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Potential acceptors of Norplant implants in comparison with recently sterilized women in Sri Lanka

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Abstract

This paper analyzes data from a population-based survey fielded in Sri Lanka, which showed that almost half of the women interested in using Norplant contraceptive subdermal implants were actually those who wanted to limit childbearing, a pattern also found in international Norplant clinical studies. A comparison between recently sterilized women and professed limiters of potential Norplant users showed the limiters to be socio-economically and demographically a significantly different group of women from those sterilized. Among several variables analyzed, the most important factor distinguishing the two groups was their relative economic status. Further comparison of the limiters with professed spacers interested in using Norplant showed that the spacers were yet another distinct category of women, the most important characteristic distinguishing between the two groups being the total number of living children. The preliminary results suggest that the Norplant implants system is not necessarily a substitute for sterilization; it appears potentially a popular method among those who want no more children but are not ready to accept sterilization. These findings that the potential Norplant implants users represent different gradients of women in the population have implications for provider counseling and user satisfaction as well as continuation.

Introduction

As efforts are made to develop and introduce new contraceptive products, it is important to evaluate whether a new product has the potential for attracting new population subgroups for whom other contraceptive products are unacceptable, unavailable or inaccessible, or whether the product is largely a substitute for a method that is already available for use and is acceptable to the targeted population. Since the development and introduction of a new contraceptive is often a costly and long

process, one hopes that the new product would not merely be a substitute, but that it possesses some intrinsically novel features that would address the needs of an otherwise unserved population. For a method with fairly high continuation rates, it is by attracting new subgroups of users that the demographic impact may be most enhanced [1].

In spite of the fact that Norplant*, the first generation of long-acting steroidal contraception, is a temporary method of contraception, a substantial proportion of the women accepting Norplant have wanted to limit childbearing. Clinical studies conducted in several countries have shown that the percentage of women accepting Norplant who do not want more children ranges from 39% to as high as 69%, excluding two extreme study populations, Egypt and Nepal (Table 1). This pattern of acceptance raises two important and interrelated programmatic questions: Is Norplant a substitute for sterilization for the subgroup of acceptors who want to stop having children? Second, in what respects do the women who want to use Norplant for limiting childbearing differ from those who want to use Norplant for pregnancy spacing?

Table 1 Percentage of Norplant acceptors not wanting any more children: clinical studies in selected countries

Country	*Reference*	*% not wanting more children*	*Number of acceptors*
Bangladesh	[2]	64.7	600
Chile, Dominican Republic, Finland	[3]	40.4	324
Colombia	[4]	51.0	389
Egypt	[5]	6.0	250
Haiti	[6]	52.8	250
Indonesia	[7]	45.0	813
Nepal	[8]	80.1	307
Nigeria	[9]	54.4	250
Philippines	[10]	69.0	100
Santo Domingo, Dominican Republic	[11]	56.0	200
		39.2	212
Singapore	[12]	69.0	100
Sri Lanka	[13]	48.0	400

* Norplant is the registered trademark of the Population Council for subdermal contraceptive implants.

With respect to sterilization acceptors versus Norplant limiters (defined as women wanting no more children but interested in using Norplant), two alternative propositions may be considered: First, that there are no significant demographic or socioeconomic differences between women who accept sterilization as a permanent method of contraception and those who are interested in Norplant but do not want any more children. Their motivation to use Norplant could be due to lack of (their own or their husband's) knowledge about sterilization or accessibility of sterilization services. There may also be some psychological factors bearing on health and perceptions inhibiting the acceptance of sterilization [14]. An alternative proposition is that there do exist significant demographic or socioeconomic differences between the two groups of acceptors. For instance, the subgroup of Norplant users wanting to limit childbearing may be relatively older, higher parity women. Hence, they may want to use Norplant for only the remaining few years of childbearing.

With regard to Norplant limiters versus Norplant spacers (defined as women wanting to space next pregnancy and interested in using Norplant), it is possible that an appreciable proportion of women professing to want no more children really desire to avoid childbirth only temporarily, as has been found in a few of the World Fertility Surveys [15]. Furthermore, some women may simply be permanent postponers, having no particular desire to have a child in the immediate future, but at the same time, unwilling to close the possibility, should their familial economic and social conditions improve [16]. Various psychological factors such as fear that children already born may die, or uncertainty with respect to their professed family size, or their husband's objection to accept sterilization may play important roles in this pattern of decision making. The professed spacers may be typically younger, lower parity women who have a stronger desire to have more children with adequate birth spacing. These women may thus be more innovative in their reproductive choice and behavior. Another group of women for whom Norplant could be appealing are those who have just attained their desired family size, but prefer to defer sterilization for a few years to ensure that their living children survive their early critical years. Further, some women may already have one or two children and do not want any more but are still too young to be legally eligible for sterilization. For these types of women, Norplant could provide an effective protection against pregnancy for up to five years and then they may seek sterilization.

