancies of women who had histories of serious gynecological disease or had been treated in the gynecological clinic resulted in higher rates in all durations of marriage.<sup>14</sup> The same type of decline was observed in these rates for the whole group. In neither the whole group nor the group free of gynecological disease was there a significant decline in fecundity until after the tenth year of married life.<sup>15</sup>

<sup>13</sup> There was so little exposure of this type that no reliable rates could be computed. The total was only one-tenth of one per cent of the entire preclinic exposure.

<sup>14</sup> The rates were as follows when the pregnancies and exposure of all cases with known pathology were excluded:

	<i>Rate</i>	<i>Exposure Years</i>	<i>No. Pregnancies</i>
First Pregnancies	189	434.8	821
All Later Pregnancies	96	1,277.5	1,229
Years Since Marriage			
0-4	102	733.2	747
5-9	99	284.7	282
10-14	82	150.6	123
15-29	71	108.9	77

<sup>15</sup> In the comparison of rates for the whole group for successive periods of married life, the  $\chi^2$  test yielded the following results:

0-4 not significantly different from 5-9,  $p =$  between .30 and .50  
(Continued on page 80)

Selection appears to have been a substantial factor in the decline in pregnancy rates after the tenth year of married life. The pregnancy rates of women who used no contraception until after they had been married ten years or longer are compared with those of all other women in Table 5 and Figure 4. Women who started to use contraception at any time between marriage and the tenth year of married life had noncontraceptive pregnancy rates which were significantly higher than those of women who delayed the use of contraception until after they had been married ten years or more. This was true of rates for the first pregnancy as well as of rates for later pregnancies. It appears, therefore, that women who delayed the use of contraception were apparently less in need of it than those who made some attempt at family limitation earlier in their

Table 5. Preclinic pregnancy rates of two groups of women when no contraception was used.

Period of Married Life	Pregnancies Per 100 Years' Exposure	Exposure Years	Number of Pregnancies
A. WOMEN WHO HAD EXPOSURE WITHOUT CONTRACEPTION AFTER THE TENTH YEAR OF MARRIED LIFE			
First Pregnancies	115	77.7	89
All Later Pregnancies Years Since Marriage			
0-4	82	190.5	157
5-9	75	237.0	178
10-14	79	194.6	153
15-29	67	126.4	85
B. WOMEN WHO HAD NO EXPOSURE WITHOUT CONTRACEPTION AFTER THE TENTH YEAR OF MARRIED LIFE <sup>1</sup>			
First Pregnancies	174	593.2	1,032
All Later Pregnancies Years Since Marriage			
0-4	103	797.2	823
5-9	124	150.7	187

<sup>1</sup> This group includes all women married less than ten years as well as women married more than ten years who practiced contraception without interruption after the tenth year of married life.

5-9 possibly higher than 10-14,  $p = \text{between } .05 \text{ and } .10$

10-14 not significantly different from 15-29,  $p = \text{between } .20 \text{ and } .30$

5-9 higher than 15-29,  $p = < .01$

0-4 higher than 15-29,  $p = < .01$

The differences were of the same order when the pathological cases were excluded.

married lives.<sup>16</sup> When the noncontraceptive pregnancy rates of the two groups are separately considered, neither set of rates shows a significant decline with increasing length of marriage, excepting that immediately following the first pregnancy.<sup>17</sup>

A comparison of pregnancy rates for the three social classes when no contraception was used (Table 4) shows significant differences in pregnancy rates for the first pregnancy by social class.<sup>18</sup> The rates of the wives of white-collar workers were lowest and those of the wives

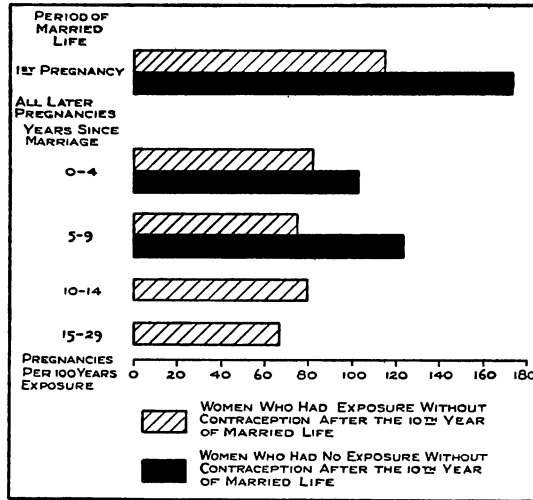


Fig. 4. Preclinic pregnancy rates of two groups of women when no contraception was used.

