PN-ACB-042
94673

OPERATIONS RESEARCH STUDY ON IMPROVING PRIVATE HEALTH PROVIDERS CASE MANAGEMENT OF ARI, DIARRHEA, AND FEVER

Bihar, India

April-May 1997

Sarbani Chakraborty

BASICS Technical Directive No.: 000 IA 00 015
USAID Contract Number: HRN-6006-C-3031-00

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ACKNOWLEDGMENTS

The author thanks the OR teams of the Kurji Holy Family Hospital, Patna; Santhal Pargana Antodhay Ashram (SPAA), Deoghar; and the Association for Development, Awareness, and Human Rights (ADHAR), Bettiah, for helping the author successfully complete her tasks. A special thanks to Sister Grace, Sister Ann D'Souza, Om Prakash Verma, Manoj Verma, and Anthony John of the Kurji Hospital for their kindness and hospitality. Finally, the work related to the OR study would not have been possible without the cooperation of the private practitioners and members of *Mahila Mandals* in Bettiah and Dumka.

ACRONYMS

ANM	Auxiliary Nurse/Midwife
ARI	Acute Respiratory Infection
BASICS	Basic Support for Institutionalizing Child Survival
CHW	Community Health Worker
DALY	Disability-adjusted Life Years
IIHMR	Indian Institute for Health Management Research
KHFH	Kurji Holy Family Hospital
NGO	Nongovernmental Organization
OR	Operations Research
ORS	Oral Rehydration Solution
PHP	Private Health Provider
PVO	Private Voluntary Organization
PVOH	Private Voluntary Organizations for Health
RRA	Rapid Rural Appraisal
SPAA	Santhal Pargana Antodhay Ashram
SSO	Service Support Organization
SSS	Sugar Salt Solution
USAID	United States Agency for International Development

EXECUTIVE SUMMARY

As consultant to the BASICS project between April 3 and May 22 1997, the author worked with the Kurji Holy Family Hospital, Patna, in completing all tasks related to the Private Providers Operations Research (OR) Study. The objective of the OR study was to improve private practitioners' case management of childhood illnesses, particularly ARI, diarrhea, and fever. This research objective was achieved through the implementation of training programs for the providers, contracting with them to practice targeted behaviors, and monitoring provider behavior. The study was funded by USAID under the PVOH II project; BASICS provided technical assistance. The principal researchers were three PVOs: Kurji Hospital, SPAA, and ADHAR, based in Bihar, India. The author's main responsibilities were to assist the Kurji Hospital in completing the evaluation of the study, analyzing the results, writing the final study report, and preparing for a presentation of the study at a workshop organized by IIHMR in New Delhi, India.

All tasks defined in the author's terms of reference (TOR) were completed. The first part of the author's trip (April 7 - 20) was spent in the field (Dumka and Bettiah) conducting interviews with private providers, community health workers (CHWs), and women's organizations (*Mahila Mandals*). During this period, some time was also devoted to further analysis of the baseline data. Between April 21 and May 6, the baseline assessment report was completed, data analysis for the final evaluation was undertaken, and the final report was written. Between May 6 and 14, the author conducted further analyzes related to the final evaluation and began preparations for the New Delhi workshop. Between May 19 and 22, additional preparatory activities for the workshop were undertaken, and the study was presented at the seminar.

During the last trip to Bihar in December 1996, the author had initiated the process evaluation of one of the interventions (training) that was implemented between September-December 1996. Further evaluations of the training seminars were undertaken during this visit, mainly through interviews with the providers that had participated in the training. The evaluation indicates the following: (i) the training sessions were very well received by the private health providers (PHPs); (ii) the diarrhea training session changed knowledge of case management practices, specially regarding the use of ORS/SSS for combating dehydration; (iii) the ARI training session was much less successful at changing knowledge of how to diagnose and treat ARI and fever; and (iv) the seminars have generated demand among PHPs for additional training.

Between January and March, additional interventions focusing on contracting or signing agreements between the community and providers and monitoring provider adherence to these contracts were implemented. Overall, provider participation in contracting in both Bettiah and Dumka was high (100%). However, in both areas, providers refused to adhere to selected behaviors. Refusal was related to provider perceptions regarding the relevance of the case management practices for specific cases. For example, providers mentioned that they would not recommend continuation of breastfeeding in cases where the mother was ill. This was because

they believed that the mother's viruses would enter the child's body, causing more illness. This is important information, and perceptions harbored by providers and their effects on selective application of case management knowledge should be given more attention in the future.

