**Introduction**

In many developing countries, private practitioners provide a substantial portion of curative care for common childhood illnesses (Berman and Rose 1996). Currently, an important dimension of health sector reform in developing countries is encouraging private sector involvement in the provision of health services (Bennett et al. 1997). In this context, the role of private providers in helping developing countries achieve their public health goals, including those related to child survival, is receiving attention (Brugha and Zwi 1998). For private providers to make a positive contribution to child survival, it is necessary that they provide effective care. A number of studies in developing countries show that this is often not the case and the technical quality of care among private providers is inadequate (Greenhalgh 1985; Rohde and Viswanathan 1995; Thaver et al. 1998; Uplekar et al. 1998).

Inferior technical quality results in poor health outcomes (Armenian and Kazandijian 1995) and contributes to high health care costs from wasted expenditures (Donabedian 1988). Consequently, developing countries wishing to achieve child survival goals within limited budgets will have to address the technical quality of care among private practitioners. Despite the relevance of this topic for developing countries, methods for improving private providers’ technical quality of care in these countries are minimally developed and there are few data from developing countries on private provider quality improvement programmes (Brugha and Zwi 1998).

To address this gap in information, the USAID-funded Basic Support for Institutionalizing Child Survival (BASICS) Project developed two new methods, the VCR and INFECTOM, for improving technical quality of care provided by private health practitioners in rural India.
monitoring following interventions to improve quality. The VCR was developed because currently available quality evaluation tools, such as direct observation of patient-provider encounters, were found impractical in their application to private practitioners in developing countries, for various reasons. Direct observation among solo-practice providers for a particular type of illness (e.g. diarrhoea) in a particular type of patient (e.g. children under 5 years) frequently requires long waiting and is thus likely to be very costly. Itinerant private providers such as rural medical practitioners in India or drug vendors in Africa are even more difficult to observe (Osiname and Brieger 1992; Rohde and Viswanathan 1995). Busy private providers often find the presence of an observer an intrusion and refuse to participate (RSN, unpublished data, 1997). Exit interviews with patients as they depart from a clinical encounter, another common approach for evaluating case management practices (Franco et al. 1996; Franco et al. 1997; Hermida et al. 1997), suffer from the same difficulty in having to wait a long time for an adequate sample of the right kind of patients.

To address these problems, the VCR adopts a delayed home-based interview approach with mothers of sick children. This method is essentially a combination of the exit interview method included in the WHO Health Facility Survey and the verbal autopsy. The VCR screens for cases through a household survey to identify under-five children sick in the past 2 weeks. The instrument is then used to ask mothers of the sick children to recall the case management process that took place during an encounter with a practitioner for the particular illness. National guidelines as well as WHO Integrated Management of Childhood Illnesses (IMCI) guidelines (WHO 1995) for illnesses such as ARI, diarrhoea and fever are used to design the simple checklist that is the basis for the interview. Instead of determining through direct observation whether the provider 'checks the child for fever with a thermometer', the VCR asks the mother if that action was performed. As a simple household survey, the skills needed to carry out and analyze the VCR should be available in most developing countries.

**INFECTOM**

The second tool is an intervention strategy for improving deficiencies noted in the VCR assessment of private providers' case management practices for childhood illnesses.

This strategy consists of a four-component package of interventions to improve technical quality and is abbreviated as INFECTOM: (1) providing **IN**formation on case management guidelines, either in brief group sessions or individual visits to providers; (2) providing **FE**dback to the practitioners regarding their current treatment practices as documented by the VCR and characterizing the gap between those practices and the standards; (3) negotiating a **CO**ntract with the health provider through which the provider selects among the recommended practices those that he/she will comply with; and (4) **ON**going **MO**nitoring of provider compliance with the contract using the VCR and recurrent feedback of the results of the monitoring to the providers and to the community.

