BIRTH CONTROL IN A MIDWESTERN CITY

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

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II. THE EFFECTIVENESS OF CONTRACEPTION AFTER CLINIC ATTENDANCE[2]

INTRODUCTION

WITHIN the past two or three years the prescription of contraception has been recognized by the federal courts and the organized medical profession[3] as a legitimate practice in the prevention of maternal morbidity and mortality. As a result, the extramural birth control clinic, of propaganda origin, is being gradually supplanted by the intramural hospital or public health clinic. This new type of clinic is primarily an agency for the care of patients who are referred by other clinics or physicians when, because of their health, pregnancy is temporarily or permanently contraindicated. If such clinics are to function efficiently, they must be planned and administered with a clear understanding of the problems involved in prescribing contraception for large groups of women, for many of whom accidental pregnancy may result in illness or death.

In a few forward-looking communities clinics were established under the direct supervision of local medical organizations prior to the court decision which did so much to clarify the status of contraception in the United States. One of the first of these was started by the Cincinnati Committee on Maternal Health in November,

[1] From the Milbank Memorial Fund.

[2] The first article in this series: Part I. "Contraception and Fertility before Clinic Attendance," was published in the Milbank Memorial Fund *Quarterly*, January, 1939, xvii, No. 1.

[3] Decision of the United States Circuit Court of Appeals, December, 1936.
Journal of the American Medical Association, June 26, 1937, cviii, No. 26, pp. 2217-2218.

1929, in a local hospital, under the supervision of the Cincinnati Academy of Medicine. Since 1930, the Committee's clinics have been in charge of a medical director who is a member of the faculty of the University of Cincinnati College of Medicine and is responsible to the Academy for clinic policies and procedures. In addition to serving patients referred by physicians, other clinics, social service agencies, or clergymen, the clinics are used for the instruction of doctors and medical students in the techniques of contraception. Although not directly under the supervision of the local public health authorities, they have been established and run solely in the interest of the public health and welfare.

Early in 1935, the Milbank Memorial Fund was requested to make a follow-up study of the patients who had attended these clinics from their inception in November, 1929, to December 31, 1934. The study was undertaken with the realization that if contraceptive clinics are to be useful maternal health services, present procedures must be subjected to a more critical assessment than any previously made. A careful study of the acceptability of the methods usually prescribed, of their effectiveness as compared with other methods in general use, and of the effect of clinic attendance on the health and marital adjustment of the couples seeking advice is necessary before clinic procedures may be properly evaluated. A study of such complex problems must inevitably be incomplete, but it affords the possibility of reaching certain broad conclusions that may serve as a basis for more effective clinic administration in the future.

THE FERTILITY OF THE GROUP

Birth control clinics serve a selected group of highly fertile women. Many women are referred for special instruction in the techniques of contraception precisely because their pregnancies have occurred in such rapid succession that there has been no time for recovery from one pregnancy before the next was conceived. The

patients of the Cincinnati Maternal Health Clinics were much more fertile than a representative sample of native-white women[4] from comparable urban areas. No data were available for an unselected sample from Cincinnati but the clinic patients had almost twice as many live births per woman as a presumably representative group of married women living in Syracuse, New York, and a birth rate 66 per cent higher than that of a similar group in Columbus, Ohio.[5]

The mean number of births and pregnancies per woman among clinic patients, at the time of their first contact with the clinic, was strikingly similar to the birth and pregnancy rates of patients of other clinics with similar policies.[6] The patients of the Cincinnati clinics were more fertile than other urban women of comparable social status who had not necessarily attended birth control clinics, but no more fertile than women in other cities who had sought expert advice on contraception.

[4] Records were secured for white patients only. The socio-economic characteristics of the group are summarized in Table 14.

[5] The total live births per 100 women, standardized for age and occupational class, were as follows:

Patients of the Cincinnati Maternal Health Clinics	312.2
Columbus, Ohio, 1930*	188.4
Syracuse, New York, 1930*	160.5

*For a complete description of these two groups, *see* Notestein, F. W. and Kiser, C. V.: The Fertility of the Social Classes in the Native White Population of Columbus and Syracuse. *Human Biology*, December, 1934, vi, No. 4, p. 600.

[6] The mean numbers of pregnancies and live births per woman at the first contact with the clinic are compared below with those reported from other clinics.

