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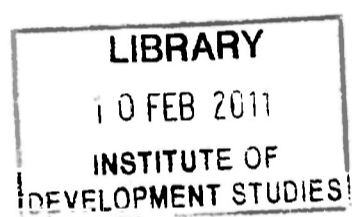
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PROSPECTS FOR POPULATION LIMITATION IN KENYA:
STATISTICAL EVIDENCE FROM THE VIHIGA PROGRAMME

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Prospects for Population Limitation in Kenya: Statistical
Evidence from the Vihiga Programme.

Concern regarding population in Kenya arises first out of the high population densities which already exist in localized areas within Kenya - Kakamega District which is dealt with in this paper is one of these - and with the population growth. It has been suggested¹ that the current rate of growth may be about 3.5 per cent per annum and that this could move up further towards 4 per cent. Thus the rate is already one of the highest in the world and is going up to the level at which it will be doubling in only ¹⁸ years. Already by 1966 the Kenya government had decided to "pursue vigorously policies designed to reduce the rate of population growth through voluntary means"², and presently substantial amounts of financing for the national family planning programme have been secured.

While a few studies have been made regarding attitudes to family size and family planning in Kenya³ and other parts of Africa, knowledge regarding these and more specifically of potential responses to any major population control programme anywhere in Africa south of Sahara hardly exists.

In 1970 Kenya launched its Special Rural Development Programme (S.R.D.P.) in six areas of Kenya, allocating supplementary finance to these areas and introducing a new "management system" within the government administrative machine aimed at accelerating development. The most important element of the S.R.D.P. besides the management system, were the principles of experimentality and replicability: deliberately experimental programmes and projects were to be undertaken, the successful ones to be replicated in appropriate districts elsewhere. The programmes and projects

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1. I.L.O., Employment, incomes and equality, Geneva, 1972, p. 121.
 2. I.L.O. Report, p. 125.
 - 3.
 3. Thomas E. Dow, "Attitudes towards family size and family planning in Nairobi". *Demography*, 4, 1967; Donald F. Hessel, Attitudes and practice of contraception in Kenya, *Demography*, 4, 1968; Angela Molnos, Attitudes towards family planning in East Africa, African Studies, 1968.

could be in any aspect of rural development and welfare, from the expansion of rural industries or research on new crops to education and women's programmes.

One of the six S.R.D.P. areas was the Vihiga-Hamisi Divisions of Kakamega District in Western Kenya, and one of the projects initiated there was a specially intensive family planning effort. This was appropriate since population density in Vihiga-Hamisi was in 1969 the highest in any rural area of Kenya, 538 per square kilometre. Population pressure has been intensive, and family holdings are now estimated to average ~~4.4~~ much more than two acres. The response secured in this area should therefore be an important guide to potential response elsewhere in the country, and to whether returns would be obtained from a similar high level of expenditure made at the national level. The main element in this intensive programme up to 1973 was the provision of additional clinics. Family planning clinics were practically new to the District in February, 1971, when 16 clinics were opened, 7 in Vihiga-Hamisi and 9 in other Divisions, with a further clinic in Vihiga a year or so later. This input ^{was} substantially increased in what may be called a second phase in February and July, 1974, bringing the number of clinics in Vihiga-Hamisi up to 14, compared to 10 in the rest of the District.

In this article we attempt to compare the response to the expansion of clinics, and other aspects of the programme, in the 'intensive effort' area of Vihiga-Hamisi with that in the rest of the District. It will be seen that there are considerable difficulties in making such a comparison and that no more than indicative results can be obtained. It is even more difficult to relate any benefits as might be determined, resulting from avoided births, to specific expenditures incurred in obtaining them. In a previous paper⁴ we have suggested that applications of cost-benefit analysis by economists to the population problem have ignored or underestimated the response factor in family planning programmes, and that therefore widely-quoted estimates of the "cost of an avoided birth" in different countries ^{are} unrealistic and unreliable.⁵ The present exercise

4. I Livingstone, "What do economists really know about population? Or, the benefits of cost-benefit," I.D.S. Discussion Paper No. 222. Institute of Development Studies, University of Nairobi, March, 1975.

5. See especially S. Eke, "The Economics of Government Payments to Limit Population", Economic Development and Cultural Change, 8(4) July, 1960, and "Reducing ^{birth} fertility to Accelerate Development", Economic Journal, 84(334) June, 1974; G. Ohlin, Population Control and Economic Development, O.E.C.D., Paris 1967.

can therefore be seen also as a case study in the determination of response, though we do not go so far as to make calculations of cost per birth prevented.

Kakamega District is fairly homogeneous tribally and culturally, the people in both areas being members of the Baluyia tribal group. Unfortunately, from the point of view of a controlled experiment, the economic factor is not constant in the two areas: as Table 1 shows, population density in 1969 was 538 per square kilometre in Vihiga-Hamisi, and only 162 in the rest of the District. Thus the economic pressure to seek family planning advice in Vihiga would be substantially greater.

The second major difficulty is that it is too early to attempt to measure the response to the 'second phase' of the programme. A new clinic attracts relatively few clients in its first year of operation, so that the clinics set up in 1974 would only this year be establishing a clientele.