**Methods**

The study was conducted in 110 villages of the Dumka and Bettiah districts of Bihar State in India. Bihar has the third highest under-five mortality rate among states in India (NFHS 1995) and the utilization of private practitioners for childhood illnesses is high (more than 85% of cases) (Rohde and Viswanathan 1990; USAID 1997). Dumka and Bettiah are located in eastern and northwestern Bihar respectively. The total population of the 110 villages is approximately 54,000, and under-fives constitute 15% of the population. The socioeconomic status of the households is low, and the illiteracy rate, especially among females, is very high (over 80%). Under-fives in the population suffer from high rates of ARI, diarrhoea and fever occurring on a base of malnutrition. The socioeconomic characteristics of the households, the role of private practitioners in child survival, and the profile of private providers included in the study are similar to those in the other underdeveloped states of India, thus making the results of the study potentially generalizable to a large population (Viswanathan and Rohde 1990; NFHS 1995; Rohde and Viswanathan 1995).

The study was implemented by three non-governmental organizations (NGOs) in Bihar with technical assistance from the BASICS Project. For 2 years before the initiation of this study, all three NGOs were involved in a community health project funded by USAID known as the Private Voluntary Organizations for Health (PVOH) Project. The PVOH Project supported the development of a cadre of community health workers responsible for delivering preventive health care. These community health workers (CHWs) were an integral part of the study and were involved in all the field activities related to it.

**Baseline survey**

The first step in the research process was a baseline survey of private providers’ current case management practices using the VCR. The VCR was designed by BASICS and after pre-testing was adapted and translated to suit the local situation. Twenty CHWs conducted the survey with each responsible for approximately five or six villages. The CHWs were already familiar with conducting household surveys from PVOH project activities. Therefore, only a short training seminar was needed to address specific issues related to the VCR survey. During the 2-day training seminar, the objectives of the survey and techniques for interviewing mothers using the VCR questionnaire were discussed and practiced by the interviewers.

The objective of the baseline VCR survey was to interview mothers of approximately 600 under-five children in the 110 villages that had been sick in the previous 2 weeks. Under the PVOH Project, a census of all households with under-five children was completed. This list was used by the CHWs to visit households with under-five children and identify children that had been sick in the previous 2 weeks. The CHW first asked household members if any under-five children had been sick with ARI, diarrhoea or fever in the previous 2 weeks. If this was not the case, then the CHW went to the next
household with under-five children. Verbal case reviews were completed with mothers of all sick under-five children in the 110 villages identified through this process. None of the mothers of sick under-five children refused to participate in the VCR. This is most likely because they knew and trusted the CHWs and were aware of their work on maternal and child health supported through the PVOH Project.

The completed VCRs were used to compile a list of private providers that mothers had sought care from in the previous 2 weeks. This produced a list of 67 providers that had recently seen sick children in the 110 villages. The CHWs located the 67 providers and interviews were completed with all the providers. Since the CHWs belonged to the 110 villages and knew the area well, it was not difficult for them to locate the providers. The objective of the provider interviews was to obtain information on providers’ background characteristics such as age, education and professional training. The interviews also provided an opportunity for the CHWs to inform private providers about the study and to motivate them to participate in INFECTOM.

To supplement the data from the quantitative VCR survey and to inform and involve key members of the community in the study, focus group discussions and in-depth interviews were conducted with government doctors, other government health workers such as auxiliary nurse midwives (ANMs), and mothers. The in-depth interviews were mainly conducted with five government doctors from the two areas. Additionally, two and five focus group discussions were completed with government health workers and mothers, respectively. The focus groups with the mothers were mainly conducted during their monthly mahila mandal (women’s group) meetings. Persons from the local NGOs trained in qualitative research methods facilitated the group discussions and conducted the interviews. Providers’ case management practices and the implications of poor case management for child health were an important part of the discussions.

Data entry and analysis from the baseline VCRs and the provider interviews were carried out using Epi-Info and Statistical Package for Social Scientists (SPSS). The analysis focused on comparing private providers’ case management practices with the WHO IMCI standards to identify deficits in technical quality of care. The assessment data from the VCR household survey were also used to determine which case management behaviours should be especially targeted through the quality improvement interventions.

Implementing quality improvement interventions

Next, the interventions included in INFECTOM were implemented. First, group meetings were organized with the providers. The goal of the group meetings was to inform private providers of the WHO case management guidelines and give feedback to the providers regarding their case management practices. Two-day sessions covering diarrhea, ARI and fever were organized. Training materials consisted of charts on national guidelines for the case management of childhood illnesses, which coincide with the WHO guidelines. The sessions were facilitated by registered general practitioners with a background in training. The format was informal with an emphasis on discussion, exchange of information and interaction between the participants and facilitators.

