

Family Health
International



The Cost of Reproductive Health Services at the Facility Level

Technical Assistance to the Africa OR/TA Project II in Costing Analysis

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The Population Council

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Africa OR/TA Project II

The overall objective of the Africa OR/TA Project II is to broaden understanding of how to improve family planning services in Sub-Saharan Africa, and to apply operations research and technical assistance to improve services by:

- increasing access to a full range of family planning services and methods;
- developing service delivery strategies that are client-oriented and acceptable to various population groups;
- improving the operations of programs to make them more efficient and financially sustainable;
- improving the quality of services;
- strengthening the capabilities of family planning program managers to use operations research to diagnose and solve service delivery problems.

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Introduction

Costing the delivery of reproductive health services has assumed greater importance in recent years in sub-Saharan Africa, given the declining economic situation in many countries and the need for program managers and policymakers to better understand the costs involved in providing reproductive health services. Traditionally, operations research (OR) studies in the region have paid more attention to measuring and documenting the effectiveness of the interventions studied than to ascertaining their cost, and their relative cost-effectiveness. Recognizing the need to include analyses of the costs involved and their relationship with the effectiveness of interventions tested, the Africa OR/TA Project II sought to include cost analyses in some of the intervention and evaluative studies being undertaken. This required specific technical expertise not available within the Project staff, and so Family Health International (FHI), a recognized leader in this field, was sub-contracted to provide intensive technical assistance for a number of studies.

This report presents summaries of some of the major findings from the activities undertaken through the technical assistance from FHI. Specifically, it reports on a study to assess the cost-effectiveness of three alternative remuneration schemes for CBD workers in Tanzania; the cost of syndromic management of STIs in family planning clinics in Zimbabwe; and the cost of visits for health services provided at the Municipal Council clinics in Nakuru, Kenya. In addition, FHI staff provided technical assistance for other selected activities.

The cost-effectiveness of remuneration schemes for CBD workers in Tanzania

Barbara Janowitz worked with Population Council Staff member Jane Chege and Andy Thompson on a study to determine the cost effectiveness of remuneration schemes for CBD workers. Andy Thompson was originally seconded to the Nairobi Office of the Population Council and later worked as a consultant. Janowitz made several partial trips to Tanzania during which she either worked on the design or the data analysis for the study. A report, “The Cost Effectiveness Of Reimbursement

Schemes For CBD Workers: A Case Study Of Tanzania” describes the study findings. In addition, draft papers that use study findings are now available and these will be submitted to appropriate journals for review.

The report contains a chapter on cost effectiveness in which information on the costs and outputs produced by three programs are discussed. Three programs were selected that used different schemes for reimbursing CBD agents, and that were also the largest programs. The three programs selected for analysis are the IPPF affiliate UMATI, the Tanzania Ministry of Health Family Planning Unit (FPU), and the Seventh Day Adventist Church (SDA). The analysis takes into consideration the impact of reimbursement strategies on the productivity of CBD agents. It also considers the effects of payments to supervisors and of training costs, as the cost effectiveness of reimbursement schemes cannot be examined in the absence of these other program cost components.

Each program uses a different strategy to remunerate its CBD agents. These strategies are:

1. Full-time agents (SDA), who are given a salary and in-kind contributions (uniforms, bags, metal boxes, umbrellas, etc.),
2. Part-time volunteers (FPU) who are given a bicycle allowance and in-kind contributions (bicycles, bags and metal boxes)
3. Part-time volunteers (UMATI) who are provided with in-kind payments (uniforms, bags, metal boxes, umbrellas, etc.) and equipment to share for income generating activities (a boat, tractors, milling machines).

The report uses visits as a measure of effectiveness and argues that CYPs are not the correct measure. This is because visits are affected by provider incentives while CYPs are also affected by other factors. Costs considered in the analysis include those for remuneration payments to agents, training and supervision. Supervision payments per visit are affected by the number of workers that each supervisor is responsible for; if this number is the same no matter what the worker is paid, then supervisor payments per visit will be lower the higher is the payment to the worker assuming that higher incentives

lead to more visits. In addition, training costs will be divided over a larger number of visits if workers receive higher compensation, again assuming that incentives lead to higher work performance.