of men on relief highest. When the exposure and pregnancies of pathological cases were excluded from the tabulations, the differences were less marked. There were no significant differences in pregnancy rates by social class after the first pregnancy, either for the whole group or for the nonpathological cases.<sup>19</sup>

<sup>16</sup> The possibility of incomplete or inaccurate reporting of early pregnancies may also be a factor in the lower rates of older women.

<sup>17</sup> When rates for two periods of married life were tested by the  $\chi^2$  test, the values of  $p$  for women who continued to use no contraception after the tenth year of married life were as follows:

0-4 not significantly different from 5-9,  $p$  = between .30 and .50

0-4 not significantly different from 15-29,  $p$  = between .10 and .20

<sup>18</sup> When the rates for the three social classes were compared, the  $\chi^2$  test yielded the following results:

Labor significantly higher than white collar,  $p$  = between .02 and .05

Relief significantly higher than labor,  $p$  = <.01.

<sup>19</sup> The  $\chi^2$  test was used to test rates for each period of married life, for the three social classes. For all comparisons,  $p$  varied between .10 and .90, and none of the differences was significant.

COITAL FREQUENCY	PREGNANCIES PER 100 YEARS' EXPOSURE	MEAN NO. MONTHS BETWEEN MARRIAGE AND FIRST CONCEPTION	EXPOSURE YEARS	NUMBER OF PREGNANCIES
TOTAL <sup>1</sup>	190	6.3	421.8	800
2 x Week or Less	143	8.4	35.7	51
3 x Week	174	6.9	268.6	468
4 x Week	233	5.2	96.2	224
5 x Week or More	268	4.5	21.3	57

<sup>1</sup> All cases for which coital frequency was known.

Table 6. Pregnancy rates for the first pregnancy when no contraception was used, by coital frequency (nonpathological cases only).

The influence of coital frequency on the first pregnancy rates of women free of gynecological disease, when no contraception was used, is shown in Table 6. There was a consistent decline in the mean number of months between marriage and the first conception, with increasing frequency of coitus. The rates were significantly higher with frequencies of four times per week or more than with frequencies of three times per week or less, but the data were insufficient to show any more detailed differences.<sup>20</sup> These findings must be interpreted with caution, since the reported frequency of coitus immediately after marriages which took place five years or more before the time of record is subject to wide error.<sup>21</sup>

The uncontrolled fertility of the group, as expressed in pregnancy rates when no contraception was used, is the yardstick by which we may measure the effectiveness of the contraception used. A contraceptive method may be thought of as effective in the degree to which it reduces the risk of conception during a given ex-

<sup>20</sup> The rates for successive frequencies were tested by the  $\chi^2$  test. Values of  $p$  follow:  
 2 x week or less not significantly different from 3 x week,  $p =$  between .10 and .20.  
 3 x week lower than 4 x week,  $p = <.01$   
 4 x week not significantly different from 5 x week or more,  $p = .30$

<sup>21</sup> For detailed discussion of the limitations of this tabulation, see Stix, Regine K.: The Medical Aspects of Variations in Fertility. *American Journal of Obstetrics and Gynecology*, April, 1938, xxxv, No. 4, pp. 577-578.

posure. This reduction in risk is shown by the estimated number of pregnancies prevented, i.e., the difference between the number of pregnancies observed during the exposure with a given contraceptive and those expected had no contraception been used. The proportion of pregnancies prevented may be taken as a measure of the effectiveness of the contraceptive.

The selections shown in Table 5 and discussed on page 80 make it necessary to provide an adjusted base against which the effectiveness of contraception may be measured.

