THE PRACTICE OF CONTRACEPTION BY CLIENTS OF THE KENYAN FAMILY PLANNING PROGRAM

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ABSTRACT

Using survey data relating to clients entering the Kenyan family planning program in May, June and July of 1970, drop-out schedules or profiles of clients are established. From these it is apparent that the behaviour of different groups of clients is markedly different; Pill users practice contraception for very much less time than IUD users and those clients genuinely entering for the first time for fewer months than those who had previously practiced contraception through the program. Though this data pertains only to a finite period after which the drop-out is incomplete, the drop out schedules were 'smoothed' and 'extrapolated' this procedure is felt to be most legitimate for Pill users who comprise 80% of acceptors. From these extended drop out profiles the contribution to recently adopted family planning targets of new entrants in the period 1974-8, and of clients 'inherited' from the past is estimated. The targets appear to be optimistic.

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Introduction

The impact of a family planning program (FPP) on fertility depends on it's ability to attract persons into the program and to retain them as active users thereafter. Comprehensive information about the numbers being attracted into the Kenyan program is available but the existing information about client retention is very limited. What is known is indicated by the followng;

> 'The retention and continuation rates for the loop and the pill respectively are ... believed to be very low. A recent pilot study supports this view since it reveals that 80 per cent of acceptors leave the program within two years'. (3 p126)

Recent research, upon which this paper is based, suggests that this statement is in part misleading and for the rest not terribly helpful. First the behaviour of IUD (loop) and pill users appears to be very different rather than similar as appears to be suggested, with the latter group continuing with their chosen device for many fewer months than IUD users. Secondly, the knowledge of the total drop-out after two years tells us too little to assess the achievability of recently adopted targets. The Kenyan FPP has set itself (6 p30) the explicit objectives of attracting 640,000 new entrants and averting 150,000 births in a five year period. Assuming, unreasonably, no 'inherited' stock of users at the beginning of the period and a general fertility rate of 220 per 1,000 these targets imply a further implicit

target of retaining these 640,000 entrants for 1⅔ months on average during the five years. An 80% drop-out after two years is quite consistent with realising this target, and equally consistent with not so doing. Clearly more information about the time profile of drop-out and average use is required.

Using official records of clients made available by the Kenya Ministry of Health, case histories were recorded from which data the following analysis follows. The need for confirmatory and complementary work is admitted but the data is felt to be sufficiently reliable for policy conclusions to be drawn.

The Survey

The source of data was the records of clients entering the program in May, June and July of 1970. The sample comprised those of this group whose client numbers ended in either a zero or a five. This procedure for selecting a sample is felt to be adequate as the distribution of the pre-numbered record cards to clients is random and there is no reason to believe that one or more particular groups of clients would systematically receive record cards ending in these numbers.

Upon entry to the program certain personal and medical information about the client is recorded. This relates to marital status, family size, age, education, husband's occupation, place of residence, tribal or community affiliation, medical history and the results of a medical examination undertaken on the occasion of the first visit. Some of this information was not recorded as it was either too vague to be usable e.g. place of residence and husband's occupation, or thought to not be relevant, namely tribal grouping and details of medical history and examination. In addition the device adopted was recorded. By matching subsequent records of revisits to the first visit form, case histories were built up in which the clients use of the chosendevice is catalogued. The procedures for doing this

were as follows. For pill and injection users the number of cycles of pills or injections received were recorded, it being assumed that all cycles of the pill received were utilised by the receiving client. For IUD users the date and purpose of visits to the clinic were recorded; unless there was explicit reference to removal or rejection the IUD was assumed to remain in situ until the end of the survey period. This general technique of recording client histories to generate an estimate of the number of months of protection from conception is not suitable for users of certain devices e.g. condoms, as the use of a given supply depends on the frequency of intercourse, about which nothing was known.

