

# Integrating Family Planning with Health Services

Does It Help?

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Rashid Faruqee

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Rashid Faruquee

Development Research Department  
The World Bank  
Washington, D.C., U.S.A.

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## ABSTRACT

Narangwal is more than the name of a village in Punjab, India. It has become associated with one of the best known and well documented field experiments in health care and family planning anywhere in the world. In that experiment, groups of villages were provided with combinations of services for health, family planning, and nutrition between 1968 and 1974. The households in each group were then followed through extensive data gathering. The World Bank has been collaborating with Johns Hopkins University in analyzing this rich set of data to study policy questions relating to systems for the delivery of services. Two monographs on the findings of this research--one dealing with population, one with nutrition--are forthcoming.

One important question addressed in the population monograph is whether the integration of health and family planning services helps in attaining family planning and health objectives. This paper focuses on the findings on this question.

The findings show that integration was more effective in recruiting family planning acceptors than was the provision of family planning alone. They also show that integration was more cost effective than separate services and more equitable in distributing family planning services to all socioeconomic groups. Integration also produced better contraceptive protection.

These results were not obtained by sacrificing health benefits. The findings show that health benefits were also impressive--in effectiveness, in efficiency, and in equity.

The life of the experiment was too short to produce a perceptible fertility decline, yet the results generally suggest that integration can help in reducing fertility, too.



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INTEGRATING FAMILY PLANNING WITH HEALTH SERVICES:  
DOES IT HELP?

Whether family planning and health services should be integrated to increase the effectiveness of family planning services is no longer a subject of debate. Most countries and international agencies favor integration because of the efficiency of using health personnel for family planning. But it still is important to ask, does integration increase the impact of services? The question can be addressed by studying the experience of a controlled experiment at Narangwal in the Indian state of Punjab. The Department of International Health of Johns Hopkins University conducted a field experiment there between 1968 and 1974. In that experiment, different groups of villages were provided with different combinations of services for health, nutrition, and family planning. The experiment had two parts. The population study examined the outcome of integrating health services with those for family planning. The nutrition study considered the interaction between malnutrition and infections in children under three years of age.

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Timothy King gave the valuable comments on an earlier draft of this paper, which is drawn from Carl Taylor, Rashid Faruqee, Robert Parker, William Reinke and R.S.S. Sarma, Benefits of Integrating Family Planning and Health Services: the Narangwal Experience (Washington, D.C.: World Bank, forthcoming). That source contains the details of the experimental design, services, and findings.

In the population study, five experimental groups of villages were matched as closely as possible for comparability. Each group of villages received a different service package:

1. Family planning, women's services, and child care services (FPWSCC)
2. Family planning and women's services (FPWS).
3. Family planning and child care services (FPCC).
4. Family planning and family planning education services (FPED).
5. Control group (CONT-P).

In the nutrition study, which covered all children under three, each of four groups of villages received a different service package:

1. Child care services: nutritional supplementation, and health care (NUTHC).
2. Nutritional supplementation (NUT).
3. Health care (HC).
4. Control group (CONT-N)

The NUTHC experimental group was the FPCC group of the population study (see figure 1).

#### Description of Services and Variables

As services developed in the course of the experiment, care was taken to ensure that the intensity of services in each experimental group was roughly the same. The project services are summarized in table 1. Never static, the services continued to evolve, so that activities would become more relevant and realistic. Services did not start at the same time in all experimental groups; this complicated the analysis, as will be noted later.



The project services can be described as follows:

- o Women's illness care, which included visits or contacts related to women's illnesses usually initiated by ill women or their families and most often occurring in the village clinic.
- o Women's other care, which included contacts initiated by project health workers through routine home visits to women for fertility surveillance, health education, family planning motivation, and preventive care.
- o Children's illness care, which included visits or contacts for curative purposes to children of women in the study villages, usually at family initiative and in the village clinic.
- o Children's other care, which included routine contacts initiated by project health workers for prevention and surveillance (but including early diagnosis and treatment in the home) for children of women in the study villages.
- o Family planning services and follow-up, which included contacts with both women and men involving the provision of modern family planning methods or the follow-up of users.
- o Family planning motivation, which included contacts by male family planning workers with husbands of women in the study villages (these contacts involved general rapport generating activities, health related advice, specific family planning and population education, and motivation to use contraceptives).

The first two categories constituted women's services (WS), the second two children's services (CC), and the third two family planning (FP) and family planning education (ED).

Table 1: SUMMARY OF SERVICE INPUTS

Kind of service	Description of service
<u>FAMILY PLANNING</u>	
Education and motivation	Intense educational efforts were provided in FPED villages; education was well integrated with health care delivery in FPWSCC and FPWS villages, and less adequately integrated in FPCC villages.
Contraceptive services	Condoms, pills, IUDs, injectable Depo-provera, vasectomies, and tubectomies were provided under similar conditions in all experimental groups.
Follow-up	The same method-specific patterns of follow-up were established for all groups.
<u>WOMEN'S SERVICES</u>	
Monitoring fertility and early diagnosis of pregnancy	Routine in FPWSCC, FPWS, and FPCC villages; carried out in simplified form in FPED villages.
Prenatal and postnatal care and supervision of deliveries done by dais (indigenous midwives)	Well-developed pattern in FPWSCC and FPWS villages; modified prenatal care provided in FPCC to protect the child.
<u>CHILD CARE</u>	
Periodic health surveillance and education to three years	Weekly monitoring of morbidity status in FPCC villages, much less frequent (about every two months) home visiting in FPWSCC villages.
Periodic measurement of weight and height	Routine ranged from every month for infants to every three months at three years of age for FPWSCC and FPCC villages.
Immunization	Routine smallpox, DPT, BCG, polio, and measles in FPWSCC and FPCC villages.
Nutrition supplementation and education	Selective provision of supplements to malnourished or faltering children, and education of mothers of all children in FPWSCC and FPCC villages.
Diagnosis, treatment, and referral of illness	Early care emphasized in FPWSCC and FPCC villages.

Note: All services in the health care villages were provided by family health workers, who were auxiliary nurse-midwives with two years' hospital training beyond high school plus an intensive six to eight weeks re-training period in the project. They were supervised on weekly visits by a doctor and by a public health nurse or lady health visitor. Family planning educators were the peripheral workers in the FPED villages. They were village teachers whose training and supervision paralleled the level and intensity of the family health workers.

A large number of input-output-outcome variables were measured in the many surveys and studies during the project. Detailed data on services were collected to provide a basis for using quantitative measures of services as independent variables in input-output-outcome analysis and for detailed studies of cost-effectiveness. To identify the background factors that influenced project results, many variables were measured. The variables can be categorized as follows: i) demographic; ii) socioeconomic; iii) attitudes and beliefs; iv) family planning knowledge and practice; v) fertility and mortality; and vi) morbidity and growth of children.

In evaluating the benefits of integration, three outcomes of the experiment were examined: the use of family planning, selected indicators of health, and the decline in fertility. Three criteria were used to assess the value of services: effectiveness, efficiency, and equity. Effectiveness was judged by looking at the outcome: for example, whether integrated health and family planning services increased the use of family planning without sacrificing health benefits. 1/ Efficiency cost-effectiveness was judged by relating outcome to input, equity by examining the distribution of services among socioeconomic groups.

The results of the Narangwal experience are summed up in the following table.

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1/ Outcome and output can be defined in many ways. Reduced infant mortality or fertility are the ultimate outcomes of project services, but there are also such intermediate variables as the number and duration of service contacts. Similarly, input can be measured in many ways. Here it is defined as the time of the personnel and the cost of services. Note that no attempt is made to distinguish the quality of output on the basis of whether services are provided separately or in combination with others. Nor is the quality of a unit of output distinguished on the basis of who uses it.

Criteria for evaluation	Family planning use	Health improvement	Fertility decline
Effectiveness	Yes	Yes	Yes
Efficiency	Yes	Yes	?
Equity	Yes	Yes	?

I turn now to the results.

### Use of Family Planning

The experience of many developed countries shows that with socioeconomic development, there is a decline in fertility because of the greater use of family planning. This does not mean that a fertility decline is possible only through socioeconomic development. Recent experience in China, Sri Lanka, and in the Indian state of Kerala shows that a country can achieve a substantial fertility decline by intervening with family planning programs, even without reaching higher income levels. But socioeconomic development alone will not increase the use of family planning programs. It is therefore important for policymakers to know what kinds of services and what approaches to the delivery of services will increase the use of family planning.