Clinic	Mean Duration of Marriage	Pregnancies per Woman	Live Births per Woman
Cincinnati Committee on Maternal Health	8.8 years	4.04	3.31
Cleveland Maternal Health Clinic*	Under 10 years	4.04	3.34
Minnesota Birth Control League**	Unknown	4.20	3.46
Newark Maternal Health Center***	8.8 years	4.16	3.22

*Robishaw, Ruth: A Study of 4,000 Patients Admitted for Contraceptive Advice and Treatment. *American Journal of Obstetrics and Gynecology*, March, 1936, xxxi, No. 3.

**Abramson, Milton: A Study of 2,113 Cases Given Contraception at the Minnesota Birth Control League Clinic. *Journal-Lancet* (Minneapolis), August, 1936, lvi, No. 3, p. 446.

***Stone, Hannah M. and Hart, Henriette: Maternal Health and Contraception. Part I. Social Data. New Jersey Birth Control League, Newark, New Jersey, July, 1932.

THE RELIABILITY OF THE DATA

An adequate follow-up study of a group of clinic patients depends for its reliability on the quality of the data on which it is based. Sufficient time must have elapsed between the initial contact and the interview to assure an adequate test of the clinic's services, the recorded information must be accurate, and the sample of patients interviewed representative of the group which originally attended the clinic.

All but four of the patients interviewed had attended the clinic for the first time at least one year before the records were made. Fifty-five per cent of them had had at least three years of experience after their initial contact with the clinic. The mean length of time between clinic contact and interview was 40.7 months, a span which should assure an adequate test of the clinic's services. The information in the records is probably as accurate as any obtainable in a history.

It was impossible to obtain follow-up records from nearly 20 per cent of the women who originally attended the clinic, because they could not be found although exhaustive efforts were made to trace them. If the "lost" cases were different from those interviewed, a bias is introduced and the nature of the bias must be appraised.

Information concerning the "lost" cases was available from the records made when they first attended the clinic. This information is compared with similar data secured from the interviewed group at the time of the follow-up study in Table 14. The interviewed group did not differ from the original group in nativity, religion, or the usual occupation of the husband. It contained fewer families on relief and nonrelief families whose income was under $600 per year, than the original group. The data on income and housing are not strictly comparable in the two groups, since they were recorded in different years. Those for the "lost" cases were recorded in the years 1930-1934, while those for the interviewed cases were recorded in the years 1935-1937. Although the differences for the same years

	All Cases	Interviewed Cases (Data Recorded 1935–37)	Lost Cases (Data Recorded 1930–34)
Number of Women	2,023	1,621	402[1]
Descriptive Data			
Nativity			
Per Cent Native Born	94.6	94.0	97.0
Religion			
Per Cent Protestant	74.1	73.4	77.1
Occupation			
Per Cent Manual Workers	81.3	80.9	83.2
Skilled and Semi-Skilled	59.6	59.9	58.4
Unskilled	21.7	21.0	24.8
Income			
Per Cent on Relief	28.4	25.2	42.1
Nonrelief—Income Under $600 per Year	5.0	3.2	12.9
Housing			
Per Cent with 2 or More Persons per Room	36.7	33.3	52.0
Sanitary Facilities: Privy Only	8.8	10.0	2.6
Toilet Only	43.7	39.7	62.4
Fertility			
Mean Age at Marriage (Years)	19.7	19.8	19.4
Mean Duration of Marriage (Years)[2]	8.6	8.8	7.8
Mean Number of Pregnancies[2]	4.0	4.0	3.8
Mean Number of Live Births[2]	3.3	3.3	3.0
Case Status at Interview or End of Study			
Per Cent Active Cases[3]	45.8	53.0	16.7

[1]380 cases whose whereabouts were unknown, plus 22 cases who refused interview, or could not be interviewed because of language difficulty.
[2]At the first contact with the clinic.
[3]Clinic contact within 12 months of record.

Table 14. Comparison of lost and interviewed cases.

might be slightly greater or slightly less than those shown, the inference is clear that the families "lost" were mainly those living in crowded tenements who probably moved frequently because of in-

adequate resources. The fertility of the two groups was essentially the same.

The greatest difference between the "lost" and interviewed cases was in their case status at the time of record. Fifty-three per cent of the women interviewed had been in contact with the clinic within a year of the interview while less than 17 per cent of the "lost" cases were "active" at the termination of the present investigation.[7] It is not surprising that it was difficult to find those patients with whom the clinic had not recently been in contact and for whom no current address was available, but because of the loss of those women the interviewed sample is definitely biased in favor of cooperative clinic patients. Corrections can be made which will adjust both for this bias and for the possibility that the interviewed sample contains too few low-income families and families on relief.