To the extent that the Norplant implant system is appealing to women who desire to stop childbearing but choose not to be sterilized, this would imply that Norplant has a novelty feature, and that it is not merely a substitute for sterilization. Acceptance of the implants by new subgroups of the population further implies that this contraceptive has the potential to meet an otherwise unmet demand.

The objective of this paper is first to compare the two groups of women who have recently accepted sterilization as a permanent method of contraception and those who want no more children but are interested in using Norplant. In the second part of the analysis, we examine similarities and differences between the professed limiters and spacers among those who want to use Norplant.

Data and methodology

The data for this study come from the Sri Lanka Rural Family Planning (RFP) Survey. The RFP Survey, carried out during August 1985 to February 1986 in Sri Lanka, was a two-stage stratified sample design using probability proportionate to size techniques. The eligible respondents were defined as currently married women of reproductive ages (<45) at the time of the survey. A total of 3253 interviews of women, randomly selected within 30 villages, was successfully completed.

The sample is not completely representative of rural Sri Lanka, however. Because of political disturbances, it was decided to exclude some districts in the northeastern part of the country. Further, the survey was limited to the Sinhalese population, which constitutes three-fourths of the total population in Sri Lanka. Nevertheless, the sample covered three of the six socioeconomic and ecological zones and 17 of the 24 total districts in Sri Lanka.

Apart from collecting data on background characteristics and fertility preferences, the survey included separate modules on various methods of family planning. The modules were designed to obtain information on knowledge, use, acceptability and availability of each method of contraception. A special module on Norplant was also included in the survey. The main purpose of this module was to assess the demand for Norplant. The eligible respondents for this module were defined as those women who were not sterilized, fecund (subjectively defined) and whose husbands were not vasectomized.

Since Norplant is a new method that most women have not yet heard of, an illustrative brochure on Norplant was included in each survey questionnaire. This brochure, designed with the assistance of the Program for the Introduction and Adaptation of Contraceptive Technology (PIACT), was the same as the one used in Norplant clinical trials in Sri Lanka [13]. The brochure contained a brief description of the features of the method, route of administration, and suitability for potential users. Both the questionnaire and the brochure were printed in the Sinhala language.

Special training in how to use the brochure and ask subsequent questions regarding Norplant was provided to the interviewers all of whom were females. The interviewers first introduced each eligible respondent to Norplant by guiding her through the contents of the illustrative brochure; then the respondent was asked questions on her interest in using the method, if it became available within 6–8 months. For those who professed no interest in using Norplant, the main reasons were also ascertained.

For our present analysis, respondents whose husbands had undergone sterilization have been excluded for two reasons: first, male sterilization accounts for only about one-fifth of the total sterilization use in Sri Lanka nationally. Second, since our purpose is to compare sterilization acceptors with potential Norplant acceptors, we considered it appropriate to confine the data to female sterilization only.

Among sterilized women, only those who were sterilized during the 24 months immediately preceding the survey are included in the analysis. It would have been preferable to confine the data on sterilization acceptors to only those who were more recently sterilized, since the question on interest in using Norplant referred to the

present time. This was not feasible, however, because there were only 119 acceptors of female sterilization in the sample in the 12 months preceding the survey. In consideration of the sample size, a two-year time period was chosen as the cut-off date, resulting in 266 female sterilization acceptors, which represented 28% of the total sample.

The respondents who expressed interest in using Norplant were classified according to their fertility preferences – those who desired to have more children (spacers) and those who did not want to have more children (limiters). The respondents also included currently pregnant women, if any. The reason for this inclusion was that many currently pregnant women might want the current conception to be their last. Hence, not including these women tend to underestimate the demand for a permanent method of contraception [17].

The data on fertility preferences were ascertained in the survey by asking, 'Do you desire to have any more children (excluding current pregnancy, if any) at any time in the future'? In order to minimize any potential bias, the respondents were asked about their family size preference in the early part of the questionnaire, before questioning them about family planning methods, including Norplant.

The data analysis involves a comparison of three subgroups of the sample population – (1) recently sterilized women, (2) Norplant limiters and (3) Norplant spacers. It may be argued that these three groups may be compared simultaneously (that is, by carrying out a global test of significance for all the groups). However, a more direct comparison between each two groups is preferable for our purpose, since there are reasons to believe that the spacers are a very different category of women from the sterilization acceptors. For instance, the latter tend to be typically older and higher parity women than spacers. Hence, there is a strong *a priori* rationale for not comparing sterilization acceptors with spacers. A more meaningful approach is to examine similarities and differences between sterilized women and Norplant limiters on the one hand, and between Norplant spacers and Norplant limiters on the other. This is the strategy we have adopted in our analysis.