However we can see from Table 1 that while the number of clinics was about the same in the two areas in 1971, the average number of people served per clinic was substantially lower in Vihiga-Hamisi, 39,000 compared to 57,000 (figures refer to total population, not women of reproducing age). More significant, however, is the proximity to a clinic (rather than the queue of people a client may find there, which in Kakamega must be short or non-existent). The average number of square kilometres served per clinic was only 69 in Vihiga-Hamisi, compared with 334 in the rest of the District: a very substantial difference. While generally the further a client would need to travel to a clinic would be 4 or 5 kilometres in Vihiga, elsewhere it might be as much as 10 or 13. Thus even in 1971, up to 1974, access to family planning facilities would be much greater in the last area.

	Vihiga- Hamisi	Rest of Kakamega	Kakamega District.
Population, 1969.	296,254	486,332	782,586
No. of Sq. Km.	551	3,007	3,558
Density per sq.km. in 1969.	538	162	220
Estimated density 1 per sq.km. in 1974	623	187	255
No. of clinics ²			
February, 1971	8	9	17
February, 1974	11	10	21
July, 1974	14	10	24
Average no. of people served per clinic			
February, 1971	39,287	57,328	-
February, 1974	31,222	56,379	-
July, 1974	24,531	56,379	-
Average no. of sq.km. served per clinic			
February, 1974	69	334	-
February, 1974	50	301	-
July, 1974	39	301	-

Table 1: The Expansion of the Family Planning Service in Kakamega District, 1971 to 1974.

1. (Population is assumed to increase at 3 per cent per annum in this table.)
2. The number of clinics assumed for 1971 includes one actually set up a year later)

The establishment of additional clinics in 1974 reduces the average number of people served per clinic to 24,000 in Vihiga compared with an essentially unchanged figure of 56,000 in the rest of the district; and the average number of square kilometres served reduces to 39, compared with 301. The impact of this further expansion cannot be analysed here, and a further statistical exercise in, say, 1977 is called for.

Vihiga-Hamisi was also favoured in the allocation of complementary and other resources. In this area 7 Kenya-enrolled nurses are currently working together with 8 field educators including one Senior Field Educator and one Male Educator. This compares with only 2 midwives working in non-S.R.D.P. health centres and 1 enrolled nurse operating a mobile service on a part-time basis (though assisted here by an S.R.D.P. financed nurse). While the SRDP area had the use of 3 vehicles, each with a driver, for the sole use of field motivators, ^{the} nurse in the non-SRDP. area had partial use of one vehicle only. The S.R.D.P. vehicles were to give wheels to a campaign which would operate through barazas (open air meetings), schools, film shows, and the like, in addition to the health centres. This programme unfortunately appears to have been held back by delays in recruiting staff. The eight field educators started work early in 1973 and staffing was maintained at this level during 1974. The main activities were public meetings, film shows and home visits. Around 1300 meetings were held in 1974 with an average audience of 85; and 110 film shows, with an average audience of 180. A total of about 110,000 people attended the meetings (which may not have been held exclusively for family planning publicity purposes, however) and 20,000 the film shows. About 650 home visits were made in 1974, averaging 54 per month. This amounts to a programme of something like 3 public meetings and 1-2 home visits per/week, ^{would take no more than half a morning} and a monthly film show per educator. This suggests that the organization of public meetings is the most time-consuming activity as the home visits per week. At the rate of 7 home visits per day, not an excessive number, the number of home visits for the area may have been raised from 650 to 16,000.

Clearly there is scope for considerable substitution between communication methods, although in part they could be complementary. According to the annual report of the Senior Field Educator, film shows were "the greatest attraction and most powerful medium of effective communication". Certainly they appear to have a considerable advantage over public meetings in that they can in any ^{case} be accompanied by a public address or discussion, while attracting approximately double the audience. It is therefore unfortunate from the point of view of the S.R.D.P. experiment that only one film van was available, and this for the Province as a whole rather than the District or S.R.D.P. area.

Contact made at public meetings and film shows, however, is something very different from the securing of acceptors. The main choice is therefore between these two approaches (especially film shows) on the one side and home visits on the other: the success rate may be higher from 16,000 home visits than from 120,000 members of public meeting audiences. To gauge the relative effectiveness of the two alternatives it would be necessary to interview new acceptors and re-visitors regarding the form of contact made. It was not possible to do this in the time available, but it is a procedure that could now be adopted as a regular part of the family planning interview. That it has not been adopted already is perhaps a weakness in the experimental approach followed.

Effects of the Programme on the Number of First Visitors

Years	Vihiga-Hamisi	Rest of District	Kakamega District total
1971	71	214	285
1972	483	824	1307
1973	959	862	1821
1974 (estimate for* full year)	1142	1079	2221
1974 (to October)	952	899	1851

Table 2. Number of First Visitors, 1971-1974, Vihiga-Hamisi/Rest of Kakamega District

(* estimated as direct proportion of total for 10 months)

Table 2 shows the numbers of first visitors over the period for Vihiga-Hamisi, for the rest of Kakamega district, and for the whole district. All show a useful upward trend. First visitors of course, are not necessarily 'acceptors' of conceptive methods: they include a small proportion of sub-fertility cases and others who may not accept contraception immediately. The figures for first visitors and for acceptors will not differ greatly however.