Women who felt the need of using contraception to control their fertility early in their married lives were apparently more fecund than those who delayed the use of contraception until after the tenth year of married life. The effectiveness of the contraception used early in married life by the more fecund women must therefore be measured in terms of the fecundity of that group rather than of the whole group, if its effectiveness is not to be underestimated. The pregnancy rates, on the basis of which effectiveness will be measured, have therefore been computed as follows: For the first pregnancy and all experience prior to the fifth year of married life, the noncontraceptive rates are those of women free of gynecological disease who started the use of contraception before the fifth year of married life. For the 5 to 9 year experience, the rate is the noncontraceptive rate, for the period, of women who first used contraception between the fifth and tenth years of married life. After the tenth year of married life the noncontraceptive rates of all women free of gynecological disease must be used, because exposure without contraception in these periods was small.<sup>22</sup>

If it is true that the most fecund women are those who use

<sup>22</sup> The standard used follows:

	<i>Rate</i>	<i>Exposure Years</i>	<i>No. of Pregnancies</i>
1st pregnancy	205	307.2	629
0- 4	123	385.2	475
5- 9	126	101.1	127
10-14	82	150.6	123
15-29	71	108.9	77

contraception earliest, the use of this adjusted standard of non-contraceptive exposure is justified because it approaches most nearly to the ideal standard whereby it is possible to measure the effectiveness of the contraception used by a given group of women on the basis of the noncontraceptive pregnancy rates of those same women.

THE EFFECTIVENESS OF CONTRACEPTION BEFORE  
ATTENDANCE AT THE CLINIC

Coitus interruptus, condom, and douche were the contraceptives most frequently used by the group before they went to the clinic. The proportion of the exposure with contraception during which each type of contraception was used is shown in Table 7. There were marked social class differences in the types of contraception used. White-collar workers used condom for nearly 40 per cent of their exposure with contraception, while couples on relief used either coitus interruptus or douche—the least costly contraceptives—for more than 70 per cent of the exposure during which contraception was used. Manual workers used condom less than white-collar workers and coitus interruptus and douche less than relief recipients.

Table 7. Proportion of total preclinic exposure with contraception during which each type of contraception was used by three social classes.

TYPE OF EXPOSURE WITH CONTRACEPTION	ALL COUPLES	COUPLES NOT ON RELIEF		COUPLES ON RELIEF
		White-Collar Workers	Manual Workers	
TOTAL NUMBER OF YEARS	6,498.4	933.6	4,061.4	1,503.4
<i>Per Cent</i>				
TOTAL	100.0	99.9	100.0	100.0
Condom	23.9	38.3	23.9	14.6
Coitus Interruptus	35.8	29.6	35.3	41.2
Douche	23.0	15.1	22.2	30.3
All Other Contraception <sup>1</sup>	17.3	16.9	18.6	13.9

<sup>1</sup> Includes all use of suppository, pessary, jelly, intrauterine device, sponge, and all alternations of two or more methods of contraception.



PERIOD OF MARRIED LIFE	ALL COUPLES	COUPLES NOT ON RELIEF		COUPLES ON RELIEF				
		White-Collar Workers	Manual Workers					
PREGNANCIES PER 100 YEARS' EXPOSURE								
First Pregnancies	70	59	66	138				
All Later Pregnancies	55	44	53	68				
Years Since Marriage								
0-4	62	54	59	78				
5-9	53	40	51	65				
10-14	50	33	48	65				
15-29	49	38	48	53				
NUMBER OF YEARS OF EXPOSURE AND NUMBER OF PREGNANCIES								
	Exp.	Preg.	Exp.	Preg.	Exp.	Preg.	Exp.	Preg.
First Pregnancies	360.8	254	100.3	59	229.2	152	31.2	43
All Later Pregnancies	6,137.9	3,379	833.4	369	3,832.3	2,012	1,472.2	998
Years Since Marriage								
0-4	2,032.0	1,264	333.2	179	1,250.3	734	448.4	351
5-9	2,333.0	1,227	342.2	136	1,440.6	732	550.2	359
10-14	1,233.8	623	126.7	42	790.5	376	316.7	205
15-29	539.1	265	31.3	12	350.9	170	156.9	83

Table 8. Preclinic pregnancy rates for three social classes, when contraception was used.

