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Using Problem-Solving Teams to Improve Compliance with IMCI Guidelines in Kenya

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April 2004

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The Quality Assurance Project (QAP) is funded by the U.S. Agency for International Development (USAID) under Contract Number GPH-C-00-02-00004-00. The project serves developing countries eligible for USAID assistance, USAID Missions and Bureaus, and other agencies and nongovernmental organizations that cooperate with USAID. QAP offers technical assistance in the management of quality assurance and workforce development in healthcare, helping develop feasible, affordable approaches to comprehensive change in health service delivery. The project team includes prime contractor University Research Co., LLC (URC), Initiatives Inc., and Joint Commission Resources, Inc. The work described in this report was carried out by the Quality Assurance Project under USAID Contract Number HRN-C-00-96-90013, managed by the Center for Human Services, URC's nonprofit affiliate, in partnership with Joint Commission Resources, Inc. and Johns Hopkins University.

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Abstract

The Quality Assurance Project (QAP) tested whether facility-based teams, trained and coached to develop and implement improvements in providers' IMCI performance, achieved improvements in case management after one year. IMCI, the Integrated Management of Childhood Illness, is an algorithm that informs healthcare providers how to treat sick children under five. In this study, 21 facility-based improvement teams in two districts of Kenya received several days' training from coach-supervisors who themselves had received three weeks of training. IMCI case management performance by IMCI-trained providers was measured by direct observation in 14 control facilities (no improvement teams) and in the 21 facilities with teams. These measurements were taken both before the team training and about one year later. The nature of the improvement efforts made by the teams during the year was also assessed.

The pooled proportion of critical IMCI case management tasks performed to standard increased 55% in the facilities with teams compared to an increase of only 14% in the control facilities, a significant difference.

Acknowledgements: The authors are grateful to Victor Masbayi (USAID/Kenya), Dennis Carroll (USAID/Washington), and the Bungoma District Health Management Team for their support and assistance. Hezron Ngugi (AMREF: African Medical Research and Education Foundation) provided valuable logistical support. At the time of the study, Paula Tavrow and Lynette Malianga were with the Quality Assurance Project, and Muthoni Kariuki was with AMREF. The authors dedicate this report to one of our coaches, the late Bernard Kasiba.

Recommended citation: Tavrow P, Malianga L, and Kariuki M. 2004. Using Problem-Solving Teams to Improve Compliance with IMCI Guidelines in Kenya. *Operations Research Report.* Bethesda, MD: Published for the U.S. Agency for International Development (USAID) by the Quality Assurance Project (QAP).

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I. Introduction

The Integrated Management of Childhood Illness (IMCI) guidelines, developed by the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF), were designed to improve the case management of sick under-five children in developing countries. Each country participating in IMCI adapts the guidelines to fit its local situation and then conducts in-service training of healthcare providers in how to use them. The guidelines consist of the following tasks: a comprehensive assessment of the child's symptoms, the classification of each symptom, a treatment plan, and responsive caretaker counseling. As of December 2002, about 97 countries worldwide had begun training primary care providers to perform IMCI (WHO 2004).

Several studies have documented that providers who follow IMCI achieve dramatically higher quality of care for the sick child (Heiby 1998; WHO 2002). However, IMCI training is quite costly. The WHO-recommended standard training, including one supervisor follow-up visit, of health providers in Africa can cost $250–400 per provider (USAID and DFID 2002). If, after IMCI training, providers' performance of IMCI deteriorates significantly, then the training is unlikely to be cost-effective, particularly for resource-constrained countries. On the other hand, if feasible, low-cost approaches can be introduced to encourage providers to continue performing IMCI after returning to their facilities, the IMCI approach may be even more attractive.