Period	Vihiga-Hamisi	Rest of Kakamega District	Kenya
1972 over 1971	580	285	10
1973 over 1972	99	5	11
1974 over 1973	19	25	1½
1974 over 1972	136	31	12

Table 3. Percentage increases in number of first visitors, Vihiga-Hamisi/Rest of Kakamega District/Kenya.

Table 3 analyses the trends in Table 2 by calculating the percentage increase from year to year. Although most of the clinics in the District date from early 1971, we should expect some time lag to exist before people become aware of and respond to the facilities offered. Accordingly it is reasonable to take changes between 1972 and 1971 as measuring a response to facilities established earlier in 1971.

This first year shows an astronomic rate of increase of 580 per cent in Vihiga-Hamisi and 285 per cent in the rest of the District. While this comparison is favourable to Vihiga-Hamisi, these high rates mainly reflect the very low initial level of visitors in 1971, and too much emphasis cannot be placed on this. On the other hand the increase from 71 to 483 in one year suggests that there would be a significant advantage in cost-benefit terms in putting clinics into receptive and previously neglected areas such as Vihiga-Hamisi was in 1971: that is, a significant number of births could be avoided by spreading clinics through receptive parts of the rural areas.

For assessing the possible long run success of the programme and its impact on the population problem, however, it is more important to compare the 1972 figures, when the initial heavy response has been absorbed, with those for 1974. This will better indicate whether the clinics are likely to be able to progressively expand the number of clients and thus make some kind of 'client' / ⁱⁿ the population growth rate. Fortunately the figures indicate significant continued expansion by 136 per cent in Vihiga-Hamisi and 31 per cent in the rest of the District.

As indicated earlier, we cannot assert categorically that this difference is due to the intensive approach used in the former area: the response could simply be due to the greater population pressure which exists. Nevertheless it is encouraging.

The apparent slow-down during the last year, 1973-74, in Vihiga-Hamisi does, however, indicate that there is still some uncertainty as to whether the momentum in recruitment will be maintained. It should be remarked that the field education programme operated for most of 1973 and 1974, and that some effects might have become apparent during 1974 particularly: the slow-down in the increase of new acceptors in 1974 is discouraging in this regard and underlines the need to measure more precisely the impact of these activities.

Characteristics of New Acceptors in Kakamega District

Even if the number of acceptors are increasing, it is necessary to know something of the characteristics of these before concluding that the numbers can be expected to continue growing. For example the new acceptors may consist only of those with large numbers of children already or of the more educated.

(i) Number of living children of first visitors.

Table 4 shows the distribution of first visitors by the number of living children in Kakamega as a whole, for 1974. We should notice first the large number of women with large families (one quarter ^{had} six children or more), reflecting the generally large families in Kenya.

Number of Children.	First Visitors	
	No.	%
0	125	7
1	356	19
2	296	16
3	213	12
4	203	11
5	185	10
6	164	9
7	125	7
8 or more	177	10
Total	1845	100
Not stated	7	-

Table 4. Distribution of first visitors by number of living children, Kakamega District, 1974 (to October).

This itself indicates the scope for direct benefits to those families concerned, in terms of more food per person, educational opportunities, etc, from a reduction in family size.

In terms of potential response, more encouraging is the fact that in 1974 54 per cent had three children or fewer (see Table 4) and 42 per cent had two children or fewer. A large proportion of clients therefore are not those who have already produced a large family. In this respect the position in Vihiga is apparently much more favourable in that it has a significantly higher proportion of visitors with fewer children. In fact this may not reflect any attitude difference in the area consequent upon the family planning programme, but only the larger percentage of younger women in the area. Also significant, however, is the increasing proportion in the small-family category; the proportion increases from 44-46 per cent in 1971-2 to 54 per cent in 1974 in the district as a whole increasing in roughly similar fashion in Vihiga-Hamisi and in the rest of the district.

	Vihiga-Hamisi	Rest of District	Total, Kakamega District
1971	55	43	46
1972	50	41	44
1973	55	47	52
1974 (to October)	59	48	54

Table 5. Number of first visitors with 3 or less children as a percentage of the total, Vihiga-Hamisi/Rest of District.

(ii) Age distribution of first visitors

The size of the family will be correlated with age, since younger women will still be in the process of building up their families. The proportion of first visitors in the younger age groups will therefore be significant in terms of the effectiveness of population limitation.

Age Group	1971			1972			1973			1974		
	Vihiga	Rest	Total	Vihiga	Rest	Total	Vihiga	Rest	Total	Vihiga	Rest	Total
10 to 24 years	32	34	34	44	36	39	47	40	44	52	44	48
10 to 29 years	60	48	56	66	58	61	64	60	62	72	65	69

Table 6. Number of first visitors in younger age groups as percentage of total, Vihiga-Hamisi/Rest of District.