The sample initially available was 228 from May, 286 from June and 241 from July, but some of these had to be eliminated, after which the usable sample was 199, 256, and 212 for the months respectively. The cases eliminated were mainly those clients who made too few visits to ensure reliability to the estimate of total use. In particular, c clients using the IUD who did not subsequently report at least six months after initial insertion were rejected unless the device was in situ at the first visit and had been for some time, This procedure is more in line with that of Freedman and Takeshita (2) than the one mentioned above; they adopted the rule that 'months of usage by any woman classified as a continuing user are counted only up to her last clinic visit when it was verified that it was still in place'. (2 p246). It must be admitted that adoption of the Freedman and Takeshita rule for all IUD clients would alter the findings considerably, especially as regards the relative performances of IUD and pill users. Careful perusal of the case histories however, suggested that their no less arbitrary rule was unduly conservative and would have led to serious underestimation of usage by IUD clients.

Patterns of Usage

The data reveals two important classifications of the entrants; one based on device adopted and one on whether or not the client had previous experience in practising contraception through the program. The breakdown of the sample by device adopted is as below,

TABLE 1

Breakdown of Sample by Device Adopted

Device	May	June	July	Total
None	16	21	18	55
Pill	121	191	168	480
IUD	59	44	26	129
Injection	3	0	0	3
All	199	256	212	667

T The breakdown by entry status, genuine new entrant (GNE) or 'other', where classification as 'other' was contingent upon the client declaring that they had previously practised contraception through the program, is given in Table 2.

TABLE 2

Breakdown of Sample by Entry Status

Entry status	May	June	July	Total
Genuine new entrants	156	219	187	562
Other entrants	43	37	25	105
Both	199	256	212	667

How so many persons who are not new entrants to the program come to be classified as such is not altogether clear. Three possible reasons can be suggested; transfer from one clinic to another without simultaneous transfer of the record card, resumption of usage after temporary discontinuation without the original record being traced or simply lack of space on the original record. Whatever the reason or reasons, the high rate of erroneous classification ought to be investigated and quantified if only to permit adjustment to the first visit and new acceptor statistics upon which considerable emphasis is placed as indices of program impact.

The significance of the above classification of clients is that usage by the different groups is very different. This is apparent from the 'drop-out' profiles or

schedules plotted over time of the different groups. These are given in Table 3. Data is only available for 19 months at most but distinct patterns emerge soon enough

TABLE 3

Drop-out Profiles for Different Groups of Clients Entering May-July 1970

(%'s of initial number of entrants)

Month	ALL IUD	ALL PILL	GNE IUD	GNE PILL
0	-	0.2	-	-
1	0.8	23.3	1.4	25.1
2	3.1	11.5	2.9	12.7
3	2.3	6.7	2.9	6.0
4	0.8	7.3	1.4	7.6
5	-	2.9	-	3.2
6	1.6	5.0	-	4.6
7	0.8	2.3	1.4	2.3
8	2.3	2.1	4.3	2.3
9	1.6	4.2	1.4	4.4
10	1.6	2.1	1.4	2.3
11	2.3	3.5	4.3	3.7
12	2.3	0.6	2.9	0.5
13	0.8	3.3	-	3.0
14	-	2.5	-	2.3
15	2.3	1.3	4.3	1.4
16	3.9	2.1	7.1	2.3
17	-	1.9	-	1.8
18*	0.8	1.0	1.4	1.2
19**	1.6	0.8	-	0.7
	n = 129	n =480	n= 70	n=434

* May and June clients only

** May clients only

for the artificial cut-off to not be too restrictive. Among Pill users the most notable feature is very high drop-out of GNE clients in the first few months; 1/4 after

only one month and 1/2 by the time 4 months have elapsed. Furthermore by the end of 1971 only 12.7% of the initial entrants in the sample had not terminated usage. Among 'other' Pill users the drop-out is more even month by month, with less than 2/3 terminated by the end of the survey period. The drop-out profile of all pill users taken together is very similar to that of GNE pill users, of course, because of the large proportion of the total from the GNE sub-group. The drop-out of IUD users is, by comparison, very much more even and slower with a total drop-out by the end of 1971 of less than 1/3 even in the case of GNE clients.