II. Background

As part of a pilot program in two rural districts—Bungoma and Vihiga—in Western Province, Kenya, approximately 80 healthcare providers in government facilities were trained in IMCI. Immediately after the training, which began in 1996, the providers' performance of IMCI appeared highly compliant with the guidelines. However, despite efforts by the districts to supervise the providers consistently, a July 1997 assessment by the Centers for Disease Control and Prevention (CDC) revealed that performance had deteriorated considerably. The Quality Assurance Project (QAP) led focus group discussions in late 1997 and found that many trained providers had stopped performing IMCI regularly. Their reasons included lack of support from the facility in-charges and staff, heavy workloads, insufficient time to perform the full IMCI algorithm, and lack of appropriate drugs and supplies. The discussions indicated that training and district-level supervision were not sufficient to ensure regular performance of IMCI, and the consensus was that for performance to improve, the work environment at each facility would have to be more conducive to the delivery of IMCI services.

QAP has helped healthcare providers in other developing countries to improve the quality of care using quality management techniques, such as facility-based problem-solving teams. A problem-solving team is two or more people collaborating to identify, analyze, and solve a problem related to the quality of healthcare. The team works

Abbreviations

AMREF	African Medical Research and Education Foundation
BDMI	Bungoma District Malaria Initiative
CDC	Centers for Disease Control and Prevention
DFID	United Kingdom Department for International Development
DHMT	District Health Management Team
IMCI	Integrated Management of Childhood Illness
QAP	Quality Assurance Project
UNICEF	United Nations Children's Fund
USAID	U.S. Agency for International Development
WHO	World Health Organization

through a series of steps defined in the problem-solving cycle and uses simple quality assurance methods and tools, such as the flowchart (Massoud et al. 2001; also see Appendix A). When this study began, teams had been successful in improving the quality of care in several African countries (including Niger, Uganda, and Zambia), but teams had never been tasked specifically with improving IMCI performance.

Both districts piloting IMCI in Kenya expressed interest in testing low-cost interventions to improve providers' IMCI performance. This was particularly the case in Bungoma, which in 1998 trained additional providers in IMCI with support from the CDC.

QAP proposed that the Bungoma and Vihiga District Health Management Teams (DHMTs) introduce problem-solving teams into randomly selected facilities to study whether they could affect IMCI performance. The teams would be encouraged to seek facility-level solutions for increasing the number of children who received a complete IMCI physical and counseling. It was hypothesized that the more regularly providers perform IMCI, the more accurately they would do it. To increase the feasibility of the activity, QAP suggested that teams be trained in their facilities by their district supervisors. After setting up the teams, the supervisors would coach them during their normal supervisory visits to the facility (please see Appendix B).

The DHMTs agreed to set up and coach teams with assistance from QAP and the African Medical and Research Foundation (AMREF), a nongovernmental organization headquartered in Nairobi. At that time, AMREF was coordinating the Bungoma District Malaria Initiative (BDMI) for the U.S. Agency for International Development (USAID) and the Kenyan government. BDMI's goal was to reduce malaria morbidity and mortality through a multi-faceted approach that included improved childhood case management using IMCI guidelines. The research reported here was intended to support BDMI in achieving that goal.

III. Research Design and Chronology of Activities

This study's main purpose was to test whether facility-based teams, trained and coached to develop and implement solutions to improve providers' IMCI performance, could achieve cost-effective improvements in case management in one year. The research design was a pre-test–post-test control group. Two-thirds of government health centers and dispensaries in both districts having at least one IMCI-trained provider (from either the 1996 or 1998 training[1]) were randomly selected to participate in the team training. The chronology of activities was as follows:

May to June 1998: Baseline assessment of health worker performance. Starting with a master list of all 140 providers who had been trained in IMCI, the researchers were able to locate and observe 70 of them in 35 facilities. Each provider was observed in approximately 10 consultations with sick children. Observers were IMCI trainers who used a structured guide to assess providers' performance in each of the four overarching IMCI tasks (assessment, diagnosis, treatment, and counseling). After observing each provider, the observers queried each provider on some basic knowledge and also on the main challenges he or she faced in performing IMCI. They also inventoried the facility to determine the availability of basic drugs and equipment needed to perform IMCI. Lastly, observers checked facility registers for the previous workday to calculate what percentage of sick under-fives were listed with IMCI-type classifications. This calculation indicated the extent to which IMCI was being performed at the facility when observers were not present. The results of this assessment, disaggregated and averaged by facility, were reported to teams during their subsequent training. (See Lin and Tavrow 2000 for replicas of the baseline data collection instruments.)

