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FINAL REPORT

**THE IMPACT OF STRENGTHENING CLINIC SERVICES
AND COMMUNITY EDUCATION PROGRAMS ON
FAMILY PLANNING ACCEPTANCE IN RURAL MADAGASCAR**

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MADAGASCAR

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SUMMARY

Background: Madagascar has an emerging health infrastructure of about 2000 health clinics. While the Government of the Federal Republic of Madagascar (GFRM) and donors are planning substantial increases in family planning services in the near future, at present the Ministry of Health (MOH), with UNFPA support and FISA (the local IPPF affiliate) collaboration, offers family planning services in only 5-10% of its clinics. Initial pioneering efforts by JIRAMA (Jiro Sy Rano Madagascar -- the Water and Power Company of Madagascar) to offer family planning services in the rural areas of the Central Province, using a mobile clinic approach, demonstrated some demand for family planning services. It is generally recognized that the mobile approach has several weaknesses, and that its specific implementation in Madagascar has entailed problems. Training for collaborating MOH staff was minimal, and educational efforts were sporadic. In addition, as is usually the case with mobile programs that have high equipment, allowance, and petrol expenses, costs were relatively high.

Methodology: The present operations research (OR) study investigated the impact of alternative models, designed to rectify several deficiencies in the existing JIRAMA program, as well as on family planning acceptance, costs, and continuation rates. In two of the 20 mobile clinic sites operated by JIRAMA (designated "High Intensity" sites), a new nurse-midwife was recruited to conduct clinic education programs and deliver family planning services. Equipment and supplies were strengthened, MOH staff received training, and a small amount of resources were committed to educational activities, mostly with mothers' clubs organized among satisfied family planning users. Two other clinics, designated "Medium Intensity" sites, received the same interventions except no new staff were recruited. JIRAMA continued to operate 16 mobile sites, with improved contraceptive supply, which served as a comparison group. The impacts of these interventions were evaluated by comparing the number of family planning acceptors, client continuation rates, and costs in the various programs and time periods.

Findings: The High Intensity program enrolled 17.4 new acceptors per month compared to 12.8 in the Medium Intensity program. In comparison, the mobile program enrolled only 3.2 new

acceptors per month during the same period, about the same as all the mobile clinics prior to the interventions. Service delivery costs/new acceptor were somewhat lower in the Medium Intensity (\$4.33) than the High Intensity program (\$5.14). Both experimental programs were substantially more efficient than the mobile program (\$15.75). Continuation rates improved in both the High and Medium Intensity program clinics but deteriorated in the mobile program, perhaps partly due to the disturbed social and political climate in the latter half of 1991, which interfered with all program activities.

Recommendations: While there are uncontrolled factors in the study that deserve additional consideration and analysis, researchers recommend that JIRAMA's mobile clinics be converted to the Medium or High Intensity program, and drew possible lessons for the forthcoming expansion of the national family planning program.

SOMMAIRE

Contexte de l'étude: L'infrastructure sanitaire naissante de Madagascar compte environ 2.000 centres de santé. Malgré la volonté du gouvernement de la République Fédérale de Madagascar (GRFM) et des bailleurs de fonds qui prévoient d'augmenter substantiellement les services de planification familiale dans un proche avenir, aujourd'hui le Ministère de la Santé, soutenu dans ses efforts par le FNUAP et la FISA (affiliée à l'IPPF) ne fournit des services de planification familiale que dans 5 à 10% de ses cliniques. L'oeuvre pionnière effectuée par la JIRAMA (Compagnie des Eaux et de l'Electricité de Madagascar) qui offre des services de planification familiale dans les zones rurales de la Province Centrale par le biais d'un système de clinique mobile, a révélé l'existence d'une demande pour les services de planification familiale dont le taux de prévalence est estimé aux environs de 5 à 6% dans les deux premières années d'activité, comparé au taux national estimé entre 1 et 2% en 1989. Nonobstant cet aspect positif substantiel, le système de la clinique mobile présente plusieurs faiblesses que tout le monde lui reconnaît ; à Madagascar les problèmes soulevés par sa mise en oeuvre surtout font l'unanimité. A titre d'exemple, aucun effort n'a été fait par la JIRAMA pour renforcer le personnel déjà trop sollicité dans les cliniques publiques de SMI au moment de démarrer ses activités de planification familiale ; elle a également connu des ruptures de stock de contraceptifs et de matériel au cours des deux premières années. Le niveau de formation du personnel d'assistance du Ministère de la Santé était minimal et les efforts didactiques sporadiques. Comme c'est le cas également avec les programmes mobiles effectuant de grosses dépenses en matériel, indemnités et carburant, les coûts ont été relativement élevés.