### Effectiveness

The effectiveness of integrated services in increasing the use of family planning was looked at in four ways. The first was to observe changes in the use of both modern and traditional methods during the project (the ever-use rate). This would not exactly capture how much of the change was contributed by the project, which only provided modern methods. So, the second was to observe only the increases in the use of modern methods (the new-acceptor rate of modern method). Acceptance rates do not capture the continuation of use. Therefore, the third was to observe changes in the

proportion of women contracepting (the continuing-use rate) at a given point of time. The fourth was to observe changes in the methods of contraception (the effective-use rate).

Acceptors of project contraception fall into three categories: those who had used modern contraceptives, those who had used traditional methods of contraception, and those who had not used contraception. The distinctions are important because they show how great an effect the project had. For example, the biggest shift in use was from nonuse before the project to the use of modern methods under the project; the smallest, from prior use of modern methods to the use of modern methods under the project. The second was merely a shift in the source of supply, but it may also have been a shift to more effective methods.

A comparison of preproject use of permanent, temporary, and traditional methods of family planning is shown for the four experimental groups in table 2. Considering both modern and indigenous methods, the ever-use rates were similar in the villages where family planning services were offered (49.4 percent of eligible women, that is, married women in the age group 15-49) and in those where no family planning services were offered (52 percent of eligible women). The ever-use rates in the four experimental groups ranged from 46.4 to 51.2 percent, but the differences were not significant.

The overall preproject use of modern methods was 17.6 percent of eligible women but varied greatly among the four groups: the ever-use rate of modern methods was 26.0 percent in the FPED group, 19.1 percent in the FPWS group, 18.1 percent in the control group, 11.9 percent in the FPCC group, and 11.7 percent in the FPWSCC group. Modern contraceptives accounted for about half the prior contraception in the FPED group and more than a third in the FPWS group and control groups. In the FPWSCC and FPCC groups, modern

contraception was used by only a fourth of those who had practiced family planning, and the use of traditional methods was correspondingly greater. Thus, if the prior use of family planning is considered with its mix of contraceptives, the biggest impact is expected in the FPWSCC and FPCC groups, followed by the FPWS group. The least is expected from the FPED group.

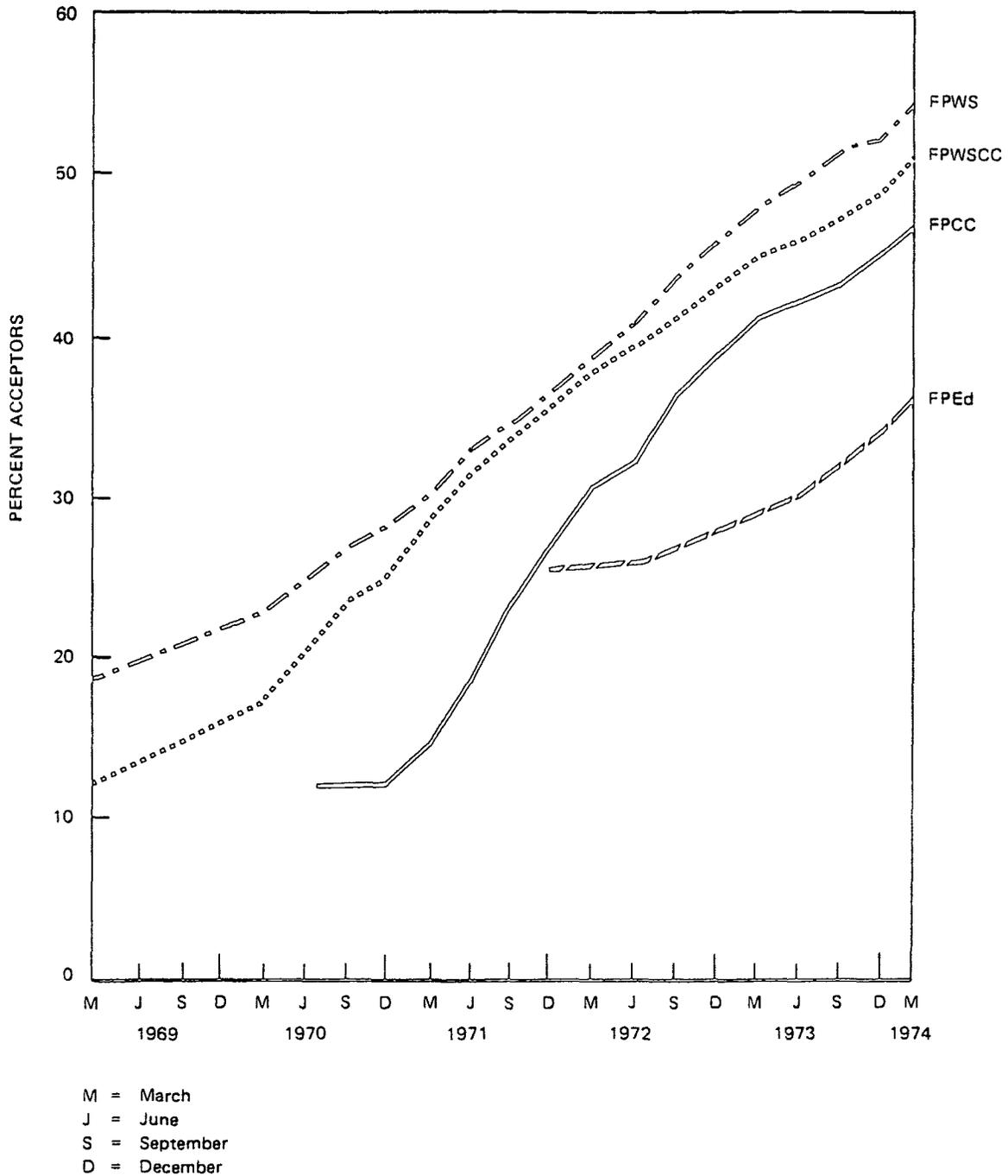
Table 2: PREPROJECT USE OF MODERN (PERMANENT AND TEMPORARY)  
AND TRADITIONAL METHODS AMONG EXPERIMENTAL GROUPS

Method	FPWSCC villages	FPWS villages	FPCC villages	FPED villages
Permanent	1.0	5.1	2.8	7.3
Modern-temporary	10.7	14.0	9.2	18.6
Traditional	39.1	29.9	34.5	25.1
None	49.2	51.0	53.6	48.8
Total	100.0	100.0	100.0	100.0

In Narangwal villages during the project, the acceptance (ever-use) rates of modern family planning methods rose to between 51 and 54 percent of eligible women (see figure 2). Those in FPCC and FPED villages rose to 45 and 37 percent. These increases relate to all acceptors.

A better indicator of the effect of the project is the new-acceptor rate--for those who used modern methods for the first time as a result of project activities. Cumulative new acceptor rates in FPWSCC, FPWS, FPCC, and FPED villages respectively were 45 percent, 42 percent, 39 percent and 22 percent by the end of the project (see figure 3). In comparing these rates, one has to bear in mind that services started at different times in the

Figure 2  
PERCENT CURRENTLY MARRIED WOMEN AGE 15-49 WHO WERE ACCEPTORS OF  
MODERN FAMILY PLANNING METHODS AT SPECIFIED POINTS IN TIME  
BY EXPERIMENTAL GROUP



