— PN-AAY-960

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OPERATIONS RESEARCH PROJECT EXPERIENCE

The Zaire Family Planning Project

Paper Prepared for the International Workshop on Cost-Effectiveness Analysis and Cost-Benefit Analysis in Family Planning Programs

August 17-20, 1981

St. Michaels, Maryland

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I. An Overview of the Zaire Family Planning Operations Research Project

This is a three-year collaborative project between Tulane University and the Communaute´Baptiste de Zaire Ouest (CBZO), funded by the Research Division, Office of Population, USAID. Key personnel include Dr. Jane Bertrand of Tulane University as principal investigator, and Dr. Nlandu Mangani, Director of a small CBZO-affiliated hospital, who is the in-country project director. In addition, Johns Hopkins University is providing technical assistance to the project with respect to health interventions and cost effectiveness analysis.

The goals of the project are to improve the health of women in reproductive age in a selected area of Bas Zaire by promoting the greater use of contraceptives, and to improve the health status of children under five by providing certain preventive and curative measures for malaria, intestinal worms and diarrhea-related dehydration.

Specific objectives, against which the project will be evaluated, include the following:

1. To increase knowledge of modern contraceptives among women of reproductive age in the target population;

2. To promote a more favorable attitude toward family planning (FP);

3. To increase the use of modern contraceptives in the target population;

4. To decrease the desired number of births among women of reproductive age;

5. To increase the percentage of children under five in the target population that receive:

   (a) treatment for malaria;

   (b) oral rehydration for diarrhea;

   (c) anti-helminthic drugs for intestinal worms.

The project will be carried out in the region of Bas Zaire (Republic of Zaire) in both an urban and rural area: the city of Matadi (estimated population of 300,000) and the neighboring zone of Songololo (estimated population to be covered: 25,000).

The project is designed to test the relative impact and the cost-effectiveness of two alternative strategies for achieving the objectives of the project. Both the urban and rural areas will be subdivided into an experimental and a comparison area, to receive the following interventions:

Experimental:	Home visits to all eligible women, including an initial free sample of contraceptives.
	A series of group meetings on health and FP topics at the community level.
	Supplying of local health posts with contraceptives and drugs for children under five.
Comparison:	Supplying of local health posts with contraceptives and drugs for children under five (no educational or promotional activities).

To measure whether the project objectives are achieved and to determine the relative cost-effectiveness of the two approaches used, three types of data analysis will be performed:

Analysis of Survey Data. A baseline survey in both the urban and rural areas is being carried out prior to the initiation of service activities; a followup survey will then be conducted after the service component has been in operation for 18 months. Comparison of the two data sets will indicate the extent to which the above-specified objectives have been achieved. In particular, it will measure the additional effect (if any) of the full outreach program (in the experimental area) in comparison to simply making the contraceptives available (in the comparison area).

Analysis of Service Statistics. Throughout the lifetime of the project, service statistics will be kept regarding number of home visitors, quantities of contraceptives and drugs sold during the home visits and at the health posts, number of new FP acceptors, number of children under five consulting at the health posts for three specific conditions, and so forth. These data will be analysed periodically by project staff, both as a managerial tool and as a mechanism for evaluating the ongoing program activities.

Cost-effective Analysis. In addition to the survey data and service statistics, certain information on program inputs (e.g., staff time, per diem expenditures, purchase of equipment and supplies, expenditures for fuel and vehicle maintenance, etc.) is being routinely collected. These data will eventually be analysed in connection with the data from the two surveys and with the routinely collected service statistics to indicate the relative cost-effectiveness of the two approaches used and the actual costs involved in obtaining these outcomes. Technical assistance for this part of the project is being provided by Johns Hopkins University.

II. Current Status of the Project

This project began in October 1980 and is now almost one year old.

The design of the project calls for a baseline survey before the implementation of services, a service program which then runs for eighteen months, and a follow-up survey in both the urban and rural areas. For convenience, the

schedule of activities for the two areas is staggered such that there is a five-month lag between the rural and urban area in the initiation of each activity.