Méthodologie: La présente étude de Recherche Opérationnelle (RO) se propose d'examiner l'impact que quelques modèles alternatifs auront sur l'acceptation, les coûts et les taux de continuation des méthodes contraceptives, l'objectif de ces modèles étant de corriger un certain nombre d'insuffisances de l'actuel programme de la JIRAMA. Dans deux des vingt sites de prestation des services mobiles gérés par la JIRAMA (appelés sites de "Forte Intensité") une nouvelle sage-femme/infirmière a été recrutée pour l'exécution des programmes d'éducation sanitaire et la prestation de services de planification familiale. La dotation en équipement et en

matériel a été accrue, le personnel sanitaire du Ministère a été formé, et une petite partie des fonds a été allouée aux activités éducatives, surtout aux associations des mères composées d'utilisatrices satisfaites des méthodes de planification familiale. Deux autres cliniques, appelées site de "Moyenne Intensité" ont bénéficié des mêmes avantages, à l'exception du recrutement d'un nouveau personnel. La JIRAMA a continué de gérer 16 cliniques mobiles avec un stock de méthodes contraceptives mieux fourni pour servir de groupe témoin. Les répercussions de ces interventions ont été évaluées en comparant entre eux les chiffres relatifs au nombre d'acceptrices, le taux de continuation des clientes et les coûts des méthodes de planification familiale dans les divers programmes et au cours des différentes périodes.

Résultats: Le programme de Forte Intensité a recruté 17,4 nouvelles acceptrices par mois comparé au 12,8 enregistré par le programme de Moyenne Intensité. A côté de ces deux programmes, la clinique mobile n'a enregistré que 3,2 nouvelles acceptrices par mois au cours de la même période, environ la même chose que toutes les cliniques mobiles avant les interventions. Les coûts de prestation de services pour chaque nouvelle acceptrice ont été quelque peu plus faibles dans les programmes de Moyenne Intensité (4,33 dollars U.S.) que dans ceux de Forte Intensité (5,14 dollars U.S.). Ces deux programmes expérimentaux ont substantiellement eu un meilleur rendement que le programme de la clinique mobile (15,75 dollars U.S.). Les taux de continuation ont été en hausse dans les deux programmes (Forte Intensité et Moyenne Intensité), par contre dans le programme de clinique mobile ils ont chuté, peut-être est-ce dû en partie à l'agitation socio-politique du deuxième semestre de 1991 qui a gêné toutes les activités du programme.

Recommandations: Bien qu'il y ait dans l'étude des facteurs qu'on ne maîtrise pas et qui méritent davantage de considération et d'analyse, les chercheurs recommandent une reconversion des cliniques mobiles de la JIRAMA en programmes de Forte Intensité et Moyenne Intensité, et une évaluation des résultats pour l'extension prochaine du programme national de planification familiale.

BACKGROUND

Madagascar is a large island nation located off the Southeast Coast of Africa which has been classified by the United Nations as one of the 20 least developed nations of the world. As is usual for least-developed countries, it has a predominantly agricultural based economy (more than 80% rural population), low and deteriorating per capita income (US \$230), low life expectancy (53/56 male/female), high infant mortality (115/1,000), and high fertility rate (6.6/woman).¹ The present population is estimated at approximately 11 million, and is variously estimated to be growing between 2.7 to 3% per year.²

In recent years there has been increasing interest in family planning programs. To date, however, the availability of services is very limited. Although the MOH operates approximately 2000 health clinics throughout the country, family planning services are offered in only 5-10% of its clinics, through support from UNFPA and with FISA (the local IPPF affiliate) collaboration. The majority of remaining MOH clinics provide only individual counseling to women interested in family planning; even in those clinics where some supplies and services are available, there is some indication that they may be reserved for "high risk" clients (classified by age and number of children), with all other interested women referred to private sector services.³

Family planning supplies are periodically stocked in private pharmacies in Madagascar. However, their availability has depended upon Madagascar's hard currency position, and supplies were absent from the market in 1986 and 1987. Pharmacies also charge high prices, thereby precluding this source of supply for the vast majority of the population.