THE METHODS OF CONTRACEPTION USED AFTER CLINIC ATTENDANCE

In the Cincinnati Maternal Health Clinics, as in most other birth control clinics in the United States, one type of contraception is prescribed almost exclusively. An occlusive rubber diaphragm together with a spermicidal jelly was prescribed for 98 per cent of the

Table 15. Proportion of women in each social class who never used clinically prescribed contraceptives, who used them for a time, and who were still using them at the time of investigation.

Social Class	Total Number	Per Cent of Women		
		Never Using Cl B	Discontinuing Cl B	Using Cl B at Interview
All Women	1,621	2.6	51.4	46.0
Couples Not on Relief				
White-Collar Workers	266	1.5	42.9	55.6
Manual Workers	951	2.6	49.8	47.5
Couples on Relief	404	3.2	60.6	36.1

[7] Clinic records are automatically classed as "inactive" when there has been no contact of any kind with the patient in a period of one year.

patients,[8] on the assumption that this was the only method of contraception which was reliable as well as noninjurious.

Ninety-seven per cent of the women for whom the diaphragm and jelly were prescribed made some attempt to use them, but at the time the study was made only 46 per cent of those interviewed were still using the prescribed methods (Table 15). The wives of white-collar workers found the diaphragm more acceptable than the women in the other two groups. Only about one-third of the wives of relief recipients were using the clinic prescription at the time of the interview.

The proportion of women who originally attended the clinic who might be presumed to be using the diaphragm and jelly at the time of the follow-up study is even less, for as it has been shown, the interviewed sample is somewhat biased in favor of cooperative patients. Table 16 shows the proportion of interviewed patients who were using the prescribed contraceptives at the time of inter-

Table 16. Proportion of interviewed cases and estimated proportion of lost cases and all cases using clinically prescribed contraceptives at the time of investigation, by year of first contact.

Year of First Contact	Mean Number of Months between First Contact and Interview	All Cases		Interviewed Cases		Lost Cases	
		Total Number of Women	Estimated Per Cent Using at Interview[1]	Total Number of Women	Per Cent Using at Interview	Total Number of Women	Estimated Per Cent Using at Interview[1]
Total	40.7	2,023	39.7	1,621	46.0	402	14.8
1930	69.4	170[2]	24.7	126	31.0	44	6.1
1931	58.3	280	21.1	221	24.0	59	10.0
1932	46.5	431	36.0	336	42.6	95	13.1
1933	36.0	545	45.9	447	52.1	98	17.9
1934	25.8	597	49.9	491	56.6	106	19.7

[1]It was found that the women using the prescribed contraceptives at the time of the follow-up study were all active cases. The proportion of lost cases using the clinic prescription at the close of the study was estimated by applying to the active cases among those lost, the proportions of active cases among those observed, in each year, who were using the prescribed contraceptives at interview.

[2]Includes a few patients who came in the last two months of 1929.

[8] Two per cent were given the jelly alone because fitting with a diaphragm was impossible.

view and the proportion of all the patients who originally attended the clinic who might reasonably be expected to have been using them at a parallel time. Only about 40 per cent of all patients were probably using the prescribed contraceptives at the time of record.[9] As might be expected, the highest proportion of users occurred among the cases with the shortest experience, and the lowest proportion among those coming to the clinic in the first two years of its existence.[10]

The prescribed contraceptives were used for more than two-thirds of the total exposure to pregnancy which followed clinic attendance.[11] (Table 17.) For most of this exposure the clinic prescription was used as directed at the clinic. About 10 per cent of the women in the group alternated the use of the diaphragm and jelly with other types of contraception or used only part of the prescribed method during some part of the postclinic period. All irregular use of the prescribed methods was classified under one heading as "variants of the clinic prescription." The types of "variants" used differed in the three social classes. The alternate use of condom and diaphragm with jelly was the variant most frequently used by couples in the white-collar group. Among manual workers and relief recipients, the major proportion of couples using variants used the diaphragm without a lubricant, or with vaseline. The exposure with "variants" of the clinic prescription constituted only about 5 per cent of the total postclinic exposure to pregnancy (Table 17). The diaphragm and jelly were used in accordance with instructions for about 64 per cent of the total postclinic exposure. The proportion of exposure varied by social class, but even the wives of relief recipients, who used the prescribed contraceptives for a small-

[9] See footnote to Table 16 for the method of estimating this figure.

[10] The detailed discussion of the acceptability of the prescribed contraceptives will be undertaken in the third article of the series.