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[1] Vihiga providers had been trained in IMCI only in 1996.

August 1998: Selection of intervention facilities. Of the 35 government facilities with IMCI-trained staff, about two-thirds were randomly selected to receive team instruction. Hospitals were excluded: 71% of selected facilities were health centers, and 29% were dispensaries.

October 1998: Training of supervisors in team-building and coaching. A three-week course for district IMCI supervisors and selected DHMT members taught supervisors how to set up and coach facility-based teams. A three-day refresher course was held in March 1999.

November 1998 to August 1999: Setting up teams. Two or three coaches spent five consecutive afternoons to set up each team. Teams were all to be set up by March 1999, but other district-level activities caused delays. Altogether, 23 teams were established; only 21 were included in the analysis because two facilities no longer had IMCI-trained staff at the conclusion of the research. Of these 21 teams, 19 were still functioning at the time of the re-assessment.

December 1998 to February 2000: Coaching of teams. Once established, teams were to receive coaching visits every two months, but lack of transport caused sporadic coaching. Most teams received three coaching visits in the year.

March 2000: Evaluation of teams. During the evaluation, all teams were visited and interviewed. They were also asked to complete a 60-minute case study exercise the researchers had developed (please see Appendix A). The case study exercise tested both the teams' problem-solving skills and their teamwork/communication skills. Prior to scoring, the researchers set a threshold of 60% to indicate adequate skills. Teams that achieved at least 60% on the exercise *and* that had implemented at least two solutions during the past year were determined to be "higher ability" teams. All other teams, including the two non-functioning ones, were categorized as "lower ability" teams. During this evaluation, six teams were categorized as "higher ability" teams and fifteen as "lower ability" ones.

March 2000: Re-assessment of health worker performance. Of the 70 IMCI-trained providers who had participated in the baseline assessment, 65 were located and observed in five consultations with sick children.[2] For the final analysis, only health workers who had participated in both assessments and had not changed their work site were included (59 providers).

IV. Results

A. Profile and Cost of Teams

At the time of the evaluation, teams had been functioning for about a year on average. Only two teams were no longer functioning. As shown in Table 1, virtually all teams had sufficient active members to perform problem-solving activities. However, on average the teams' problem-solving skills scored 53%, below what the evaluators had set as the threshold for sufficient problem-solving ability.

In general, the cost of setting up and maintaining a team for a year was $424, which was considered affordable by the DHMTs in a March 2000 dissemination meeting. Except for the indicators designated by the evaluators for categorizing teams as higher or lower ability, the only significant differences between the groups of facilities were in the number of IMCI-trained providers currently working.

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[2] After reviewing the data from the first assessment, it was determined that ten consultations for each worker did not provide significantly different information than the first five for each worker, so the pre-post comparison used the first five consultations from each phase.

Table 1 Profile and Cost of Teams in Facilities (March 2000)

