

THE EFFECT OF CONTRACEPTION ON THE  
BIRTH RATE OF A PUERTO RICAN  
COMMUNITY DEVELOPMENT PROJECT

by

Wilson M. Wing, M.D., M.P.H. <sup>1/</sup>

and

Clarence J. Gamble, M. D. <sup>2/</sup>

<sup>1/</sup> Department of Public Health Administration,  
Johns Hopkins School of Hygiene and Public Health.

<sup>2/</sup> Department of Anatomy  
Harvard Medical School

That contraception has an effect on birth rates has long been recognized. Numerous studies have been made of the pregnancy rates of groups of users, (1). While these give valuable evidence of the effect on the size of individual families and the success of various methods, they cannot satisfactorily be used to calculate the effects to be expected on entire communities or groups of unselected families.

An excellent study of three entire communities was made by Dr. Yoshio Koya in Japan, (2). Choosing three typical villages, he sent his staff of physicians and a midwife to inform each family that contraception was available and to offer free instruction and supplies. The result was a fall in the birth rate from 27 per 1,000 population in the year before the program began to 14 in its fifth year. The pregnancy rate for the same villages calculated by the method of Stix and Notestein (subtracting from the time of exposure 10 months for each birth or stillbirth, and 4 months for each miscarriage) (3) fell from 30 to 18 per 100 couples per year. Similar results were secured when contraception was offered to an entire community at the Koban Coal Mine in Japan (4). In the third year the birth rate dropped to 9.7 per 1,000 population.

Results found in Japan will not necessarily be approximated in other nations. It seemed worthwhile, therefore, to make a similar study of the effect of contraception on an entire community in Puerto Rico. Chosen for the purpose was a rural community development project of the Puerto Rican Government not far from San Juan, the capital city.

The community development project was organized under the Land Authority. A valley of unused land was secured for the purpose. Approximately ten percent of the area was reserved for

public use, such as for churches, school, recreation ground, common pasture, police, health services, and commercial purposes. The remainder was divided into 148 lots of about  $5/8$  or  $1/2$  acre, with a few still smaller. The land is hilly; the streets, which are laid out on a nearly rectangular pattern, become in places so steep as to be useable only for foot traffic.

On May 6, 1951 the lots were assigned to landless farm laborers (agregados) who had been living nearby under unsatisfactory conditions. No charge was made for the land, but only those to whom they were allotted or their descendants may occupy the parcels (parcelas). Subdivision for two families is prohibited. The occupying families built their own houses, some of them bringing with them those which they had previously been occupying on the land of others.

While the families selected may not represent an average of the Island population, a large proportion of its citizens are similarly situated. Preference in the selection may have been given to agregados with the larger families.

Some information about contraception had reached the inhabitants through a nearby project of the Johns Hopkins School of Public Health and the Asociacion Puertorriquena pro Bienestar de la Familia. Beginning in 1950, these organizations had sent a Puerto Rican nurse to offer birth control to the farmers in a rural region. A jeep took her to the hillside cabins where she told the mothers that contraception was available and that they could secure instructions and free supplies by coming to the physician at the public health center. As distances were large

and roads steep, the number of patients enlisted was small. In 1954 the procedure was changed. Under the direction of a physician, the nurse took the simpler methods of contraception to the users' houses and if supplies were requested, these were immediately delivered.

In order to secure the greatest acceptability, the nurse described a number of methods to the patient and allowed her to choose the one which seemed most satisfactory. The families were also encouraged to change this for others if the wife or her husband wished. The methods offered were: jelly and syringe, condom, suppository, foam tablets, or, if the patient preferred, diaphragm and jelly. Women using the diaphragm were fitted at the health center. No charge was made for the supplies and these were renewed at revisits which were planned approximately once per month. As it was planned to test the effect of temporary means of contraception, no effort was made to encourage sterilizations, though this permanent method was occasionally discussed by the nurse. Arrangements for three recent sterilizations were assisted by the Asociacion. Since the community development project was near the boundary of the area served by the Asociacion's nurse, its families had not been intensively visited before the present study.

To determine the extent to which contraception had been used and its effect on the birth rate of the community, each household was visited by a Puerto Rican nurse in March or April, 1957. A record was made of the age of the wife, of the duration of marriage, and of the number and dates of the pregnancies. The data secured in those visits showed that in the 148 houses on the parcelas there were 153 families. On the average, the wives or

widows at the time of instruction in contraception, sterilization, or first interview were 37 years of age and had been married for 20 years. At that time they had borne 5.8 children, of whom 5.0 were still living. In the entire group there were 145 wives, who reported 731 living children. These constituted the population of this study. <sup>1</sup> The resident population in all of the 148 houses including some relatives and omitting children living elsewhere, was 947.