In order to facilitate further analysis these drop-out profiles were 'smoothed' and extrapolated, so that sufficient time could be made to artificially elapse for 100% drop-out to occur. The 'smoothed' profiles were as follows;

i. For GNE Pill users, 25% after 1 month, 13% after 2 months, 7% after each of months 3 and 4, 3% per month after months 5 through 11 and 2% per month thereafter.

ii. For all Pill users, 23% after 1 month, 11% after month 2, 7% after each of months 3 and 4, 3% per month after months 5 through 11 and 2% per month thereafter.

iii. For GNE IUD users, 2% per month throughout.

iv. For all IUD users 1.5% per month throughout.

From these 'smoothed' and extrapolated drop-out patterns the following results were derived;

i. The last client of any group of GNE clients adopting the Pill will drop out after 25 months, after 27 months with all pill users, after 50 months with GNE clients adopting the IUD and after 67 months with all IUD clients.

ii. The average use is 7.6 months by GNE pill clients, 8.6 months by all clients, 25.5 months by GNE IUD clients and 33 months by all IUD adopters.

Implications for Recently Proposed Targets

The family planning program (6 p30) has adopted two targets for the period 1974 - 1978, namely the attraction of 640,000 new entrants in the five years and the prevention of 150,000 births also in five years, though presumably a slightly different five years in order to allow for the time lag between events that would otherwise have occurred i.e. conception and birth. Of these targets the first is likely to be adopted as the 'working' target' not least because the existing data collection system is geared to the collection of this and other visits statistics but not to estimating births averted. The realisation of a births averted target of this order of magnitude is implicitly assumed in the Kenya Development Plan 1974-78 when it is noted that

> "If population growth can be continued at 3.3% per year, per capita output will rise by 4.1 per cent per year". (5 p17)

Just what 'contained at 3.3 per cent' means is unclear, but interpretation as an average of 3.3% over 5 years, however achieved, permits crude estimation that, as compared with a rate of 3.5%, the lower rate involves the prevention of almost exactly 150,000 births during the plan. The achievement of this target requires that some number of woman years of contraception be generated by the FPP. Table 4 details these for different assumptions about the general fertility rate that would otherwise have prevailed; the absence of data on age specific fertility rates has necessitated the use of the less satisfactory general fertility rate in the following analysis.

TABLE 4

Woman Years of Contraception to
Achieve the Births Averted Target

General Fertility Rate	Woman Years
200	750,000
210	714,285
220	681,825
230	652,170
240	625,155
250	600,000
260	576,923

These targets are calculated by multiplying the births averted target by the number of years of contraception needed to prevent one birth at each and every assumed level of the general fertility rate (GFR). The achievement of this target, whichever in fact it is, will depend on several factors. First, the number of new clients attracted into the program during the plan period. Second, the average use by this group, also during the plan period. Third, the number of clients 'inherited' by the plan from the past, and, finally, the average use by these persons over the five years. The number of new entrants can only be assumed of course but the data given earlier does permit some estimation of the other variables. From this data the achievability of the recently adopted births averted target can be assessed.

During the plan the number of new and old clients and their contraceptive practice need to be taken into account. Unfortunately the data available does not refer to one sub-group of these categories i.e. what might be termed 'resumers'. These may be part of the 'inherited' stock of clients or of the new entrants number or indeed of neither because they may be former clients who had terminated usage before the beginning of 1974 and who decided to resume usage during the plan period. Though there is no means of estimating what their numbers might be, it may be reasonably

assumed that it is not large. On this ground of numerical insignificance it was decided to assume that the resumers would be counted as new entrants if they did resume and that upon so doing they would practice contraception as per the pattern of other new entrants. This is perhaps erroneous - there is some presumption that prior experience does influence usage - but some such arbitrary assumption was necessary in the circumstances.