Pregnancy rates when contraception was used were significantly lower than those when none was used, but the differences were not great. The rates of white-collar workers were lowest and those of families on relief highest (Table 8). Rates for individual contraceptives (Table 9) showed marked differences. Those for condom were much lower than the rates for any other type of contraception, while those for douche did not differ significantly from pregnancy rates when no contraception was used.<sup>28</sup>

The social class differences in pregnancy rates with contraception

<sup>28</sup> When the  $\chi^2$  test was used to compare rates for two types of contraception, as used in the same period of married life, values of p were as follows:

Condom lower than "other contraception," 0-4,  $p < .01$

Douche not significantly different from no contraception, 5-9,  $p =$  between .10 and .20.

PERIOD OF MARRIED LIFE	CONDOM	COITUS INTERRUPTUS	DOUCHE	ALL OTHER CONTRACEPTION				
	PREGNANCIES PER 100 YEARS' EXPOSURE							
First Pregnancies	25	103	126	45				
All Later Pregnancies	23	61	87	45				
Years Since Marriage								
0-4	29	65	92	47				
5-9	19	59	85	46				
10-14	22	58	81	43				
15-29	13	59	77	36				
	NUMBER OF YEARS OF EXPOSURE AND NUMBER OF PREGNANCIES							
	Exp.	Preg.	Exp.	Preg.	Exp.	Preg.	Exp.	Preg.
First Pregnancies	128.2	32	65.9	68	97.7	123	69.0	31
All Later Pregnancies	1,422.8	321	2,263.2	1,373	1,399.5	1,216	1,052.3	469
Years Since Marriage								
0-4	447.7	132	660.8	428	594.7	549	328.7	155
5-9	566.7	108	904.3	536	478.1	407	383.9	176
10-14	303.8	67	497.9	291	208.3	169	223.7	96
15-29	104.5	14	200.2	118	118.3	91	116.0	42

Table 9. Preclinic pregnancy rates for each type of contraception.

were due to two factors: (1) the fact that white-collar workers used relatively effective contraception, manual workers fairly effective contraception, and relief recipients mainly ineffective contraception, and (2) the fact that with the exception of douche, the self-supporting couples used each type of contraception more effectively than the couples on relief.<sup>24</sup> (Table 10.)

The effectiveness of contraception in reducing the risk of preg-

<sup>24</sup>  $\chi^2$  tests on the total rates for each contraceptive as used by the three social classes yielded the following results:

Condom: labor higher than white collar,  $p = <.01$

relief higher than labor,  $p = <.01$

Coitus interruptus:

white collar and labor not significantly different,  $p =$  between .30 and .80

relief higher than labor,  $p = <.01$

relief higher than white collar,  $p =$  between .02 and .05.

TYPE OF CONTRACEPTION	PREGNANCY RATES			EXPOSURE AND PREGNANCIES					
	Couples Not on Relief		Couples on Relief	Couples Not on Relief				Couples on Relief	
	White-Collar Workers	Manual Workers		White-Collar Workers		Manual Workers			
				Exp. Yrs.	No. Preg.	Exp. Yrs.	No. Preg.	Exp. Yrs.	No. Preg.
All Contraception	46	53	69	933.7	428	4,061.6	2,164	1,503.4	1,041
Condom	15	22	40	358.1	53	972.7	211	220.2	89
Coitus Interruptus	59	60	68	276.8	164	1,432.7	856	619.6	421
Douche	108	87	89	140.7	152	901.2	781	455.2	406
All Other Contraception	37	42	60	158.2	59	754.8	316	208.3	125

<sup>1</sup> Standardization did not affect these rates significantly.

Table 10. Total pregnancy rates for each type of contraception by social class.<sup>1</sup>

nancy is shown in Table 11. All contraception, as used by the whole group, prevented about half the pregnancies which would have occurred had no contraception been used for exposures of equal length and distribution. Condom was the only single contraceptive which was highly effective. Among white-collar workers the use of condom was 88 per cent effective in reducing the risk of pregnancy, and even among couples on relief its use reduced the risk of pregnancy by about 65 per cent.