The monitoring was initiated in January, two weeks after the contracting was completed. Despite the slightly complicated design for the monitoring, the CHWs were able to successfully implement the monitoring. The only problem they encountered was from mothers who expressed dissatisfaction at having to constantly answer the CHWs questions without getting anything in return. This is an indication that in the replication of this study, attention should be directed at preparatory work with mothers, informing them about their important role in quality improvement and the benefits to be derived from their participation. In March, the final evaluation was conducted, using most of the same instruments as the baseline survey.

The main results of the operations research are as follows:

(a) In both Bettiah and Dumka, the interventions produced positive changes in providers' disease-specific and non-disease-specific case management practices. The analysis of pre- and post-intervention results for disease-specific case management practices indicate that in Dumka, which had a higher number of ARI + fever and ARI cases, provider performance on measuring respiration with a watch or timer improved significantly (+57%). Other important ARI and fever related case management practices for which improvement was seen in Dumka are as follows: checking fever with a thermometer (+23%), taking the child's clothing off for examination (+27%), and counseling mothers about danger signs (+21%). Unfortunately, provider performance on checking the child's chest with a stethoscope for ARI cases recorded negative changes (-40%). It is possible that providers believe that checking the chest with a stethoscope and measuring respiration with a watch are interchangeable case management practices. In Bettiah, where the majority of children suffered from diarrhea and fever, change was recorded in checking fever with a thermometer (+27%), feeling the abdomen (+25%), asking about the history of diarrhea (+7%) and vomiting (+7%), and recommending ORS/SSS (+50%).

(b) In both Bettiah and Dumka, substantial positive changes were seen in non-disease-specific case management practices. Some of these practices include asking about the history of the illness, asking about the care given at home, and counseling on how to administer medicine and the types of foods and fluids to be given during the illness. In Bettiah and Dumka, 33 and 44 percent improvement was seen in asking about the history of illness and asking about the care given at home, respectively. Changes were seen in all counseling practices. Statistical comparison of mean scores for examination and counseling practices demonstrates that the differences before and after the intervention are statistically significant (<.05).

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(c) Comparison of pre- and post-intervention results for providers participating in the interventions with providers not participating in the interventions produced interesting results. The results demonstrate that providers who did not participate in the interventions also improved their performance on most case management practices. Since the non-intervention group is in close proximity to, and in frequent contact with, providers participating in the interventions and CHWS, these changes are most likely attributable to these interaction. However, the providers in the intervention group improved their performance much more than did the providers in the control group. The differences were particularly large for important case management practices such as measuring respiration with a watch or timer (Dumka), asking for the child's immunization card, recommending immunization, counseling mothers on how to administer medicine and the types of fluids to give during illness, danger signs to watch for, and asking if the mother had any questions (Bettiah and Dumka).

(d) From the perspective of program formulation, it is relevant to know if implementing both interventions together is more effective than implementing one or the other. Results from Bettiah and Dumka indicate that providers who participated in both of the interventions (training + contracting) did not necessarily perform better than those providers who only participated in the contracting. In Dumka, the training was marginally more effective, with providers participating in both interventions performing better than their counterparts (only contracting) in 12 out of 22 case management practices (54%). In Bettiah, those who had participated in training + contracting performed better than their counterparts in only 9 out of 23 case management practices (39%).

(e) One of the unexpected and highly positive effects of the interventions is provider participation in community health activities, such as health education, and in joint meetings with CHWs to discuss strategies for improving community health. Sixty-three percent of providers in Dumka participated in *Mahila Mandal* meetings, compared with 22 percent in Bettiah. Provider participation in CHW meetings in Dumka was also higher than in Bettiah (45% for Dumka compared with 22% for Bettiah). In both Bettiah and Dumka, the topics most commonly discussed by providers in *Mahila Mandal* meetings included use of ORS during diarrhea, water and sanitation, approaches to preventing childhood illnesses, and women's health.