If the use of contraceptives by new acceptors is taken to be the same as the GNE category from the sample, the total contribution of these clients to any target in terms of woman years of contraception can be estimated provided the distribution of these clients between the available devices and through time is known. Using 1972 and 1973 as a guide, a ratio of about 1 IUD acceptor to 8 Pill acceptors is suggested; the ratio in 1972 was 1:7.3 and in 1973 1:8 (7). Acceptors of other devices are not totally insignificant, however, and their inclusion requires that some assumption about their usage be made. Inclusion of these clients with Pill users reduces the ratio of 'high use' (IUD) clients to 'low use' (Pill plus other devices) clients to 1:8 in 1972 and 1:9 in 1973. Assuming a ratio of 1:8 is perhaps the most optimistic that can be made, therefore. The distribution of the new entrants through time is important in that the average contribution by any given number of entrants during the plan period will fall as the entry date is closer to the end of the plan. Prediction of the actual pattern of entrants is not possible of course but assuming it to be even throughout the plan at 10,666 per month, the aggregate contribution by new clients will be 428,951 woman years. Assuming an even monthly take throughout the plan is generous in this instance because a rising trend would increase the proportion of the total new entrants whose contribution during the plan will be low simply because of the time limitation. This aggregate contribution implies an overall average of 8.04 months usage per new entrant; 6.75 months for Pill and 'other device' users (8/9 of the total by assumption) and 18.33 months by IUD users. (Were the ratio of 'high use' to 'low use' clients to fall to 1: 10 the aggregate contribution of 640,000 new entrants would fall to 416,363 years).

An estimate of the size of this 'inherited' stock can be made using the drop-out profiles given earlier, provided that figures for acceptors are available month by month and device by device for the preceding years. Such data was in fact available only for 1972 and 1973 and for the rest an element of estimation was involved in obtaining the required figures. For 1969, 1970 and 1971 no acceptors figures were available but using the experience of 1972 and 1973 as a guide the available first visits statistics were converted into estimates of acceptors by applying a ratio of .95. For 1969 and 1970 no monthly figures on visits or acceptors were available, so were estimated either by a simple averaging of annual data (1968) or the application of a quarterly index of first visits to annual data followed by averaging of the quarterly figures for the threee months. (The index of first visits was available from the Ministry of Health). As regards the distribution of the acceptors between devices, data for 1968 shows a ratio of 'high use' to 'low use' clients of 1:1:36, the data from the (1970) sample shows a ratio of 1:4 and figures for 1972 and 1973 show a ratio of about 1:8. To crudely interpolate this trend a ratio of 1:2 was assumed for 1969 and one of 1:6 for 1971. Application of the drop-out profiles to the data so derived, produced the estimate that 26,022 Pill users and 14,871 IUD users were 'inherited' by January 1974.

This exercise can be repeated for each month in the plan, although clients initially entering in January 1974 or later would not in this case be counted in the numbers inherited by any month as they have already been included in the 640,000 new entrants of the plan period. In this way an estimate is made of the number of pre-plan entrants practising contraception during any month of the plan. Assuming that the clients terminating in any month are distributed evenly (so that their average contribution in the month is $\frac{1}{2}$ a month) the number of woman years of contraception by the inherited stock can be calculated. The aggregate contribution of these clients during the whole plan period is estimated at 42,917 woman years.

The number of woman years of contraception likely to be achieved by the clients practising contraception during the plan is, therefore, estimated to be 471,865, of which 428,951 are estimated to be contributed by the new entrants and the remainder by the inherited stock of clients. The estimate of the contribution of the new entrants is based on the assumption that the ratio of 'high use' to 'low use' clients is stabilised at 1:8. This overall estimate can be compared with the theoretical targets required on different assumptions about fertility and the shortfalls from these theoretical targets calculated. These are given in Table 5. As may be seen, at every one of the rates assumed there is a positive shortfall on the targets. This ranges in fact from one of 18.2% to one of 37.1% of the target. Of these possibilities there is good reason to believe that the higher estimates are the most reasonable. Fordyce's data (1) suggests a general fertility rate for Kenya in 1968/9 of 219 per 1,000; if this rate is assumed the shortfall is about 31% of the births averted target. This rate of 219 is, however, the average for all districts when the weight accorded to each is the population in 1969. Recalculating with the weight accorded to each district being the mean estimate of woman years of contraception for each district from Jones (4 p13) the average is reduced to 198 per 1,000. At this rate the shortfall is 37.7% of the target.