Since the data on sterilization for this analysis are based on those women who were sterilized during the two years preceding the survey, the demographic characteristics for the sterilized group in the sample tended to be slightly exaggerated (upwardly biased). That is, the mean age and mean marital duration of the sterilized acceptors would have been lower if those who got sterilized in the last 24 months were removed and the sample drawn from only those who were sterilized in more recent months. Therefore, the sterilized acceptors could be even younger and married shorter than those found in this analysis. Because of this, the data on achieved parity may also be slightly underestimated. These likely biases in demographic characteristics tend to strengthen, not weaken, the differences found between sterilized women and Norplant limiters. Therefore, the observed differences between the two groups with respect to the demographic characteristics could be considered 'lower bound'.

A major limitation with the data analyzed in this paper is that while the Norplant group represents 'potential' acceptors, the sterilization group consist of those respondents who have actually elected sterilization as their method of contraception.

In the survey, the sterilized women were not asked about their willingness to try Norplant, if it were available. Alternatively, the potential acceptors of Norplant were not asked whether, in the absence of Norplant, they would be willing to choose sterilization. Some (an unknown) proportion of the respondents would have probably switched from one method to the other. We assume in this analysis that the proportion switching from Norplant to sterilization and vice-versa would cancel each out.

The bi-variate results are analyzed by using the chi-square test of significance for categorical data and by the analysis of variance for data with continuous scales. For the multivariate analysis, we chose the stepwise discriminant technique [18]. This technique affords analysis of the extent to which population subgroups can be correctly classified into groups on the basis of their respective set of characteristics. The application of the stepwise procedure identifies the relative importance of each of the independent variables. The two main types of statistics obtained from discriminant analysis are Wilk's lambda and the percentage of subjects classified correctly by the model.

Wilk's lambda is an inverse measure of the discriminating power of the variables in the models; hence, the larger the lamba, the less the variation is explained by the model. The highest lambda theoretically obtainable is 1.0. The discriminant analysis is the appropriate choice of the technique for our purpose, since we wish to investigate whether the population subgroups can be significantly distinguished based on their respective characteristics, and to the extent that they are different, we wish to know which variables distinguish them the most and what is the predictive power of the variables.

Results

The sample distribution of the comparison groups is shown in Figure 1. Of the total sample, there were 2150 respondents (66% of the total survey sample) who were not sterilized and fecund at the time of survey. Of this group, 52% did not want to use Norplant, 13% were unsure, and 35% expressed interest in using the Norplant implants, if it were to be available within the six-to-eight months. When the women interested in using Norplant were further classified according to their stated desire for additional children, 54% wanted to have more children in the future and 46% professed to want no more children. Incidentally, in the Norplant pre-introductory trials conducted in Sri Lanka, the percentage of women who did not want more children was 48% (Table 1).

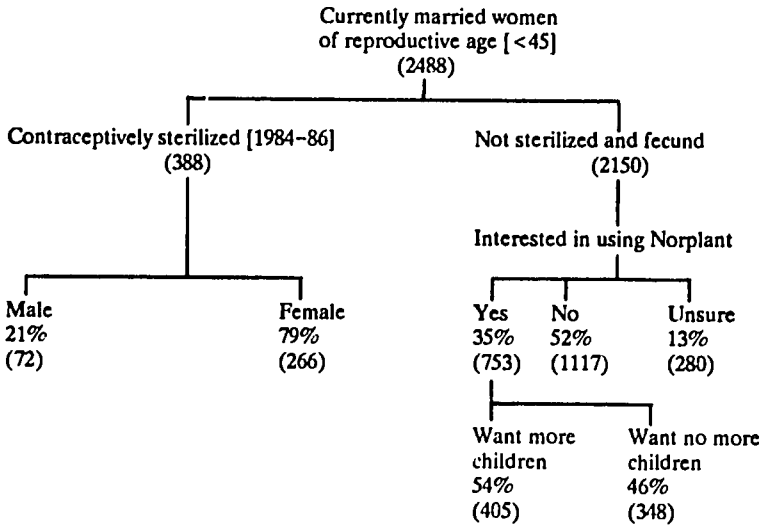

Figure 1 Sample distribution of sterilized (during 1984–86) women and not sterilized, fecund women interested in using Norplant. Note: Values in parentheses indicate number of cases

Sterilization acceptors and Norplant limiters

Table 2 shows bivariate results for several background characteristics between the sterilized and Norplant limiters. Women in the Norplant group are slightly older; the largest proportion of them are in age group 30–34, whereas the modal age group for the sterilized women is 25–29. In spite of the fact that Norplant limiters are older, there are significantly higher proportions of them with fewer children; hence lower mean number of living children. This appears to be correlated with more recent marriages among the Norplant limiters, implying that women in this group tended to marry late.