As of August 1981, the data collection for the survey in the rural area has been completed, as well as approximately 15 percent of the data collection in the urban area. As such, the service program can now be initiated in the rural area, and this is expected to happen during Dr. Maria Wawer's (consultant from John's Hopkins University) trip to Zaire in early August, 1981. Services are scheduled to begin in the urban area at the close of 1981.

Given that the program is just beginning, there are no results to present with respect to cost effectiveness. However, the forms to be used for the routine collection of service statistics and for an estimation of inputs into the program have been designed for use in the project.

III. Forms to be Used to Collect Service Statistics and Data on Program Inputs

Forewarned of the problem of trying to retrospectively collect the necessary data with which to carry out cost effective analysis, the principals on this project have attempted to design a system which is to be implemented from the onset of the service program, which will yield the data ultimately necessary for the cost effectiveness analysis. These forms, prepared by members of the Johns Hopkins staff in collaboration with the principal investigator from Tulane, have yet to be field tested. However, they are presented in Appendix A, as an example of a system which is believed to provide the necessary information and at the same time to be practical in terms of day-to-day use.

The series includes 11 different forms, to be filled out by different individuals on the project staff. A list of the forms (in French), as well as the data they contain, the period which they cover, and the person responsible for completing them, is included at the beginning of Appendix A. This list is followed by the forms themselves. The use of the data from these forms for cost effectiveness analysis is outlined in Appendix B.

It should be mentioned that the test of these forms in the Bas Zaire project may not be truly generalizable to other projects, even in Zaire. The biasing factor is the project director, Dr. Nlandu Mangani, who likes running a tight ship (to the extent that conditions permit in Zaire) and actually welcomes some of these forms as a means of controlling the distribution of products, the flow of funds, the activities of the personnel, etc. Morevoer, he likes the idea of the project having this innovative aspect (which it is in the Zairian context) and seems willing to invest the time and effort of his staff in seeing it carried out. It is questionable whether this attitude could be considered typical.

IV. Anticipated Use of the Data to be Collected With the Set of Forms

The data collected from these forms will have three principal uses: as a managerial tool, as an evaluative mechanism, and as a basis for the eventual cost effectiveness analysis.

1. Managerial. The forms (#1, #2, and #3) report the daily activity of the team of outreach workers in terms of the number of home visits and group meetings carried out, as well as time devoted to other activities such as travel, time spent discussing the program with chiefs and other leaders, time lost to avoidable delays (vehicle breakdown), etc. If these reports are kept up to date, it will be possible to access the overall level of activity of the group, the relative productivity of individual members, and increases or decreases in the level of activity during the lifetime of the project. These data should prove useful in more effectively supervising this group of personnel.

Likewise, the forms to be filled out at the health posts (#5 and #6) will provide data on the relative acceptability of contraceptives in the different villages and areas where they will be offered. While service statistics don't tell the whole story, they should indicate trouble spots where the program is not progressing as expected and is in need of special attention. While all posts should receive a minimum level of supervision, additional attention can be given to those deemed most in need of it.

Forms 8 and 9 provide necessary information regarding program input (training and vehicle use) as explained in Appendix B.

Finally, the forms 4, 6, 10 and 11 will be useful, simply to handle the logistics of multiple products being distributed to multiple distribution points. It is hoped that by having a well established accounting procedure for handling the distribution of products and flow of funds, that this will help to cut down on irregularities in the financial management of the program.

2. Evaluative. The service statistics will provide an indication early in the project regarding the degree to which the target population accepts contraceptives and the trends which occur in contraceptive use over the lifetime of the project. Whereas the baseline and follow-up surveys will measure the impact of the program after an 18 month period, the service statistics will give more immediate, continuous feedback such that adjustments or modifications can be made in midstream as necessary (without altering the basic design of the project and research).

