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**COMPONENT COST-EFFECTIVENESS IN
THE MEXICAN NEW STRATEGIES PROJECT**

Henry Elkins, Ph.D ¹, and Luis Fernando Macias²

- 1.Center for Population and Family Health,
Columbia University.
- 2.Office of Maternal-Child Health and Family
Planning, Mexican Ministry of Health.

Center for Population and Family Health
Faculty of Medicine
Columbia University
60 Haven Avenue
New York, New York 10032

INTRODUCTION

This paper analyzes the cost of various program components in the New Strategies Project in Mexico, and demonstrates how such an analysis can aid administrators in selecting among alternative program designs.

New Strategies was a service and research project undertaken by the Mexican Ministry of Health in collaboration with the Center for Population and Family Health, Columbia University. The Office of Population of the U. S. Agency for International Development provided major support. The project ran from January 1979, to December 1980 in rural areas of three states, and from August 1978 to June 1979 in three low-income areas of Mexico City. Services were provided by community agents who had received for six weeks of training. In the urban areas they provided contraceptive pills, an injectable contraceptive (norethisterone oenanthate), and condoms. They also referred clients to clinics for IUD insertion and sterilization. In the rural areas, community agents provided similar family planning services, as well as limited maternal and child health care.

The urban project tested three different forms of compensation for agents -- a salary, salary plus bonus, and no financial compensation. Initially, the project attempted to test different modes of compensation for the rural agents. But when those without compensation functioned poorly, the Ministry offered all agents a monthly stipend of 500 pesos (US \$20 at the then current exchange rate of about 25 Mexican pesos = US \$1). In an effort to improve supervision, the use of vehicles by both rural and urban supervisors was also tested.

Robinson has posited an analytical framework for analyzing costs along two dimensions: 1) Direct (variable) costs versus indirect (fixed) costs; and 2) Non-Recurring (capital) costs versus recurring costs. (Warren Robinson, 1971). Direct costs, such as that of gasoline, vary with the type and level of program activity and are generally more immediately subject to an administrator's control. Indirect (fixed) costs (sometimes called "overhead") include items such as rent for administration offices and salaries of administrators. These are, in the short run, less amenable to administrative control. Non-Recurring costs include expenses that may be amortized over time, such as specialized equipment and basic staff training. Recurring costs include expenses for such things as salaries and office supplies, for which a program makes repeated expenditures. Any item can, theoretically, be placed in one of the four categories defined by these two axes.

This paper analyzes the direct costs incurred by the project for recruiting and training, and for supervision. Recruiting and training costs dealt with here are mainly direct, non-recurring expenses: The major costs occurred in the first few months, and were to be amortized over the life of the project. The supervision costs analysed here are direct and recurring -- salaries, transportation, and per diem payments.

Unfortunately, we are unable to separate out training and supervision completely. Some aspects of training were an integral part of ongoing supervision, for example, recruiting and training replacements for agents who left the program, and the training

that took place at the monthly meetings of agents. Consequently, the cost of recruitment and training is somewhat underestimated, while that of supervision is inflated. However, few programs can avoid such misclassification, and we believe that this kind of analysis is valuable nonetheless.

METHODOLOGY

The direct costs were coded and aggregated at the central level of the program. Assignment of costs was straightforward, with the exception of the salaries of the district supervisors (which were assigned to training costs up to the end of the formal training periods, and to supervision costs thereafter). The training component includes costs for recruiting. The supervision component contains costs for in-service training that occurred after the initial formal training. The cost of service expenses is principally that of agents' stipends. Administrative costs include the salaries of central-level personnel, accounting, office supplies, and petty cash. Not included in this analysis are indirect costs and those of contraceptives, medicines, office space, evaluation, and technical assistance.