The level of educational attainment is also considerably much higher among the Norplant limiters than in the sterilization group; however no distinctive pattern emerges with respect to occupation between the two groups. The wealth status, measured through the index*, shows that the Norplant limiters are significantly better-off financially than the sterilized women. Furthermore, more of the Norplant group resides in relatively more advanced communities, as measured through the index of areal level of development†. That the Norplant limiters represent a more modern segment of the population is reflected in fertility preference also. This group prefers a smaller family size and also aspires for significantly longer birth spacing.

* Index of wealth refers to sum of several household amenities, where each of the following is counted as 1: availability of electricity, cement floor, tile/asbestos roof, brick or cement wall, permanent toilet, and tap water in the respondent's house. The index ranges from 0 to 7.

† Areal development index refers to the classification of the geographic zones, based on multiple socioeconomic and ecological characteristics, as classified by the Sri Lanka Central Bureau of Census and Statistics [19].

Table 2 Demographic and socioeconomic differences between sterilized women and professed limiters (non-sterilized women who are interested in using Norplant, but want no more children), and between professed limiters and professed spacers (those who are interested in using Norplant for spacing purposes)

Characteristic	*Female sterilization acceptors (% or mean)*	*p-level*[a]	*Professed limiters interested in using Norplant (% or mean)*	*p-level*[b]	*Professed spacers interested in using Norplant (% or mean)*
Demographic					
Woman's age		<0.01		<0.001	
15–19	0.0		0.9		7.7
20–24	9.0		9.8		29.9
25–29	32.0		20.7		36.3
30–34	30.1		28.7		17.9
35–39	22.2		25.6		7.5
40–44	6.7		14.3		0.7
Mean	31.2		32.5		26.6
Total living children		<0.001		<0.001	
0–1	0.4		6.0		37.3
2	15.0		28.2		37.3
3	34.6		23.9		18.4
4	25.6		17.8		5.0
5+	24.4		24.1		2.0
Mean	3.9		3.6		2.0
Marital duration[+]		<0.001		<0.001	
Up to 5 years	7.3		20.8		49.5
6–9 years	37.6		25.2		35.0
10–15 years	38.8		30.5		13.7
15 or more years	16.3		23.5		1.8
Mean	10.8		10.7		5.7
Socioeconomic					
Couple's education[++]		<0.01		<0.001	
Both 0–5 years	30.9		21.4		21.0
Both 6–9 years	13.2		16.5		15.3
Both 10+ years	8.3		16.8		14.0
Wife lower than husband	24.5		24.6		28.0
Husband lower than wife	23.1		20.7		21.7
Mean for husband	5.9		6.9		7.0
Mean for wife	5.6		6.6		6.5
Couple's work status		ns		<.05	
Wife–House work/ Husband–Farmer	30.1		27.6		38.3
Wife–House work/ Husband–Non-farmer	45.1		50.3		44.5
Wife–Non-domestic/ Husband–Farmer	9.4		10.3		7.7
Wife–Non-domestic/ Husband–Non-farmer	15.4		11.8		9.5
Couple's wealth index		<0.001		<0.001	
Low	71.8		55.2		71.4
Medium	22.2		29.6		22.6
High	6.0		15.2		6.0

Table 2 *(continued)*

Characteristic	*Female sterilization acceptors (% or mean)*	*p-level*[a]	*Professed limiters interested in using Norplant (% or mean)*	*p-level*[b]	*Professed spacers interested in using Norplant (% or mean)*
Areal development index		<0.001		<0.001	
Low	26.3		34.5		45.5
Moderate	43.6		23.5		27.9
High	30.1		42.0		26.6
Fertility preference					
Mean ideal family size	2.3	<0.001	2.0	ns	2.1
Unwanted pregnancy		ns		<0.001	
None	38.4		32.5		50.5
One or more	61.6		67.7		49.5
Mean	0.9		1.0		0.6
Ideal birth spacing (months)		<0.001		ns	
<36	14.7		7.8		10.0
36	43.2		35.3		31.1
37–48	14.3		14.1		15.4
>48	27.7		42.8		43.5
Mean	42.6		47.2		47.3
Contraceptive method currently used				ns	
None	na		35.9		32.3
Traditional	na		38.0		40.6
Modern temporary	na		26.1		27.1
Knowledge, availability and accessibility of sterilization					
Knows about sterilization	na	na	99.1	ns	99.5
Knows about availability	na	na	98.0	ns	96.4
Inaccessability experience	na	na	10.9	na	na
(*n*)	(266)		(348)		(405)

[a]Between female sterilization acceptors and professed limiters
[b]Between professed limiters and spacers

[+]Excludes 51 missing cases; [++]Excludes 3 missing cases

na = not applicable; ns = not significant

Notes: Only those women who were sterilized during 24 months preceding the survey are included in the analysis table. See text for reasons

p-values for all the variables except the variable 'mean ideal family size' represent differences in categorical distribution obtained by χ-square test. *p*-value for the mean ideal family size represents differences in mean values obtained by analysis of variance

The last set of variables in Table 2 refers to knowledge, availability and accessibility of sterilization. Clearly, most of the women were aware of sterilization and also knew about its availability. Inaccessibility, as measured by the proportion of women who tried to get sterilization but did not succeed, was reported by about one in ten Norplant limiters.