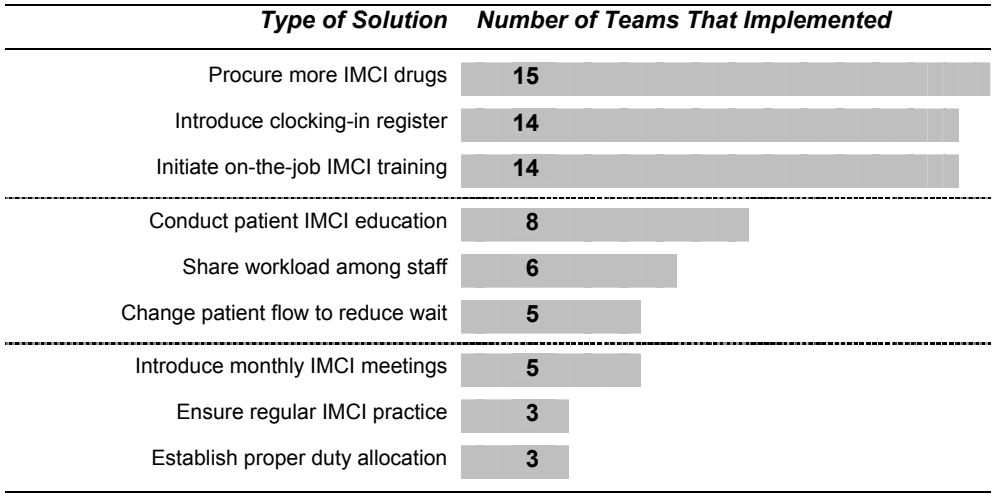
On Average	Lower Ability Teams (N = 15)	Higher Ability Teams[1] (N = 6)	All Teams (N = 21)
Months in operation□Number of members trained□Number of active members□Number of coach visits□Facility in-charge is team leader	12□11□7□3□3 7%	11□12□8□2□ 50%	11□11□8□ 3□41%
Cost per team for setup and operation[2]□Cost per active team member[2]	$464□$ 63	$363□$ 43	$424□$ 57
Team ability score (based on case study exercise)[3]□Number of solutions implemented[3]□Number of IMCI-trained providers[4]	47%□1.7□3	73%□3.7□5	53%□2.2□ 3

1. Definition of a "higher ability" team: scored 60% or above on case study exercise and had implemented two or more solutions.
2. Costs consisted of: team training, training supplies, coaches visits, and team operating expenses. Training of coaches and providers' time were not included.
3. Significant at p<.001.
4. Significant at p<.01.

B. Solutions Developed by Teams

At the time of the evaluation, all teams had implemented at least one solution to a problem, but none had moved on to a second. Figure 1 shows the range of solutions. Many teams determined that a key reason for poor IMCI performance was that providers felt demoralized due to the lack of IMCI drugs, so the most common solution was to work with local health center development committees to procure more IMCI-recommended drugs. To address time constraints, many teams initiated clocking-in registers to encourage providers to get to the facilities early. Teams also tried to do on-the-job training to increase the number of providers who could perform IMCI. In two facilities, on-the-job training was very structured, whereas in the others it was informal. Some facilities also tried to ensure that IMCI was regularly practiced and that IMCI-trained providers were the ones assigned to see sick children.

Figure 1 Types of Solutions Teams Implemented (1998–2000)



C. Changes in IMCI Performance

The results showed that significant changes in performance had occurred in two years (Table 2). Facilities with higher ability teams showed the most significant improvements in provider performance, although they did experience an insignificant decline in correct treatment. Facilities with lower ability teams showed some significant improvements as well, but not as much. Facilities with no teams experienced significant improvement in assessment, but significant deterioration in counseling.

Table 2 Percentage of Children Who Received Correct IMCI Case Management, by Existence and Ability of Facility Team (1998–2000)