OVERVIEW OF COSTS

Table 1 summarizes the direct costs of the New Strategies Project in rural and urban areas, for training, supervision, service delivery, and administration. The initial round of recruitment and training constituted 16 percent of total direct costs in rural areas, compared with only 2 percent in urban areas. As discussed below, the training costs were higher in rural than in urban areas because of travel and per diem expenses

for trainees. It is noteworthy that supervision constituted the largest proportion of costs in both rural and urban programs: 48 percent of the total in the rural program, and 65 percent in the urban program. Service delivery costs were proportionately higher in rural than in urban areas (29 percent and 9 percent, respectively). This is because all rural agents received a monthly stipend after early 1980, whereas only some of the urban community agents received compensation. The administrative costs (totaling US \$74,740) were arbitrarily divided equally between rural and urban areas.

TABLE 1

Summary of Direct Costs, by Program Component, for Rural and Urban Areas, New Strategies Project, Mexico, 1978-1980

Component	Rural		Urban	
	Amount in US \$	Percent of Total	Amount in US \$	Percent of Total
Training.....	100,401	16	3,685	2
Supervision.....	299,411	48	104,684	65
Service Delivery..	181,837	29	14,343	9
Administration and Other.....	37,370	6	37,370	23
Total	619,019	100	160,082	100

Note: 25 Mexican pesos = US \$1.

Source: Central accounting data coded by component, Mexican Ministry of Health.

RECRUITING AND TRAINING

The initial investment in recruitment and training made continuation of agents a major administrative concern. This concern was particularly acute for rural areas, since the cost of training a rural agent was nearly 12 times the cost for an urban agent. Though both rural and urban agents received six weeks of training, the cost per rural trainee was US \$208 (\$6.97 per training day) compared to \$18 per urban trainee (\$0.59 per day), as Table 2 shows.

TABLE 2

Direct Costs for Recruitment and Training of Community Agents in Rural and Urban Areas, New Strategies Project, Mexico, 1978-1980

Item	Rural (US \$)	Urban (US \$)
Agents' expenses	74,890	-----
Salaries, honoraria.....	28,662	3,692
Transportation, per diem payments.....	1,032	146
Total.....	104,584	3,838
(Number of agents trained).....	(502)	(217)
Cost per trainee.....	208	18
Cost per trainee per day.....	6.97	0.59

Note: 25 Mexican pesos = US \$1.

Source: Accounting data, New Strategies Project, Directorate of Maternal Child Health and Family Planning, Mexican Ministry of Health.

The principal reason for the higher cost of training rural community agents is as follows: in urban areas, the training of agents usually took place in a community building in the trainees' own neighborhood. Urban trainees, therefore, required virtually no reimbursement for transportation or meals away from home. In contrast, the rural program paid transportation costs and per diem expenses for agents training far from their own communities, generally in the district or subdistrict health offices.

One might well hypothesize that, because of high residential mobility in slum areas, the urban program would have suffered from higher termination rates for agents than would the rural program. In fact, the agent termination rates were 36 percent (over two years) in each program. Discontinuation of an agent, either because of poor performance or dropout, represented a substantial financial and programmatic loss for both programs.

The importance of termination can be illustrated by comparison with the Indonesian government's family planning program. By 1981, the government had invested about US \$800 in training each of 10,621 field workers in Java and Bali. (These, like Mexico's community agents, do not have civil service status). However, during 1981, only 1.5 percent of the field workers terminated for all reasons, an extraordinarily low rate. (R.A. Soejatni, 1982). Even with the high cost of training field workers in Indonesia, the low termination rate makes that training program less expensive (per month of field worker service) than the New Strategies Project.

Because of higher training costs, the impact of agent termination was much greater on the rural than on the urban program. The difference between direct training costs understates the problem of rural termination because the replacement cost for a rural agent was even higher than the the initial training cost of US \$208 shown in Table 2.