Table 6 shows that a substantial proportion of first visitors are in the younger age groups, which is encouraging. More significantly, the proportion in the 10 to 24 year age group has increased considerably in just a few years from 34 per cent in 1971 to 48 per cent in 1974. This increase has been more rapid in Vihiga-Hamisi than in the rest of the district, though it may be somewhat optimistic to put this down to the programme.

(iii) Education of first visitors

The educational background of acceptors is also important to consider. The 'economic development' school argue that success in population limitation is likely only if there is a major change in desired family size, and that such a fundamental change of attitude will only come about through economic development affecting the level of income, education and social system. In the absence of this a family planning programme may only succeed in recruiting acceptors primarily from among the more educated and well-to-do.

Extent of Education	1972			1974		
	Vihiga %	Rest %	Total %	Vihiga %	Rest %	Total %
No. education	31	42	38	23	39	31
Standard 3 or less	40	48	45	33	46	39
Standard 7 or less	93	90	91	91	90	91
Form 1 or more	7	10	9	9	10	9
Standard 1-3	9	6	7	10	7	8
Standard 4-7	53	42	46	58	44	51

Table 7. Education of first visitors, 1972 and 1974, Vihiga-Hamisi Rest of Kakamega District

Table 7 is encouraging in this respect in so far as only 9 per cent of first visitors had been educated beyond Standard 7. 31 per cent in 1974 had received no education at all.

There is some evidence, however, of a differential effect as between educated and less educated. Between 1972 and 1974, the percentage of first visitors with no education fell from 38 to 31, while the percentage with standard 4-7 schooling increased from 46 to 51. This was, moreover, mainly due to changes in Vihiga-Hamisi where the percentage without schooling fell from 31 to 23, at the same time as those with

Standard 4-7 rose from 53 to 58. This effect might therefore be associated with the special programme in Vihiga, through one should be rather cautious in jumping to this conclusion.

(iv) The effect of infant mortality.

At low levels of living, also, infant mortality is high, and the risk of losing some children will encourage parents to have large families. The 'economic development effect' might be operative here again, insofar as reduction in infant mortality associated with development may be a precondition of reducing the desired family size. Among first visitors in Kakamega District in 1974 as many as 40 per cent stated they had lost one child or more, and 18 per cent two children or more. These figures are probably considerably exaggerated - there is evidence that many mothers included miscarriages in the number of children lost - but they are large enough to suggest that this could be a major problem in recruiting acceptors.

Continuation Rates in Kakamega District

While the number of first visitors will not differ very much from the number of acceptors, success in recruiting acceptors does not necessarily imply similar success in avoiding births, since these clients may not continue with birth control for long: and if we are concerned with population limitation or limitation of the rate of increase of population, it must be with avoided births that we are concerned. In order to calculate the costs and benefits of the Vihiga programme, therefore, it is important to take account of continuation rates.

Accordingly, all 1972 acceptors in Kakamega adopting the pill as a contraceptive method were traced through their subsequent visits to their initial clinic until the end of November, 1974. Since very few of these 1,039 clients were still attending by that time, this gave almost the equivalent number of complete 'case histories', each starting same time in 1972. Continuation rates for clients adopting the I.U.D. were not calculated, as this would have required a longer time series of data than was available.

Continuation rate after	1	2	3	4	5
	Kakamega District	Vihiga-Hamisi	Rest of District	Rest of District (Rural only)	Kakamega Township
	%	%	%	%	%
One month	66.9	63.4	69.7	66.8	73.0
12 months	28.0	24.5	30.8	31.9	29.6
24 months	3.4	2.8	3.8	3.6	4.8
No. of clients:	1039	465	574	304	270

Table 8. Continuation rates in Kakamega District

Table 8 gives continuation rates for Kakamega District (col. 1) after various time periods. This shows that only 28 per cent remained in the programme after 12 months, and only 3.4 per cent after 24 months. Out of the 1039 clients only 25 visited a clinic in the last three months of the period surveyed and might therefore reasonably be thought still to be attending. Thus extending the period surveyed beyond November, 1974, would not affect these figures.

It is worth comparing these rates with similar figures for some other developing countries.

	I.U.D. Acceptors' Continuation Rates		Pill Acceptors' Continuation Rates	
	12 months	24 months	12 months	24 months
Korea	57	38	26	-
Singapore	69	-	56	-
Taiwan	67	54	-	-
Mauritius	68	-	53	-
Hongkong	66	49	58	-
Thailand	76	56	71	-
Bangla Desh	74	66	-	-
Pakistan (West)	56	-	62	47
W. Malaysia	68	52	35	-
Ceylon	81	69	56	-
Phillipines	70	55	60	38
India	70	54	32	-
Mean	69	55	51	43
Kakamega District of Kenya	-	-	28	3½

Table 9. Comparison with Continuation Rates in Other Developing Countries

SOURCE: T.K. Ruprecht and C. Wahren, Population Programmes and Economic and social Development, O.E.C.D., 1970.