The report argues that remuneration policies should be examined in the context of how programs allocate their funds among remuneration, training, and supervision. Program performance can be improved by training workers, by providing them with supervision, or by providing them with incentives. These three strategies must be considered within the context of a particular program. For example, one of the three CBD programs (FPU) examined makes small in-kind payments to their workers, and as a consequence, their visit production is not very high. At the same time, this program spends large amounts on training and supervision. Thus, costs are high while output is low, and the cost effectiveness ratio is not very favorable. A second program pays higher rewards to its workers (SDA), and is more cost effective because the high payments to workers generate a far higher visit production over which to allocate the costs of training and supervision. The third program (UMATI) makes small in-kind payments to the workers but its training and supervision programs are consistent with its remuneration policy in that it spends small amounts on both training and supervision. Thus, the output that it produces is similar to the other program that has low financial incentives but its over-all costs are much lower, so that it turns out to be the program with the most favorable cost effectiveness ratio when output is measured in terms of visits to clients. Table 1 shows these results.

When only payments for agents are considered, FPU appears to have the most cost effective remuneration policy (Table 1, column 1). However, when other costs affected by remuneration levels are considered, FPU turns out to have the least cost-effective remuneration policy. Although only three programs were analyzed, our findings show that reimbursement was positively associated with the number of agent visits. Although agents in both UMATI and FPU receive only in-kind compensation, the higher payments in UMATI are associated with a greater number of visits per agent than in FPU. In SDA, the program in which agents are paid, visits are far higher.

Table 1. Adjusted Cost per Visit and Simulated Cost per Visit by Program (US \$)

Program	Cost per Visit adjusted for gender (1)	Simulated Cost per Visit	
		Assuming supervision and training costs for FPU (2)	Assuming supervision and training costs for UMATI (3)
FPU			
Payment to agents	0.29	0.29	0.29
Payment to supervisors and training costs	<u>4.65</u>	<u>4.65</u>	<u>0.98</u>
Total cost per visit	4.94	4.94	1.27
SDA			
Payment to agents	0.94	0.94	0.94
Payment to supervisors and training costs	<u>0.71</u>	<u>1.16</u>	<u>0.26</u>
Total cost per visit	1.65	2.10	1.20
UMATI			
Payment to agents	0.31	0.31	0.31
Payment to supervisors and training costs	<u>0.78</u>	<u>3.45</u>	<u>0.78</u>
Total cost per visit	1.09	3.76	1.09

The important point of table 1 is that the cost effectiveness of agent remuneration cannot be evaluated by focusing on this variable alone. When supervision and training costs are included in the analysis, UMATI and SDA turn out to be more cost effective than FPU. This is because they either have low costs for these program functions (UMATI) or they have high outputs over which they divide these costs (SDA). When there are high training and supervision costs, then a high level of output is needed for high cost effectiveness; otherwise, the costs per visit are high as shown in column 2 for both UMATI and FPU. When training and supervision costs are low, then low agent compensation or high output dominates in achieving high cost effectiveness; in this case, the high output of SDA or the low remuneration in the other two programs leads to similar cost effectiveness ratios as shown in column 3.

Our results have important implications for the financial sustainability of CBD programs. In preparing for declines in donor funding, programs need to take a broader focus than simply slashing salaries or payments to agents. The full budget should be examined so as to determine how the program could best survive with lower funding from donors.

The paper, “Should Cost per CYP per CYP be used to evaluate CBD programs?” has been completed. It argues that cost per CYP should not be used to evaluate CBD programs because CYPs, in addition to being affected by agent productivity, are also affected by method mix, the amount of a product that is provided at a visit, and the sex composition of the CBD agents. Table 2 shows how these factors affect the cost per CYP ratio.