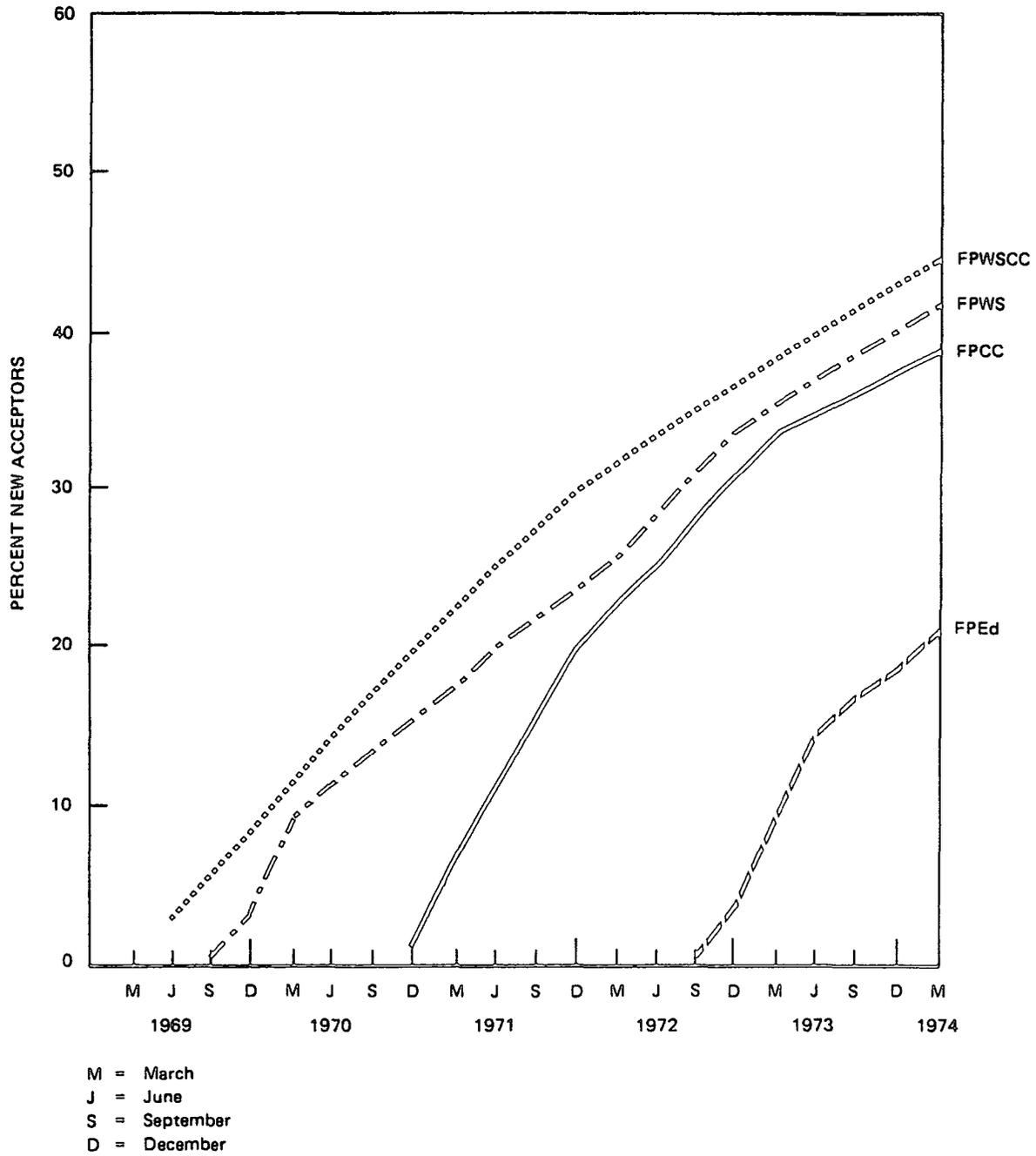
different service groups; FPED services, for example, started nearly two and a half years later than FPWSSC services. These rates are useful, however, to indicate the trend of project acceptance rate and they somewhat modify the picture in figure 2. Cumulative project acceptor rates show that although the overall acceptor rates were higher in FPWS villages than in FPWSSC villages, the present acceptor rates were higher in the FPWSSC villages. In addition, the gap between the curves for FPCC and FPED villages, which widened during the project period in figure 2, remained essentially the same in figure 3. The much greater source-substitution by prior users in FPWS and FPED villages accounts for the differences between figure 2 and figure 3. Figure 3 more accurately portrays the project results. 1/

Figure 3 shows that acceptance curves in all the four groups of villages are roughly parallel, implying that the project succeeded in getting couples to start contraception more or less at the same rate in all the experimental groups. More important, however, is a comparison of trends in continuing-use rates, measured by the proportion of eligible women practicing contraception at a given time. Figure 4 presents the fluctuating continuing-use rates in the four experimental groups. A trend line (constructed by fitting quadratic equations to smooth the curves) shows a somewhat different picture (see figure 5). The smoothed curves show that in all the experimental groups except FPCC, the practice rates were still rising. However, the rate of rise in FPED villages was considerably slower. In FPCC villages, even a decline in the practice rate seemed to have started. One possible reason for the observed trend in FPCC villages is that there may be a lag period between

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1/ These results at Narangwal are comparable with the achievements in family planning by other experiments and special projects in India.

Figure 3  
CUMULATIVE RATES OF PROJECT ACCEPTORS IN EXPERIMENTAL GROUPS



**Figure 4**  
**PERCENT CURRENTLY MARRIED WOMEN AGE 15-49 WHO WERE PRACTICING**  
**FAMILY PLANNING BY EXPERIMENTAL GROUP**

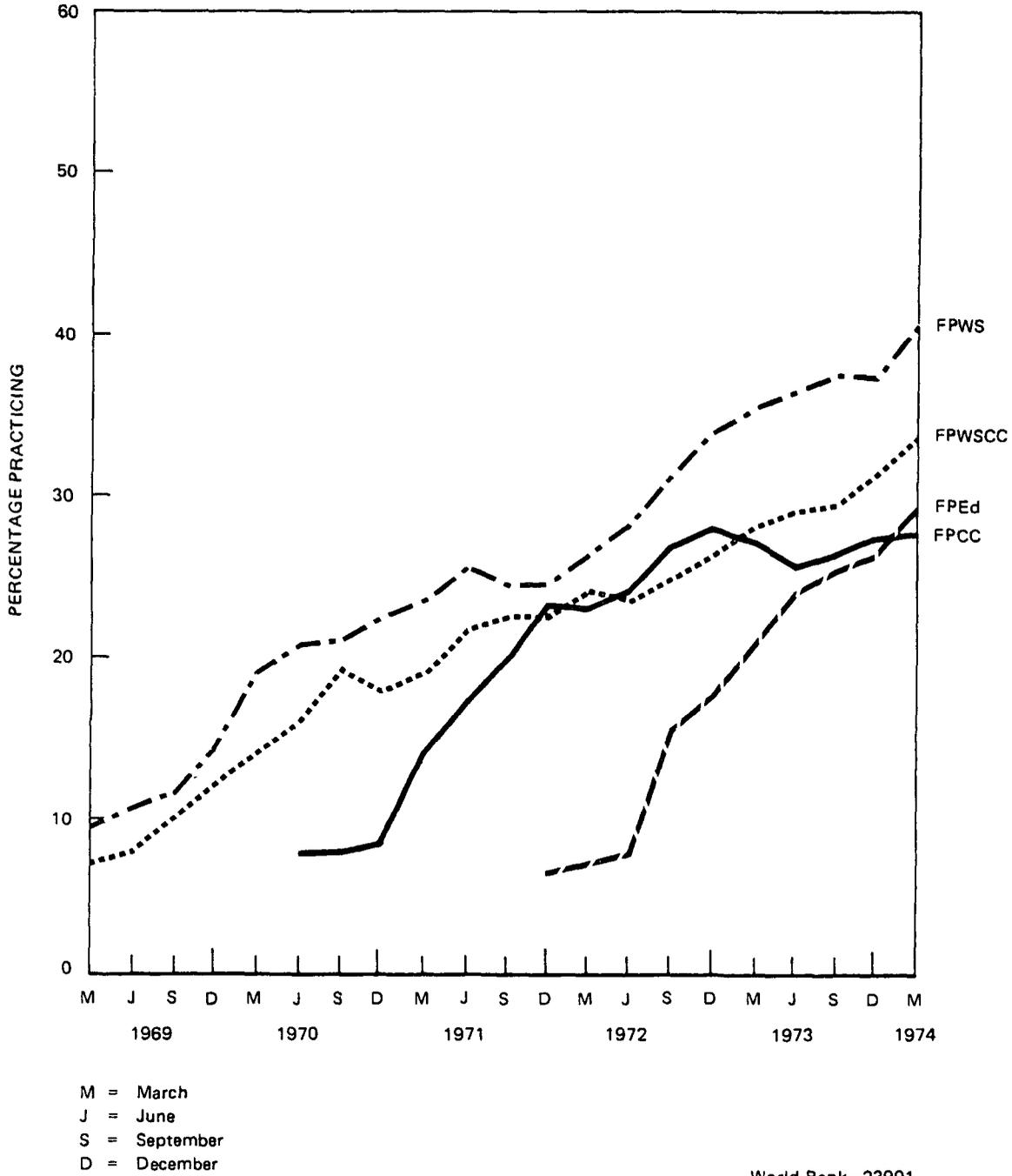
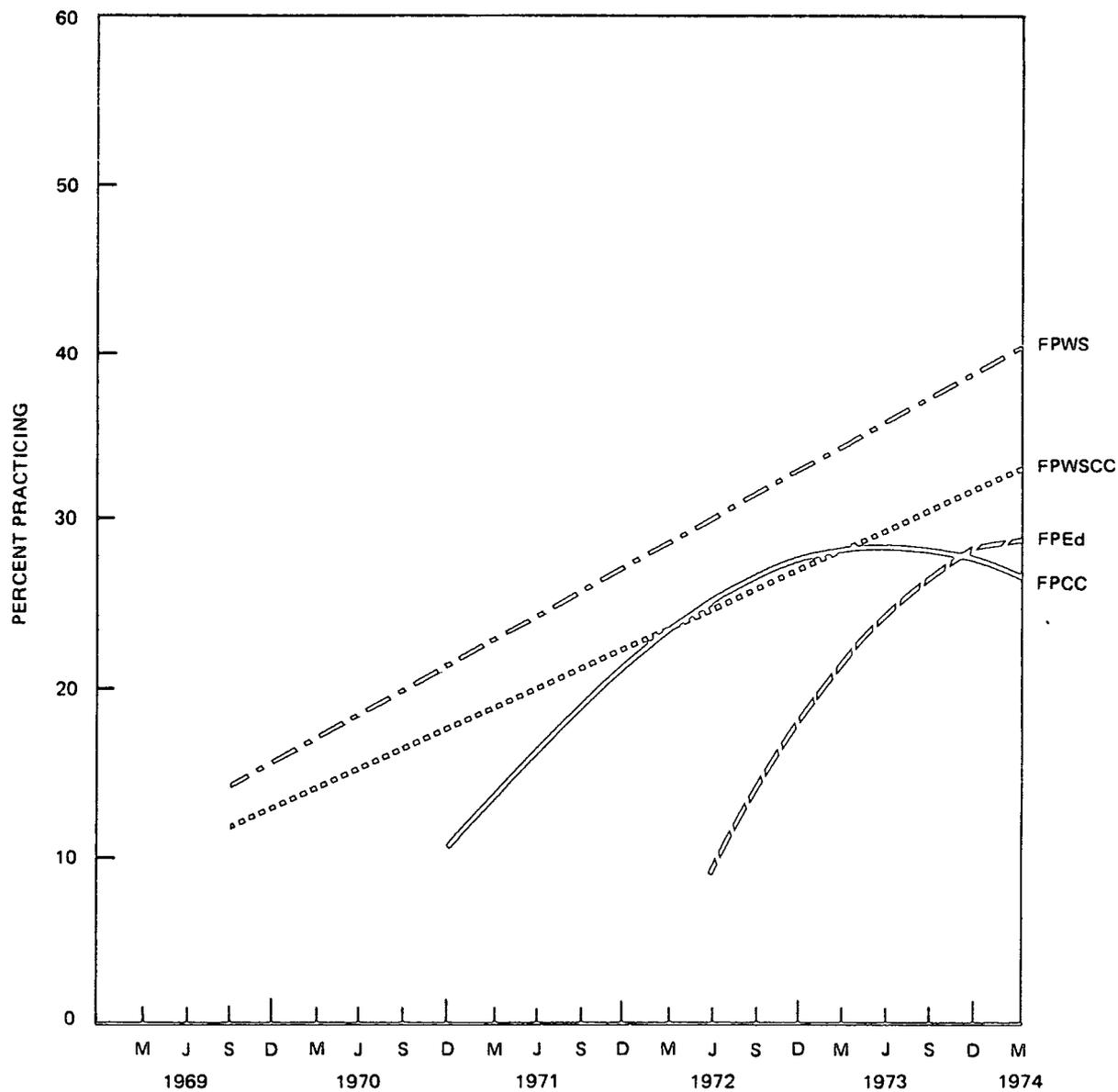