Although the loss of an urban agent sometimes disrupted services, there were often other agents located a short distance away who could temporarily provide contraceptives. Furthermore, when the urban program did recruit a substitute agent, training of the new agent was relatively easy, since the high density of the urban areas permitted training of new groups of agents within their own general area. In contrast, when a rural agent dropped out, it was rarely possible to organize a new group within reasonable distance of the agent's community. Instead, the district supervisor generally trained new agents one by one within their own communities. On the one hand, such in-service training in the the agent's own community had the advantage of offering experience with real clients and the possibility of learning by practice. The supervisor could also match the training to the agent's learning capabilities and the community situation. On the other hand, the cost of maintaining the supervisor in the field was US \$45 per day (for salary, vehicle, and per diem). Obviously, the cost of training an agent mounted rapidly as the supervisor devoted her exclusive attention to a single trainee. Moreover, most supervisors were already hard pressed to supervise the 29 other community agents in their districts. Neglect of the other agents while the supervisor

trained new agents was costly in ways impossible to measure.

Monthly district meetings of rural agents provided another opportunity for training that was highly economical, but probably not highly effective. The program paid 50 pesos (US \$2) to each agent to cover transportation, but the cost of transportation and meals was really much higher for nearly all agents. The difference was borne by the agents themselves -- those who attended. Some agents reported spending 20 times the amount the project gave them for transportation. Unfortunately, for many agents, the lack of transportation or cost thereof was prohibitive. Moreover, because of bus schedules, many of those who did attend the monthly meetings either arrived late or left early. Finally, when administrative matters had been taken care of, there was little time left for training. The monthly meetings did help bolster morale among agents and did provide a means of distributing supplies, paying salaries, and collecting service statistics, but the short time available for training was hardly sufficient for more than a brief treatment of a new topic or short review of a subject previously covered.

Another factor in agent discontinuation was personal characteristics. The agents who tended to continue in service (and who also proved most effective) were likely to be married, over 20 years of age, and themselves contraceptive users. Although the rural program sought to recruit agents with these characteristics, the need to spend six weeks away from home for training proved to be a formidable obstacle. The urban program, by training within the agent's own neighborhood, was much more

successful in attracting older, married agents.

On the basis of this experience, the Ministry of Health planned experimental training of rural community agents. This training would take place in several stages, each of five days duration. The Ministry anticipated at least three advantages:

1. The trainees would spend only four nights per stage away from their families. The Ministry hoped thereby to recruit more older, married women.

2. In the intervals between stages, the trainees would have opportunity to return to their communities to practice what they had learned, and the supervisors would be able to reinforce the training with real cases in the field.

3. If, after one or more stages, the agent discontinued for any reason, the program would lose the training investment for only the stages completed, at a cost of about US \$40 per week, rather than US \$208 for the entire six weeks. Costly in-service training (at US \$45 per day) for replacement candidates would cover only the stages missed, and the replacement candidates would join the other trainees for the remaining stages.

SUPERVISION

The major costs for supervision were the salaries of the supervisors, all of whom were either nurses or social workers. The project therefore needed to utilize the time of the supervisors as efficiently as possible, as well as to enhance the effectiveness of the tasks they performed. A principle constraint was transportation, since public transportation to remote rural villages was either nonexistent or restricted to

buses and trucks that ran once or twice a day. Also, few of these operated during the evening hours, a good time for community meetings.

To overcome the constraints of public transportation, the New Strategies Project furnished rented automobiles (Volkswagon sedans) for the supervisors. Providing vehicles for the supervisors met with considerable skepticism. Relatively few nurses in Mexico knew how to drive under any circumstances, much less on rocky paths or narrow mountain trails.

Despite numerous problems in dealing with the rental agency over vehicle repairs, the New Strategies supervisors demonstrated that vehicles had at least two advantages. First, the vehicles decreased the supervisors' traveling time and augmented the hours the supervisors were able to spend in the communities. Thus, having cars allowed the supervisors to increase both the frequency and the duration of visits. Second, the vehicles gave the supervisors the flexibility to stay in the community during evening, weekend, or other hours when residents of both sexes and community leaders were more often available for meetings.