It has been estimated that 45% of eligible women in the capital city of Antananarivo have ever practiced family planning and 15% have ever used effective methods.⁴ However, the proportion of eligible women nationally practicing modern contraception in 1982 was estimated to be only 1% and was perhaps 2% in 1989.

In 1987, in the context of very limited access to family planning services in rural areas, the Power and Water Company of Madagascar (JIRAMA), an innovative parastatal organization, organized a "mobile clinic" program with UNFPA support to serve the needs of both JIRAMA employees and the general population in selected rural areas of the Central Province. The

program introduced family planning education, clinic supplies, and services to 20 government-operated MCH clinics. A mobile family planning team composed of JIRAMA staff visited each clinic on a monthly basis, with the visits organized along three geographic routes (see map, Appendix 1). During the visits, the team brought contraceptive supplies, provided supervision, and collected records. The limited objectives of this program were to provide family planning services to 1500 women as well as to vaccinate 825 children against communicable diseases. By 1989, the program had achieved 2300 acceptors and more than 1700 continuing users of family planning--using mostly injectable and oral contraceptives. However, the program experienced shortages of supplies and was unable to meet all of the requests for services. For several months prior to this study, the clinic staff turned away new requests for family planning services in order to save dwindling supplies of contraceptives for continuing users.

The JIRAMA program's experiences suggest that some rural demand for family planning services exists in Madagascar, but the extent of the demand has been difficult to quantify in the face of weak service delivery. In view of Madagascar's demographic pressures, development needs, and deteriorating environmental conditions caused by heavy pressure on forests for firewood and subsequent erosion, the Government of the Federal Republic of Madagascar (GFRM), with substantial donor support, is now planning to greatly expand its family planning program. Issues undertaken in this OR study relate to the extent of rural demand for family planning, the intensity of the program effort to be undertaken, and alternative models for delivering services. In the present context these issues are timely and may contribute to future planning by JIRAMA, the GFRM, and the donor community.

OBJECTIVES AND HYPOTHESES

The ultimate objectives of the study included the reduction of morbidity, mortality, and fertility among the population living in the geographic vicinity of the study clinics. The immediate objectives were to conduct a study in four "intensified" rural clinics of the Central Province of Madagascar to determine the relative effectiveness and cost of recruiting and maintaining new family planning clients in clinic programs of varying intensity, compared to a mobile clinic model operating in 16 sites in the same general area.

The study tested three hypotheses:

- after a 15-month period, the "High Intensity" program will show a statistically and programmatically significant increase in the average number of new family planning clients recruited per month, and in the number of new clients who continue with a contraceptive method for at least six months, compared with these same measures during the 12-month period preceding the intensive program, and compared against the experience of the mobile clinic program during the same 15-month period;
- after a 15-month period, the "Medium Intensity" program will show a larger number of clients recruited and sustained than the Mobile program, but less than the more intensive program;
- the unit cost to recruit one new family planning client in the "Medium Intensity" program will be less than the Mobile program but higher than the "High Intensity" program.

METHODOLOGY

The operations research study employed a time series quasi-experimental design to compare the impact of two different levels of intensification (designated "High" and "Medium") against a comparison group of mobile clinics. Comparisons were made between the three programs (High, Medium, and Mobile) at two different time periods (before and after the start of the interventions).

The "High Intensity" program consisted of providing a nurse-midwife, training for MOH staff, equipment, resources for educational programs (mostly mothers' clubs), and monthly supervision. The responsibilities of the nurse-midwives included:

- conducting education programs in the MCH clinics, especially with the large number of clients who utilize the curative and immunization services;
- providing family planning services in the clinic;
- organizing and supervising volunteer support for family planning, and general improved health behavior among satisfied family planning users, community leaders, and mothers' clubs;
- organizing and conducting public information and education in the market on market days.

Additionally, in this program MOH clinic staff received five days of orientation and training about family planning, their potential contribution to the program, and the expected increased program effort. Some clinic equipment was supplied by funds from the study budget; contraceptive supplies were provided by UNFPA at a much increased level, both for these sites and the other 16 mobile clinic sites. Staff were supervised and were provided with limited in-service training by the Project Coordinator/Trainer and the chief Nurse Supervisor/Trainer on a monthly basis.

The "Medium Intensity" program was similar to the High Intensity program, providing training, equipment, resources for education, and supervision. However, no additional nurse-midwives were supplied to these clinics.