Figure 5  
TRENDS IN CONTRACEPTIVE PRACTICE RATES IN EXPERIMENTAL GROUPS  
(Smooth Curve Obtained by Fitting Quadratic Equations to Continuing - User Rates)



M = March  
J = June  
S = September  
D = December

the use of services and a rise in family planning (because it would take time for the reduced infant and child mortality to have an effect on desired family size).

The demographic impact of family planning depends on what kinds of contraceptives are used. <sup>1/</sup> Obviously, the use of condoms or pills cannot be as effective as sterilization. So, further adjustments in contraceptive practice rates are needed. The mix of contraceptives differed greatly for the four experimental groups and changed from beginning to the end (see table 3). Toward the end of the project (1974) almost half those practicing contraception in FPED group were still only using condoms. At the other extreme, more than 40 percent of those practicing contraception at the end of the project in FPCC group were sterilized. The expectations for demographic impact thus are reduced for the FPED group and increased for the FPCC group. The continuing-use rates were adjusted for effectiveness of the methods to give effective-use rates (see figure 6). In general, the integration of family planning and health services helped in the movement from less effective methods to more effective methods.

To be considered next is the effect of the various health services on the practice of family planning. This is best done by reviewing results among the different categories of prior practice of family planning. Because prior nonusers of family planning started with the zero practice rates, they showed the greatest increases in family planning practices. Children's other services tripled the use of modern methods by prior users of traditional

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<sup>1/</sup> The relative effectiveness of various methods (measured by the pregnancy rate of noncontracepting women) was measured as follows: condom, 34 percent; oral pills, 28 percent; tubectomy, 97 percent.

Table 3: PERCENTAGE DISTRIBUTION OF CURRENT USERS OF FAMILY PLANNING, BY METHOD

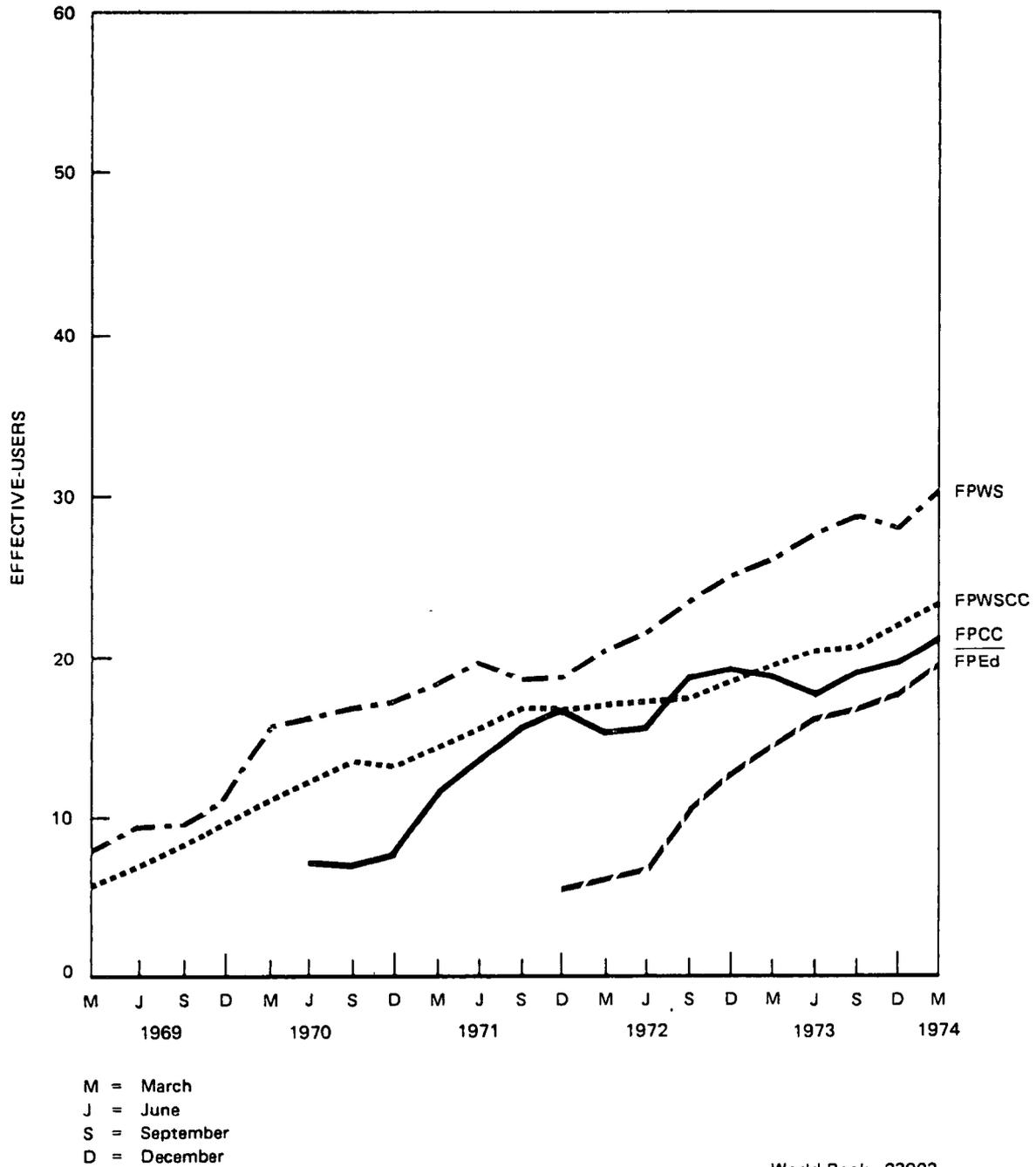
Method	FPWSCC		FPWS		FPCC		FPED	
	1970	1974	1970	1974	1970	1974	1970	1974
Condom	18.0	34.8	20.6	28.7	0.0	30.7	5.5	47.7
Pill	3.8	5.5	1.9	0.9	0.0	4.7	0.0	0.4
IUD	18.8	8.2	13.5	25.1	0.0	3.3	18.2	7.0
Injectable								
Depo-provera	30.8	29.9	27.7	20.0	0.0	19.8	1.8	19.4
Vasectomy	9.8	6.7	25.2	13.7	58.6	23.6	32.7	12.8
Tubectomy	18.8	14.9	11.0	11.6	41.4	17.9	41.8	12.9
Total	100	100	100	100	100	100	100	100