The results of the stepwise discriminant analysis are presented in Table 3. Of all the variables considered in the analysis, the most important factor that distinguished Norplant limiters from sterilized women is the wealth index. The former group is relatively better-off than the latter, and desires longer birth spacing. Most interestingly, total living children and age are not the most important factors for the total sample.

Table 3 Relative importance and predictive power of variables distinguishing sterilized acceptors and Norplant limiters: Results of stepwise discriminant analysis

Variables	*Wilk's lambda*	*% correctly classified*	*n*
Age group, 15–44		65.4	
Couple's wealth index	0.964		
Ideal spacing between births	0.939		
Total living children	0.921		
Respondent's age	0.897		
Ideal family size	0.894		
Areal development index	0.892		
Couple's occupation	0.890		
(*n*) Sterilized			(265)
(*n*) Norplant limiters			(346)
Age group, 15–29		69.3	
Total living children	0.840		
Ideal spacing between births	0.811		
Couple's wealth index	0.795		
Couple's occupation	0.783		
Areal development index	0.770		
(*n*) Sterilized			(109)
(*n*) Norplant limiters			(111)
Age group, 30–44		63.1	
Couple's wealth index	0.972		
Ideal spacing between births	0.952		
Couple's occupation	0.937		
Respondent's age	0.927		
Total living children	0.913		
Ideal family size	0.910		
(*n*) Sterilized			(156)
(*n*) Norplant limiters			(235)

Note: Each variable shown in each model is significant at $p < 0.01$

The relative importance of the variables varies when the sample is stratified by younger (<30) and older (30+) age cohorts. While the number of living children is the most important factor for the younger age cohorts, wealth index still remains the primary distinguishing factor for the older cohort. This suggests that the results for the total sample are considerably influenced by the characteristics of the older respondents. Of the three groups, the characteristics pertaining to the younger age cohort have the most powerful discriminating power; the variables included in this analysis correctly classify 69% of the cases.

Norplant limiters and Norplant spacers

Table 2 also shows that Norplant limiters differ significantly from Norplant spacers. The spacers are considerably younger and lower parity and more of them have been recently married, hence shorter marital duration. They have also experienced less unwanted pregnancies than the limiters. Furthermore, proportionately more of the spacers are relatively poor, as measured by the wealth index. More of them live in less developed areas and have farming as their main occupation.

These two groups are characterized by some similarities also. Both have about the same level of educational attainment. Further, the desired family size and ideal birth spacing are about the same for them. There are no significant differences with respect to the current pattern of contraceptive use between the two groups. Both catetories of women are aware of female sterilization as a method of permanent contraception. Most of the women, regardless of their preference for additional children, know where to go to obtain the services.

The relative importance of the variables distinguishing the spacers from the limiters are shown in Table 4. For both the younger and older age cohorts, the total number of living children is the most important distinguishing factor. For the younger age cohort (<30), areal development index is the second most important factor. In contrast, age is the second most important factor for the older age cohort (30+). Areal development and wealth index remain important distinguishing factors. That is, Norplant spacers are generally less well-off and live in less developed areas than Norplant limiters. The variables included in the discriminant analyses correctly classify 71–75% of the cases.

Discussion and conclusion

The finding of the study that sterilized women have larger completed family size and proportionately more of them come from poorer economic conditions is consistent with other studies in Sri Lanka [20]. An important factor producing this pattern of acceptance of sterilization may be reflective of the policy of providing monetary compensation to acceptors of sterilization [21]. The policy is aimed at removing economic barriers for those wishing to limit children, especially from economically disadvantaged segments of the population.

Table 4 Relative importance and predictive power of variables distinguishing professed spacers and professed limiters for potential Norplant use: Results of stepwise discriminant analysis

Variables	*Wilk's lambda*	*% correctly classified*	*n*
Age group, 15–44		74.0	
Total living children	0.752		
Respondent's age	0.706		
Areal development index	0.694		
Couple's wealth index	0.688		
Couple's occupation	0.683		
Couple's level of education	0.682		
(*n*) Spacers			(400)
(*n*) Limiters			(346)
Age group, 15–29		74.9	
Total living children	0.892		
Areal development index	0.877		
Couple's occupation	0.868		
Couple's wealth index	0.863		
(*n*) Spacers			(297)
(*n*) Limiters			(109)
Age group, 30–44		71.4	
Total living children	0.857		
Respondent's age	0.824		
Areal development index	0.807		
Couple's wealth index	0.796		
Couple's education	0.790		
Couple's occupation	0.787		
(*n*) Spacers			(105)
(*n*) Limiters			(235)

Note: Each variable shown in each model is significant at $p < 0.01$

The findings that both the limiters and spacers have the same pattern of contraceptive behavior is also consistent with the results obtained from the World Fertility Surveys [22]. It should be noted, however, that the similarities may be confounded by variations, with respect to the two groups, in current pregnancy status, coital frequency, and breast-feeding. These were not examined in this analysis. Furthermore, the use of similar methods of family planning may not necessarily imply that continuation or use-effectiveness rates are similar for the limiters and spacers [23].