[11] Each woman was presumably exposed to the risk of pregnancy during those periods in which she was living with her husband and not pregnant, sterilized, or in the menopause. The exposures here presented are the aggregate exposures of all women in the sample whose exposure fell in each category.

Type of Exposure	All Couples	Couples Not on Relief		Couples on Relief	
		White-Collar Workers	Manual Workers		
Total Exposure in Years	4,425.4	723.2	2,692.4	1,009.8	
	per cent of exposure				
No Contraception					
Habitual	1.8	0.7	1.7	2.9	
Temporary[1]	0.5	1.1	0.5	0.1	
All Contraception	97.7	98.2	97.8	97.0	
All Cl Ⱥ	69.0	76.4	69.2	62.9	
Cl Ⱥ[2]	63.7	70.8	63.6	58.9	
Variants of Cl Ⱥ[3]	5.2	5.6	5.6	4.0	
All Other Contraception	28.7	21.8	28.6	34.1	
Condom	7.3	7.2	8.4	4.6	
Coitus Interruptus	9.8	6.5	9.7	12.7	
Douche	7.3	3.7	6.5	12.2	
Other Types[4]	4.2	4.3	4.0	4.7	

[1] Practice of contraception interrupted in order to permit pregnancy to occur.
[2] Used as prescribed.
[3] See page 159 for definition.
[4] Includes all alternations of methods, suppositories, sponge, etc.

Table 17. Proportion of exposure after clinic attendance, during which each type of contraception was used, and during which no contraception was used, by social class.

er proportion of the exposure after clinic attendance than did the women in either of the other groups, used the diaphragm and jelly, as directed, for nearly 60 per cent of their postclinic exposure.

Couples who discontinued the use of the prescribed methods turned to the types of contraception in general use before clinic attendance. Among couples who used contraceptives other than those prescribed, families on relief tended to use the least costly contraceptives, coitus interruptus and douche, for a large proportion of their exposure, while white-collar workers used condom for a larger proportion of their exposure than any other contraceptive except the ones prescribed by the clinic.

POSTCLINIC PREGNANCY RATES

Pregnancy rates with the prescribed contraceptives were very low, much lower than those for any type of contraception used

Period of Married Life	All Women	Couples Not on Relief		Couples on Relief
		White-Collar Workers	Manual Workers	
	PREGNANCIES PER 100 YEARS' EXPOSURE			
First Pregnancies	3	3	5	—[1]
All Later Pregnancies	9	6	8	15
Years Since Marriage				
0–4	12	10	9	28
5–9	9	3	8	16
10–14	8	8	7	10
15–29	8	4	8	11
	NUMBER OF YEARS OF EXPOSURE AND NUMBER OF PREGNANCIES			
	Exp. / Preg.	Exp. / Preg.	Exp. / Preg.	Exp. / Preg.
First Pregnancies	116.1 / 4	72.8 / 2	40.2 / 2	3.1 / 0
All Later Pregnancies	2,703.1 / 244	439.4 / 25	1,672.2 / 133	591.5 / 86
Years Since Marriage				
0–4	442.7 / 54	94.0 / 9	273.2 / 24	75.4 / 21
5–9	935.7 / 82	179.5 / 5	571.9 / 47	184.3 / 30
10–14	713.6 / 58	118.0 / 9	428.6 / 32	167.0 / 17
15–29	611.1 / 50	47.9 / 2	398.4 / 30	164.7 / 18

[1] Insufficient exposure.

Table 18. Pregnancy rates with diaphragm and jelly, after clinic attendance, by social class.

preclinic.[12] The rates are shown in Table 18. The social class differentials were in the same direction as those usually observed in birth rates by social class but the rates of white-collar workers and those of manual workers showed no significant differences for the exposures during which the prescribed contraceptives were used. The rates of relief recipients, however, were significantly higher than those of either of the other groups.[13]

The pregnancy rates for "variants" of the clinic prescription were

[12] Part I, pp. 85-87, Tables 9 and 10.

[13] The significance of differences between the rates compared in the text was tested in each instance by means of the χ^2 test. This test is not ideally suited to the type of data here presented, but is the best approximation at present available. All statements that rates do not differ significantly are based on values of p that are .10 or larger. Statements that rates are significantly different are based on values of p that are .02 or smaller. In cases where differences are questionable, i.e., when values of p are greater than .02 but less than .10, the values of p are given in footnotes.

significantly higher than those for exposures with diaphragm and jelly used as prescribed, except in the case of white-collar workers, a large proportion of whom used the diaphragm and jelly alternately with condom (Table 19). Even though the exposure with "variants" of the prescribed contraceptives was relatively short, the inclusion of this experience with that during which the diaphragm and jelly were used in accordance with instructions yielded rates for all women which were slightly but consistently and significantly higher than those shown in Table 18 for women who used the diaphragm and jelly as prescribed. This difference demonstrates the importance of precise techniques in the use of any type of contraception.