In 44 of the families, the wife or widow was 45 years of age or over. The <sup>re</sup>maining 101 were couples living together, in which the wife was under 45. Of these, 54 were found to be using contraception. By 35 couples the permanent form, sterilization <sup>2/</sup> had been elected, 33 of the female and 2 of the male. The earliest operation for sterilization was done in 1945. The annual number increased to 8 in 1956. Three have been sterilized in the first four months of 1957 and 10 additional couples said they were planning tubectomies. Four of these are pregnant; one is using a temporary method of birth control; and five are non-contraceptors. Temporary contraceptive methods were being used by 19. Eight more asked for and received contraceptive supplies at the time of the 1957 visit. Thirteen were pregnant, (including the four planning sterilization). For the remaining 26 who were under 45, the reasons stated for not using birth control are given in Table 1.

Pre-instruction pregnancy rates have been calculated from the time of marriage to the time of instruction or of sterilization, or to the age of 45. (Table 2). For those who did not accept contraception, rates were calculated to the time of the last

interview. Nine months of temporary sterility have been subtracted from the elapsed time for each live birth or stillbirth and four months for each abortion or miscarriage. 3/

The pre-instruction pregnancy rate was 52 per 100 couples per year for the entire group and 65 for wives under 45 years of age. Among the latter the rate of 76 pregnancies per 100 couples per year for those who chose sterilization was higher than that of 64 for those accepting temporary contraception, and that of 60 for the non-users. These may have included some couples of low fertility. For the wives over 45 the rate of 41 during their married lives before the age of 45, reflected the lessened fertility of their later reproductive years.

In calculating a pregnancy rate for those using temporary methods of birth control, it is difficult to determine whether conceptions are due to omissions of the prescribed procedure. For this reason a rate for the users has been calculated by including all non-pregnant months and all conceptions unless the patient reported that contraception had been permanently discontinued. In the 550 months of use there were 12 pregnancies, a rate of 26 per 100 couples per year. (Five additional pregnancies occurred during periods when the families said they were not using contraception.)

Next to sterilization, the condom was the method most extensively used, accounting for 232 out of 550 months of temporary contraception. The post-instruction rate for all contraceptors was 8 pregnancies per 100 couples per year. ~~During the 1696 months which elapsed between sterilization and April, 1957, the 35 families in which a spouse had been sterilized had no pregnancies.~~

The effect of contraception may also be estimated by comparing the annual births before contraception was much used with the births in recent years. In the five years, 1946 through 1950, the average number of births each year among all of the 145 families studied was 35. These constituted a birth rate of 340 per 1,000 wives under 45. In 1955 and again in 1956 there were 23 births, and 1957, 15; <sup>plus gave a</sup> crude birth rates of 24 and 16 per 1,000 population and one of 220 and 145 per 1,000 wives under 45. The decrease in annual births from the earlier period was 34 and 57 percent.

It is of interest to calculate the effect of planned parenthood on the population of the community. In the pre-instruction period of the 27 users of temporary methods, a child was born, on the average, every 30 months of married life. If the same fertility had continued during the 880 elapsed post-instruction months of this group before April, 1957 29 more children would have been born. The 17 which were born showed a reduction of 12 unwanted children.

During the pre-operation experience of those who chose permanent protection, there was a live birth every 26 months of married life. This rate, if continued, would have resulted in 65 unwanted children in the 1696 months of experience from the time of sterilization to April, 1957. None were born.

Permanent and temporary methods of birth control have, therefore, made it possible for the families of the community to prevent the birth of 77 unwanted children, and have to this extent decreased the population of the community development project.

The reduction in population would probably have been larger had it not been for the practice of restricting sterilizations to families with four or more children. Many of the wives to whom instruction in temporary methods was offered replied, "We want to be sterilized, and are planning to have the four needed children as soon as possible."

#### DISCUSSION

The findings in this study show certain differences from others previously made in Puerto Rico. Belaval, Gould, and Gamble in 1937 found a preclinic rate of 104 pregnancies per 100 couples per year (5), and Beebe and Belaval in a larger series a few years later found one of 95 (6). These are somewhat higher than the rates in the group here reported of 76 for those sterilized and 64 for those using temporary methods. The post-instruction rates of 29 and 40 of the two previous reports may not be significantly higher than that of 26 found in the relatively short experience of this group.

The birth rate of 340 per 1000 married women under 45 found in 1946-1950 before contraception was much practiced in this group is higher than that for Puerto Rico as a whole in 1950 which was 295 per 1000 married or consensually united couples <sup>4</sup>/(7). The census figures include urban women who have neither wished nor produced as many children as their rural counterparts and show a higher incidence of sterilization and practice of contraception. (8, 9, 10). It is larger than the rate of 13.5 for Puerto Rican-born women 14-45 in New York (11).

The pre-instruction pregnancy rate of 52 for this group is distinctly higher than that of 30 found by Koya in three typical Japanese villages, but nearly the same as that of 65 in groups using



contraception in India and Pakistan. (12) The post-instruction rate of 26 is also nearly the same as those of 24 for salt-and-sponge or salt-jelly, and 22 for diaphragm-and-jelly (12).