Table 2. Average Annual Costs per CYP under Various Assumptions for CBD Programs in Tanzania (1995-96)

(In US Dollars¹)

Program	1 Average Annual Number of Visits Per Agent	2 Cost per Visit²	3 Cost per CYP	4 Cost per CYP Assumption A³	5 Cost per CYP Assumption B⁴	6 Cost per CYP Assumption C⁵
SDA	425	1.65	5.69	5.69	5.69	5.69
UMATI	143	1.09	6.23	5.03	5.57	5.14
FPU⁶	105	5.33	37.88	n/a	n/a	23.56

1. US\$ = 561.5 Tanzanian Shillings (Based on an average of mid-year foreign exchange rates from 1995 and '96)
2. Cost includes payments to agents, supervision and training. For more information, see (Chege, et al., 1998).
3. UMATI agents distribute same number of pills per visit as SDA agents and continue to produce the same number of visits as in column 1.
4. UMATI agents distribute same number of pills per visit as SDA agents, however, the time that is freed up is used to produce only half as many additional visits, so they serve fewer additional clients than in column 4.
5. UMATI and FPU agents have the same method mix as SDA agents (but the number of pills and condoms distributed in each visit is the same as in column 3).
6. Information was unavailable on the number of visits made according to type of method distributed. Only program totals on visits and CYPs were available. 1995 only; 528 Tanzanian shillings = 1 US\$

A program that chooses to emphasize follow-up care and thus encourages frequent revisits may have a higher cost per CYP ratio than does one in which large amounts of product are provided to new acceptors and to continuing users. Also a program that favors oral contraceptive pills will likely produce more CYPs than does one that has a stronger emphasis on condoms because programs generally provide more CYPs of pills on a visit than they do condoms.

The costs of syndromic management in family planning clinics in Zimbabwe

Janowitz and Thompson designed, implemented and analyzed data on the costs of syndromic management at family planning clinics in Zimbabwe. In that capacity they traveled to Zimbabwe, and worked on the protocol and analysis in Kenya. Two papers, at least one of which is expected to be part of the final report on syndromic management, have been prepared. The paper, “Labor Costs of Syndromic Management/Risk Assessment for STIs” shows that the costs of labor may be ignored in determining the costs of syndromic management; this is because clinic staff have unused time that can be shifted to client services.

A time motion study was carried out after workers had been retrained in syndromic management at three clinics in Zimbabwe. In addition, a mini situation analysis was carried out prior to and following the retraining; this data collection was used to determine whether the intervention was implemented and how the time spent on various visits changed.

Results (Table 3) showed that while there was an increase in the percentage of clients that received the intervention, many clients did not receive it. Thus, not all new clients received a risk assessment or had a pelvic exam (part of carrying out syndromic diagnosis).

Table 3. Percent of New FP Acceptors Who Received Specific Services

Type of Service	Pre	Post
	Spilhaus/Mpilo (n=14)	Spilhaus/Mpilo (n=20)
Risk Assessment	14	40
Mean number of items in risk assessment	2	3
Pelvic Examination	50	70
Specimens for STD lab Tests	0	30

Table 4 explores the various factors that contribute to the length of a visit including risk assessment, a pelvic exam and the collection of lab specimens. Because some of the cell sizes are small, we also show the median visit length.

Table 4. Mean and Median Contact Time by Services Provided, for New FP Acceptors and Resupply/Repeat FP Clients for Post-Test

	Risk Assessment			No Risk Assessment		
	Yes	No	No	Yes	No	No
Lab Tests						
Pelvic Exam	Yes	Yes	No	Yes	Yes	No
Duration of Visit (in Minutes)						
Mean	43	26	10	58	26	10
Median	43	25	10	38	22	8
(n)	(23)	(7)	(9)	(3)	(18)	(127)

Note: Mann-Whitney Wilcoxon Test to test significance of difference of means:

Risk Assessment/Lab Tests/Pelvic Exam v. Risk Assessment/No Lab Tests/Pelvic Exam: sig = .002

Risk Assessment/No Lab Tests/Pelvic Exam v. Risk Assessment/No Lab Tests/No Pelvic Exam: sig = .004

No Risk Assessment/Lab Tests/Pelvic Exam v. No Risk Assessment/No Lab Tests/Pelvic Exam: sig = .034

No Risk Assessment/No Lab Tests/Pelvic Exam v. No Risk Assessment/No Lab Tests/No Pelvic Exam: sig = .000

Women whose risk was assessed but who did not receive any of the two other services spent about the same amount of time with a provider as women who received none of these services. It would appear that conducting a risk assessment adds little or no time to a visit.

A pelvic exam adds about 15 minutes to the length of a visit, and this increase in visit length is not dependent on whether a woman had a risk assessment. The collection of lab specimens adds about 17 minutes to the visit for those women who had both a pelvic exam and a risk assessment.