A list of 67 private providers mentioned by the mothers during the household survey were invited to participate in the interventions and 44 (59%) attended. The sessions were held at the field headquarters of the local NGOs and providers had to travel up to 4 hours by personal or public transportation to attend the sessions. The providers paid for their own transportation and were not given honoraria or other monetary incentives for attending. After the information sessions were complete, interviews were completed with approximately 25 participants (57%). The purpose of the interviews, conducted by members of the Kurji Hospital research team, was to evaluate the information sessions.

Following the group information sessions, CHWs visited all 67 private providers to negotiate individual behavioural agreements (contracts) to carry out the specific practices of the standard guidelines. The contracts were developed based on the case management practices included in the VCR. During these visits, the 23 private providers that had not attended the group information sessions were given brief the information that had been given at those sessions. Following negotiation with the CHWs, the providers chose those case management practices that they could and would comply with.

Two weeks after the contracting was complete the CHWs began monitoring provider compliance with the contracts. The monitoring required CHWs to interview mothers of sick children who had sought care from the providers in the previous 2 weeks using a modified VCR. The VCR for the monitoring activity was limited to questions on providers’ case management practices. Each CHW was assigned five or six villages, and carried out the VCR monitoring interviews during individual household visits for health education. To ensure reliable monitoring, CHWs were required to collect information on at least 10 cases for each type of illness per provider before reporting to the provider. After completing the required number of VCRs per provider, the CHWs matched the information from the monitoring with the provider contracts and completed a provider performance report.

The CHWs returned to the providers with this report, praised them to the extent that they adhered to the contract, and discussed with them what factors might be making it difficult for them to comply with those case management practices in which their performance was inadequate. This sequence of monitoring and feedback was conducted twice before the final evaluation survey. In addition, CHWs often informally visited providers to reiterate the importance of practicing the case management guidelines. The process of negotiation with the providers and the monitoring and feedback interventions was assessed qualitatively through semi-structured interviews with all the CHWs (20), 18 providers and 15 mothers. These interviews were conducted by one of the authors (SC).

Seven months after INFECTOM was implemented, another cross-sectional survey was conducted to evaluate the impact.
of the interventions on private providers’ case management practices for ARI, diarrhoea and fever. This consisted of VCRs with mothers of approximately 300 under-five children in the 110 villages who had had ARI, diarrhoea or fever in the previous 2 weeks. A in the case of the baseline survey, the 300 sick children were identified through CHW visits to households with under-five children in the 110 villages. The final survey was conducted in March-April, which is low season for ARI and diarrhoea. Consequently, the sample size for the final survey was almost half that of the baseline survey.

Since the CHWs were involved in all aspects of the interventions, there was concern about the possibility of biased reporting. Therefore, the results from the final VCR survey were validated with in-depth and focus group interviews with providers (two focus groups and five in-depth), mothers (five focus group), and several community leaders (six in-depth). These were conducted by one of the authors (SC) and members of the Kurji Hospital Operations Research Team. The interviews and group discussions focused on obtaining information on noticeable changes in private providers’ case management practices. Finally, given the simple pre- and post-intervention study design, events in the external environment that could have influenced private providers’ case management practices were explored to offset that potential bias. This was done by asking the 67 private providers if they had been exposed to television, radio or reading materials on the case management of childhood illnesses and/or if they had attended any training seminars on the topic, besides the ones organized as a part of INFECTOM.

Univariate and bivariate analysis of the pre- and post-intervention data was undertaken using SPSS. The univariate analysis examined (1) pre-intervention case management practices compared to post-intervention practices for all the providers, and (2) post-intervention case management practices of providers that had participated in group sessions and individual visits/contracting compared with providers that had only participated in the individual visits/contracting. The bivariate analysis examined whether differences in mean case management scores for providers, pre- and post-intervention, were statistically significant (p < 0.05).