The results of the study do not support the contention that the sterilized women are necessarily older than the Norplant limiters. Instead they typically marry early, are younger, and achieve a larger family size within a relatively shorter reproductive span. As a result, the two groups of women represent different patterns of reproductive behavior.

Other surveys have shown that knowledge and availability of sterilization services are not necessarily a constraint in Sri Lanka [24]. Inaccessibility to sterilization, which

is found to be a constraint for one in ten Norplant limiters, may be related to the eligibility criteria for sterilization* as well as other medical contraindications. It is noteworthy that the Norplant spacers, in contrast to limiters, tend to be poor and live in less developed areas. This may be partly related to age differentials.

That the ideal birth spacing for sterilization acceptors is substantially shorter than for Norplant limiters probably reflects their respective experiences of actual reproductive behavior. The sterilized group may have thought a shorter birth spacing as ideal because they did experience a relatively shorter birth interval, in spite of what their truly desired spacing may have been. Alternatively, it could be that the sterilized women believed that shorter birth intervals were preferable. How much of the ideal spacing pattern is affected by the actual reproductive experience can not be ascertained from the data.

It should be noted that responses to questions on interest in using Norplant does not necessarily indicate whether the women are eligible on medical groundst to accept the implants. A clinic-based study in which the prospective clients are first screened for eligibility for both sterilization and Norplant, then are counseled for both sterilization and Norplant (among those wanting no more children), may help identify the magnitude of the non-eligibility factor. Such a study design would also permit an in-depth investigation of socio-psychological factors affecting the decision to accept Norplant or sterilization. Aside from the non-acceptance of the method on medical grounds, the extent to which those who express interest in using Norplant will actually use the method could be determined from conducting a follow-up survey after Norplant is made available to the study communities. Nevertheless, the data on responses from those who express interest in using Norplant appear internally consistent and in the expected direction [25], suggesting that they are not the product of random responses.

The present data do not permit any insights on women's satisfaction subsequent to the acceptance of Norplant. However, clinical data from various countries, including Sri Lanka, show that the continuation of the method is very high (ranging from 60% to 92% at 24 months) and the method has been found to be highly acceptable for the majority of acceptors in cross-cultural settings [6,12,13,26]. This also suggests that data on women's interest to use Norplant deserve consideration in both program development and service delivery.

Because of limitations of the data, the findings from this study should be considered tentative. Nonetheless, the inferences that can be drawn from the results is that Norplant limiters are a demographically and socioeconomically different group of

* The three eligibility criteria for female sterilization in Sri Lanka are that the potential acceptor should be less than 45 years old, in marital union, and have at least two living children. The acceptor is also required to obtain consent of her spouse.

† Contraindications for Norplant use include, liver disease, jaundice, sickle-cell anemia, thromboembolic disease, hypertension, pelvic inflammatory disease (PID), undiagnosed genital bleeding, cancer, or pregnancy.

women than acceptors of sterilization. Those who do not want any more children but are interested in using Norplant are older, marry later, and have fewer children than the sterilized women. They also have higher educational attainment, reside in economically more advanced communities and have a relatively higher economic status than the sterilized women. The Norplant limiters also aspire to have a smaller completed family size.

The Norplant spacers represent yet another category of women than the Norplant limiters. Women belonging to the former group are considerably younger and have fewer children than women in the latter group. The Norplant spacers are poorer and live in less advanced communities with farming as their main occupation than the Norplant limiters. Both groups of women desire, however, about the same number of children with about the same desired length of birth spacing.

Overall the three groups (sterilized, Norplant limiters and Norplant spacers) appear to be distinctly self-selected on the basis of their socioeconomic, demographic and fertility preference characteristics. These preliminary results lead us to conclude that Norplant is not necessarily a substitute for sterilization; it has the potential for attracting new groups of women in the population, who do not want any more children but are not yet ready to accept sterilization.