This is done in Table 9. The figure for Kakamega District at 12 months is 28 per cent compared to a mean of 51 per cent for the countries listed. The situation after 24 months is even more striking, a rate of $3\frac{1}{2}$ per cent for Kakamega compared with 47 per cent for West Pakistan and 38 per cent for the Phillipines. As we shall indicate presently, the probability is lower than that for Kakamega, since Kakamega is not among the least responsive districts.

Much more staggering even than these figures, however, is the drop-out rate after one month, 33 per cent: one-third of acceptors did not return to the clinic at all after the first visit. This is shown rather graphically in Fig. 1 which gives the continuation rates - and thus the drop-out rate - on a cumulative basis.

This figure more than any indicates the inadequacy of reliance on figures of first visitors and re-visitors as a measure of progress in acceptance of family limitation and avoidance of births. Continuation rates are not calculated at present by the Statistical Unit for family planning within the Ministry of Health, although it would not be too difficult to do so, on a sample basis: each client has an individual number retained for all visits, which can be fed into the computer. This appears essential in order to monitor changing interest in family limitation over time and the changing effectiveness of the programme, as well as the comparative position in different areas.

Two other attempts have been made at estimating continuation rates in Kenya. Bondestam⁶ used three alternative models to estimate drop-out rates, on an aggregative basis using the ratio of revisitors to first visitors for Kenya as a whole for 1970-71. His estimate of the percentage dropping out was:

- 17-30 per cent after one month
- 30-35 four months
- 39-42 seven months
- 45-47 ten months

Mugo Gachuhi⁷ took a sample of 1465 women in Nyeri District in 1970 to

6. J. Mugo Gachuhi, 'who needs family Planning?' I.D.S. Staff Paper No. 115, Institute of Development Studies, October, 1971.