TABLE 5

Calculated Shortfalls on Plan Targets

General Fertility Rate	Target (Years)	Shortfall (Years)	Shortfall (Births)
200	750,000	278,135	55,627
210	714,285	242,420	50,908
220	681,825	209,960	46,191
230	652,170	180,305	41,470
240	625,155	153,290	36,789
250	600,000	128,135	32,034
260	576,923	105,058	27,341

In considering how the anticipated underachievement of the targets might be avoided three variables need to be taken into account; the number of new entrants to the FPP, the distribution of these between alternative devices and,

conceivably independent of the 'device mix', the average use by the practising clients both new and old. The number of the inherited stock and the distribution of these between devices is of course predetermined. For each level of general fertility rate assumed earlier four solutions to the estimated shortfalls were calculated:

Solution A, increase the number of new entrants ceteris paribus;

Solution B, redistribute the 640,000 new entrants towards 'high use' devices ceteris paribus;

Solution C, raise the average months of use by the new entrants ceteris paribus;

Solution D, raise the average months of use during the plan by the inherited stock, again ceteris paribus.

These are detailed in Table 6.

TABLE 6

The Range of Solutions to the Anticipated shortfall on Plan targets

General Fertility Rate	A	B	C	D
200	1,055,348	1:0.79	13.26	94.21*
210	1,002,042	1:0.99	12.59	83.73*
220	952,385	1:1.22	11.98	74.2*
230	909,333	1:1.49	11.42	65.5*
240	869,012	1:1.79	10.92	57.6
250	831,467	1.2.14	10.45	50.2
260	797,024	1:2.57	10.01	43.4

* not feasible in a five year period.

The posited solutions can be compared with present experiences or expectations: 640,000 new entrants; a ratio of 'high use' to 'low use' clients of 1:8 or worse, judging from the trend evident over many years; an average contribution by new entrants of 8.04 months and finally an average contribution

by members of the inherited stock of 12.6 months.

Of these solutions A and B are the ones most easily monitored. Solution B does not appear to be very plausible as the trend against the IUD is well confirmed and apparently related to the unwillingness of staff to recommend the device because of the greater initial work and greater responsibility felt to be associated with the IUD as compared with the Pill. Assuming that Solution A is the one that will be pursued two constraints are significant; the capacity of the FPP to enrol new clients and the number of potential new entrants in the five years of the plan.

During 1973 there were about 300 clinics operating throughout the year, but only up to 250 or so of these reported attendances. For the reporting clinics the monthly average number of acceptors was 17. Great variation is apparent however between districts, which is potentially significant as discrimination between districts is a possible policy. For example, in the last quarter of 1973 the mean number of acceptors was 15 per clinic per month: but the standard deviation around this mean was 9 and the range 38 to 1. Predictions of future enrolment patterns from past data are likely to be erroneous of course but the diversity of experience is such as to warrant further attention to this fact. Using an average figure, however, it may be noted that the target of 640,000 in five years is based on an average monthly intake of 26 for each of the 400 permanent clinics that it is proposed to operate and 10-15 for each of the proposed mobile units (6 p30). By comparison coverage of the forecast shortfalls implies a monthly average for the 400 permanent clinic of between 32.6 and 43.4 assuming that the mobiles still recruit 15 clients per month. As the 400 permanent units are to be operated on a full time basis as compared with only $\frac{1}{2}$ day per month for some clinics in 1973 it may be assumed that there will be no capacity constraint during the plan.