(f) Finally, results from a multivariate analysis of changes in case management scores for selected providers and background characteristics such as education, professional qualifications, and experience, did not find any of the correlations statistically significant. Additionally, the R-square for the model was only 43 percent, indicating that background characteristics explained less than half of the changes in provider case management scores. The sample size for these analyzes were very small (15 in Bettiah and Dumka). This might have affected the validity of the results obtained from the multivariate analysis.

Micro-studies in other parts of India indicate that the profile of private providers in other states of India matches that of private providers targeted in the OR study. Poor households in other states of India, such as Madhya Pradesh, Rajasthan, and Uttar Pradash, share many of the socioeconomic characteristics of the households included in the study. These factors make the results of the study generalizable and replicable in other states of India. In the direct utilization of study results for project formulation, the following lessons learned from the OR study should be taken into account:

(a) It is important to phase activities appropriately and allocate adequate time for each activity. For example, there should be enough time to fully analyze the results of the baseline assessment before designing interventions such as training seminars. This will allow program planners to design well-targeted and cost-effective training programs. Time should be allocated for periodic process evaluation of the interventions, and modification of interventions as necessary.

(b) During baseline data collection, every effort should be made to compile detailed information on the magnitude of poor case management practices among providers and the determinants of these behaviors. Understanding the nature of the problem and its complexity is closely related to formulating focused interventions that will have optimal impact. In the absence of such efforts, there is a danger that interventions will not be cost-effective.

(c) In replicating the results of the study elsewhere, the important role of the CHWs and the organizations to which they belong should be taken into account. Both community-based NGOs involved in the study have been working in Bettiah and Dumka for five to ten years. The CHWs are known to the communities and the providers, as are the NGOs. Therefore, the foundation on which to implement the interventions was already present. If this infrastructure is not available, then 6 months to 12 months may be required to build the relationships before the interventions can be successfully implemented.

PURPOSE

The author participated in this trip to undertake the following activities defined by BASICS in the author's terms of reference (TOR) and approved by the Kurji Hospital/India and IIHMR/India.

1. **Draft Baseline Assessment**: Draft full assessment report and carry out the following tasks required for drafting the report: (i) finish analysis of data, (ii) prepare tables and graphs, and (iii) draft report for review by the Kurji OR team and BASICS.

2. **Data Collection for Final Evaluation**: The following activities related to the final evaluation should be undertaken: (i) in-depth interviews with providers and (ii)

interviews with CHWs and *Mahila Mandals*. The purpose of these activities is to obtain additional information for assessing the outcome of the study and analyzing the process (process evaluation).

3. **Final Study Report**: Analyze data from the final evaluation and draft a report for review by the Kurji OR team and BASICS.

4. **Workshop**: Assist the Kurji OR team prepare for a presentation of the study at the operations research workshop in New Delhi, organized by IIHMR/India.

BACKGROUND

Since independence in 1947, India has made substantial progress in expanding its public health system. Partly as a result of these efforts, India's infant mortality rate (IMR) has been reduced from 137 per 1,000 live births in 1970 to 90 per 1,000 live births in 1991. Life expectancy during this period has improved from 50 to 61 years. Despite these achievements, India continues to face many public health challenges.

The leading source of burden of disease in India measured in terms of disability-adjusted life years (DALYs) are maternal and perinatal causes (35 million DALYs), respiratory illnesses (33 million DALYs), diarrheal diseases (28 million DALYs), and tuberculosis (11 million DALYs) (World Bank, 1995). Mortality from childhood illnesses is not distributed evenly across India's 36 states and 9 union territories. Some states, such as Kerala, have been remarkably successful at reducing child mortality, while other states are lagging behind: Bihar, one such state, has the second highest IMR and under-5 mortality rate in India. Therefore, if India has to make progress in reducing the burden of disease from childhood illnesses, states such as Bihar must be targeted.

Table 2: Infant Mortality Rates and < 5 Mortality Rates: All India, Intervention States and Comparison States (per 1,000 live births and per 1,000 < 5 children)

Area	Infant Mortality Rate	< 5 Mortality Rates
All India	79.5	109.3
Bihar	89.2	127.5

Source: Demographic and Health Survey

Indian Health Policy and Financing

The government's health policy is based on the primary health care approach to provide free preventive and curative services to a large section of the population. The health spending is about 1.3 percent of gross domestic product (GDP), lower than that of Bangladesh, Pakistan, and Sri Lanka. However, total health spending is around 6 percent. This indicates that a large percentage of health spending in India is private. India has a federal system of government; therefore, the

center and states are jointly responsible for the financing of health services. This has meant that poorer states have found it difficult to fund health with resultant implications for disparities in health status across states. A recent World Bank study found that government services were highly inefficient, ineffective, and of poor quality.