7. L. Bondestam "Research Report No. 12: Population Growth in Kenya", Scandinavian Institute of African Studies, 1972.

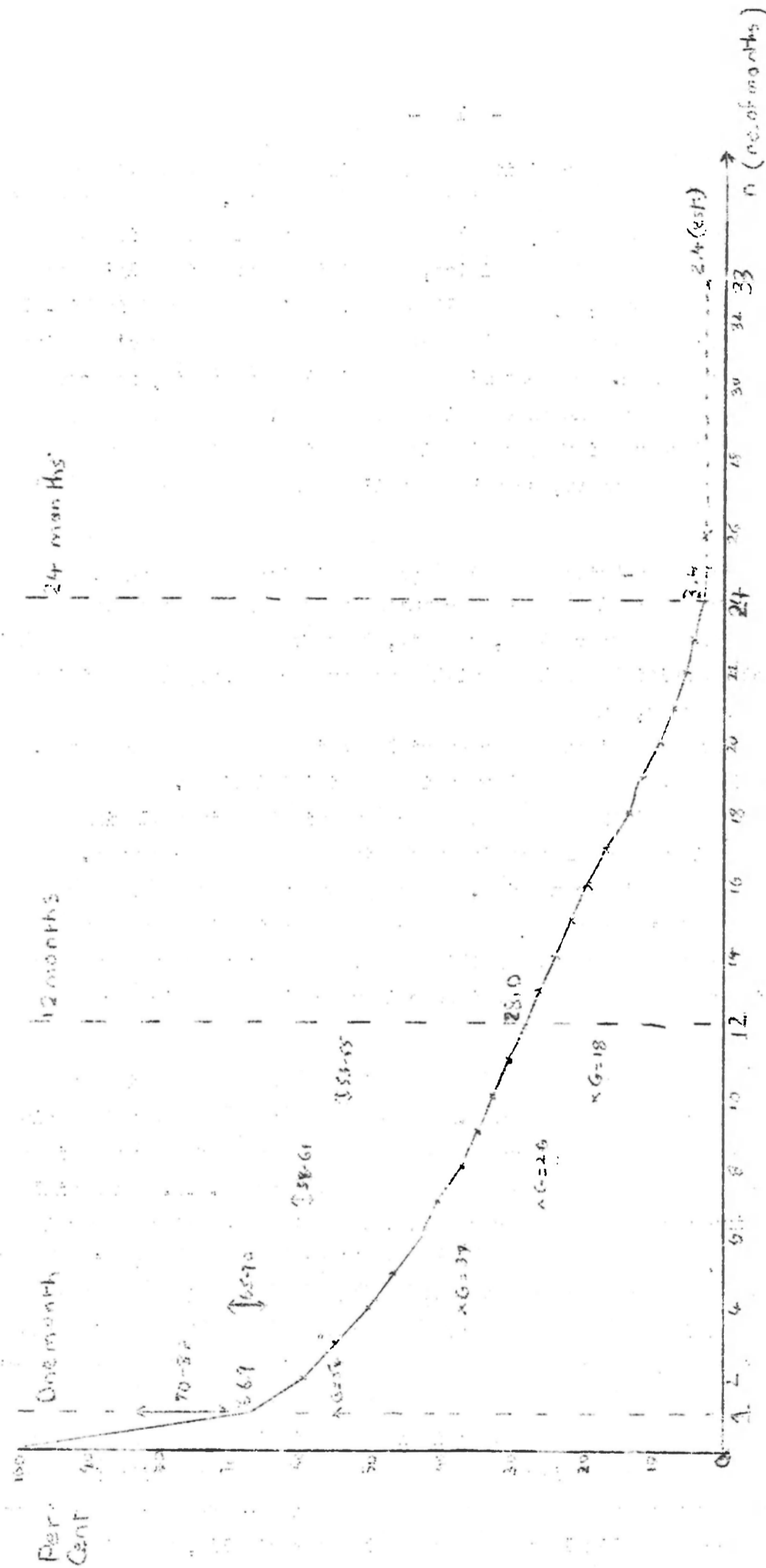


Fig. 1. Continuation at clinics: Percentage of clients attending clinics n months after first visit:
by Mugo Gachuhi
Kakamega District. (I= estimates by Bondestam for Kenya 1970-71; G= estimates for Nyeri District, 1970)

calculate the number of revisits made for different contraceptive methods. For pill users only 53.3 per cent made a second visit, 37 per cent a third visit, 26 per cent a fourth, and 18 per cent a fifth. According to the procedures followed at Kenya clinics, the visits would 'ideally' have occurred after 1 month, 4, 7, and 10 months. This as assumed in Fig. 1 where Gachuhi's estimates are plotted, together with Bondestam's against our own for Kakamega. Bondestam's appear highly optimistic, inaccuracy probably being due to the aggregative method used. The other two sets of figures relate to different districts at slightly different times, but are not too far apart, though Gachuhi's would be subject to sampling error.

This drop-out rate would appear to indicate two things:

- (i) that there is a lack of commitment among first visitors to adopting serious birth control, that is, that first visitors may be willing to collect an initial supply of pills without necessarily any definite intent to use them, and
- (ii) that there is need for special tactics to prevent drop outs, particularly among those who have paid this initial visit. Thus the most effective deployment of field educators might be in following these particular clients rather than in attempting to make new converts. This evidence is not encouraging, either regarding the effectiveness of the field educator programme, but clear investigation is needed of the detailed approach undertaken by this staff. It certainly suggests that home visits to the homes of previous clients could be particularly important.

The other question mark raised is against the practice of issuing pills rather than the I.U.D. The pill has always been the main contraceptive method used, accounting for 80 per cent of the total in the last quarter of 1974, compared to 9 per cent for the I.U.D. Thus pills are used ~~nine~~ times as often as the I.U.D. It is not obvious why this should be so, as there is no evidence on clients' forms of any widespread resistance to adoption of the I.U.D., whereas very occasional comments regarding a client's preferences are reported. Indeed the practice seems to be to issue pills more or less automatically in the absence of specific objections based on high blood pressure or such like. Yet pills cost considerably more than the I.U.D.; it is more difficult in rural areas, where clients are not easily contacted and where medical facilities are scarce to check on any clients suffering from side - effects; women in rural areas are much more likely to take the pills erratically, reducing the actual effectiveness of the method in preventing pregnancies, perhaps

considerably; and it appears that nurses are just as competent as doctors in making the insertions, so that there is no staffing problem in recommending the I.U.D.⁸ In contrast the advantages of the loop, given the alarming drop-out rate mentioned, are that a positive effort on the part of the client to discontinue participation is required - the client cannot discontinue without re-attending the clinic; secondly, this second visit offers the clinic an opportunity for persuading the client not to discontinue; and thirdly, despite the lack of commitment among first visitors already mentioned, acceptance of the I.U.D. guarantees a minimum participation of two years in the absence of an earlier positive decision for removal. The effect, measured in numbers of avoided births, could be substantial.

We may now turn to consider whether there is any evidence of better performance in Vihiga-Hamisi in respect of the continuation rate. As already pointed out, the programme has not been fully operative for long enough to permit a proper evaluation of its impact; this is even more true with respect to the continuation rate, as an initial impact on the number of first visitors is presumably easier to achieve than a large number of fully-committed acceptors. Nevertheless one might have hoped for a slight differential response in favour of Vihiga-Hamisi. In fact as Table 8 shows the continuation rate there after 12 months was rather worse, 24.5 per cent compared to 31 per cent for the rest of the district. The drop-out rate after one month, 36.6 per cent compared with 30.3 per cent, was significantly worse. One would expect a better performance in Kakamega Township for reasons of clientele and of convenient access. The drop-out rate after one month is indeed significantly less in Kakamega town, 27 per cent, but it can be seen that this itself does not account for the poorer result in Vihiga-Hamisi. The explanation may be that the larger the increase in the number of acceptors, the higher the proportion of the less committed. At any rate we may conclude that the programme has so far had no impact as far as the continuation rate is concerned; but this needs to be checked by a re-calculation of continuation rates, say, early in 1976, taking a cohort of 1975 acceptors, this exercise to be repeated annually.

8. Gachuhi states that "oral contraceptives are the most problematical methods of fertility control that have been introduced to African women", loc. cit. p. 7.

The Applicability and Relevance of the Kakamega Experience for Other Districts of Kenya.