The "Mobile" program provided family planning services through monthly visits by a traveling team to 16 MOH clinics. This was a continuation of the earlier program, which operated in the 20 sites during the previous two years. However, during the comparison period of the study, the supply of contraceptives was increased substantially.

Data on family planning acceptance, resupply, date of discontinuation, age, parity, and other standard clinic record features were maintained in a new clinic register introduced in the four experimental clinics. Similar records were kept at the mobile sites. All records were collected monthly and transferred to *Epi Info* files at JIRAMA headquarters.

STUDY LOCATIONS

The High Intensity clinics, located in the Central Province (see map, Appendix 1), are Analavory and Miarinarivo. Analavory, situated 120 km west of Antananarivo, is on the main road to Tsiroanomandidy (Highway 1), at the crossroad of Highway 43. The population was estimated by the Ministry of Interior at 36,000 in 1987. The town borders a beautiful lake which attracts some visitors, and supports a small fishing industry. Analavory has a weekly market which is frequented by residents of the surrounding areas. The MCH/FP clinic is located in a small, district hospital, employing one physician and three midwives. In the mobile program, between December 1987 and March 1989, there were 66 family planning acceptors and 44 continuing users recruited at this site.

Miarinarivo is 96 km west of Antananarivo, off the main highway, in a hilly area at an elevation of 1340 meters. The population was estimated at 8,600 in 1987. The family planning clinic is a MCH/FP center, employing one physician and one midwife. This clinic had 107 acceptors and 79 continuing users in the earlier mobile program.

The Medium Intensity clinics, also located in the Central Province, are Mantasoa and Manjakandriana. Mantasoa, located 60 km from Antananarivo, is a small town with a population of 8200, approximately 15 km off the main road. Mantasoa also contains a small lake which attracts some tourists. It is not a commercial center.

Manjakandriana is a town with a population estimated at 20,300, located 45 km from Antananarivo. Manjakandriana is situated on a national road and also has a train service. The town serves as a trade center for the surrounding areas.

In addition to the general socio-geographical differences between experimental sites described above, there were several uncontrolled differences, especially with regard to the experience and orientation toward family planning of clinic staff. These differences are probably important in influencing program success and argue for caution in interpreting the results. The Miarinarivo clinic has a highly experienced female physician, an ex-employee of JIRAMA, who has provided substantial support for family planning activities. The clinic was also provided a somewhat dynamic nurse-midwife for the program, who previously worked for JIRAMA. This nurse-midwife frequently traveled by taxi and motorcycle to conduct IEC activities as far as 30 km from the clinic, and demonstrated initiative in planning and scheduling her activities.

In contrast, Analavory, the other High Intensity site, was provided a nurse-midwife with little experience in family planning, having worked previously in leprosy control. She demonstrated little initiative, spoke frequently about problems, had poor rapport with other clinic staff, was reluctant to conduct field trips for IEC without a chaperon, and complained that women in the community did not listen to her.

The Medium Intensity sites also had substantial differences. Manjakandriana had a female physician who previously worked for both JIRAMA and FISA (the IPPF affiliate). She was highly motivated, experienced, and supportive of family planning. In contrast, the Mantasoa environment was influenced by a male physician, with health problems, who had a variety of difficulties providing concrete assistance or support for program activities. In 1991, a second physician was added to this clinic staff. However, while she was more highly motivated, she was newly graduated, inexperienced, and therefore did not have a strong influence on the program.

The 16 mobile clinic sites (also located in the Central Province) represent roughly the same range of characteristics as the four experimental sites.

FINDINGS

Number of new family planning clients recruited/month

As can be noted in Table 1, both the High and Medium Intensity programs dramatically increased the number of new family planning acceptors recruited per month. Also, both programs recruited substantially more new acceptors per month than the Mobile program which showed little improvement in the two periods. Combined, the two High Intensity sites enrolled a mean of 17.4 new acceptors per month compared to 12.8 in the Medium Intensity sites. Despite this difference, the percentage change in the mean number of new family planning acceptors per month over the study period was approximately the same for both the High and Medium Intensity programs. As shown in Table 1, this was around 4-4.5%.

The Mobile program enrolled a mean of 3.3 new acceptors per month during the same 15-month period, which approximates to the monthly average of 3.1 achieved by all the mobile clinics prior to the interventions. Figure 1 provides a graphic illustration of the relative effectiveness of each program in recruiting new clients both before and after the interventions. All programs declined somewhat in the third and fourth quarters of 1991. This is most likely a result of the social and political disturbances, including strikes, experienced throughout the country during that period.