As regards the potential number of new entrants and the extent to which this potential has to be realised little can be said because of lack of data. A few simple

calculations are instructive however. Defining the eligible population as the number of females aged between 15 and 44, Fordyce's (1) estimate for this group in 1969 (2,135,807) was compounded at 3% per annum up to 1978 to provide a bench mark in each year. The target of 640,000 new entrants in five years is capable of being achieved in too many ways for them all to be considered, but for illustrative purposes three alternative time distributions on the target were considered. These were, first an immediate rise to the simple 5 years average of 128,000, second, an increase of 33% per annum throughout which yields slighly less than the required number, and, finally, a sharp rise to 100,000 in Year 1 of the plan and to 135,000 in Year 2 which rate is then maintained through to 1978. On assumption I the percentages of eligible persons to be attracted into the FPP falls from 5.1% in 1974 to 4.6% in 1978; on assumption 2 it rises from 2.7% to 7.5% and on assumption 3 it rises to 5.3% in 1975 and then falls to 4.8% in 1978. These illustrative numbers are to be compared with the actual rates for 1972 and 1973 which were 1.9 and 2.0% respectively. If the highest anticipated shortfall given earlier were to be avoided by attracting more new entrants the numbers entering the FPP would have to rise accordingly. On assumption I the new entrants would then comprise 8.5% of the eligible number in 1974 and 7.6% in 1978.

Though the basis on which the above examples were worked is extremely conjectural they do illustrate the fact that the FPP has set itself a difficult task. Whether this is realised will depend very much on the ability of the proposed team of 817 field workers (a new innovation) to influence the relevant variables namely the number of new entrants, the device mix and the retention of clients by the program.

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Appendix-derivation of the Inherited Stock Estimates

From the drop-out profiles it can be estimated that in any month the FPP will inherit Pill clients from up to 27 months earlier and IUD clients from up to 67 months previously. The proportion of entrants in earlier months surviving to time period are estimated to be as follows;

From month	Pill	IUD
t-1	.77	.985
t-2	.66	.970
t-3	.59	.955
t-4	.52	.940
t-5	.49	.925
t-6	.46	.910
t-7	.43	.895
t-8	.40	.880
t-9	.37	.865
t-10	.34	.850
t-11	.31	.835
t-12	.29	.820
t-13	.27	.805
t-14	.25	.790
t-15	.23	.775
t-16	.21	.760
t-17	.19	.745
t-18	.17	.730
t-19	.15	.715
t-20	.13	.700
t-21	.11	.685
t-22	.09	.670
t-23	.07	.655
t-24	.05	.640
t-25	.03	.625
t-26	.01	.610
t-27	.005	.595
.		.
.		.
.		.
t-67		.005

N.B. Between months t-27 and t-67 the proportion of IUD clients surviving to month t drops by .015 per month.

Using these coefficients it is possible to estimate the total number of earlier months Pill adopting entrants surviving to any month t with the following expression;

$$S^{p}_{t} = .77A^{p}_{t-I} + .66A^{p}_{t-2} + .59A^{p}_{t-} \ldots .0I0A^{p}_{t-26} + .005A^{p}_{t-27}$$

where S^{p}_{t} is the number of Pill acceptors of earlier months surviving to month t A^{p}_{t-I} is the number of Pill acceptors in month t-I, etc

The expression for IUD clients is similar of course though with different coefficients. Now because the entrants of January 1974 and later are already included in the new entrants for the plan period they must not be double counted by including them in the stock of clients inherited by February February 1974 and later months. This can be assured by adjusting the expression so that month t+I does not inherit clients from month t etc. The expression for February will be as follows;

$$S^{p}_{t+I} = .66A^{p}_{t-I} + .59A^{p}_{t-3} \ldots + .0I0A^{p}_{t-25} + .005A^{p}_{t-26}$$

Given the drop-out schedule February 1974 will not inherit any clients from month t-27, March (t+2) from t-26 etc. For month t+27 and later there will be zero Pill users inherited from the pre plan period. All months in the plan period will inherit pre plan IUD acceptors given the drop-out schedule.