Data from the baseline/follow-up surveys and from the service statistics will indicate the extent to which members of the target population adopt modern contraceptives when they are made readily available at low cost. In a preliminary analysis of the data from the rural baseline survey, a surprisingly high percentage of women interviewed (53 percent) claimed to be using some type of traditional method (abstinence, withdrawal, a traditional belt, or rhythm) of fertility control, in comparison to approximately 3 percent who were using a modern contraceptive method. One of the key aspects from this research will be to determine whether and to what extent these women switch to modern methods of contraceptives when they become available.

Cost Effectiveness. Results from the cost effectiveness analysis will complement the above-mentioned data on the acceptability of modern contraceptives among this population and will provide data for decision making regarding future FP projects in Zaire. First, it will provide an estimation of cost per new acceptor, cost per "couple year of protection," and other indicators of cost per unit of output. This information is of interest to donor agencies and other international organizations that are considering the initiation of other FP projects in this region, as well as to the government of Zaire if it should decide to take a more active role in promoting family planning.

Second, this analysis will indicate the relative cost effectiveness of the two approaches being tested: supplying the health post as well as extensive outreach work versus simply supplying the health posts. While it is expected that the supply-plus-outreach will result in greater contraceptive use, the question remains as to which is more cost effective. If the supply-plus-outreach produces only a slightly higher increase in contraceptive use than supplying alone, yet it costs several times as much to achieve, then the supplying alone might emerge as the more cost effective alternative. By contrast, the results could indicate that the supply-alone strategy is low cost but also ineffective; that to get a substantial increase in contraceptive use, it is necessary to pay the higher price of the full program including outreach work.

Finally, it will be useful to compare cost data from this project with cost data from another project now being initiated in rural areas of Zaire, in which FP services are to be offered as part of a larger MCH program, including environmental sanitation. Given that FP services have not been readily available in most parts of Zaire in the past, and that a new initiative is now developing for the expansion of these services, it will be useful to test different models of service delivery, and in particular, to have concrete cost estimates for different strategies.

APPENDIX A

Forms for Collecting Service Statistics and Data on Program Inputs for the Zaire Family Planning Project

(in French)

Nbre.	Activités Couvertes	Période couverte	Complétée par	Données concernant l'investissement	Données consequentes	Information D'approvisionnement (stock)
1	visites à domicile	1 jour	visiteuses à domicile	approvisionnement	distribution, nbre de ménages visités, référés	
2	visites à domicile	1 mois	superviseur	approvisionnement	distribution, nbre de ménages visités, référés	
3	visites à domicile/ & meetings de groupes & formation	1 mois, journellement	superviseur	temps alloué, distribution dans les meetings de groupes	nbre d'assistants dans les meetings de groupes	
4	visiteuses à domicile - information d'approvisionnement	1 mois	superviseur	approvisionnement	distribution	flots d'approvisionnement et stocks de groupes de visiteurs à domicile, y compris coupons
5	hôpital/dispensaire distribution	1 mois, journellement	infirmiers, docteur au dispensaire ou clinique	approvisionnement	distribution	
6	hopital/dispensaire: information d'approvisionnement	1 mois	infirmiers, docteur en charge de l'inventaire	approvisionnement	distribution	flots d'approvisionnement et stocks de dispensaire et hôpital

Nbre.	Activité Couverte	Période Couverte	Complétée par	Données Investies	Données Conséquentes	Information d'approvisionnement	Commentaires
7	dispensaire & hôpital: DIU, Depo, Sterl.	1 mois	dispensaire/manager d'hôpital	activitée	DIU, sterl., Depo. Injection de villages		seront résumés du registre
8	formation	1 session	formateur en charge de la session	temps alloué:personnel (formateurs et stagiaires et autre) matériel et equipement, autre, par jour	nbre de stagiaires		
9	Général: transportation	1 mois, journellement	le chauffeur				seront alloués pour le coûts des différentes activités
10	Général: inventaire central	1 mois, journellement	en charge de stock (Dr. Mangani)			entrées et sorties chronologiques du stock central	seront résumés pour la forme No. 11
11	Général: information d'approvisionnement	1 mois	en charge de stock (Dr. Mangani)			flots de stock: vers et des dispensaires, hôpital et visiteurs a domicile, valeur des ventes pour chaque unité	