Given that a substantial proportion of potential users of Norplant want no more children, the pattern of continuation can be expected to vary between the limiters and spacers. Further, the composition of these two distinct categories of women for the use of Norplant also has implications for user satisfaction. Because of their high degree of motivation to control fertility, the limiters may be more likely to be tolerant with problems and hence have a higher degree of satisfaction with Norplant than the spacers. This implies that the providers, in their counseling and follow-up, would need to take into account the possible influences of the two different purposes for accepting Norplant. A higher degree of discontinuation and dissatisfaction may not necessarily indicate poor performance of a program or the method; rather that there is a relatively large component of spacers, and the spacers may have less motivation than the limiters to use the method for an extended period of time. This factor is important because in many developing countries a considerable proportion (an average of one-third) of all births take place within a two-year birth interval [27]. The motivation to space or stop having children also has bearings on the choice of the use of new biodegradable implants being developed versus the standard, non-biodegradable type of implants of Norplant.

The role of motivation to control fertility is an important area of research in the acceptability of long-acting steroidal contraception, of which Norplant is the first to have successfully reached the advanced stages of introduction and availability. As several long-acting steroidal contraception products are presently at various stages of development, the question, "Acceptability for whom?", is likely to assume a priority agenda for research. This paper has provided some preliminary insights, with respect to the acceptance of Norplant versus sterilization, for undertaking further research in this area. A significant advancement may be made by overcoming the limitations inherent in the data analyzed in this paper.

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References

1. Berelson, B. (1976). The impact of new technology. *Proc. R. Soc. Lond. (Biol.)*, **195**, 25–35
2. Family Health International. (1987). Pre-introductory clinical trials of Norplant contraceptive subdermal implants: Report on the one-year experience in Bangladesh. (Unpublished report)
3. Sivin, I., Holma, P., Diaz, S., Alvarez-Sanchez, F., Robertson, D.N. and Stern, J. (1984). Long-term experience with Norplant implants in international clinical trials. *Contracept. Deliv. Syst.*, **5**, 53–62
4. Lopez, G., Rodriguez, A., Rengifo, J. and Sivin, I. (1983). Two-year prospective study in Colombia of Norplant implants. *Obstet. Gynecol.*, **68**, 204–208
5. Shaaban, M.M., Salah, M., Zarzour, A. and Abdullah, S. (1983). A prospective study of Norplant implants and the TCu380Ag IUD in Assiut, Egypt. *Stud. Fam. Plann.*, **14**, 163–169
6. Family Health International. (1988). Pre-introductory clinical trials of Norplant contraceptive subdermal implants: Report on the one-year experience in Haiti. (Unpublished report)
7. Lubis, F., Prihartono, J., Agoestina, T., Affandi, B. and Sutedi, H. (1983). One-year experience with Norplant implants in Indonesia. *Stud. Fam. Plann.*, **14**, 181–183
8. Family Health International. (1988). Pre-introductory clinical trials of Norplant contraceptive subdermal implants: Report on the one-year experience in Nepal. (Unpublished report)
9. Family Health International. (1988). Pre-introductory clinical trials of Norplant contraceptive subdermal implants: Report on the one-year experience in Nigeria. (Unpublished report)
10. Family Health International. (1987). Pre-introductory clinical trials of Norplant contraceptive subdermal implants: Report on the one-year experience in the Philippines. (Unpublished report)
11. Alvarez-Sanchez, F., Brache, V. and Faundes, A. (1988). The clinical performance of Norplant implants over time: A comparison of two cohorts. *Stud. Fam. Plann.*, **19**, 118–122
12. Singh, K., Viegas, O.A.C. and Ratnam, S.S. (1988). Norplant contraceptive subdermal implants: one year experience in Singapore. *Contraception*, **37**, 457–469
13. Basnayake, S., Thapa, S. and Balogh, S. (1988). Evaluation of safety, efficacy and acceptability of Norplant implants in Sri Lanka. *Stud. Fam. Plann.*, **19**, 39–47
14. Cushman, L.F., Philliber, S.G., Davidson, A.G. , Graves, W.L. and Rulin, M.C. (1988). Beliefs about contraceptive sterilization among low-income urban women. *Fam. Plann. Perspect.*, **20**, 218–221
15. Cleland, J. (1986). Fertility and family planning surveys: Future priorities in the light of past experiences. *Int. Fam. Plann. Perspect.*, **12**, 2–7
16. Lightbourne, R.E. (1985). Individual preferences and fertility behavior. In: *Reproductive Change in Developing Countries*, J. Cleland and J. Hobcraft, eds., Oxford University Press, New York, pp. 165–198
17. Ross, J.A., Hong, S. and Huber, D.H. (1985). *Voluntary Sterilization: An International Fact Book*. Assoc. for Voluntary Sterilization, New York
18. Dillon, W.R. and Goldstein, M. (1984). *Multivariate Analysis: Methods and Application*. John Wiley & Sons, New York
19. SLDCS (Sri Lanka Department of Census and Statistics) (1978). *World Fertility Survey, Sri Lanka 1975, First Report*. Dept. Census Stat., Ministry of Plan Implem., Colombo
20. Kahn, J.R. and Thapa, S. (1989). Sociodemographic determinants of contraceptive method choice in Sri Lanka: 1975–82. *Biosoc. Sci.* (In press)
21. Thapa, S., Abeywickrema, D. and Wilkens, I.R. (1987). Effects of compensatory payments on vasectomy acceptance in urban Sri Lanka: A comparison of two economic groups. *Stud. Fam. Plann.*, **18**, 352–360
22. United Nations. (1986). *Contraceptive Practice: Selected Findings from the World Fertility Survey*. ESA/P/WP.93. Dept. Intl. Econ. Social Affairs, New York
23. Cleland, J. and Rutstein, S. (1986). Contraception and birth spacing. *Int. Fam. Plann. Perspect.*, **12**, 83–90