We may conclude that if syndromic management (or a pelvic examination) were to become a routine part of family planning visits for selected groups of women, it would add about 15 minutes to their visits. Risk assessment added no time and the lab specimens were collected for validation purposes only and would not be carried out once the study was concluded.

While syndromic management does require additional time to be spent on visits, our results show that even if the intervention was expanded to include all clients that should require syndromic management, this additional time could be accommodated through a decrease in time spent to collect the lab samples (only carried out to validate syndromic diagnosis and not part of the intervention) and thus would not require additional staff time. This analysis is shown in table 5.

Table 5. Potential Impact on Time Spent with Clients of Implementing Syndromic Management

	Mpilo and Spilhaus	Lister
Average number of visits per provider per day	8.7 visits	5.5 visits
Adjusted average number of visits per provider per day ¹	10.5 visits	8.5 visits
Average length of visits	19.7 minutes	19.1 minutes
Average daily contact time ²	207.1 minutes	161.7 minutes
Average number of visits per provider per day for FP acceptors, repeat visits, or “other” ³	8.2	6.8
Percent of these clients who <i>should</i> receive syndromic management ⁴	45%	58%
Percent of these clients who <i>did</i> receive syndromic management ⁵	36%	18%
Added time to offer syndromic management for “targeted” clients ⁶	+ 11.8 minutes	+ 43.2 minutes
Subtracted time for lab tests ⁷	- 27.2 minutes	-8.5 minutes
Net change in daily contact time per provider	- 15.4 minutes	+ 34.7 minutes

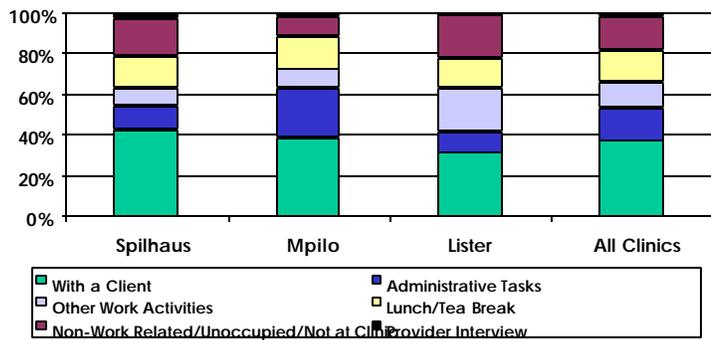
Daily contact time per provider if syndromic management implemented	197.7 minutes	196.4 minutes
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1. The adjusted number of visits was calculated by comparing the average daily contact time per provider from the Mini Situation Analysis (MSA) with that from the TMS (considered the “gold standard”). The contact time derived from the MSA was lower than that in the TMS (20% lower for Mpilo and Spilhaus; 47% lower for Lister). The average number of visits was adjusted based on these differences.
2. Average daily contact time = adjusted average number of visits x average length of visits.
3. For Mpilo and Spilhaus, new FP acceptors, repeat FP visits, and “other” visits made up 78% of the total visits. For Lister, these clients made up 80% of the total visits.
4. Based on the assumption that all new FP acceptors, one-third of repeat FP clients, and half of “other” clients should receive syndromic management.
5. Based on the percent of these clients who received pelvic examinations.
6. Calculation: For Mpilo and Spilhaus: 9% of 8.2 visits = 0.74. Time needed to perform pelvic examination = 16 minutes. 0.77 visits x 16.5 minutes = 11.8 minutes.
For Lister: 40% of 8.3 visits = 2.7 visits. 2.7 visits x 16 minutes = 43.2 minutes.
7. Lab tests were performed for verification. Calculation: For Mpilo and Spilhaus: 19% of “targeted” clients had specimens collected. 19% of 8.2 visits = 1.6. Time needed for specimen collection = 17 minutes. 1.6 visits x 17 minutes = 27.2 minutes.
For Lister: 7% of “targeted” clients had specimens collected. 7% of 6.8 visits = 0.5. Time needed for specimen collection = 17 minutes. 0.5 visits x 17 minutes = 8.5 minutes.

Thus this table shows that there would be an actual decrease in total client contact time in two of the clinics and a small increase in the third clinic. Results from the time motion study also show (figure 1) that after retraining in syndromic management was introduced, the percent of time spent with clients was less than 40 percent. Thus, the provision of syndromic management should not have decreased the duration or number of visits.