methods. 1/ No significant effect was observed among prior users of modern methods. Similar but less dramatic effects were observed for women's other services. Children's illness care more than doubled family planning practice rates among prior nonusers. Effects less dramatic but still significant were observed for both children's and women's illness care for other categories of use. In contrast with other care, illness care for both women and children produced a significant increase in the practice of family planning by prior users of modern methods. Because these other services were more project-initiated than patient-initiated, the results indicate that services have the potential of being targeted on those who have never used family planning or who have used only traditional methods. People with prior experience of family planning tended to respond spontaneously to the availability of family planning and health services; therefore, project initiative seemed to be less important for them, and illness care had the greater impact.

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1/ See page 4 for a description of illness services and other services.

**Figure 6**  
**PERCENT CURRENTLY MARRIED WOMEN AGE 15-49 WHO WERE "EFFECTIVE-USERS"**  
**OF FAMILY PLANNING AT SPECIFIED POINTS IN TIME BY EXPERIMENTAL GROUP**



The project-initiated other services for surveillance and prevention had much more universal coverage and showed less of a direct concurrent relation with the use of family planning than did illness services. The only apparent association was that new recruits to family planning late in the project seem to have received (somewhat) more children's other services during the period of successful recruitment to family planning. A converse relation--early acceptance of family planning leading to greater use of health services--was not demonstrated.

A regression model was used to assess the net effect of services on contraceptive practice. Table 4 presents the results. The coefficients in the regression equation are small because service inputs are expressed as individual contacts. The coefficients can be interpreted as approximate increases in the percentage of contraceptive users in the population given an increased input of one unit (contact or visit) of service per woman. In this context, one contact with women's other services is seen to have almost nine times the effect of one contact with children's other services; a visit for women's illness services is about twice as effective as a visit for child's illness services.

But when the effect of services is examined in relation to the mean number of services received, the picture is somewhat different (table 5). If the coefficient for each service variable is multiplied by the mean number of service contacts, the effect of children's other services in the project is shown to be as strong as women's illness services, but still not as strong as women's other services. Women's other services were associated with a 14.4 percent increase in the probability of accepting family planning, compared

Table 4: MULTIPLE REGRESSION RESULTS: EFFECTS OF THE VOLUME OF SERVICE CONTACTS IN 1969-1973 AND OTHER VARIABLES ON USE OR NONUSE OF FAMILY PLANNING AT ANY TIME DURING THE PROJECT 1969-73 (DICHOTOMOUS DEPENDENT VARIABLE)

Independent variable	Regression coefficient	t-value	Level of significance
Education of husband	.0337	2.1	<.05
Occupation of husband: Labor	.0082	0.2	n.s.
Farming	.0543	1.3	n.s.
Other	*	*	*
Religion-caste: Jat-Sikh	-.0800	1.8	n.s.
Ramdasia and other low castes	-.0474	1.1	n.s.
Other	*	*	*
Living children and wife's age: <3 and <35	.1810	3.4	*.001
<3 and >35	*	*	*
>3 and <35	.2568	4.4	<.001
>3 and >35	.0885	1.7	n.s.
Number of children dead	-.0234	1.6	n.s.
Awareness of modern contraception	-.0296	0.6	n.s.
Prior use of contraception	.0704	3.5	<.001
Belief about child mortality	.0112	0.7	n.s.
Talk with husband	.0671	2.4	<.02
Attitude toward family planning: Approval	.0799	2.1	<.05
Uncertain	*	*	*
Disapproval	.0307	0.8	n.s.
Service contacts: Women's illness (1969-1973)	.0026	5.0	<.001
Women's other	.0071	5.8	<.001
Children's illness	.0012	2.7	<.01
Children's other	.0008	4.8	<.001
Male motivation	-.0025	0.9	n.s.

$R^2 = 0.24$

\* Suppressed category; effect included in constant term (-0.0373).

n.s. = not significant (p >.05)

**Table 5: MEAN NUMBER OF SERVICES AND ASSOCIATED REGRESSION COEFFICIENTS  
FROM THE REGRESSION ANALYSIS IN TABLE 4**

Service variable	Mean number of contacts ( $\bar{X}$ )	Coefficients	(B) x ( $\bar{X}$ )* (B) x 100	Beta coefficients
Women's illness	18.1	.0026	4.7	0.1472
Women's other	20.3	.0071	14.4	0.1729
Children's illness	21.6	.0012	2.6	0.0866
Children's other	60.3	.0008	4.2	0.0973

\* Estimated percentage increase in likelihood of family planning acceptance with average services use.

with an increase of somewhat less than 5 percent associated with women's illness and children's other services. In this case the relative importance of the variables in explaining differences in contraceptive use is about the same as the ranking of the "t" values (table 4) and the beta coefficients, normalized coefficients that take into account differences in standard deviations of the variables (see also table 5).

In sum: Combined and integrated services for health and family planning were more effective in getting women to practice family planning than were services for family planning alone. But integrated services (FPWSCC) were less effective than one of the two combined services (FPWS). Of the health services, women's services were more effective than children's services in getting women to practice family planning. That may explain why the services in FPWS villages were more effective than those in FPWSCC villages.

#### Efficiency

Integrated health and family planning services at Narangwal were efficient because, by combining various activities in a single visit, economies were significant in both time and money. In addition, because the combinations made sense in the village home, there appeared to be more rapport and greater changes in behavior.

By the last year of the project (1974) the input of family planning workers and family planning educators averaged six to eight hours of direct service time a week. For family planning activities the weekly distribution of time was 37 minutes in FPWSCC villages; 57 minutes in FPCC villages; 83 minutes in FPWS villages; and 249 minutes in FPED villages. The time taken to maintain friendly relations and rapport took 113 minutes in FPED villages,

compared with 43-49 minutes by family health workers in the other experimental villages. Further evidence on the relative increase in efficiency is provided by the time per average service contact in 1973-74, which was shortest where integration was greatest: 4.4 minutes in FPWSCC villages; 5.7 minutes in FPWS villages and FPCC villages; 14.3 minutes in FPED villages. When time per family planning contact was estimated separately, the averages were found to be about 4 minutes in FPWSCC villages, 8 minutes in FPWS villages, 19 minutes in FPCC villages, and 16 minutes in FPED villages.

What was the relative cost-effectiveness of different service packages? The cost per new family planning acceptor was \$12.27 in FPWSCC villages, twice that amount in FPWS villages, three times that amount in FPCC and FPED villages. The cost per couple-year family planning was \$10.27 in FPWSCC villages, 1.7 times that amount in FPWS villages, 2.5 times that amount in FPCC villages, and three times that amount in FPED villages. The cost per family planning contact was \$0.51 in FPWSCC villages, \$0.77 in FPWS villages, \$1.45 in FPED villages, and \$1.92 in FPCC villages. The cost in FPWSCC villages approached the 1968-69 cost per family planning contact in the government's primary health centers (\$0.33).