The Role of the Private Sector

The private sector plays a very important role in providing child health services in urban and rural areas of India (Table 2). The growth of this sector has been rapid and largely unregulated. Till recently, the private sector was largely ignored by the Indian government. Recently, there has been a realization that demand for health care is growing, and more public sector resources for expanding and improving the quality of services in the public sector cannot be anticipated. Therefore, the most recent national health policy has explicitly acknowledged the private sector and has recommended that the government formulate and test strategies for involving the private sector in meeting India's public health goals. Studies have shown that the quality of care provided by the private sector in India is poor (Rhode and Viswanathan, 1995; Bhat, 1995, Yesudian, 1995); therefore, guaranteeing good quality of care in the private sector is of special concern.

TRIP ACTIVITIES

Between April 3 and May 22, 1997, the author participated in ongoing activities related to an OR research study in Bihar, India. During the trip, the following activities were undertaken.

Field Trip to Dumka and Bettiah

Between April 7 and 20, field work was conducted in Dumka and Bettiah focusing on interviews with providers, CHWs, and *Mahila Mandals*. A total of 24 providers (75% of all providers) and 18 providers (51% of all providers) were interviewed in Dumka and Bettiah, respectively. All CHWs were interviewed and three to four *Mahila Mandals* in each area were visited. While the author's original intention was to interview all providers in each research area, this was not possible due to the fact that some providers were away, while others were difficult to reach because they were located in areas that were not safe to visit. In addition to in-depth interviews with providers, observations were carried out on approximately five providers in Dumka and Bettiah. The author was accompanied on the field trip by the Kurji OR team, and while in the field, support was provided by the CHWs in SPAA and ADHAR.

Overall, the field trips were extremely useful in getting additional information from providers regarding the training seminars. Information regarding the background characteristics of providers and structural inputs available to the provider, such as thermometers, stethoscopes, and essential drugs was also collected. Finally, data collected during the field trip on provider

knowledge and attitude regarding case management of ARI, diarrhea, and fever were useful in comparing with the information regarding practice of these behaviors.

Drafting Baseline Assessment Report

According to the original work plan, the author was supposed to complete the baseline assessment during February-March. However, due to complications related to data transfer, this work could not be completed. Therefore, a total of 10 days was spent analyzing the data from the baseline assessment and writing the baseline assessment report. The main activities related to data analysis included cleaning the data, developing an analysis framework, and analyzing the data. After the data was analyzed, the report was written (available from BASICS upon request).

Completing Process Evaluation

Additional data for the process evaluation of the interventions were collected during the field trip to Bettiah and Dumka. The main activities related to the process evaluation included interviews with providers, CHWs, and mothers regarding the training, contracting, and monitoring. Additionally, interviews were conducted with Kurji OR staff.

Drafting Study Report

A total of 15 days were allocated for analyzing the data from the final evaluation and writing a first draft of the report. The first step in the process was formulating an analysis plan. Subsequently, the data was cleaned and analyzed. A first draft of the report was written after data analysis and distributed for comments (available from BASICS upon request).

Workshop Presentation

Five days were spent on the preparation and delivery of a presentation on the study at a workshop organized by IIHMR in New Delhi, India. Preparatory work included creating overheads, writing speeches, and training Kurji OR staff on how to do the presentation.

RESULTS AND CONCLUSIONS

Baseline Assessment

The main findings from the baseline survey are as follows: (i) the majority of households in the research area have poor socioeconomic status; (ii) under-5 children suffer from multiple illnesses, particularly ARI + fever, and ARI+diarrhea + fever; (iii) household utilization of PHPs is high (86%); (iv) mothers and PHPS performed well on some case management practices and poorly on others; and (v) the case management practices on which they performed poorly were closely related to mortality from childhood illnesses.