Even after syndromic management was provided, staff had unoccupied time. Figure 3 shows for the full day, for each of the clinics and for the aggregated group of clinics, the percent of time spent on various activities. Table 6 shows the average time spent in minutes per day on various activities. For the total group, about 38 percent of time was spent with clients with an additional 29 percent spent in various administrative tasks or other work activities. The percent of time spent with clients was higher at Spilhaus and Mpilo than at Lister. Thus, time spent with clients in the post-test was higher for the two clinics that had more fully implemented the syndromic approach and had also collected lab samples.

Figure 1. Percent Distribution of Staff Time by Activity



Administrative tasks include: completing/reviewing forms, filing forms, preparation of workspace, and preparing for next client.
 Other work activities include: work-related discussion with staff, official meeting, reading, and phone call.
 Time motion study based on observations over a 5-day period of three providers at each clinic.

Table 6. Average Daily Staff Time Spent on Activities (In Minutes)

Activity	Spilhaus	Mpilo	Lister	All Clinics
With a client	217	200	162	192
Administrative tasks	63	123	51	80
Other work activities	43	49	113	70
Lunch/tea break	81	83	75	79
Non-work related/ unoccupied/not at clinic	94	46	102	80
Provider interview	12	9	7	9
Total	510	510	510	510

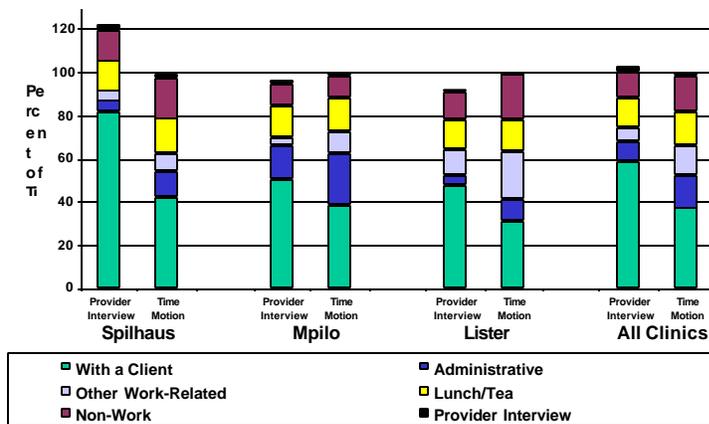
Administrative tasks include: completing/reviewing forms, filing forms, preparation of workspace, and preparing for next client.

Other work activities include: work-related discussion with staff, official meeting, reading, and phone call.

Although we are unable to determine whether the retraining and reinforcement in the syndromic approach together with the collection of lab specimens has affected the quantity and quality of other services, our findings indicate that such a result is unlikely. Even after the retraining, providers have some unoccupied time and some time when they are simply not at the clinic; thus, any time that was required to perform new services could have been drawn from previously available unused time. In addition, time spent on supporting activities is high, 78% as high as time spent with clients, and some of this time could likely be made available to serve clients.

The second paper, “How Accurate Are Providers in Estimating How They Spend Their Time?” shows that providers do not provide accurate information on how they allocate their time. This conclusion was reached by comparing information from interviews with providers with that from the time motion study.

Figure 2. Percent of Staff Time by Activity, According to Provider Interviews and Time Motion Study



Administrative tasks include: completing/reviewing forms, filing forms, preparation of workspace, and Other work activities include: work-related discussion with staff, official meeting, reading.

See figure 2.

We found that providers reported spending more time with clients than was found in the time motion study. We were further able to determine that providers *underestimated* the amount of time that they spent with clients (Table 7) while they *overestimated* the number of clients that they served during a given period of time (Table 8).

Table 7. Average Length of Visits in Minutes, According to Mini Situation Analysis and Provider Interviews, by Clinic

Type of Visit	Spilhaus		Mpilo		Lister		Total	
	MSA	PI	MSA	PI	MSA	PI	MSA	PI
All Visits	23*	12*	17**	14**	19	19	20*	14*
(n)	(107)	(431)	(118)	(290)	(70)	(177)	(295)	(898)

T-tests for significance: * p = 0.0000 ** p = 0.0626

Table 8. Average Number of Visits per Provider per Day, from Various Data Sources

Data Source	Spilhaus	Mpilo	Lister	All Clinics
Provider Interviews	35.4	18.2	13.6	22.5
Service Statistics	20.0	20.3	8.3	16.5
Mini Situation Analysis	7.1	10.7	5.5	7.6
“Estimated” number of visits*	9.5	11.8	8.5	9.8

*The estimated number of visits was by dividing the average total contact time from the TMS by the average visit length reported in the MSA.