One explanation for the FPCC contacts being least efficient is that family planning services in these villages were started several years after child care services had been well established, thus requiring a big readjustment in the work patterns of family health workers. It appears that child care services will be always somewhat more difficult to integrate with family planning services than with women's services. But when family planning was combined with both women's and children's services, family health workers made much more efficient use of their work time.

### Equity

There were significant differences in preproject rates of ever-use of modern contraceptives among religion-caste groups, among education groups, among occupation groups, among age groups, and among family-size groups (table 6). The general pattern was that people of higher caste, higher education, higher occupation, and larger family size groups had greater rates of contraceptive use. The group aged 25-34 had the highest rate, the group under twenty-five the lowest.

The differences in rates of contraceptive use during the project became less significant than the differences in preproject use. The exception was the age of wife: there was a reversal of the difference between the youngest (under twenty-five) and the oldest (over thirty-five). The reversal, which was demographically more advantageous, was so great that the age difference became even more significant than the preproject difference.

Couples recruited by the project were from three prior-use categories: users of traditional methods, users of modern methods, and nonusers. There were no socioeconomic differences in acceptors recruited from preproject users of traditional methods and of modern methods. More important than eliminating differences in the recruitment of prior users was narrowing differences among new recruits.

The sociodemographic characteristics of new recruits were distinctly different from those of preproject users: the low-caste group had a recruitment rate greater than did the high-caste group. Differences by the occupation of the husband, highly significant for preproject users, were eliminated. Education of husband maintained the same pattern of distribution as that for preproject users, with higher education being associated with

**Table 6: PREPROJECT USE (MODERN, TEMPORARY, AND PERMANENT METHODS),  
PROJECT USE RATES, PROJECT RECRUITS FROM NONUSERS  
AMONG SOCIODEMOGRAPHIC GROUPS**

Sociodemographic group	Preproject users of modern, temporary, and permanent method (percent)	Project users (percent)	Percentage recruited by project from nonusers
<b>Religion-Caste:</b>			
Jat-Sikh	20.6	45.8	32.4
Sch-Sikh	12.9	47.0	38.9
Others	18.4	47.5	35.6
	$X^2 = 21.88$ (2) $p = <.001$	$X^2 = 0.49$ (2) n.s.	$X^2 = 5.01$ (2) $p = .084$
<b>Education of Husband:</b>			
0	15.2	46.0	35.7
1-5	17.4	44.2	32.4
6-10	21.5	53.8	45.1
11+	32.4	60.2	40.0
	$X^2 = 49.0$ (3) $p = <.001$	$X^2 = 17.40$ (3) $p = <.001$	$X^2 = 9.8$ (2) $p = .020$
<b>Occupation of Husband:</b>			
Farming	17.9	48.8	38.4
Labor	11.0	47.0	38.7
Service	27.0	49.2	36.4
Other	20.6	48.0	34.7
	$X^2 = 42.85$ (3) $P = <.001$	$X^2 = 0.68$ (3) n.s.	$X^2 = 1.2$ (3) $p = .750$
<b>Age of Wife:</b>			
<25	12.3	52.1	46.8
25-34	22.6	57.1	45.3
35+	17.9	34.5	19.8
	$X^2 = 23.48$ (2) $p = <.001$	$X^2 = 0.68$ (2) $p = <.001$	$X^2 = 82.9$ (2) $p = <.001$
<b>Living Children:</b>			
<3	11.8	41.5	33.8
3-5	21.6	51.2	38.4
6+	24.2	49.7	33.5
	$X^2 = 42.25$ (2) $p = <.001$	$X^2 = 19.50$ (2) $p = <.001$	$X^2 = 2.6$ (2) $p = .282$

higher family planning rates but at considerably lower levels of significance. In contrast to preproject users, who mainly were older women, the project was able to get fresh acceptors at a considerably higher rate from among women under thirty-five. Only about 20 percent of the women over thirty-five became users of family planning for the first time; but about 46 percent of women under thirty-five did. The relation between preproject use and number of living children was significant. In contrast, fresh recruitment ranged from 33.5 percent for couples with six or more children to 38.4 for couples with three to five children.

#### Use of Health Services

The integration of family planning with health services increased the efficient and equitable use of family planning. These results in family planning were not obtained by sacrificing health benefits. The findings show that health benefits were substantial and commensurate with the health services provided.

#### Effectiveness

The effectiveness of integrated services in improving health was examined by observing changes in the mortality, morbidity, and growth of children under the different packages of services. At Narangwal, the death rate of children under three years of age was analyzed because the children's health services were largely concentrated on children of that age. Changes in maternal mortality rates would have been an important measure of the effectiveness of women's health services, but the analysis of maternal mortality was not feasible because of there being few maternal deaths.

Rates were calculated for stillbirths, infant mortality (neonatal under one month and postneonatal from 1 to 12 months), and children's deaths between one and three years of age (see table 7). The stillbirth rate roughly measures the probable effect on the fetus of prenatal care for the mother, especially the effect of providing iron, folic acid, and tetanus toxoid to all mothers and nutritional supplementation to poorly nourished mothers. <sup>1/</sup> This rate was 57 per 1,000 live and still births in the control villages and was 23 to 35 percent lower in the villages with services.

The effects of services on still births were comparable for the low-caste group in both FPWSCC and FPCC villages. Only in the FPCC villages was there some effect among the high-caste families. This possibly implies that the more intensive child care services in FPCC villages covered all caste groups, and that workers in FPWSCC villages, with less available time, may have concentrated their prenatal care efforts on low-caste mothers. It also is likely that low-caste mothers accepted supplementation more readily than high-caste mothers in FPWSCC villages.

Infant mortality rates were disaggregated into neonatal death rates (for the first month of life) and postneonatal death rates (for the next eleven months). The difference in the neonatal death rates was significant: the rate was 78 per 1,000 live births in control villages, 64 in FPWSCC villages, and 47 in FPCC villages. This variable also differed by caste. In neonatal survival rates, the high-caste children in FPWSCC villages were affected by the services, but the low-caste children were not. This contrasts

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<sup>1/</sup> Full prenatal and postnatal care were provided in FPWSCC and FPWS villages; modified prenatal care was provided in FPCC villages to protect the child. See table 1.

**Table 7: EFFECTS OF CHILDREN'S SERVICES ON MORTALITY RATES, BY AGE, CASTE, AND EXPERIMENTAL GROUP, 1970-73**

Experimental group	Stillbirths <sup>a</sup>		Infant mortality <sup>b</sup>				Child (1-3) mortality <sup>c</sup>	
	High	Low	< 1 month		1-12 months		High	Low
	Caste	Caste	High Caste	Low Caste	High Caste	Low Caste	Caste	Caste
Control villages <sup>d</sup>	47	71	81	84	52	52	7	26
		(57)		(78)		(51)		(19)
FPWSCC villages	52	39	58	86	40	66	3	10
		(44)		(64)		(54)		( 7)
Percentage difference <sup>e</sup>	+10.6	-45.1	-28.4	+2.4	-23.1	+26.9	-57.1	-61.5
	(-22.8)		(-18.0)		(+5.9)		(-63.2)	
FPCC villages	27	37	67	48	28	33	12	18
		(37)		(47)		(34)		(13)
Percentage difference <sup>e</sup>	-63.8	-47.9	-17.3	-42.9	-46.2	-36.5	+71.4	-30.8
	(-35.1)		(-39.7)		(-33.3)		(-31.6)	

**Note:** "High" caste were the Jat Sikhs, the landowning farmers, and "Low" caste were the scheduled Sikhs, predominately landless laborers. These castes made up 75 to 85 percent of the population. Total mortality rates including other castes are shown in parentheses.

a. Rate per thousand live and stillbirths combined.

b. Rate per thousand live births.

c. Rate per 1,000 children 1-3 years of age.

d. Combined rates from the control villages of the Population and Nutrition studies.

e.  $\frac{b \text{ (or c)} - a}{a} \times 100 = \% \text{ Difference.}$

sharply with the results for still births, for which prenatal care is critical and the prenatal care could have been provided to low caste in FPWSCC. As for the neonatal death rate, in villages where services were less intensive in their outreach (FPWSCC), high-caste families perhaps sought care from the project or other sources, and neonatal mortality was moderately reduced. Low-caste children were significantly affected by services in FPCC villages, showing a reduction of 43 percent in the neonatal death rate. In FPCC villages, home visits were much more intensive (weekly, compared with monthly or bi-monthly visits in FPWSCC villages after the immediate postpartum period). Basically the same pattern held for children in the postneonatal period, with high-caste children in FPWSCC villages and all children in FPCC villages being significantly affected by the child care services.