FORMULAIRE NO. 1

RAPPORT JOURNALIER DES VISITES A DOMICILE A REMPLIR PAR LES VISITEURES A DOMICILE

Nom - visiteuse _____ Date _____ Village ou Section: _____

		enfants à l'age prescolaire							Femmes éligibles												
													Nbre. qui accepte				Nombre référé pour				
No. de Maison	Nom de la personne fournissant l'information*	Nbre. d'enfant à l'age prescolaire	Enfants qui ont la diarrhée	Nbre. paquets oralyte vendu	Nbre. d'enfants diagnostiqué avec malaria	Nbre. de tablettes de chloroquines vendues	Nbre. d'enfants avec vers intestinaux	Nbre. de tablettes de mebendazole vendues	Nbre. de tablettes d'aspirine vendues	Nbre. de femmes éligibles de 15-49 ans qui vivent	Nbre. de femmes éligibles présentes	Nbre. employant déjà un contraceptif moderne	Quelle méthode moderne est employée?	Aucun contraceptif	Pilules	Mousse	Preservatifs	DIU	Stérilisation	Injection-Depo.	Autre	Commentaires et observations
TOTAL	#visites:																				
	prix par unite																				
	valeur des ventes																				

Codes:
P=Pilules
M=Mousse
Pr=Preservatifs
D=DIU
S=Sterilisation
A=Autre

*status de la visite:
I=Inhabité
P=Personne à la maison
R=Refus

ventes totales [ ]

* = elle déjà utilise la methode

Formulaire No. 2

Zone: ☐ urbane ☐ rurale

Résumé Mensuel des Visiteuses a Domicile

Forme complétée par _____

Mois _____

	Visiteur 1	Visiteur 2	Visiteur 3	Visiteur 4	Visiteur 5	Total par équipe
Nbre. de domiciles où on a essayé de visiter:						
Nbre. de domiciles où on a réalisé une visite:						
Nbre. d'enfants pré-scolaires:						
Nbre. d'enfants qui avait la diarrhée:						
Nbre. de paquets d'oralyte achetés:						
Nbre. d'enfants diagnostiqués avec la malaria:						
Nbre. de tablettes de chloroquine achetées:						
Nbre. d'enfants avec des vers intestinaux:						
Nbre. de tablettes de mebendazole achetées:						
Nbre. de tablettes d'aspirines achetées:						
Nbre. de femmes eligibles de 15-49, visitées:						
Nbre. employant deja des contraceptifs:						
Nbre. de femmes qui acceptent:						
Rien						
Pilules						
Mousse						
Préservatifs						
Nbre. référé (nbre. de coupons distribués):						
Insertion DIU						
Stérilisation						
Injection Depo						

Signature: _____

FORMULAIRE 3: ACTIVITE JOURNALIERE POUR L'EQUIPE DE VISITEURES A DOMICILE, A ETRE REMPLIE PAR LE SUPERVISATEUR

Mois, Année _____ Nom du supervisateur _____

Date	Nom du village ou endroit visité	Nbre. de visites complétées	Nombre de visiteures travaillant aujourd'hui	Heure à laquelle les visites ont commencé	Heure à laquelle les visites ont terminé	Heures totales-hommes des visiteurs pour toutes les visites	Distribution d'heures par activité: Heures en Route	Introduction avec le chef et visites-domicile	Reunion s en groupes	Autres Activités dans le champ*	Réunions et préparation des rapports à Nsona Mpangu	Ré-entraînement	Autre Activité à Nsona Mpangu*	Donnée additionnelle sur les réunions de groupes: Nombre d'adultes ayant participé	Estimation du pourcentage consacré aux sujets de naissances désirables	Quantité et type de matériel distribué	Commentaires et observations *Expliquer si "Autre" est plus de 4 heures
1																	
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	
19																	
20																	
21																	
22																	
23																	
24																	
25																	
26																	
27																	
28																	
29																	
30																	
31																	
Totaux Mensuels																	