Process Evaluation

The evaluation of the training session indicates the following: (i) the training sessions were very well received by the PHPs; (ii) the diarrhea training session changed knowledge of case management practices, specially regarding the use of ORS/SSS for combating dehydration; (iii) the ARI training session was much less successful at changing knowledge of how to diagnose and treat ARI and fever; and (iv) the seminars have generated demand among PHPs for additional training.

Provider participation in contracting was high (100% in both Bettiah and Dumka); however, in both areas, providers refused to adhere with selected behaviors. Refusal was related to provider perceptions regarding the relevance of the case management practices for specific cases. For example, providers mentioned that they would not recommend continuation of breastfeeding in cases where the mother was ill because they believed that the mother's viruses would enter the child's body, causing more illness. This is important information, and perceptions harbored by providers and their effects on selective application of case management knowledge should be given more attention in the future.

The monitoring program was slightly complicated, requiring information gathering from mothers, comparison with provider contracts, and returning to providers with the information. Despite this fact, the CHWs understood the process clearly and implemented it successfully. The only problem during the monitoring was that mothers were complaining about having to constantly provide information to the CHWs without getting any compensation. This is an indication that when replicating this study in other areas, efforts should be directed at preparatory work with the mothers to inform them about the importance of their participation in the project and the benefits to be derived by them and the community from improved quality of care.

Final Evaluation

The main findings from the final evaluation are as follows: (i) comparison of pre- and post-intervention results indicate substantial improvements in providers disease- and non-disease-specific case management practices for ARI, diarrhea, and fever; (ii) the changes in non-disease-specific case management practices before and after the intervention were statistically significant at a p-value of 0.00 (<.05); (iii) the providers in the intervention group improved their case management practices more as compared to the control group; (iv) providers who had participated in both training and contracting did not necessarily perform better than providers who had only participated in the contracting; and (v) the results from a multivariate analysis of changes in provider case management practices and background characteristics such as age, education, and professional training was inconclusive.

Given the short duration of the study (nine months), the positive changes in providers case management practices for ARI, diarrhea, and fever are extremely heartening. However, while acknowledging the success the of study, some of its limitations which are linked to the

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effectiveness of care provided and health outcomes should also be delineated. First, one of the limitations of the study is that it has not brought about significant changes in providers' drug dispensation practices. Interviews with and observations of providers indicate that one of the major problems related to rural private health providers is irrational dispensation of drugs.

Providers dispense drugs in extremely harmful combinations and without consideration of long-term harmful effects. In both Bettiah and Dumka, broad spectrum antibiotics were prescribed for all illnesses, irrespective of type of illness (bacterial or viral) and severity. Injections were dispensed in almost all cases, typically under extremely unhygienic conditions, thereby contributing to the risk of HIV/AIDS. Based upon conversations with government doctors, medical officers, the press, and policymakers at the state level, it is clear that these people perceive irrational medical dispensation practices as one of the biggest problems related to these private health providers. If key government personnel have to be convinced about involving these providers in achieving India's child survival goals, then they will have to be given evidence that providers are willing to change their medical dispensation practices. However, it should be noted that the determinants of irrational drug dispensation practices among these providers is complex and is most likely a combination of lack of knowledge, economic incentives, and the demand for injections among consumers. For many case management practices targeted under the study, the providers had little to lose from practicing the behaviors. This is not the case for drug dispensation practices, which might require more stringent regulatory interventions, or intervening in both the demand and supply sides.

A second limitation is that the lack of good data on severity has prevented the analysis of how providers respond to mild, moderate, and severe cases. In both Bettiah and Dumka, mothers reports regarding severity signs was quite poor and did not correlate with the complexity of illness in the children. For example, a child who had ARI+fever+diarrhea and had been sick for over 19 days was reported to have the mildest symptoms, such as loss of appetite and reduced activity. Obtaining information from mothers regarding severity is the most cost-effective approach to obtaining this data, however, at least in the Bihar case, the data was poor. In the future, greater attention will have to be paid to techniques for obtaining this information through, preferably, equally cost-effective means.