Table 19. Total pregnancy rates with variants of the prescribed contraceptives, after clinic attendance, by social class.

Total	Couples Not on Relief		Couples on Relief
	White-Collar Workers	Manual Workers	
PREGNANCIES PER 100 YEARS' EXPOSURE			
36	10	36	60
NO. OF YEARS OF EXPOSURE AND NO. OF PREGNANCIES			
Exp. | Preg.	Exp. | Preg.	Exp. | Preg.	Exp. | Preg.
232.3 | 83	40.5 | 4	151.6 | 55	40.2 | 24

Pregnancy rates with types of contraception other than those prescribed are shown in Table 20. The rates with condom, after clinic attendance, did not differ significantly from those for diaphragm and jelly, in any of the social class groups. Rates for other types of contraception were somewhat higher. The social class differences in rates with each type of contraception were small and of doubtful significance. They might have been more significant had the experience been greater.[14] The rates for all contraception other

[14] The observed values of p were as follows:

Condom:
- White-collar workers and relief recipients, p was between .05 and .10
- Other comparisons showed no significant differences.

Coitus Interruptus:
- White-collar workers and manual workers, p was between .05 and .10
- Manual workers and relief recipients, p was between .05 and .10
- White-collar workers and relief recipients, $p > .01$

Douche:
- White-collar workers and manual workers, p was between .05 and .10
- Manual workers and relief recipients, p was between .10 and .20

Type of Contraception	Total Pregnancies per 100 Years' Exposure[1]							
	All Couples		Couples Not on Relief				Couples on Relief	
			White-Collar Workers		Manual Workers			
All Contraception	28		16		27		36	
Condom	10		6		9		17	
Coitus Interruptus	38		24		37		47	
Douche	36		30		40		31	
Other Types[2]	21		10		18		38	
	Number of Years of Exposure and Number of Pregnancies							
	Exp.	Preg.	Exp.	Preg.	Exp.	Preg.	Exp.	Preg.
All Contraception	1,270.8	355	157.5	25	768.9	206	344.4	124
Condom	324.6	32	52.4	3	226.0	21	46.2	8
Coitus Interruptus	435.2	167	46.7	11	260.5	96	128.0	60
Douche	324.3	116	27.1	8	174.5	70	122.7	38
Other Types[2]	186.7	40	31.2	3	107.9	19	47.5	18

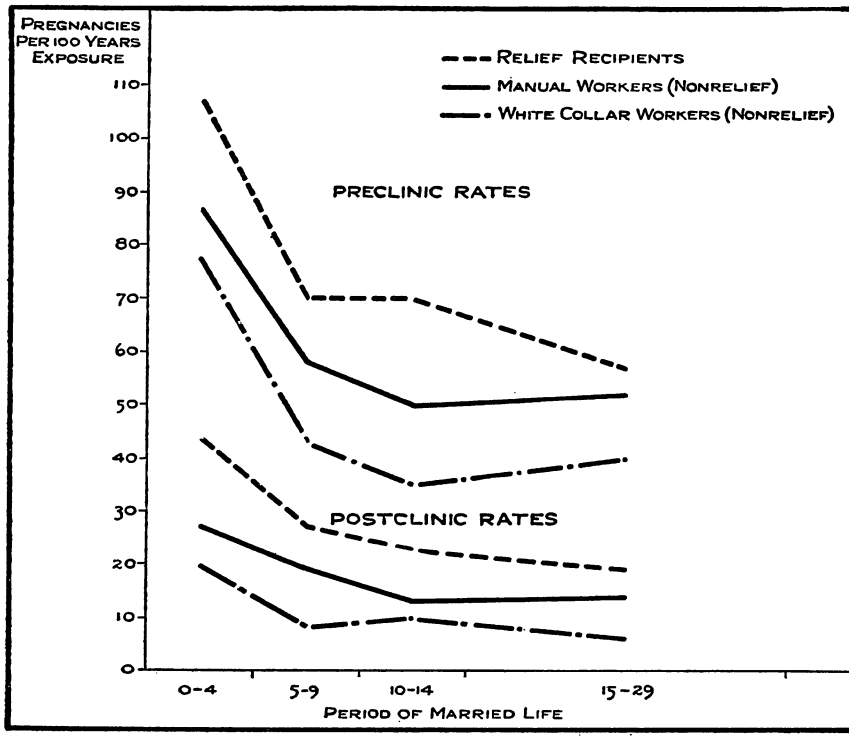
[1]Standardization does not affect the rates.
[2]Includes all alternations of methods, suppositories, sponge, etc.