Formulaire No. 4

Nom de la visiteuse: _____

Visiteuses à Domicile - Information Sur l'Approvisionnement Mensuel

Mois: _____

	Information d'approvisionnement (1) Inventaire au début du mois	(2) Nouvel Approvisionnement	(3) Distribution (a) avec coupons	(b) sans coupon	(c) Total	(4) Approvisionnement retourné au project	(5) (5)=(1)+(2)-3)-(4) Inventaire à la fin du mois	(6) Valeur des ventes
Contraceptifs								
Pilules (cycles)								
Mousse (boîtes)								
Préservatifs (douzaines)								
Santé								
Aspirine (tablettes)								
Oralyte (pacquets)								
Chloroquine (tablettes)								
Mebendazole (tablettes)								
Coupons								
DIU								
Depo Provera								
Stérilisation								
Autre réapprovisionnement des contraceptifs (pilules, mousse, préservatifs)								
No. total des coupons								

Completé par: _____

Date: _____

Ventes totales

Somme collectée

Somme dûe

Formulaire No. 5: Rapport Journalier pour les dispensaire et l'hôpital sur les médicaments relatifs au Project de Nsona Mpangu

☐ Dispensaire ☐ Hôpital; Nom: _____ Nom de l'Infirmier: _____ Mois, Année: _____

Date	Nom du patient	Age	(Si c'est un enfant) Diagnostique ou problème	Produit distribué	Quantité donné gratuitement (no. coupons)	Quantité vendu	Prix par unité	Valeur de vente	Somme reçue

Formulaire No. 7: Hôpital - Insertions DIU, Stérilisation et Injections Depo - Rapport Mensuel

Forme Complétée par: _____

Mois: _____ Facilités: _____

	Accepteurs					
	Avec Coupon		Sans Coupon		Nombre Poursuivi:	
	No.	Noms des Villages	No.	Noms des Villages	No.	Noms de Villages
DIU						
Sterilisations						
Injections de Depo						

Formulaire No. 8

Rapport sur les Sessions d'Entraînement

Date de l'entraînement: De _____ jusqu'au _____

No. de jours travaillés: _____

But de l'entraînement: _____

_____

_____

Personnes qui ont dirigé l'entraînement: _____

_____

_____

_____

_____

Noms de personnes qui ont reçu l'entraînement: _____

_____

_____

_____

_____

_____

_____

_____

_____

(continuez dans une autre feuille, si necessaire)

Autres personnes qui ont participé ou aidé

Nom	Rôle

*(NOTE: Ce formulaire doit être rempli pour chaque entraînement. S'il y a deux entraînements de personnel différent en même temps, il faut remplir deux formulaires. S'il y a un seul entraînement de deux semaines, on peut remplir un seul formulaire pour toute la période.

Formulaire No. 8 (cont'd)

Equipement utilisé

Type	Quantité (nombre d'unités)

Materiel distribué

Type	Quantité (nombre d'unités)

Autres coûts d'entraînement

Allocation journalière pour manger et dormir était donné:

Personnes qui ont reçu l'entraînement ☐ oui ☐ non

Autres personnes qui ont aidé ☐ oui ☐ non

Formulaire completé par:

_____

Date: _____

FORMULAIRE NO. 9

CHARTE JOURNALIERE DU CHAUFFEUR

Mois _____ Signature _____

Date	Kilométrage (au commencement)	But	Lieu	Coût d'essence	Autres coûts de vehicule	
					Coût	Raison
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21.						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
Total						

Formulaire No. 10

LOG CHRONOLOGIQUE MENSUEL DE L'INVENTAIRE CENTRAL

Mois: _____ Année: _____

Inventaire:

Approvisionnement	Nombre d'unités au début du mois	Date	Nombre d'unités arrive	Nombre d'unités distribué	L'endroit où c'était distribué	Nombre d'unités dans le stock aprés les transactions