The bivariate analysis required derivation of case management scores for each provider. The scores were obtained using a simple, non-weighted scoring system of 1 and 0 for each case management item. Providers were given a 1 for each item of case management on the checklist that was carried out and a 0 if the action was not performed. The aggregate score for each provider was obtained by adding across all the items of case management.

Results

Characteristics of the study population

All the 67 providers identified by the mothers during the baseline VCR survey were males. The mean age of the providers was 36 years and the majority (75%) had completed high school. None of the providers had received formal training in allopathic medicine or licenses that allow legal medical practice. They had learned to practice medicine through 5–10 year employment or informal apprenticeships with trained medical doctors, in pharmacies, and/or hospitals. Most of the providers practiced an eclectic blend of western (allopathic) and traditional Indian medicine. The providers operated on a fee-for-service reimbursement system. However, they did not charge for the consultation; instead they charged patients for the medicines they dispensed – specifically, the cost of the drugs plus a profit margin. The providers had most of the medical equipment and supplies necessary for practicing the WHO guidelines for IMCI. For example, all the providers had a stethoscope to check stridor, a watch or timer to measure the respiration rate, a thermometer to check fever, co-trimoxazole for treating pneumonia and anti-fever medicines. Few providers, however, kept oral rehydration packets (ORS) or had scales for weighing children. None of the providers kept vaccines.

Interventions - group sessions for information and feedback

Group information and feedback sessions were the first interventions implemented as part of INFECTOM. Approximately two-thirds (59%) of the 67 private providers in Bettiah and Dumka participated in the group intervention sessions. For both sessions (diarrhoea, and ARI and fever), participation rates were higher in Dumka than in Bettiah. For example, 78% of the private providers attended the diarrhoea information and feedback sessions in Dumka, compared with 40% in Bettiah. Reasons given by providers in Bettiah for not attending included that they were fighting a cholera epidemic in a nearby village, they were busy with other work or had not received the information on time. None of the providers mentioned lack of interest as a reason for not attending.

The seminar evaluations indicated that providers considered the information and feedback sessions to be extremely useful, and they expressed a desire to attend more in the future. All the providers completing the evaluations were willing to pay for future sessions. Two of the principal benefits of the sessions mentioned by the providers were access to new information on diseases that they treat on a daily basis and the opportunity to interact with colleagues. All the providers mentioned it was useful to have trained general practitioners as seminar facilitators and that this system should be continued in future seminars. A few providers mentioned that it would be even more useful to have paediatricians act as seminar facilitators. The main weakness of the information sessions as identified by the providers was that they were too short. The providers expressed interest in monthly training seminars.

Interventions - individual visits and contracting

CHW visits to individual practitioners followed the group information and feedback sessions. The visits provided the opportunity for a detailed review and discussion of all recommended case management practices. All 67 providers (100%) participated in individual practice visits and contracting. Providers negotiated with the CHWs the case management practices that they would or would not adhere to. For example, providers readily agreed to ‘check fever with a thermometer’
and ‘check the respiration rate with a watch or timer’, but it was more difficult to get universal agreement to perform practices such as ‘asking the mother to continue breast-feeding during illness’. This was related to the providers’ perceptions of the negative effects of breast-feeding the child while both mother and child are sick. This information was useful in determining those aspects of providers’ beliefs and practices that required further targeting through information and reinforcement.

**Providers’ case management practices for childhood illnesses**

Table 1 describes the private providers’ case management practices for ARI, diarrhoea and fever at baseline and after the interventions. The data show that before the interventions, private providers’ actions on several important case management practices for childhood illnesses were inadequate. For example, according to the WHO IMCI guidelines, checking the respiration rate in children with a cough or difficulty breathing is critical for accurately diagnosing pneumonia (WHO 1995). As Table 1 shows, private providers performed this important ARI action at baseline in only 14% of cases. After the interventions, private providers’ performance on this case management action had risen to 71%, an improvement of 57%.

For the management of dehydration during diarrhoea, the WHO recommends the use of ORS or home-based sugar and salt solutions (WHO 1995). At baseline, private providers included in this study recommended ORS or sugar–salt solution in only 16% of cases. After the interventions, private providers’ performance on this case management guideline had risen to 48%, a 22% change.