While it would be advantageous to rely on routine collection of data at clinics to estimate provider time use, our results show that providers do not provide accurate information. Thus, our results are in agreement with previous research conducted by FHI and the INOPAL project in that we find that provider interviews cannot replace data from a TMS in providing information on time use for cost estimates. Unlike the previous research, however, we found that providers underestimated the length of an average consultation.

The costs of visits for health services in Nakuru, Kenya

Andy Thompson traveled to Nakuru, Kenya and developed and implemented a study to determine the costs of providing various visits for health services at clinics in Nakuru, Kenya. Barbara Janowitz provided technical help on the project. This study was carried out at five clinics. A patient flow analysis was used to determine how much time providers spent with clients and how much time they spent in

activities that did not involve clients. In addition, information was obtained on the cost of various supplies, the salaries and benefits of staff members, and the administrative costs of the clinics. Results showed that in all of the clinics of the Nakuru Municipal Council that there was a considerable amount of unused time.

On average, providers spend 12 percent of an eight-hour workday with clients. However, there is a great deal of variation. For example, providers in Lanet spend 23 percent of the day attending to clients while their counterparts in Industrial Area spend only four percent of the day with clients. Although we are unable to determine what providers do when they are not seeing clients, it is likely that some of the non-contact time is spent on essential tasks related to visits, such as preparing the workspace and cleaning up after a visit, or on carrying out administrative tasks such as completing client records and service statistics. However, it is unlikely that all time non-contact time is spent in this way. It is probable that some of the time is spent waiting to serve clients.

Table 9. Average Minutes per Day and Percentage of Workday Spent with Clients According to Type of Provider and Clinic

Provider Type	Bondeni	Industrial Area	Nakuru West	Lanet	Langa Langa	Average	Percentage Of 8 Hour Work Day
Clinic Officer(CO)	99	0	96	215	165	116	24%
Nurse	64	35	40	119	81	65	14%
Ungraded Nurse	8	11	24	62	52	29	6%
Percentage of 8 hour work day of above staff*	8%	4%	8%	23%	16%		12%

*Includes all COs, nurses and ungraded nurses

As a consequence of the small amount of time spent with clients, most of the visit costs may be attributed to “overhead” costs or the costs of resources that are not used to provide services rather than to direct costs or the cost of services associated with the actual provision of services. Moreover, clinics

in which providers were the least busy had the highest costs for visits of any type (see table 10). Thus, visit costs are far lower in Langa Langa and in Lanet than in the other three clinics.

Table 10. Average Cost per Visit by Type of Visit and Clinic (In Kenyan Pounds)

Service	Bondeni	Industrial Area	Nakuru West	Lanet	Langa Langa	Clinic Average*	Clinic Average (US\$)
FP	n/a	51.33	15.52	6.33	7.13	10.75	3.58
Antenatal	13.70	22.07	14.81	5.89	5.82	9.10	3.03
Child Health	7.71	25.21	10.28	2.73	4.08	5.58	1.86
Outpatient	11.06	22.33	10.73	4.37	5.56	7.32	2.44
Tuberculosis	2.80	n/a	3.23	1.59	3.02	2.80	0.93
STI	10.78	19.67	15.52	6.33	9.19	10.74	3.58

* Based on a weighted average of outpatient visits produced in each clinic

n/a = Service not available or not provided during data collection

In order to reduce costs, the NMC needs to either increase the use of its services or decrease the number of staff at its clinics.

Other activities/accomplishments

Janowitz participated in a workshop in Zimbabwe co-supported by the Africa OR/TA Project II on standards and guidelines for service delivery. She presented a session (with John Stanback of FHI) on evaluation.

Janowitz participated in the final dissemination workshop of the Africa OR/TA Project II. She served on panels that discussed CBD programs and integration of STD services into family planning programs.