Figure 1: Number of new FP clients per quarter in Jirama clinics before and after interventions

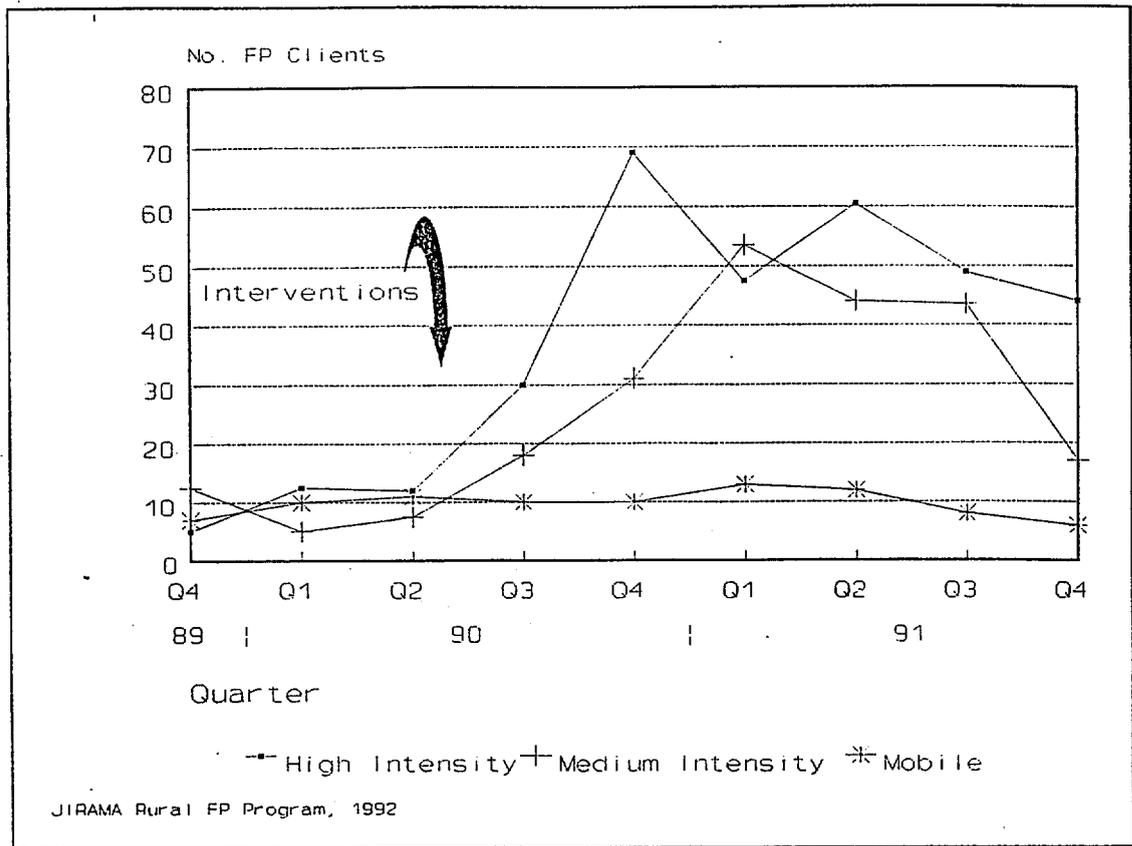


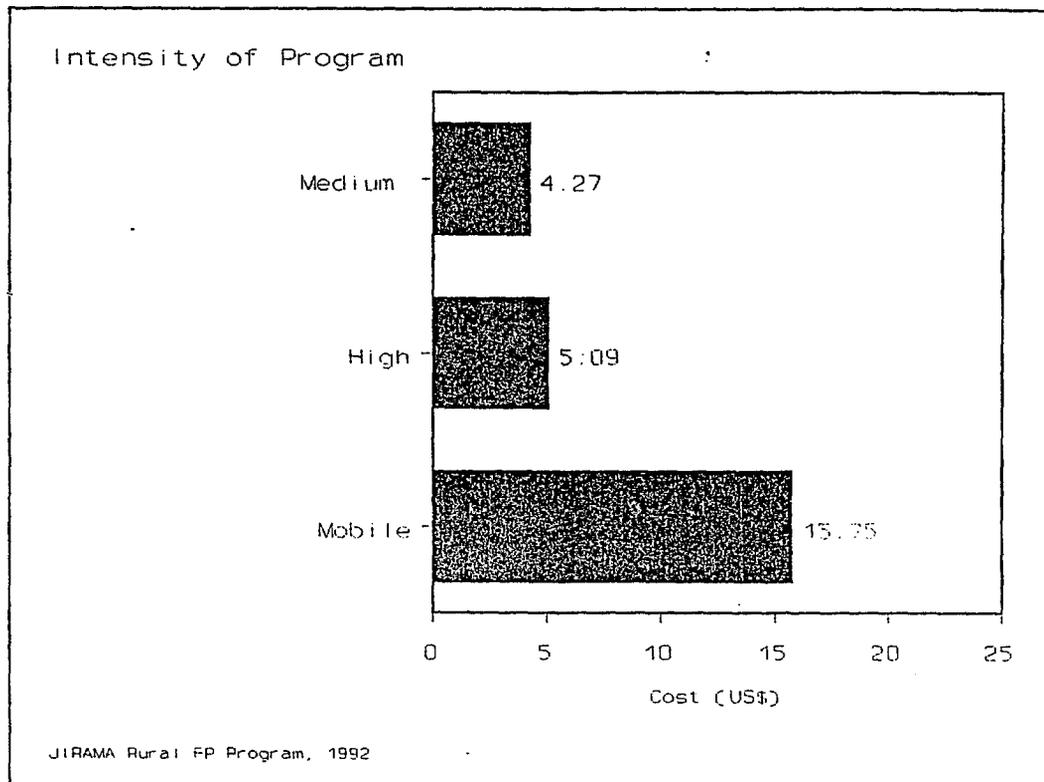
Table 1: Mean Number of New Family Planning Clients by Study Site and Period recruited per month

Study Period	High Intensity Mean	Medium Intensity Mean	Mobile (control) Mean
Before	4.2 %	2.9 %	3.1 %
After	17.4 %	12.8 %	3.3 %
Percentage changes	4.1 %	4.4 %	1.1 %

Cost of recruiting new family planning clients

An estimate of service delivery costs per new client for each of the three programs is presented in Figure 2 and Table 2.

Figure 2: *Estimated service delivery costs/new family planning acceptor by program*



Allocating half of the service delivery costs for recruiting new clients, and with the other assumptions listed in Table 2, the service delivery costs (excluding the cost of donated contraceptives) were \$5.09 in the High Intensity sites, \$4.27 in the Medium Intensity program and \$15.75 in the Mobile program. The higher costs in the Mobile program result from the amortized cost of the expensive vehicle, and substantial allowances to the mobile staff who traveled nearly 25 days per month. While the High Intensity program recruited more clients (in accord with hypothesis 1), the Medium Intensity program operated with greater efficiency in recruiting new client (contrary to hypothesis 3). The High and Medium Intensity programs recruited many more clients, 973 in the 15 months for the 4 clinics compared to 767 for the 16