Although there were fewer deaths among children aged 1-3, the effect of services on these deaths was as important as it was in deaths at an earlier age. The mortality rates for children aged 1-3 in FPWSCC and FPCC villages were 7 and 13 per 1,000 children, compared with 19 in control villages. The effect was greatest in FPWSCC villages, which had a mortality rate 63 percent lower for this age group than controls, but services for this population had an equal effect on all castes. Interestingly, services for older children in FPCC villages had no effect on high-caste children. This may reflect that the high-caste older children did not participate in the nutrition supplementation program.

To measure morbidity at Narangwal, FPCC and control villages were surveyed weekly. The morbidity indicator is the average duration of episodes of seven illness: fever, cough, pneumonia, diarrhea, vomiting, eye infection, and skin infection. These were selected because of their frequency and

importance for children under three. For each illness, the average duration was less in the FPCC villages than in the control villages (see table 8). The differences ranged from 14 to 33 percent.

The measures were further refined. The total annual days of illness per child were estimated for infants under one and for children aged 1-3 by using the duration and average incidence rates for each illness. The analyses show that services in FPCC villages reduced the amount of illness by twenty-two days a year in each group (table 8): the reductions were 16 percent for those under a year and 21 percent for those aged 1-3.

The differences in another indicator of effectiveness of child health services--child growth--were also significant. Growth increased dramatically, with average weight differences of 0.5 kilogram and height differences of 2 centimeters between children in study villages and control villages. The effect of sex and caste on growth added to the effects of project services: high-caste male child from a study village was 2 kilograms heavier and 6 centimeters taller at age three than a low-caste female child from a control village. The number of living siblings also added to the effect: a child with two male and two female siblings was on the average 0.5 kilograms lighter than a child with one living brother or none. This is a powerful argument for the health benefits of family planning.

### Efficiency

The efficiency of health services at Narangwal was measured by service contacts per capita, by the time spent per service contact, by the service cost per capita, and by the cost per service contact. The integrated services in FPWSCC villages generated more contacts than those in FPCC

Table 8: EFFECTS OF CHILDREN'S SERVICES  
ON MORBIDITY LEVELS, 1970-73

Kind of illness	Control villages	FPCC villages	Percentage reduction
	<u>Average days per episode</u>		
Fever	3.9	2.9	-25.6
Cough	11.4	8.5	-25.4
Pneumonia	3.6	3.1	-13.9
Diarrhea	6.3	5.1	-19.1
Vomiting	5.2	3.5	-32.7
Eye infection	8.3	6.3	-24.1
Skin infection	8.7	7.2	-17.2
	<u>Average annual days of illness per child</u>		
Total for those under one year	135	113	-16.3
Total for those aged 1-3	105	83	-21.0

villages. The different patterns of time inputs and service contacts were compared by calculating the average time per contact. In 1971 the average time per contact in FPWSCC villages was 5.4 minutes. This figure combines all services in the home and clinic into one average. The corresponding averages were 6.9 minutes in FPWS villages and 7.6 minutes in FPCC villages. The greater efficiency of the integrated services is indicated by the averages for child care: 4.6 minutes per contact in FPWSCC villages, where they were combined with women's services, but 6.7 minutes in FPCC villages. Another fact contributing to the differences in child care services between FPWSCC and FPCC villages was the greater use of home visiting, which required more time per contact in FPCC villages.

For both women's services and child care, the costs per capita in FPWSCC villages were consistently lower than in FPWS and FPCC villages indicating the greater efficiency of integrated services (table 9). The average annual cost of children's services was \$0.56 per capita in FPWSCC villages and \$1.07 in FPCC villages. This difference is another indication of the difference in intensity of surveillance in the two experimental groups. Nutritional supplementation, primarily of children aged 1-3, also cost more in FPCC villages (\$0.87 per capita) than in FPWSCC villages (\$0.60 per capita). The cost of women's services other than maternity care was \$0.60 in FPWSCC villages and \$0.88 in FPWS villages; that of maternity care was \$0.23 and \$0.43 for these two experimental groups. The cost per capita of limited services to women in FPCC villages was much less.

Table 9 also shows the cost per service contact. The cost per unit of service for children's and women's services at Narangwal ranged from \$0.19

Table 9: COMPARATIVE EFFICIENCY OF NARANGWAL SERVICES  
(U.S. dollars = 7.5 rupees)

	Control villages	FPED villages	FPWS villages	FPCC villages	FPWSCC villages	Government services
<u>Annual cost per capita</u>						
Child care	-	-	0.05 <sup>a</sup>	1.07	0.56	
Nutrition care	-	-	-	0.87	0.60	
Women's services	-	0.07 <sup>a</sup>	0.88	0.13 <sup>a</sup>	0.60	0.08 <sup>b</sup>
Maternity care	-	0.01 <sup>a</sup>	0.44	0.11 <sup>a</sup>	0.23	-
<u>Cost per service contact</u>						
Women's services	-	-	0.36	0.29	0.29	0.21 <sup>c</sup>
Child care	-	-	-	0.23	0.19	0.13 <sup>d</sup>
Maternity care	-	-	1.31	1.21	0.79	
<u>Expenditure per capita</u>						
Private services	2.12	3.05	2.09	2.20	1.76	-
Government services <sup>e</sup>	0.89	0.45	0.39	0.20	0.20	0.25

- a. These reflect cost for supportive services (related to either the main services or incurred to maintain rapport).
- b. This figure is for curative and maternal child health care combined.
- c. This figure is for care of illness.
- d. This figure is for care of maternal and child health.
- e. This is the average cost of government health services within a primary health center area (Johns Hopkins 1976).
- Not available or not applicable.

to \$0.36; the cost in government primary health centers in 1968-69 was \$0.21 per patient visit and \$0.13 per maternal-and-child-health contact. There were major differences in the achievements of Narangwal and those of primary health center services, but the costs per contact for both services were remarkably close.

Despite government and project expenditure on health care services, the villagers still spent a large amount of money on private health care. Information on such out-of-pocket spending was collected during the sample household survey and combined with data on project and government expenditure to estimate total expenditure on health care per capita in project villages, including control areas. The findings in table 9 show that the provision of project services permitted a reduction in the amount of money spent on health care by the villagers and by the government. Nonproject health care expenditure was \$1.96 in FPWSCC villages, which had the most project services, compared with \$2.96 in control villages and \$3.51 in FPED villages, which had no project health care services. When the second two amounts are compared with the expenditure per capita (project and nonproject) in FPWSCC villages, it is clear that introducing the comprehensive package of women's and children's services (excluding nutrition) in Punjab villages cost only slightly more than the existing pattern of government and private services--\$3.59 per capita a year, compared with \$2.96 and \$3.51. In contrast, the total expenditure on each of the other service packages--FPWS, FPCC, and FPED--shows them to be somewhat more expensive alternatives.

### Equity

Surveys conducted before the project demonstrated a significant direct relation between income and the use of health services. Low-income people used health services less than high-income people. Narangwal services were designed, however, for all people in the study villages, with special concern for those in the greatest need. It was therefore important to find out whether the Narangwal project overcame preexisting disparities and improved equity in the use of project services.

The use of services was categorized in three ways: no use during the project, use early (1969-71) or late (1972-73) in the project, and use throughout the project. The families were characterized by socioeconomic measures, including caste, income, ownership of land, education of husband or father, and the possession of radios, bicycles, or sewing machines. The project services attracted all types of women and children almost equally. Women from land-owning families and those whose husbands were better educated used women's illness services significantly more than other women. Other than that, there were no significant differences in use between different socioeconomic groups. But there was a small, consistent trend for women of higher socioeconomic status and children of lower socioeconomic status (except for education) to use services more.

Cross-sectional household surveys measuring the use of different sources of care also confirmed the equitable distribution of project curative services and the removal of disparities between women and children of high caste and those of low caste. The data from these surveys showed that 38 percent of the illnesses of high-caste children were treated by project personnel, compared with 39 percent of those of low-caste children. Among

women the proportion of illnesses receiving project services was 28 percent for high-caste families and 29 percent for low-caste families. But in project villages, high-caste families (20 percent) continued to use outside sources of services much more than low-caste families (7 percent), producing a use rate significantly higher for high-caste children (56 percent) than for low-caste children (45 percent). Thus project services in many cases tended to supplement outside sources of care for high-caste children, but they substituted for most outside sources for low-caste children. The pattern of displacement of other sources of care by project services among high-caste woman and low-caste women was similar to that observed in their children. The data therefore indicate that the project delivered services equitably, but that the demand for continued use of other sources of care varied significantly by socioeconomic level.