The fundamental principles of the S.R.D.P. are experimentality and replicability. Despite the acute population pressure in Vihiga-Hamisi these principles remain the justification for the allocation of disproportionate resources to the area, as a means of testing the potential returns from a more intensified approach generally to family planning. Table 9 shows that the trend attendances since 1968, when the family planning programme

Year	First Visitors	Re-Visitors	Total
1968	11.7	17.9	29.6
1969	29.8	72.9	102.6
1970	35.1	113.7	148.8
1971	41.1	138.7	179.8
1972	45.2	172.3	217.5
1973	50.1	211.3	261.4
1974	50.8	232.7	283.4

Table 9: Family Planning Attendances in Kenya, 1968-1974 (000s).

in Kenya was in its infancy, has been encouragingly upward, as in Kakamega District. At the same time there is some apparent loss of impetus over the last few years in the number of first visitors, which increased only very slightly between 1973 and 1974. The ratio of re-visitors to visitors was only just over 4:1 in 1974, confirming that the problem of drop-outs is a general one. In Vihiga-Hamisi, while the number of avoided births during the period is probably not substantial, at least in relation to the population growth rate and the seriousness of the population problem in the area, there are a number of hopeful signs, and we can perhaps say that a start has been made in difficult circumstances. The question is, how replicable is this limited initial success?

Even comparison with the rest of Kakamega District has limited significance because of the great difference in population densities between the two areas. At the same time there is a strong degree of cultural homogeneity within the District which does not hold for comparisons between different districts where tribal differences in attitudes and

District	Percentage increase in no. of acceptors 1974 over 1972	No. of acceptors in 1974	Population per sq. km. in 1969.	District	Percentage increase in no. of acceptors 1974 over 1972	No. of acceptors in 1974	Population per sq. km. in 1969.
<u>Group I</u>				<u>Group II</u>			
1. Kwale	271	293	25	11. Siaya	-29	352	151
2. Busia	257	436	119	12. Leikipia	-48	253	7
3. Uasin Gishu	152	1293	50	13. Kisumu	-52	789	192
4. Kilifi	129	821	24	<u>Group III</u>			
5. Kakamega	73	2193	220	1. Lamu	76	82	4
6. S. Nyanza	48	357	114	2. Kajjido*	52	234	4
7. Kirinyaga	46	1287	146	3. Kitui	44	199	11
8. Embu	41	1364	62	<u>Group IV</u>			
9. Bungoma	32	677	113	1. Baringo	-	141	15
10. Trans Nzoia*	16	337	50	2. Nandi	-	129	75
11. Meru	19	4328	63	3. N. Pokot	-	53	16
<u>Group II</u>				4. Isiolo	-	39	1
1. Nakuru*	3.1	1594	40	5. Narok	-	26	7
2. Kiambu	4.4	3613	184	6. Tana R.	-	18	1
3. Nyeri	4.2	3553	108	7. Marsabit	-	14	1
4. Mwangi	2.2	1308	176	8. Elgeyo Markwet*	-	8	57
5. Mombasa Is.	1.8	2735	1155	9. Samburu	-	7	3
6. Kisii	-4.3	668	304	10. Turkana	-	0	1
7. Nyandarua	-5.7	955	54	11. Garissa	-	0	4
8. Masaku/Machakos	-19	1378	6	12. Mandera	-	0	2
9. Taita	-20	237	50	13. Manjir	-	0	2
10. Kericho*	-20	570	97				

Table 10. Comparisons of Indicators for Different Districts of Kenya. * = First column shows percentage increases for 1974 over 1972.

social structure could result in very different responses. In Table 10 we have divided the Districts of Kenya into four categories. For each district is given the percentage increase in the number of acceptors in 1974 over the corresponding 1972 figure, the number of acceptors in 1974, and the population per square kilometre as at the last census.

Only limited conclusions may be drawn from such data because, of course, the intensity of the family planning effort will vary in each area. On the other hand the programme is a national one, and some facilities do exist in each area for those wishing to make use of them. The assumption behind the grouping of the table is that 'favourable' indicators of potential response to family planning efforts are a combination of a significant rate of recent increase in the number of acceptors and a reasonably large number of acceptors in the current year. The most 'favourable' districts from this point of view are given in Group I, districts which have a high rate of increase in acceptors (listed in order of this rate) and a minimum annual number of acceptors (at least 250). These are distinguished from Group II districts which also have a reasonable annual number of acceptors but as can be seen a distinctly poor rate of increase, or even a substantial decrease from 1972. The rates of increase in Group III are large, but since these had only a small number of acceptors in 1974 they are not rated as obviously favourable areas. Finally, in Group IV, we list 13 districts with an average of only 33 acceptors in 1974, four of them with no acceptors at all. All of these are largely pastoral areas with low densities of population and traditional social systems areas in which population limitation may not be urgent anyway, and interest very limited.

The main significance of the table is the division between Group I and II. Kakamega is seen to be in what could be considered on this rough basis the favourable group, comprising only 11 districts. Many districts in Group II which have a high number of acceptors (though not necessarily in relation to population) have recently shown a disappointing rate of increase of acceptors. In another sense, of course, these other areas such as Nyeri and Kiambu have performed well by maintaining a high level of acceptors over a period of several years.