Formulaire No. 11: Information Sur le Stock D'Approvisionnements

Coûts Centraux - Rapport Mensuel

Mois: _____

Forme Complétée par: _____

	Inventaire au début du mois		Addition à l'approvisionnement			Approvisionnement Retourné au centre	Distribution aux unités (clinique, disp., visites a domicile)	Inventaire a la fin du mois (8)=(1)+(5)+(6)+(7)
	(1)	valeur (2)	gratuit (3)	achétés (4)	total (5)	(6)	(7)	
P.F.								
Pilule								
Mousse								
Préservatifs								
DIU								
Depo. provera								
Stérilisation								
Santé								
ASA								
Oralyte								
Chloroquine								
Mebendazole								

APPENDIX B

Outline of the Uses of Data Collected From These for the Cost Effectiveness Analysis

Prepared by Consultants from Johns Hopkins University

Analysis:

The required ratios of input to output of each activity are:

1. Home visits

Output = (1) # of households visited

(2) # of acceptors of each method

Input = home visitors hours x wages (salaries + per diem + fringe benefits)

+ transportation + supply distributed

$$\text{CE Ratio} = \frac{\text{input value}}{\text{output (1)}} \text{ or } \frac{\text{input value}}{\text{output (2)}}$$

Sources:

Data	Source
Output	
# of houses visited	form #1, #2
# of acceptors	form #1, #2
Input	
home visitors hours (allocation of time)	form #3
wages, per diem & fringe benefits	Tulane forms
transportation	chauffeur's log - form #9
supply distributed	forms #1, #2, #4

2. Group meetings

Output = # of people attending, maybe manhours of attendance

Input = (hours of home visitors giving the group meeting)

x (wage + p.d. + f.b.) + supply distributed + material used

$$\text{CE Ratio} = \frac{\text{input value}}{\text{output}} = \frac{\text{(hours of home visitors in group meetings) wages + (material used + supply distributed) x prices}}{\text{\# of people attending (x hours?)}}$$

Sources:

Data	Source
# of people attending	form #3
duration	form #3
hours of personnel giving the group meeting	form #3
wages + per diem + fringe benefits	Tulane forms
material used	form #3
price of material used	Tulane
supply distributed	form #3
price of supply distributed	Tulane

3. Hospital & dispensary activity & distribution

Input = manhours allocated to each activity x (wage + f.b. + p.d. for each manhour input) + material used + supply distributed + services of the hospital allocated to the project's activities

Output = # of acceptance of each treatment and supply

$$\text{CE Ratio} = \frac{\text{manhours costs} + (\text{material \& supply}) \text{ cost} + \text{overhead hospital costs allocated to each activity}}{\text{\# of acceptances of each treatment or supply}}$$

Sources:

Data	Source
record of activities	registrar, form #7
manhour for each activity	functional analysis
cost of manhour for each activity	government forms of hospital personnel & dispensary
material used	observation
supply used	forms #5, #6
cost of supply & material	form #5, Tulane
cost of material	Tulane

4. Training

Input = manhours (trainers & trainees) costs, supply distributed, and material & equipment used + transportation

Output = # of trainees

$$\text{CE Ratio} = \frac{\text{manhours costs + supply + material + equipment + transportation}}{\text{\# of trainees x \# of hours trained}}$$

Sources:

Data	Source
manhours, per diem $<^{\text{yes}}_{\text{no}}$	form #3
wage + fringe benefits, per diem	Tulane forms
supply	form #8
material	form #8
equipment	form #8
cost of supply material & equipment	Tulane
transportation	chauffeur's log

5. Overhead costs

Central Supply Pool

- materials and equipment used in the office or/and not allocated for a specific activity
- manhours for the project, which are not allocated for a specific activity

These costs will be in Tulane forms and will be added to the summation of all other costs for the purpose of calculating the overall costs of repeating the project, or, if possible, be allocated to each activity.