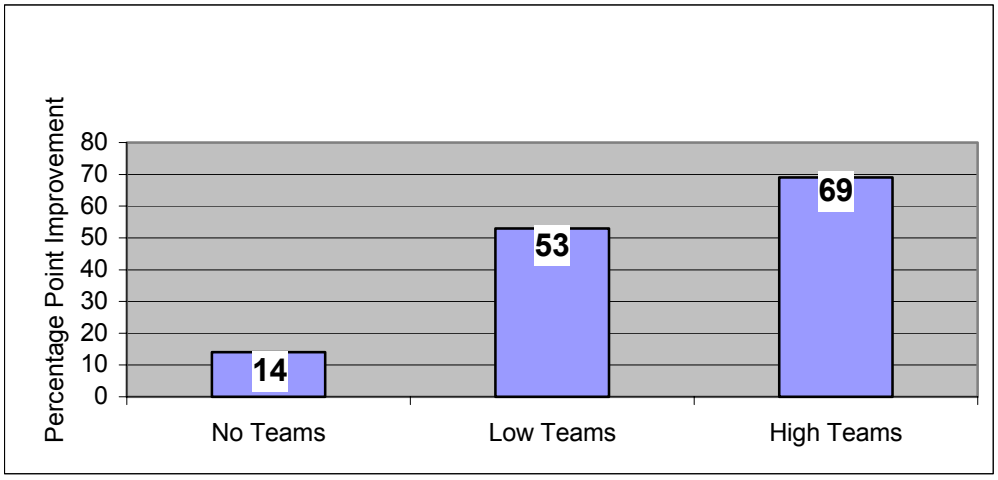
	Facilities without Teams (N = 14)		Lower Ability Teams (N = 15)		Higher Ability Teams[1] (N = 6)	
IMCI Case Management[2]	**1998**	**2000**	**1998**	**2000**	**1998**	**2000**
Perfectly assessed	13.3	36.7[3]	10.0	36.7[3]	1.8	41.8[3]
Correctly classified	53.3	65.5	43.3	63.3	25.5	52.7[3]
Correctly treated	64.2	56.3	50.8	55.0	63.6	49.1
Sufficiently counseled	75.0	60.0[4]	65.8	57.5	65.5	81.8[3]

1. Definition of a "higher ability" team: scored 60% or above on case study exercise and had implemented two or more solutions.
2. "Perfectly assessed" means that the provider asked about all danger signs, symptoms, sequalae, and did a full nutritional assessment; "sufficiently counseled" means that the caretaker received all necessary information, and some effort was made to ensure that he or she understood.
3. Significant improvement between the two years at $p<.05$.
4. Significant decline between the two years at $p<.05$.

D. Composite Improvement in Performance

Taking a composite of the percentage point improvement in IMCI performance in the two years for an overall perspective shows that facilities with teams made significantly more improvements in case management than those without teams (Figure 2). Higher ability teams achieved somewhat more than lower ability teams, but the difference is not significant.

Figure 2 Percentage Point Improvement in IMCI Case Management by Existence and Ability of Facility Teams (1998–2000)



Note: Based on composite of the four aspects of IMCI case management: assessment, classification, treatment, and counseling.

V. Conclusions

This study suggests that problem-solving teams tasked with improving IMCI performance in their facilities do have a significant impact on providers' compliance with IMCI guidelines, although not all performance trends are positive. While it is not possible to show a direct cause-and-effect contribution of specific solutions to better IMCI performance, the results of this study indicate that the presence of teams—even lower ability teams—has a positive effect on compliance. Even where few solutions are actually implemented, team activities may bolster staff morale and reinforce supervisors' message to trained providers that it is important to perform IMCI correctly. Moreover, having skills in problem solving and an atmosphere of teamwork may lead to positive spill-over effects to other facility issues not measured in this study.

Given that the cost of IMCI training is generally $250–400 per provider in sub-Saharan Africa, developing countries there may wish to consider a further investment of $425 per facility in problem-solving activities to create a more favorable environment for IMCI. While the results would probably not be dramatic, this study indicates that teams are capable of making providers feel more supported and of helping them to have sufficient time to apply the IMCI algorithm to consultations with sick children. The main challenge is to provide continual coaching to teams, both to motivate them and to help them to improve any deficient skills.

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Appendix A: Kenya Quality Improvement Team Case Exercise[4]

Name of Facility Team: _____ District: _____

Date: _____ Evaluator:_____

Time started:_____ Time ended:_____ Number team members today____

Integrated Management of Childhood Illness (IMCI) Case Study

The purpose of a case study is to help us to assess your knowledge and ability to use problem-solving methodology. When you are reading the case, you should try to imagine that you are in the shoes of the people working in Sawasawa Rural Health Centre. You are going to be asked to solve their problems, not the ones at your facility.

When you are working on the case study, please ensure that your team recorder accurately documents all of the team's answers. All of the answers should be on the recorder's copy of the case study. If your recorder is not present today, please select someone else.