At baseline, private providers’ performance on other important case management practices, such as explaining danger signs to mothers and supportive care, was also poor. These too had improved after the interventions. Finally, there were some case management actions on which provider performance at baseline was somewhat better than other case management guidelines. For example, in more than 50% of cases, providers touched the child as part of the examination, used a thermometer to check for fever, described to the mother how to administer medicine, and counselled what food to give the child during the illness. After the interventions, private providers’ performance on these actions also showed considerable improvement.

To summarize, after participation in the VCR and INFECTOM, private providers’ performance on the WHO recommended case management practices for childhood illnesses was better than at baseline, with many of the individual differences achieving statistical significance. Comparison of mean overall case management scores by bivariate analysis also indicated a statistically significant difference between provider performance on non-disease-specific case management practices before and after the intervention (t = 14.29, p < 0.05).

Private providers participating in all the quality improvement interventions were compared with those who had only participated in the contracting visits and ongoing monitoring. The results show that providers who had participated in all INFECTOM interventions did not necessarily perform better than those who had participated only in individual visits and continued monitoring. For example, in Dumka district, participation in the group information sessions added only marginally to improvements in practices, with providers participating in both interventions performing better than their counterparts in only 2 of 22 case management practices. In Bettiah, those who participated in both interventions performed better than their counterparts on only 5 of 22 case management practices.

One of the unexpected and highly positive influences of the interventions was provider participation in public health activities at the community level, such as health education. Since the interventions were initiated, providers have begun to participate in women’s organization (mahila mandal) meetings. Topics discussed by private providers in these meetings included water and sanitation (21%) and use of oral rehydration or sugar–salt solution during diarrhoea (24%).

**Discussion**

**Validity of study results and generalizability**

Discussion of the implications of the study results for policy and programme formulation aimed at other populations and providers in India or other developing countries demands consideration of internal and external validity issues. The study design (one group, pre- and post-intervention) challenges the internal validity of the study. The lack of a control group raises doubt as to whether the behavioural changes seen can be confidently attributed to the VCR and INFECTOM activities per se since events external to the study may have influenced the practitioners’ behaviour (Cook and Campbell 1997). We felt that our protocol addressed this concern adequately in this isolated and rather simple environment by actively seeking information on other potential influences and finding none.

The use of CHWs for all aspects of implementation of the interventions is cost-effective, but has the potential to create bias in an environment where the CHWs may feel that the study results reflect their abilities. This concern was addressed through the compilation of qualitative data by one of the authors (SC) to supplement the results of the quantitative survey. The results from the discussions with mothers, health providers and community members confirmed and validated the data from the VCR showing improvements in private providers’ case management practices for childhood illnesses. For example, mothers mentioned that, instead of giving children intravenous saline infusions, providers had begun to recommend sugar–salt solution. Government health workers also confirmed this information. In addition, mothers mentioned that providers had begun to inform them about danger signs and ask if they had any questions. Based on the results of these additional data gathering exercises, we conclude that the VCR and INFECTOM did improve private providers’ case management practices for childhood illnesses.

The quasi-experimental design of the study also influences its
external validity. For example, it is possible the study population had characteristics that contributed to the success of the interventions. While this may be the case, quasi-experimental design is common in health systems research and there are numerous examples of valid data from studies adopting this design. The characteristics of the private providers included in this study closely match those of rural private providers in other underdeveloped states of India where infant and child mortality rates are very high (Viswanathan and Rohde 1990; Rohde and Viswanathan 1995). Therefore, we conclude that the results of the study are generalizable to rural private providers in other parts of India. At the same time, it must be emphasized that private providers in developing countries are extremely heterogeneous; hence it should not be concluded that the VCR and INFECTOM will be equally effective among other types of private providers (e.g. licensed physicians) or providers using different systems of medicine (e.g. homeopathic or ayurvedic practitioners). To determine the generalizability of the VCR and INFECTOM to other types of private providers, the methods will have to be tested among those groups.