Table 20. Pregnancy rates for contraceptives other than those prescribed, after clinic attendance.

than that prescribed at the clinic were significantly lower for white-collar workers than for manual workers, and significantly lower for manual workers than for relief recipients. Correction of rates for all contraception because of possible bias due to the slightly low proportion of couples on relief in the interviewed as compared with the original sample did not change the rates significantly. The social class differentials observed in the total rates preclinic were maintained in the total rates postclinic, although all rates were at a lower level (Fig. 7).[15] The differentials were due mainly to differences in the prevalence of the less effective types of contraception.

Pregnancy rates with each type of contraception were only about half as high after clinic attendance as they had been before (Fig. 8). It is difficult to determine just why this should happen, though a

[15] These rates include exposure with and without contraceptives.



[1]Includes exposure with and without contraceptives.

Fig. 7. Pregnancy rates for total exposure,[1] in each period of married life, before and after clinic attendance.

similar observation was made in the case of patients of a New York birth control clinic.[16]

It is possible that those couples who used contraception other than that prescribed by the clinic were mainly couples who had previously found those types of contraception satisfactory. There was a marked tendency for couples who did not use the clinic prescription or who discontinued its use to turn to the same types of contraception they had used before they attended the clinic (Table 21). Between one-third and one-fourth of all the couples who had used contraception before coming to the clinic used the same method or methods after attending the clinic that they had used before. The question arises whether those couples whose use

[16] Unpublished data from the Milbank Memorial Fund.

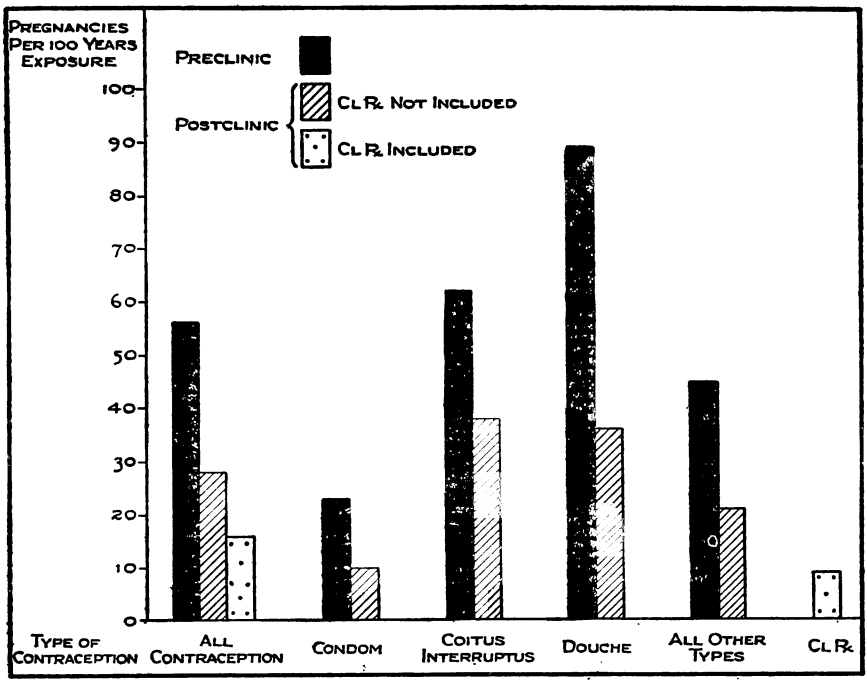


Fig. 8. Pregnancy rates with specified types of contraception before and after clinic attendance.

of a contraceptive preclinic was conspicuously successful were the ones to continue to use it or to return to it after they attended the clinic. No significant differences were demonstrable in the preclinic rates of couples who used the same method postclinic and of those who turned to other methods, except in the case of those who used douche. The preclinic rates of couples who continued to use douche after they attended the clinic were significantly lower than those of couples who turned from douche to other types of contraception.[17] There were 54 women who never used clinically prescribed contraceptives after they attended the clinic, but who used

[17] The total preclinic rates for each type of contraception, standardized by duration of marriage, were as follows:

	Condom	*Coitus Interruptus*	*Douche*
Couples using same contraceptive postclinic	21	69	83
Couples using other types of contraception postclinic	23	64	91

Type of Contraception Used Before Clinic Attendance	Type of Contraception Used After Clinic Attendance				
	All Couples		Per Cent Using		
	Number	Per Cent	ClR Only	Same Contraceptive as Used Preclinic[1]	All Other Types and Combinations[1]
All Contraception	1,453[2]	100.0	53.0	27.5	19.5
Condom Only	172	100.0	50.0	28.5	21.5
Coitus Interruptus Only	233	100.1	46.4	31.8	21.9
Douche Only	196	100.0	35.2	34.7	30.1
Condom or Coitus Interruptus	233	100.0	57.9	36.9	5.2
Condom or Douche	135	100.0	51.1	26.7	22.2
Coitus Interruptus or Douche	127	100.0	49.6	36.2	14.2
Condom or Coitus Interruptus or Douche	107	100.0	60.7	37.4	1.9
All Others	250	100.0	70.0	30.0	

[1]Many of these used ClR for a time, and later turned to the use of the other methods.
[2]Total using contraception both before and after clinic contact. 141 couples used none before they attended the clinic, and 27 couples had no exposure or used no contraception after they attended the clinic.

Table 21. Distribution of couples using each contraceptive method before attendance at the clinic by type of contraception used after clinic attendance.

other types of contraception with complete success. These women had preclinic pregnancy rates with contraception that were significantly lower than those of all other women in the group.

The drop in rates postclinic must be attributed mainly to factors other than selection, though selection may be a factor for part of the group. It is possible that the rise in the abortion rate immediately preceding their attendance at the clinic[18] was an indication that some couples considered their families complete and came to the clinic because they were determined to have no more children. Such couples would doubtless practice any contraception more diligently because of that determination. It is possible also that what they learned at the clinic concerning their own anatomy and the technique of douching may have helped to make all contraception more effective, regardless of the type used.

[18] Part I, pp. 89-90.

THE EFFECTIVENESS OF CONTRACEPTION AFTER CLINIC ATTENDANCE

In measuring the effectiveness of clinically prescribed contraceptives, it is necessary to depart from the methods used in earlier clinic reports. In most clinic studies the percentage of "successes," or the proportion of women using a given contraceptive who had no accidental pregnancies while using it, has been employed as the measure of effectiveness of that contraceptive. Comparison of the proportion of "failures" with the contraceptives prescribed at the clinic and the proportion of "failures" with other types of contraception, based on their use before clinic attendance, yields wide differences in the per cent of "success" of the pre- and postclinic methods.[19]

In almost every instance the exposure to the risk of pregnancy with contraceptives, prior to attendance at the clinic, is much longer than that following clinical instruction. The period between marriage and the first contact with a birth control clinic is usually sufficiently long to give virtually every patient the opportunity to become pregnant once and most patients the opportunity to become pregnant several times. In the postclinic period covered by the usual follow-up study, the elapsed time is so short that many patients would not have become pregnant even though they had used no contraception, some might have become pregnant once, and very few could have become pregnant more than once, under any circumstances. For these reasons the proportion of women "failing," i.e., having accidental pregnancies, in the long period before their contact with the clinic must perforce be much higher than the proportion "failing" in the short period following clinic contact, even though the contraceptives used in both periods were equally effective.

With the computation of pregnancy rates based on exposure to

[19] *See* Kopp, Marie: BIRTH CONTROL IN PRACTICE. New York, Robert McBride and Co., 1934, Tables 42 and 72.

Stone, Hannah: Maternal Health and Contraception. *Medical Journal and Record,* May 3, 1933, Tables III and V.

the risk of pregnancy, a concept first introduced by Pearl,[20] it becomes possible to measure the effectiveness of a given contraceptive in terms of its prevention of pregnancies which would have been expected had no contraception been used for an equivalent exposure. Thus, the comparison of the effectiveness of different types of contraception may be made with the knowledge that the effectiveness ratios are based on the same noncontraceptive rates and the same units of time.

The effectiveness of a contraceptive is measured in terms of its prevention of the pregnancies that would have occurred had no contraception been used for the same length and distribution of exposure. The product of the exposure with the contraceptive, and the pregnancy rate observed in each period of married life when no contraception was used, yields the number of pregnancies expected in each period of married life if no contraception had been used for an exposure of equal length. The difference between the sum of the expected pregnancies in all durations of married life and the sum of all the pregnancies observed when the given contraceptive was used is an estimate of the number of pregnancies prevented by the use of that contraceptive. The ratio of observed pregnancies to those prevented yields the per cent of effectiveness of the contraceptive.