While we believe that having cars improved the effectiveness of supervision in the rural program, the costs and the cost effectiveness of this measure are also important considerations.

The cost of the vehicles, including the rental and maintenance, was US \$286 per month. The total monthly cost for a rural supervisor with a car was US \$719: \$333 for salary, \$286 for the vehicle, and \$100 for per diems (sixteen days of field work at \$6.25 per day). The comparable monthly cost for rural supervisors in the government's General Rural Program (who did

not have cars) was US \$516: \$333 for salary, an estimated \$83 for public transportation, and \$100 for per diem payments. The provision of the rental vehicles, therefore, increased the cost per supervisor per month by \$203 (39 percent).

However, New Strategies Project rural supervisors oversaw an average of 30 community agents, compared to 12 agents each for their counterparts in the General Rural Program. Thus, the New Strategies monthly cost for supervision per agent was 30 percent lower: US \$23.97 for New Strategies versus US \$34.40 for the General Rural Program. In terms of total program costs the increased efficiency translated into a program savings of 21 percent.

Moreover, in terms of active family planning clients, the New Strategies agents whose supervisors had cars were apparently more effective than those on the General Rural Program. At year-end 1980, the agents in the New Strategies rural program had 9 percent more active clients than did the General Rural Program agents. The combination of lower costs and greater agent effectiveness in the New Strategies Rural Project yielded a net cost-effective advantage of 24 percent.

It is interesting that even in the urban program, where the advantage of providing supervisors with cars is less intuitively obvious, this measure appeared to be cost effective. In the urban slum area of Gustavo Madero, New Strategies supervisors had cars but the program did not otherwise differ from the General Urban Program. However, the New Strategies agents served an average of 22 active clients, compared to 13 active clients per agent in

similar slum areas of the General Urban Program. (The average number of agents per supervisor was about 36 in both the urban component of New Strategies and the government's urban program.)

On the basis of the New Strategies experience, the Mexican Ministry of Health has now provided vehicles for all supervisors of community agents in both rural and urban areas. Because the cost of government vehicles is far less than that of rented vehicles, the Ministry anticipates that providing cars will prove even more cost effective than in the New Strategies Project.

SUMMARY

This paper analyzes two types of direct costs incurred by the Mexico New Strategies Project: the non-recurring cost of initial recruiting and training, and the recurring cost of supervision (which includes the cost of recruiting and training replacement agents).

Since recruiting and training costs were budgeted as principally capital expenditures, management was logically eager to retain agents as long as possible. The initial cost of US \$208 for training a single rural community agent far exceeded that for an urban agent (\$18). Termination of rural agents therefore represented a substantial capital loss, and the cost of replacing agents was usually far greater than \$208 because of the necessity of utilizing supervisors to train replacements individually.

In view of these costs, the Ministry of Health planned to experiment with training agents in a series of five-day stages, rather than in a single period of six weeks. By offering

training periods more attractive to women with families, the Ministry hoped to recruit a higher percentage of older, married women, who have proven to be both more effective and less likely to drop out. The Ministry thereby expected to reduce losses from agent termination, reduce in-service training costs, and increase program effectiveness.

Over a two year period, field supervision was the largest single cost component in both the New Strategies Project and the the Ministry of Health's community programs. Because of the recurring nature of supervision expenditures, supervision was destined to become an even larger proportion of expenditures in later years. Efforts to reduce supervision costs, therefore, warranted special attention.

Cost analysis of supervision of community agents demonstrated that although the use of cars in rural areas increased costs per supervisor, the monthly cost per agent supervised was only US \$24, compared to \$34 in the government's rural program where supervisors did not have cars. Moreover, in terms of active family planning clients, New Strategies supervisors who had cars outperformed government supervisors who did not in comparable rural and urban areas. In light of these findings, the Mexican Ministry of Health decided to provide vehicles for supervisors of community agents in both rural and urban areas.

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