Regarding the implementation environment, the two NGOs were special in their having been part of a previous USAID community health project and having an experienced cadre of CHWs working in the targeted villages. It would be useful to study the effectiveness of the approach working through other types of community workers (e.g. agricultural extension workers, non-formal-education workers), through other types of implementing organizations, for example, an NGO

### Table 1. Comparison of pre- and post-intervention results for private providers participating in the interventions: Bettiah and Dumka, Bihar, India

<table>
<thead>
<tr>
<th>Type of case management practice</th>
<th>% pre-test (n = 600)</th>
<th>% post-test (n = 300)</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>History-taking practices</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A sked about the child’s immunization cards</td>
<td>31</td>
<td>49</td>
<td>p = 0.00006b z = 5.27</td>
</tr>
<tr>
<td>Recommended immunizations</td>
<td>35</td>
<td>61</td>
<td>p = 0.4814 z = 0.0626</td>
</tr>
<tr>
<td>A sked the mother about care given at home</td>
<td>44</td>
<td>88</td>
<td>p = 0.00006b z = 10.72</td>
</tr>
<tr>
<td>A sked about the child’s immunization cards</td>
<td>31</td>
<td>49</td>
<td>p = 0.00006b z = 5.27</td>
</tr>
<tr>
<td>Took child’s clothing off to examine the child</td>
<td>74</td>
<td>96</td>
<td>p = 0.4321 z = 0.4430</td>
</tr>
<tr>
<td>A sked about the history of illness</td>
<td>60</td>
<td>93</td>
<td>p = 0.0030b z = 2.77</td>
</tr>
<tr>
<td>Examination practices</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Touched the child as part of the examination</td>
<td>71</td>
<td>96</td>
<td>p = 0.00006b z = 7.29</td>
</tr>
<tr>
<td>Used a thermometer to check temperature</td>
<td>56</td>
<td>79</td>
<td>p = 0.3632 z = 0.3112</td>
</tr>
<tr>
<td>Used a watch or timer to check the respiration rate</td>
<td>14</td>
<td>71</td>
<td>p = 0.5627 z = 0.1108</td>
</tr>
<tr>
<td>Looked in and examined the child’s throat</td>
<td>52</td>
<td>63</td>
<td>p = 0.00006b z = 16.52</td>
</tr>
<tr>
<td>Felt the child’s abdomen</td>
<td>65</td>
<td>96</td>
<td>p = 0.4404 z = 0.3852</td>
</tr>
<tr>
<td>A sked about the child’s history of vomiting</td>
<td>64</td>
<td>67</td>
<td>p = 0.4880 z = 0.0191</td>
</tr>
<tr>
<td>Counselling practices</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recommended breast-feeding</td>
<td>53</td>
<td>90</td>
<td>p = 0.2912 z = 0.3190</td>
</tr>
<tr>
<td>Mentioned signs to look for as an indication that the child is getting worse</td>
<td>34</td>
<td>68</td>
<td>p = 0.4013 z = 0.1671</td>
</tr>
<tr>
<td>Recommended how to prevent illness in the future</td>
<td>29</td>
<td>46</td>
<td>p = 0.4013 z = 0.1889</td>
</tr>
<tr>
<td>A sked the mother if she had any questions</td>
<td>25</td>
<td>66</td>
<td>p = 0.00006b z = 11.67</td>
</tr>
<tr>
<td>Described how to administer medicine</td>
<td>65</td>
<td>99</td>
<td>p = 0.4013 z = 0.1556</td>
</tr>
<tr>
<td>Recommended ORS or sugar-salt solution for diarrhoea cases</td>
<td>16</td>
<td>48</td>
<td>p = 0.00006b z = 8.23</td>
</tr>
</tbody>
</table>

a Z scores and p values were calculated using standard statistical formula for hypothesis testing for a difference in proportion at the 0.05 level.

b Significant at the 0.05 level.
which had a clinic-based health programme without CHWs, or a decentralized government health agency such as a district health office. One of the authors (RSN) is currently involved in a VCR/INFECTOM intervention in Indonesia in collaboration with a sub-district health centre. In that setting the VCR captures the practices of both public and private sector practitioners. BA SICS technical support played an active role in the study, helping the local implementing agencies to develop the instruments, analyze and interpret the survey and other data, develop the interventions, and solve the problems that arose during implementation. The type and extent of such technical assistance that will be required for other local implementing agencies in future applications remains to be determined.