The provision of curative services required a visit to the family health worker's village clinic and were mainly initiated by patients. Most services other than curative services were initiated by the project. They included prevention and surveillance, usually in the home. Except for differences by caste, the proportion of women using these services varied slightly but not significantly by socioeconomic classification. In general, a greater proportion of low-caste women used them, making these even more equitable than curative services.

To sum up: The use of curative services was essentially equalized for the different socioeconomic groups. It appears that the provision of curative services by the Narangwal project made it possible for the low-caste group to shift to project services while the high-caste group continued to use private services, but the disparity in total use of the services by caste was

reduced. Project-initiated preventive and surveillance activities promoted equity because their allocation was based on need. For children's other services, differences in use were shifted in favor of low-caste children, low-income families, landless families, and those with the fewest material possessions. The coverage by women's other services was similar.

#### Decline in Fertility

The fertility data disaggregated by experimental groups do not permit firm inferences about trends in annual fertility rates or about the effect of services on these rates. The period was too short to observe a secular trend or to calculate moving averages to correct fluctuations. In addition, the births in a year, on which the fertility rates were based, were few in number, and fluctuations were accentuated because the births were to different groups of women. There also was variation in the quality of birth data gathered in the various groups: villages that had the most extensive services had the least underreporting.

#### Effectiveness

The fluctuation in fertility rates from year to year was considerable, partly because of the small sizes of the experimental groups. The largest decline was in FPWS villages (21 percent), followed by FPWSCC villages (15 percent). The decline in FPED villages was 7 percent, that in the control villages 12 percent. The FPCC villages registered a rise of 2 percent. Thus, two of the groups (FPWS and FPWSCC) had declines significantly greater than the control group. The crude birth rates reflect the same patterns.

The use of family planning had the greatest effect in FPWS villages: differences were highly significant in all three years (table 10). Reductions in births were also significant in FPWSSC villages, but the effect was less than in FPWS villages. These results establish the link between the use of services and the reductions in fertility through contraceptive use.

As noted earlier, the fertility decline was greatest in FPWS villages, next greatest in FPWSSC villages. The results indicate that such declines were achieved by contraceptive use from project sources. In FPCC and FPED villages, the reductions in births were not significant, partly because of a smaller number of contraceptive users.

Because of the limitations of fertility data based on groups, an attempt was made to assess the effect of services on fertility, primarily through relating changes in the fertility of individual women to the use of service inputs. The individual-level variable was constructed by measuring the percentage change in the annual probability of birth for each woman exposed to pregnancy during the project. 1/

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1/ This was constructed as follows: by using the information on duration of marriage ( $D_1$ ) and the total number of live births ( $B_1$ ) up to the end of 1969, the average annual probability of birth ( $P_1 = B_1/D_1$ ) was computed for each woman to indicate preproject fertility. Similarly, by using the duration of the project ( $D_2$ ) and total live births ( $B_2$ ) during the project up to the time the women withdrew from project exposure (outmigration, dissolution of marriage, or end of project, whichever happened first), another average annual probability of birth ( $P_2 = B_2/D_2$ ) was computed. The absolute decline ( $P_1 - P_2$ ) in the probability of birth was then expressed as a percentage of the initial level ( $P_1$ ). The percentage decline in fertility was  $100(P_1 - P_2)/P_1$ .

Table 10: PERCENTAGE OF WOMEN WHO HAD A LIVE BIRTH, BY PRACTICE OF FAMILY PLANNING IN THE PRECEDING YEAR AND BY EXPERIMENTAL GROUP

<u>Percentage of women who had a live birth</u>						
	Calendar year		Nonusers of family planning	Users of family planning <sup>a</sup>	$\chi^2$	P-Value
FPWSCC	1971	22.9	14.4	5.17	.024	
	1972	25.8	14.7	10.03	<.005	
	1973	20.5	14.3	3.57	.062	
FPWS	1971	26.3	9.6	19.42	<.005	
	1972	29.1	12.7	18.79	<.005	
	1973	21.2	10.3	10.80	<.005	
FPCC	1971	26.0	6.1	5.57	.020	
	1972	20.8	15.9	1.39	.243	
	1973	22.9	20.6	0.26	.636	
FPED	1971	20.0	6.1	3.07	.084	
	1972	25.2	9.1	3.56	.062	
	1973	20.5	12.9	2.97	.088	

<sup>a</sup> These births occurred presumably because of the failure of contraceptive method used or because of inefficient or irregular use.

Of the 2,298 cases examined during the project, about 18 percent had an increase in the probability of birth, and about 4 percent had no change. But 78 percent of women in the sample had a decline, though low. More than half had a decline in probability of less than 20 percent; about a fifth more than 20 percent. As would be expected, age is significantly related to the dependent variable.

The relationship between the use of services and the individual-level fertility decline appears to be complex. Table 11 presents the mean number of service contacts of various types by the groups with varying ratios of fertility decline. The table shows that in all instances the least use of services was related to a moderate decline in fertility. Those who had no decline, or even a negative decline, were heavy users of services, as were those who had high declines in fertility. These results suggest that some heavy users were families to which services were rendered in response to health needs generated by high fertility. The most relevant finding is that the remaining group of heavy users of services had a substantial decline in fertility (16 percent and more), and these couples may be those for whom the fertility impact of services was beginning to be evident. The relation between service inputs and the dependent variable (the percentage decline in the average probability of birth per year of exposure to the project) is therefore nonlinear.

#### Efficiency

The cost-effectiveness of the Narangwal services in causing a decline in fertility cannot be ascertained because of the ambiguity observed in the relationship between the use of services and a decline in fertility. The indirect evidence is of course provided through the observed link between the practice of family planning and fertility at the group level (see table 11)

Table 11: MEAN NUMBER OF SERVICE CONTACTS  
AND PERCENTAGE DECLINE IN FERTILITY

Percentage decline in average annual probability of birth	Mean number of contacts					
	Women's illness services	Women's other services	Children's illness services	Children's other services	Family planning motivation services	Family planning service & follow-up
Negative	11.7	15.9	18.4	69.6	12.1	5.9
0	13.7	19.4	26.6	92.6	13.5	8.1
1-10	17.1	18.5	25.4	59.7	11.8	8.4
11-15	14.1	11.1	9.5	20.6	6.3	3.4
16-20	13.1	13.5	14.2	27.4	8.8	7.3
21-30	17.9	16.8	20.6	43.6	8.8	9.5
30+	12.9	16.4	15.4	61.3	9.2	8.0
Total	14.2	14.8	16.5	45.0	9.4	6.5

and the cost-effectiveness of integrated services in increasing family planning use. As noted before, the duration of the project was not long enough to have the full effect on fertility. This makes the analysis of the project's efficiency in causing a decline in fertility tenuous.

#### Equity

The evidence on equity is also ambiguous. The earlier discussion indicated that equity was achieved in the practice of family planning from project sources. An analysis of the fertility decline by income groups indicates, however, that the proportion of women who experienced either an increase or no change in the annual probability of birth decreased with income, but that a greater proportion of women in higher income groups had

declines in fertility measured by the annual probability of birth. 1/ The association is significant.

Caste is the most important indicator of social status in Punjab. For Jat-Sikhs (high caste) the proportion of women who experienced an increase in the annual probability of birth was lowest and the proportion who experienced reductions was highest. The findings were reversed for scheduled Sikhs (low caste). The others were in between. The husband's education was associated differently with declines in the individual level fertility of women. The women with better educated husbands (sixth grade or higher) fell predominantly into two extreme groups--one experiencing no fertility decline and the other experiencing a decline of more than 20 percent during the project. The less educated group had a higher proportion with a moderate (up to 20 percent) decline in fertility. These findings indicate that the objective of equity was at least partially achieved because a moderate decline was achieved among the less educated group and not all in the higher educated group experienced a decline in fertility.

#### Conclusion

The Narangwal data provides some of the most important evidence recorded anywhere on the benefits of integrating family planning with health services. The results show that the benefits can be great--in effectiveness, in efficiency, and in equity, whether measured by health or by family planning. Even for a decline in fertility, for which the project life was too short to be evident, the results generally show that integration helps.

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1/ See page 37 for a description of this individual level fertility variable.

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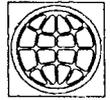


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