Figures of population density, though not too meaningful on a district basis, are given as an additional check. It can be assumed that the economic pressure to accept family planning will be greatest in areas of higher population density. In this respect Kakamega is seen

to have one of the very highest densities, greater than Kiambu or Nyeri.

Two conclusions might be drawn from this very rough analysis. First, the experience of any one area such as Vihiga-Hamisi (the results of which are themselves uncertain) can^{be} extended directly to only a limited number of other areas because of variations in recent 'performance', population densities (economic pressures), and social and cultural differences. Second, it would appear that Kakamega is relatively favourably placed in this respect, so that we should not expect expenditures on family planning to yield particularly higher returns than those in Vihiga-Hamisi.

If the high intensity programme were to be expanded to other areas, still on a partly experimental basis, it might be sensible to select some districts from Group I (for example Kwale, Uasin Gishu and Embu), and one or two from Group II, such as Nyeri.

Implications for Calculations of the Cost of an Avoided Birth

We have mentioned that the literature on population economics seriously neglects the 'response factor' in estimating the costs and benefits of population programmes; in particular that neglect of the costs and difficulties of obtaining acceptance of birth control may dominate all other costs such as the costs of devices, and that therefore widely accepted estimates of the costs of an avoided birth in various countries, frequently put as low as 2-5, are not realistic. The foregoing long-winded attempt at evaluating the effects of^a specific local programme give strong support to this feeling.

First of all, it has been shown how difficult it is to extrapolate trends in the number of first visitors/acceptors. Hence the costs^{of} obtaining an acceptance also cannot be extrapolated. We have seen that the momentum in a particular area may be lost, and that rates of increase may vary greatly between areas. There are signs of an impact effect when facilities are made available for the first time (except on a limited scale) in a particular area. All these things provide partial evidence of the existence of some 'response function' along which the costs of obtaining acceptors will vary.

Secondly, it is extremely difficult to attribute a trend, or differences in trends, to particular family planning expenditures and programmes.

Thirdly, there are in different districts very large differences in the numbers of acceptors, absolutely and in relation to women of reproductive age, pointing to the importance of social and cultural factors affecting attitudes to family planning.

There are in addition very large localized (even intra-district) variations in population density affecting the extent of economic pressures to accept birth control. For both these reasons it is dangerous to calculate any national 'average' or 'marginal' cost of avoiding a birth.

A check was also carried out on the use of individual rural clinics. This might give some idea, for example, of the 'marginal cost' of ^{an} avoided birth obtained as a result of establishing an additional small clinic. As might be expected, the General Hospital in Kakamega town is the busiest in the district, catering in 1974 for about 6 first visitors per week. Established clinics were in 1974 dealing with about four times as many re-visitors as first visitors, so that one might estimate attendance there at around 30 visitors per week. In contrast rural clinics (i.e. clinics outside Kakamega town) averaged about 1.5 first visitors per week or slightly less. The average number of clients attended to, including re-visitors, would be approximately 7 per week. This suggests that the marginal cost of an avoided birth obtained through an additional rural clinic will be quite high, though not necessarily ^{too} high in relation to benefits: in other parts of Kenya less favourable for family planning this marginal cost may be very much higher, as new acceptors will be even more scarce and rural clinics operating at under - capacity.

Conclusions

The upward trend in the number of first visitors/acceptors in Kakamega District is encouraging, as is the differential rate of increase in this number in the 'test area' as compared to the rest of the district. The characteristics of new acceptors in Vihiga-Hamisi are not discouraging: they are not merely women with very large families already (and the proportion with smaller families seems to be increasing); or people from the older age-groups (the proportion from the younger age-groups is also increasing, especially in Vihiga-Hamisi); or women with more education.

However the continuation rates of family planning clients are catastrophic: 33 per cent never re-visit the clinic after the initial attendance. The number of avoided births achieved and the actual impact on the number of babies being born and on the size of the population is so far quite limited, no doubt, as a result. The rest area has not performed any better in this respect (if anything it has done worse) than the rest of the district. This probably reflects an inadequate effort in the area of experimenting with techniques of persuasion and a central concentration in the earlier period on the easier option of merely setting up clinics.

It is still too early to make a final judgement regarding the effectiveness of the field educator programme, but some restructuring may already be indicated.

The extent to which the Kakamega experience is replicable for other districts is highly uncertain; the probability, however, is that substantially better results would not be forthcoming elsewhere.

From the general analytical point of view we may conclude that the calculation of costs and benefits of an avoided birth for Kenya would be an extremely hazardous business, from the point of view of the response factor alone. From the point view of population policy in Kenya, the overall conclusion should be not the abandonment of the programme despite the difficulty of demonstrating a substantial impact but, first, a reformulation of the programme to attack problem of non-continuation, and second, in the face of the increasingly serious population situation, the acceptance of the hopeful indicators referred to, and of the fact that controlling population growth is likely to be a long haul, with the size of the problem becoming worse the longer the delay in coming the grips with it,