Factors contributing to the effectiveness of the VCR and INFECTOM approach

It is useful to discuss, on the basis of available evidence, the key design features of the VCR and INFECTOM that may have contributed to its success in improving private providers’ case management practices. Studies have shown that changing physicians’ clinical practices requires adopting a multi-pronged approach. In addition, there is evidence that interventions such as educational outreach through peers (academic detailing) are more effective than lectures (didactic approach), or mailing clinical practice guidelines information to physicians (Russell et al. 1992; Davis et al. 1995; Thomson 1995; David 1998). The interventions implemented through INFECTOM were multi-pronged and combined group training sessions with continuous reinforcement of the information through outreach visits by the CHW’s similar to academic detailing. This combination was potentially a more powerful stimulus for the private providers to adopt the recommended case management practices.

A nother important dimension of the VCR and INFECTOM that may have contributed to its success was the emphasis on both knowledge and practice. Studies show that improving knowledge is a necessary but not sufficient pre-condition for improving physicians’ case management practices (Paredes et al. 1996; Brugha and Zwi 1998; Thaver et al. 1998). To bring about sustainable improvements in private providers’ case management practices, both knowledge and other factors influencing performance, such as provider payment systems, community and client perceptions, and laws and regulations, need to be addressed. The quality improvement interventions in INFECTOM are designed to create an environment in which providers have various incentives to apply their knowledge and practice the recommended actions.

Several studies show that patient expectations are an important influence on providers’ case management practices (Greenhalgh 1985; Maly et al. 1996; Ofori-A djei and A rhinful 1996; Paredes et al. 1996; Taver et al. 1998). By combining information given to mothers indirectly by the conduct of the VCR and by the continuous monitoring and feedback to the community on private provider performance, the interventions created an environment in which the community had information on expected quality standards and the providers knew that they had this information. This may well have played a role in encouraging the providers to deliver good quality care.

Finally, the contract between the providers and the NGO acting on behalf of the community was also intended to make the providers feel an obligation to perform good quality care. In rural developing country settings where the client and the community are direct purchasers of the providers’ services, the social contract is a potentially powerful mechanism and incentive for practitioners to provide care of good quality, both technical and perceived. Since the study did not disaggregate the effects of knowledge and practice on providers’ case management practice, it is difficult to draw any firm conclusions on these possible mechanisms. However, the emphasis of the VCR and INFECTOM on both knowledge and practice may well have been critical in bringing about the changes in private providers’ case management practices, which were observed.

In conclusion, this study has shown that the VCR and INFECTOM are potentially effective methods for evaluating and improving technical quality of care among private providers in developing countries. Determination of the generalizability of the VCR and INFECTOM methods to other developing country settings, implementing agencies, and types of practitioners will require further studies which address the issues already discussed in this report.

Endnotes

1 Technical quality is defined as ‘performance according to standards that achieves the most favorable balance between health risks and benefits’ (Donabedian 1986).

2 BASICS stands for Basic Support for Institutionalizing Child Survival. The BASICS project is USAID funded and has current activities related to child survival in over 38 developing countries.

3 The exit interview is an important part of quality evaluations in developing countries, and is used to interview mothers of sick children immediately after an encounter with a health provider. These interviews are typically used to collect information on (1) the quality of care as perceived by the mother, (2) the effectiveness of health provider counselling in informing the mother, and (3) patient satisfaction with the encounter.

4 Most developing countries do not have adequate death registration systems, making it difficult to obtain mortality data, particularly information on cause of death. The verbal autopsy approach questions mothers or other household members about symptoms and signs observed and about actions taken by the family in response to these symptoms and signs to elicit information on the cause of death.

5 The local NGOs determined that they could expect to find approximately 600 sick children in the 110 villages. This was estimated using the percentage of children in Bihar at any given time suffering from childhood illness (A R I, diarrhoea and fever) (around 7.5% combined for A R I, diarrhoea and fever). Since 15% of the population of 34 000 consisted of children under five (8100), it was estimated that around 607.5 children would be sick at any given time. The number was rounded off for convenience.