The popularity of sterilization as a method of contraception appears greater than in previous Puerto Rican studies and is perhaps an indication of a trend.<sup>5/</sup> The 35 percent of those under 45 who had been sterilized may be compared with the 11.3 percent of sterilized couples married in 1930-39 studied by Hatt (10). The 35 sterilized in our group were 56 percent of all contraceptors, a slightly higher proportion than the 20 sterilized among 42 current users reported by Stycos (9). An upward trend in sterilizations is indicated by this author, who reported that the sterilizations in district hospitals in 1949-50 were 195 percent of those in 1944-45 (13).

In Koya's three typical villages, those sterilized were 5.4 per cent of the families under 45 and 8.8 percent of the contraceptors. As a result of repeated offerings of contraception, over a period of 5 years, 63 percent of those under 45 with three or more living children in the Japanese villages were practicing contraception, including those sterilized. In the 80 families in our group in this category, 26, or 77 percent were contraceptors.

SUMMARY.

The 145 families studied in a community development project in Puerto Rico had, on the average, before instruction in contraception, borne 5.8 children, of which 5.0 were living. They had had 52 pregnancies per 100 couples per non-pregnant year of married life.

Since 1949, contraceptive instruction and supplies have been available at a health center 10 miles from the project, and had been offered to a few wives in their houses.

Of the 101 families in which the wife was under 45, 54 were using contraception. Eight more began contraception during the survey. The post-instruction pregnancy rate had been 6.8 per 100 couples per year. Thirty-five had been sterilized. Nineteen had been using temporary methods of contraception with a post-instruction pregnancy rate of 23.

The crude birth rate was 24 per 1000 in 1955 and 1956 and 167 in 1957. The annual births were 34 and 57 percent fewer than in <sup>the</sup> each years from 1946 to 1950.

It is calculated that sterilization had prevented the birth of 65, and temporary contraception the birth of 12 unwanted children.

## FOOTNOTES

- 1/ The official map shows 164 lots. Of these 16 were reserved for public use. The house on one was vacant. In 4, the spouses were separated; 1 was occupied by a widow under 45; 2 by single men; and for one no history was available because of advanced age. Six of the remaining 139 houses were occupied by two families of different generations. The families studied in the project numbered 145.
- 2/ Sterilization differs from the temporary form of contraception only in that unwanted births are prevented by a single voluntary act, rather than repeated acts.
- 3/ The calculation of Stix and Notestein was used, but was modified by subtracting 9 rather than 10 months for full-term pregnancies, since conception sometimes occurs early in the puerperium.
- 4/ Total count of women age 15 through 44 years of age less those identified as single or widowed.
- 5/ By December 1957 5 additional sterilizations had increased the proportion to 40% percent of those under 45.

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TABLE 1.  
FAMILIES IN THE COMMUNITY DEVELOPMENT PROJECT  
May 1, 1957

I <u>Presumably not Reproducing</u>		52
45 or over	44	
Widow under 45	1	
Single men	2	
Separated	4	
History incomplete	1	
II Presumably Fertile		26
A. Non-Contraceptors		
Reasons given for non-contraception		
No children	4	
Youngest child 9 years or older	5	
Ill	1	
Religious objections	5	
Dislike method	3	
Will talk to husband	2	
Sterilization planned	5	
No reason	1	62
B. Contraceptors		
Sterilized (2 vasectomies)	35	
Using temporary contra- ception (19 began before the 1957 census	27	
III Temporarily Infertile		13
Pregnant (4 planning ster- ilization)	13	
Total		153

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TABLE 2.

PREGNANCY RATES OF CONTRACEPTORS AND NON-CONTRACEPTORS  
BEFORE AND DURING CONTRACEPTION

	Number of Families	Aver- age Age of Wife	Years Mar- ried	Aver- age Yrs. Mar- ried	Children			Months of Ex- posure to Preg- nancy	Pregnancies Per 100 Couples per Fertile Year	
					Born	Born Aver- age	Living Aver- age		Num- ber	Couples per Fertile Year
<b>PRECONTRACEPTIVE EXPERIENCE</b>										
Wife 45 or over	44	55	1736	39	351	8.0	6.7	11,268	382	41
Non-Contraceptors	39	32	539	14	205	5.3	4.6	4,512	228	60
Those Sterilized	35	27	347	10	161	4.6	4.4	2,676	169	76
Users of Temporary Contraception	27	29	289	11	117	4.3	3.9	2,364	125	64
TOTAL	145	38	2911	20	834	5.8	5.0	20,820	904	52
<b>CONTRACEPTIVE EXPERIENCE</b>										
After Sterilization	35							1,696		0
Temporary Contra- ception (since instruction)	19							550	12	26
All Contraceptors	54							2,246	12	6

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