Positive changes in case management practices for providers in the control group and those who did not attend the training are most probably attributable to the role of CHWs in disseminating information among the providers about the case management practices and constantly reinforcing this information. As interviews with providers revealed, CHWs visited them three to four times a month. This lends itself to the hypothesis that the CHWs played a very important role in inducing providers to change their case management practices. This has important implications for replication of this study in other settings. Additionally, the two PVOs through whom the study was implemented at the community level (SPAA and ADHAR) have been working in these areas for at least five to ten years: the organizations are well-known in the communities and to the private health providers. This meant that very little time was wasted at the beginning of the project in forming relationships with the providers. This is another factor that would need to be

taken into account when replicating the study in other settings. If these initial conditions are not present, an additional 6-12 months might be required to successfully replicate this project else where.

RECOMMENDATIONS

The recommendations cover both objectives of the project, i.e., to conduct a study on private providers' case management practices, and through this process, build the capacity of PVOs in operations research. Since BASICS' role in the project was to provide technical assistance for smooth execution of the study and capacity building, recommendations on both topics are warranted.

Study-specific Recommendations

Given that the Kurji OR team had almost no experience in OR prior to this study, they have done a commendable job. Additionally, during the first seven months of the study, they had very little outside support due to several factors, such as changes in the technical assistance team at IIHMR and logistical difficulties in maintaining continuous contact with BASICS. These factors should be taken into account when reviewing the following recommendations.

(a) One of the problems was the disconnect between research activities during the first few months of the study. For example, the baseline survey was completed in July; however, it was never analyzed in detail. As a result, important information regarding case management practices of the providers at baseline, the number and types of providers serving the households in these areas, was never obtained. Comparison of the baseline and final evaluation results from the household survey indicate that there are a few provider (15-20 in each Bettiah and Dumka) that are highly popular and visited most frequently for childhood illnesses. From the perspective of obtaining optimal results, these providers should have been targeted.

Therefore, one of the major lessons of experience from this OR study is that it is important to phase activities appropriately and to allocate adequate time for each activity. For example, there should be enough time to fully analyze the results of the baseline assessment before designing interventions such as training seminars. This will allow program planners to design well-targeted and cost-effective training programs. Time should be allocated for periodic process evaluation of the interventions and modification of interventions as necessary.

(b) Another weakness in the study was that not enough attention was paid to understanding the determinants of provider behavior. For example, it would have been useful to know if poor case management practices among providers are due to lack of knowledge or due to other factors such as economic incentives and/or demand factors. In the case of the OR

study, it was decided prior to such an analysis that the interventions should be training and contracting with providers. It is possible that after an analysis of the determinants, the PVOs would have designed very similar strategies. However, it is good research and project planning practice to move from in-depth baseline data analysis to formulation of interventions. This also allows for the formulation of cost-effective and well-targeted interventions.

Recommendations Related to Providing Technical Assistance

Some of the recommendations included in this section are based upon extensive discussions with the Kurji OR team regarding their views about the technical assistance provided to them during the study. Other recommendations reflect the author's personal views.

(a) There is a genuine need to develop the capacity of support-service and community-based NGOs in operations research or action-based research as it is commonly referred to by PVOs in Bihar. This was well-recognized by the three PVOs working on the OR study. The wide-scale popularity of participatory research techniques such as rapid-rural appraisal (RRA) among PVOs has led to an overemphasis on using qualitative research techniques. It is important to train PVOs is simple quantitative techniques. This training should be targeted according to the type and level of support provided by a PVO. For example, it is perfectly appropriate to train personnel in a support service organization (SSO) in techniques such as sample size calculation and research design. At the community level, CHWs can be trained to do simple quantitative estimates that can help them appraise a situation (such as through simple frequency calculations).

(b) The Kurji OR team believed that they would have benefitted greatly from attending training workshops on the various aspects of research. They felt that they would be capable of undertaking all tasks related to an OR study if they were given time to attend training workshops and were provided with good reference materials.

(c) The Kurji OR team also felt that a technical assistance team should be available to answer their questions as and when necessary. Some within the team expressed the idea that this made local consultants more attractive that those from the U.S. Therefore, setting up good communication linkages between the technical assistance team and the recipient team(s) is particularly important. This can be difficult in situations where communication technology is not highly developed.

(d) Finally, there was a general feeling that visits by the technical assistance team should coincide with milestones in the research process, such as the baseline assessment and analysis, formulation of interventions, and the final evaluation. These are the times when technical assistance is most needed.