clinics in the Mobile program. This was achieved at a substantially lower cost per client, as shown in Table 2 and Figure 2.

Table 2: Estimated Service Delivery Costs/New Acceptor (in US\$) by Intensity of Experimental Program¹

Cost Categories	Intensity of Program		
	High	Medium	Mobile
Staff ²	2,140	880	5,854
Supplies/Equipment ^{3,4}	145	109	2,625
Allowances	181	108	3,300
Petrol ⁵	33	33	300
IEC ⁶	508	508	---
TOTAL EST. COSTS	\$3,007	\$1,638	\$12,079
(Total New Clients) ⁷	590/2	383/2	767/16
Est. Cost/New Client	\$5.09	\$4.27	\$15.75

¹ It is assumed that staff time spent for recruitment of a new client is substantially longer than for serving continuing users returning for resupply and that there are a larger number of continuing than new users. For comparative purposes, and for convenience, service delivery costs were estimated and allocated half for services to continuing clients and half for new clients.

² The High Intensity program staff costs include the nurse-midwives hired for the 15-month study period, and an estimated 20 percent of MOH clinic personnel costs for the two clinics, and 15 percent of the time of the chief nurse-supervisor. Medium Intensity clinic staff costs include only the estimated MOH personnel costs (20 percent) and 15 percent of the chief nurse-midwife's time. The Mobile program costs are based on an estimated 5 percent of MOH personnel costs at the 16 clinics, plus the JIRAMA mobile staff costs minus 30 percent of the chief nurse-midwife allocated to the other programs.