24. SLDCS (Sri Lanka Department of Census and Statistics) (1988). *Sri Lanka Demographic and Health Survey, 1987.* Dept. Census Stat., Ministry of Plan. Implem., Colombo
25. Thapa, S., Basnayake, S. and Farr, M.G. (1987). Demand for long-acting steroidal contraception: The case of Norplant in Sri Lanka. Paper presented at the 14 NCIH Annual International Health Conference, Washington D.C.
26. Sivin, I. (1988). International experience with Norplant and Norplant-2 contraceptives. *Stud. Fam. Plann.*, **19**, 81–94
27. Hobcraft, J., McDonald, J.W. and Rutstein, S. (1983). Child-spacing effects on infant and early child mortality. *Popul. Index*, **49**, 585–618

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Resumé

Cet exposé analyse les données résultant d'une étude effectuée dans la population du Sri Lanka, qui a révélé que près de la moitié des femmes intéressées par l'utilisation des implants contraceptifs sous-cutanés Norplant étaient effectivement celles qui souhaitaient limiter leurs grossesses, constatation faite également lors d'études cliniques internationales conduites sur ces implants. Une comparaison entre, d'une part des femmes récemment stérilisées et, d'autre part des utilisatrices potentielles de Norplant ayant affirmé qu'elles souhaitaient limiter les naissances, a fait apparaître que ces dernières consituaient un groupe de femmes présentant, du point de vue économique et démographique, des différences significatives par rapport à celles qui avaient été stérilisées. Parmi plusieurs variables analysées, le statut économique respectif était l'élément le plus important distinguant les deux groupes. De plus, une comparaison entre les femmes souhaitant limiter les naissances et celles qui déclaraient vouloir les espacer et s'intéresser à la méthode Norplant a montré que ces dernières constituaient encore une autre catégorie de femmes, la caractéristique la plus importante distinguant les deux groupes étant le nombre total d'enfants vivants. Les résultats préliminaires suggèrent que la méthode d'implants Norplant n'est pas forcément une solution de remplacement à la stérilisation. Potentiellement, cette méthode semble être une méthode d'élection pour les femmes qui désirent ne plus avoir d'enfants mais qui ne sont pas prêtes à accepter la stérilisation. Le fait que l'on ait pu définir, parmi les utilisatrices éventuelles d'implants Norplant, différentes catégories de femmes dans la population, a des incidences à la fois sur les services de guidance, sur la satisfaction des utilisatrices et sur la continuation de la méthode.

Resumen

En este trabajo se analizan los datos provenientes de un estudio efectuado en la población de Sri Lanka, que indicó que casi la mitad de las mujeres interesadas en utilizar implantes anticonceptivos subcutáneos Norplant eran efectivamente las que deseaban limitar sus embarazos, constatación efectuada igualmente en estudios clínicos internacionales realizados con tales implantes. Una comparación entre mujeres recientemente esterilizadas y usuarias potenciales de Norplant que manifestaron que deseaban limitar los nacimientos señaló que estas últimas constituían un grupo de mujeres que presentaban, desde el punto de vista económico y demográfico, diferencias significativas respecto de las mujeres esterilizadas. Entre las diversas variables analizadas, el factor más importante que distinguió a los dos grupos fue su respectivo nivel económico. Por otra parte, una comparación entre las mujeres que deseaban limitar los nacimientos y las que manifestaban que deseaban espaciarlos y se interesaban por el método Norplant indicó que estas últimas constituían incluso otra categoría de mujeres; la característica más importante que distinguía a los dos grupos fue el número total de hijos con vida. Los resultados preliminares sugieren que el método de implantes Norplant no es necesariamente una solución que reemplaza a la esterilización. Potencialmente, este método parece ser popular entre las mujeres que no desean tener más hijos pero que no están dispuestas a aceptar la esterilización. El hecho de que se pudieran definir, entre las usuarias potenciales de implantes Norplant, diferentes categorías de mujeres en la población tiene repercusiones en cuanto a los servicios de asesoramiento, la satisfacción de las usuarias y la continuación del método.