The factors underlying the differences in the total pregnancy

Table 11. Per cent of effectiveness of each type of contraception as used by three social classes.<sup>1</sup>

TYPE OF CONTRACEPTION	ALL COUPLES	NONRELIEF		COUPLES ON RELIEF
		White-Collar Workers	Manual Workers	
ALL CONTRACEPTION	52.0	63.5	54.2	38.0
Condom	80.9	88.3	81.6	64.5
Coitus Interruptus	45.4	52.1	47.4	36.8
Douche	25.2	16.0	27.6	23.2
All Other Contraception	61.4	70.0	63.4	46.6

<sup>1</sup> Ratio of pregnancies prevented to those expected had no contraception been used. (For further explanation, see Stix and Notestein, *op. cit.*, 1934, p. 67.)

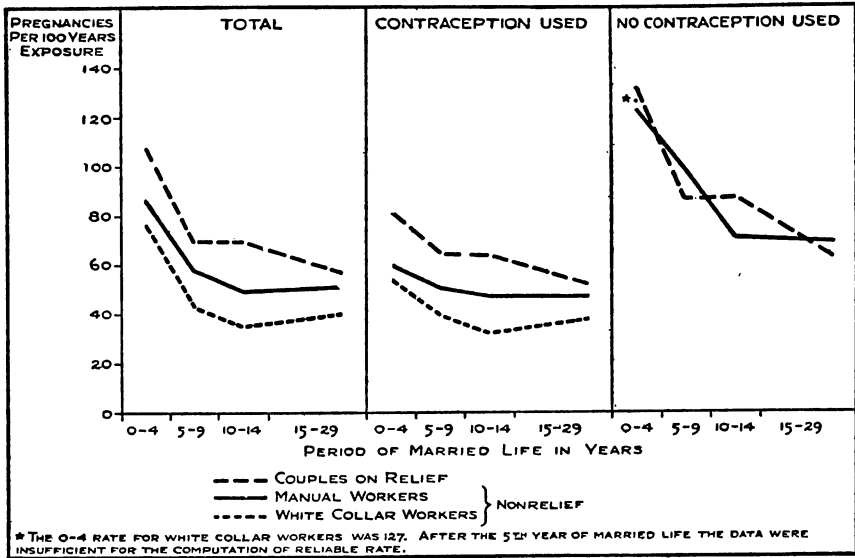


Fig. 5. Preclinic pregnancy rates per 100 years' exposure for three social classes.

rates per one hundred years' exposure of the three social classes are shown graphically in Figure 5. When no contraception was used, the pregnancy rates of the three groups were essentially the same. When contraception was used, they differed in all durations of married life. The differences in the total rates were due partly to these differences in the effectiveness of contraceptive practice and partly to differences in the prevalence of contraception in the exposure of the three groups.

Table 12. Preclinic pregnancy terminations when contraception was used and when none was used.

TYPE OF TERMINATION	ALL PREGNANCIES	NO CONTRACEPTION USED	CONTRACEPTION USED	EXPOSURE UNKNOWN <sup>1</sup>
Number of Pregnancies	6,554	2,776	3,633	145
Per Cent of Pregnancies Terminating In				
Live Births	81.9	89.3	75.8	93.8
Illegal Abortions	7.5	1.2	12.6	2.1
Other Wastage <sup>2</sup>	10.5	9.5	11.6	4.1

<sup>1</sup> Premarital pregnancies.

<sup>2</sup> Spontaneous and therapeutic abortions and stillbirths.

PREGNANCY WASTAGE

The women who used contraception did so because they wished to be able to control the size of their families. When pregnancy occurred in spite of the use of contraceptives many women resorted to induced abortion. Illegal abortion was ten times as frequent in the termination of accidental pregnancies as in the termination of pregnancies which occurred when no contraception was used (Table 12 and Figure 6). The resort to abortion when contraception proved inadequate has been observed in other groups.<sup>25</sup>

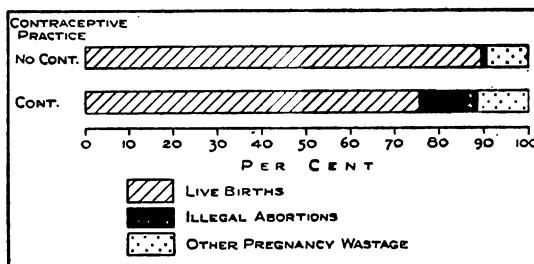


Fig. 6. Preclinic pregnancy terminations when contraception was used and when none was used.