³ Supplies (excluding the cost of donated contraceptives) were allocated fully to the 15-month study period.

⁴ Equipment costs to the High and Medium program clinics are amortized over a five-year life and computed for the 15-month study period. The vehicle for the Mobile program, which was expensive in Madagascar, was amortized over a seven-year life expectancy.

⁵ About 80 percent of the petrol costs of the Mobile program were charged to the program, while the High and Medium Intensity programs were charged 10 percent each for supervision by the mobile team.

⁶ Most of the IEC costs for the High and Medium Intensity programs covered supplies for mothers' clubs.

⁷ The total figure of new clients during the study period (15 months) for the High and Medium Intensity programs cover two clinics each, while that for the mobile program represents 16 clinics.

Continuation rates

As shown in Table 3, the Medium Intensity program obtained the highest 12-month continuation rate (contrary to hypothesis 1), while both the intensified programs achieved higher continuation rates than the Mobile program.

Table 3: Continuation rates for the Three Study Areas Before and After Interventions of 12 months

Program Intensity	Before Intervention	After Intervention
High Intensity	71.9 %	74.7 %
Medium Intensity	61.5 %	78.8 %
Mobile (control)	62.4 %	21.9 %

For the study areas the relative increase in continuation rates after the intervention can be noted. The increase for the area of medium intensity appears significant: 17.3% (compare to 2.8 for the high intensity and -40.5 for the mobile approach), but an associated explanation is problematic as the interaction of the intervention cannot be isolated. Staff motivation seems to be the key of program success; in one of the two medium intensity sites at Manjakandriana the staff was highly motivated and thus performed at the same level as the staff at the high intensity sites, who were recruited for family planning services only. The control area covered by the mobile clinic only showed a dramatic increase in discontinuation rates. The control sites were affected to a greater degree by civil disturbances than the experimental sites.

CONCLUSIONS

Both the High and Medium Intensity programs were effective in recruiting a substantial number of clients in a cost-effective manner. In fact, the service delivery costs appear unusually low in both experimental programs. The low costs reflect both the relative success of the programs and the generally low salary levels in Madagascar. In trying to bring the cost analysis in line with more standardized approaches, there is no change to the overall finding that the Mobile program model is much more expensive per new family planning acceptor than the other two models.

The High Intensity program recruited more clients but at a slightly higher cost than the Medium Intensity program. Also, both programs achieved comparatively good continuation rates in comparison both to the Mobile program, and to family planning programs in other sub-Saharan African countries. Both experimental programs exceeded the Mobile program in terms of effectiveness, cost, and continuation.