References


Acknowledgements
This study would not have been possible without the participation of Debashish Chakraborty, Om Prakash Varma, M anoj Varma and A nthony John of the K urji Operations Research Study Team; Dr A K. M ishra and his team of 10 community health workers in D umka district; and Dr N andalal and his team of 10 C HWs in B ettiah district. The study was financed by USAID under contract # HRN-C-00-93-00031-00 (formerly HRN-6006-C-00-3031-01). We thank Dr Ronald Waldman and Dr D avid P yle of the BA SiC S Project for their comments on the paper. Responsibility for the contents of this paper lies solely with the authors.

Biographies
Sarbani Chakraborty is a health specialist in the M iddle E ast, North A frica Region of the World Bank based in Washington D C. At the time of this study, she was a Ph. D. student in the Department of International Health, J ohn Hopkins University. She also holds a M. PH from J ohn Hopkins and a M Sc from the London School of Economics, and has worked on several USAID-funded projects (BA SiC S and Commercial Market Strategies) and with non-governmental organizations in India. She is broadly interested in health services financing and delivery issues, and is currently focusing on public-private collaboration.

Sister A nn D' Souza is the director of the D eepshika Community Health Center, K urji Holy Family Hospital, Bihar, India. She is a registered nurse (R N) and midwife (R M), and has a certificate in public health nursing (CP H N). She is responsible for a variety of community health projects in urban and rural Bihar focusing on child health.

Robert S Northrup is a Principal Program Associate with the Strengthening Health Services program of M anagement Sciences for Health, a private international health technical assistance agency, and adjunct professor in the Department of International Health, J ohn Hopkins University. At the time of this study, he was director of the Private Sector Working Group of the B A SiC S Project. He has a M D from H arvard University and has worked in developing countries on child illnesses—particularly diarrhoea—primary health care, and community-oriented medical education for over 30 years, including in Bangladesh, India, and Indonesia. His current work focuses on improving the quality of care for sick children among private providers in developing countries.

Correspondence: Sarbani Chakraborty, 4603 O verbrook Road, Bethesda, MD 20816, USA.

Improving private practitioner care of sick children 407


Acknowledgements
This study would not have been possible without the participation of Debashish Chakraborty, Om Prakash Varma, M anoj Varma and A nthony John of the K urji Operations Research Study Team; Dr A K. M ishra and his team of 10 community health workers in D umka district; and Dr N andalal and his team of 10 C HWs in B ettiah district. The study was financed by USAID under contract # HRN-C-00-93-00031-00 (formerly HRN-6006-C-00-3031-01). We thank Dr Ronald Waldman and Dr D avid P yle of the BA SiC S Project for their comments on the paper. Responsibility for the contents of this paper lies solely with the authors.

Biographies
Sarbani Chakraborty is a health specialist in the M iddle E ast, North A frica Region of the World Bank based in Washington D C. At the time of this study, she was a Ph. D. student in the Department of International Health, J ohn Hopkins University. She also holds a M. PH from J ohn Hopkins and a M Sc from the London School of Economics, and has worked on several USAID-funded projects (BA SiC S and Commercial Market Strategies) and with non-governmental organizations in India. She is broadly interested in health services financing and delivery issues, and is currently focusing on public-private collaboration.

Sister A nn D' Souza is the director of the D eepshika Community Health Center, K urji Holy Family Hospital, Bihar, India. She is a registered nurse (R N) and midwife (R M), and has a certificate in public health nursing (CP H N). She is responsible for a variety of community health projects in urban and rural Bihar focusing on child health.

Robert S Northrup is a Principal Program Associate with the Strengthening Health Services program of M anagement Sciences for Health, a private international health technical assistance agency, and adjunct professor in the Department of International Health, J ohn Hopkins University. At the time of this study, he was director of the Private Sector Working Group of the B A SiC S Project. He has a M D from H arvard University and has worked in developing countries on child illnesses—particularly diarrhoea—primary health care, and community-oriented medical education for over 30 years, including in Bangladesh, India, and Indonesia. His current work focuses on improving the quality of care for sick children among private providers in developing countries.

Correspondence: Sarbani Chakraborty, 4603 O overbrook Road, Bethesda, MD 20816, USA.