Abortion was most frequent among white-collar workers and least frequent among families on relief (Table 13). As reported in an earlier paper,<sup>26</sup> there was also a direct association between income level and the proportion of pregnancies illegally aborted, and a marked rise in the proportion of illegal abortions with increasing order of pregnancy.

Involuntary pregnancy wastage was approximately the same in the three social class groups, and showed no significant difference with the use or non-use of contraception, with changing order of pregnancy or with differences in income.

In the five-year period immediately preceding clinic contact there was a slight rise in the proportion of accidental pregnancies terminated by abortion. Only 73 per cent of the accidental pregnancies

<sup>25</sup> Stix, Regine K.: A Study of Pregnancy Wastage. The Milbank Memorial Fund *Quarterly*, October, 1935, xiii, No. 4, p. 357.

Pearl, Raymond: Fertility and Contraception in New York and Chicago. *Journal of the American Medical Association*, April 24, 1937, cviii, Table 5.

<sup>26</sup> See Stix, Regine K. and Wiehl, Dorothy G.: Abortion and the Public Health. *American Journal of Public Health*, May, 1938, xxviii, No. 5, Figures 1 and 2, and pp. 623-624.

TYPE OF TERMINATION	TOTAL	COUPLES NOT ON RELIEF		COUPLES ON RELIEF
		White-Collar Workers	Manual Workers	
Number of Pregnancies	6,554	703	3,838	2,013
Per Cent of Pregnancies Terminating In				
Live Births	81.9	76.7	81.4	84.8
Illegal Abortions	7.5	13.1	8.1	4.5
Other Wastage <sup>1</sup>	10.5	10.2	10.5	10.7

<sup>1</sup> Spontaneous and therapeutic abortions and stillbirths.

Table 13. Preclinic pregnancy terminations by social class.

occurring in this period terminated in live births as compared with 77 per cent of all other preclinic pregnancies. This is indirect evidence of a special interest in family limitation which was soon to bring these women to the birth control clinic.

#### SUMMARY

About 80 per cent of the white patients who attended the clinics of the Cincinnati Committee on Maternal Health in the five-year period ending December 31, 1934, were interviewed by a trained nurse in a follow-up study conducted by the Milbank Memorial Fund. The women interviewed were mainly Protestants of native birth whose husbands were usually occupied at manual labor. One-fourth of the families were on relief at the time of interview.

Most of the group had used some form of contraception before attending the clinic, but the greater proportion had delayed its use until after the first or second pregnancy. Among the self-supporting couples, white-collar workers used contraception for a larger proportion of their exposure to pregnancy than manual workers. Couples on relief used contraception for a smaller proportion of their exposure than either of the self-supporting groups.

When no contraception was used, pregnancy rates for the first pregnancy differed slightly by social class. White-collar workers had the lowest rates and couples on relief the highest. After the first

pregnancy the rates of the three groups showed no difference. Women who were highly fecund, in all groups, used contraception earlier than those whose fecundity was relatively low.

The differences in the fertility of the three social classes were due mainly to the amount and effectiveness of the contraception used in each group. Condoms, the most effective type, were used most by white-collar workers and least by couples on relief. The use of all contraception prevented about 52 per cent of the pregnancies which would have occurred had the group used no contraception for a similar period of exposure. In almost every instance, contraception was used more effectively by the self-supporting workers than by the relief recipients. Condoms were 88 per cent effective when used by white-collar workers, 82 per cent when used by manual workers, and only 65 per cent when used by relief recipients.

When contraception failed many women resorted to induced abortion. Abortion increased with increasing income and order of pregnancy and varied by social class. The proportion of pregnancies terminating in unavoidable pregnancy wastage showed little or no variation by order of pregnancy, income, or social class, and was the same among accidental pregnancies as among those which occurred when no contraception was used. A rise in the proportion of accidental pregnancies which were terminated by induced abortion in the period immediately preceding attendance at the clinic points to the probability that many women came to the clinic because they needed more satisfactory methods of family limitation than the ones available to them.