PROGRAM IMPLICATIONS

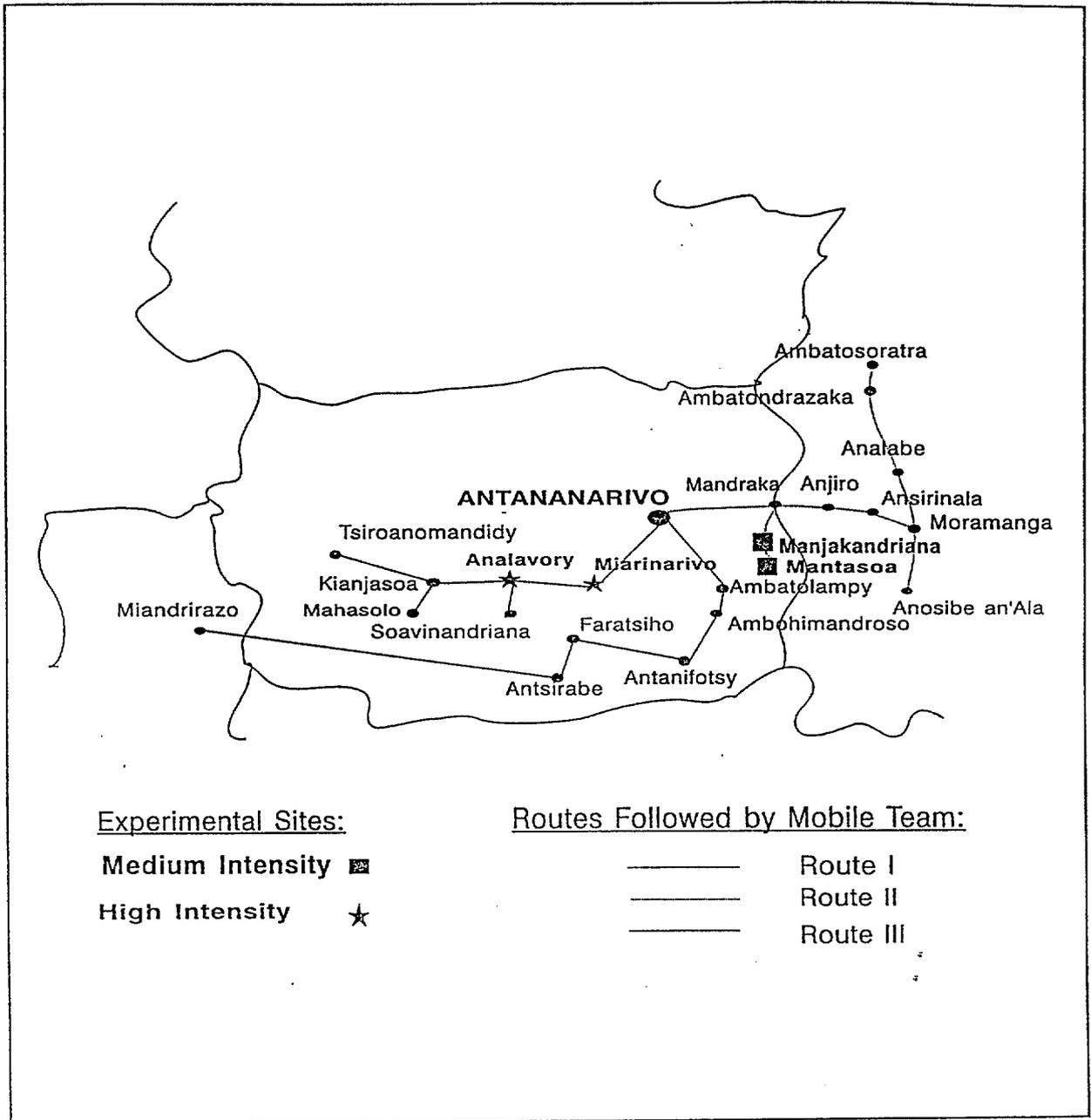
These results suggest that JIRAMA's continuing mobile program should be converted to a program more like one of the experimental models--either Medium or High Intensity, depending on the site locations, resources available, and specific program objectives. With its highly experienced mobile team of trainers and supervisors, JIRAMA is well positioned to make this conversion. Indeed, JIRAMA reports that the mobile team is already shifting responsibilities from service delivery to training activities.

Both the number of uncontrolled variables in the quasi-experiment, especially varying levels of support and experience between clinics, suggest caution in applying the results more widely at this time. Nevertheless, it appears that the results of this study may contain implications for the design of a national family planning program. The study results and analysis to date support the contention that substantial demand exists for family planning services in rural areas, and that the response of the population is a function of the intensity and quality of services offered.

Sound arguments could be made for recommending the expansion of either the High or Medium Intensity program model. Expansion of the High Intensity model would be likely to hasten the adoption of family planning in Madagascar. However, expansion of the Medium Intensity program may prove more efficient. Perhaps both models have a place in a national program in Madagascar, depending on the size, location, transport pattern, staffing and other features of service delivery sites. It would seem reasonable to place emphasis on training, supervision, and supplies (Medium Intensity program) in smaller and more isolated areas, and consider adding additional staff (or rearranging responsibilities of existing staff) to manage family planning services and provide community education (High Intensity program) in larger population centers.

Staff of The Population Council and JIRAMA are planning to continue monitoring these experimental and Mobile sites, and to facilitate the shift from a mobile program to a more efficient and effective fixed site model. Civil disturbances have severely affected this experience during the period following the end of the study.

Appendix 1. Project Area in Central Province, Madagascar



NOTES AND REFERENCES

1. Carl Haub and Machiko Yanagishita, 1992 World Population Data Sheet (Washington, D.C. Population Reference Bureau, inc., April 1992).
2. See for example, Madagascar Rapid II Analysis, draft, USAID, 1986; Ferguson-Bisson, D. et al., Madagascar: Population and Family Health Assessment, USAID, May 13-31, 1985; and UNICEF, Vohipeno Integrated Child Survival and Development Program, UNICEF, Undated (1986?).
3. Adamchak, S., and J. Lecomte, Madagascar Population and Family Health Assessment, USAID, February, 1988.
4. Ibid.