The effectiveness of diaphragm and jelly, as used by all the women who ever used the prescribed methods, ranged between 95 per cent for white-collar workers and 82 per cent for relief recipients (Table 22). For those women who used the prescribed contraceptives continuously, and according to instructions, the effectiveness ratios were somewhat higher. Condom was as effective as the most effective use of diaphragm and jelly. Even those contraceptives thought to be relatively unreliable showed a surprising degree of effectiveness when used by white-collar workers. It is probable that

[20] Pearl, Raymond: Contraception and Fertility in 2,000 Women. *Human Biology*, September, 1932, iv, No. 3, p. 400.

the effectiveness of such contraceptives can be greatly increased by diligence and care in their use. All contraception was 85 per cent effective after clinic attendance.

The large proportion of couples who gave up the diaphragm and jelly, as well as the relatively high effectiveness of the contraception not prescribed by the clinic, suggest that unless there are cogent reasons aside from effectiveness for prescribing only one type of contraception, several types should be prescribed. A single contraceptive is unlikely to be equally acceptable to all types of people, for the choice of a contraceptive is a highly individual problem. Moreover, careful instruction in the best use of any contraceptive would probably increase its effectiveness. It would be far wiser to prescribe for each couple the type of contraception best suited to that couple's tastes and needs, and to instruct them in the most effective way to use that method, than to assume that all couples will accept one type of contraception with equal enthusiasm.

Table 22. Per cent of effectiveness of each type of contraception as used by three social classes before and after clinic attendance.[1]

Type of Contraception	All Couples		Couples Not on Relief				Couples on Relief	
			White-Collar Workers		Manual Workers			
	Pre-clinic	Post-clinic	Pre-clinic	Post-clinic	Pre-clinic	Post-clinic	Pre-clinic	Post-clinic
All Contraception	52	85	64	93	54	85	38	76
All Cl B	—	90	—	95	—	90	—	82
Diaphragm and Jelly	—	92	—	96	—	92	—	85
Variants of Cl B	—	64	—	91	—	62	—	35
All Contraception Except Cl B	52	72	64	86	54	73	38	63
Condom	81	91	88	95	82	91	65	85
Coitus Interruptus	45	62	52	80	47	64	37	52
Douche	25	63	16	71	28	59	23	68
Other Types	61	78	70	91	63	82	47	57

[1]Ratio of pregnancies prevented to those expected had no contraception been used. (For further explanation see Part I—pp. 83 and 84, and footnote 1—Table 11.)

SUMMARY

A group of patients who attended the clinics of the Cincinnati Committee on Maternal Health between November, 1929, and December 31, 1934, were interviewed in their homes between April, 1935 and April, 1937. The patients interviewed constituted about 80 per cent of the group who had originally attended the clinic, and were somewhat more cooperative than those who could not be traced.

An occlusive rubber diaphragm and spermicidal jelly were prescribed for 98 per cent of the women who sought contraceptive advice at the clinic. About 45 per cent of those interviewed and an estimated 40 per cent of the original group were using the prescribed contraceptives at the time of the follow-up study, which covered a mean interval of about 40 months between the initial clinic contact and the interview.

Pregnancy rates with diaphragm and jelly were very much lower than any rates with contraception before attendance at the clinic. Rates of self-supporting workers were significantly lower with the prescribed contraceptives than the rates of relief recipients.

Couples who did not use the prescribed contraceptives or discontinued them turned to the types of contraception in general use before they came to the clinic. Pregnancy rates with each type of contraception were very much lower after the women had attended the clinic than before. While rates for individual contraceptives did not differ greatly in the three social classes, the social class differentials observed before clinic attendance were maintained at a lower level after the women had been to the clinic because white-collar workers used mainly the most effective types of contraception, manual workers fairly effective types, and relief recipients those contraceptives which were least effective.

All contraception, after clinic attendance, was 85 per cent effective in preventing pregnancies that would have been expected had no contraception been used. The contraception used by white-

collar workers was 93 per cent effective; that used by manual workers 85 per cent effective, and that used by relief recipients 76 per cent effective.

The rejection of the single contraceptive prescribed at the clinic, by more than half of the women who applied for advice, together with the relatively high effectiveness of contraceptives other than those prescribed, leads to the conclusion that clinics should prescribe a number of different kinds of contraception, suiting each to the needs of the individual couple.