STEP 1: Identify Problems and Select Opportunities for Improvement.

Sawasawa Rural Health Centre (RHC) is a very busy facility. Its busiest day is Monday, following the weekend. Almost all the health workers who see sick children have been trained in IMCI. The health workers wait until the health education talk is completed before seeing any sick children. The talk is given on Mondays, Wednesdays, and Fridays and usually runs for about 40 minutes. The queues at Sawasawa RHC are often long, and the children are seen for less than five minutes each. The health workers want to clear the queue by 12:30. The caretakers complain that they don't get enough information to properly manage their children's illnesses.

a. List **five** problems or opportunities for improvement at Sawasawa Health Centre. Try to work as quickly as you can. **You will have a maximum of 5 minutes.**

1_____

2_____

3_____

4_____

5_____

b. The next step is to choose a priority problem to work on.

To do the prioritization, the Sawasawa staff used a prioritization/decision matrix, using the following **criteria**:

(A) Risks to children of not addressing the problem

(B) Importance to caretakers of solving the problem

(C) Team's ability to solve the problem

[4] This exercise was edited to reduce paper requirements and expand its usability.

They rated the problems from 1 to 5, with 5 being the highest (highest risk, highest interest of the staff, and greatest ability of the staff).

Using the problems you identified on the previous page, please complete this matrix. Use (A), (B), (C) instead of writing the full criterion. You will have a maximum of **10 minutes.**

Problem	Criterion: A, B, or C	Total	Ranking
1.			
2.			
3.			
4.			
5.			

The Sawasawa staff decided to work on the problem of **"The contact time during a sick child consultation is too short."**

STEP 2: Define the Problem Operationally.

The next step is to write a problem statement. Please write a problem statement for the problem the Sawasawa staff chose. To write a good problem statement, you first need to answer the questions below. You will have **10 minutes** to answer the questions and **5 minutes** to write the problem statement.

1. What is the current performance? What is the desired performance?

   _____

   _____

2. How did the Sawasawa staff know that contact time is a problem?

   _____

   _____

3. What are the effects of the problem on the children's health at Sawasawa?

   _____

   _____

4. What verifiable indicator(s) should Sawasawa use to know the problem has been solved?

_____

_____

Now complete this problem statement:

An opportunity exists at Sawasawa Rural Health Centre to…

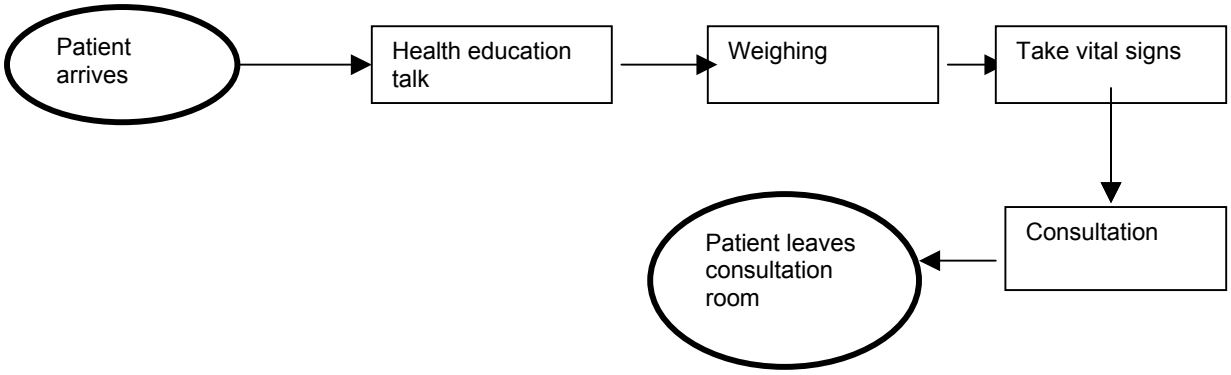
_____

_____

_____

STEP 3: Identify Who Needs to Work on the Problem

The Sawasawa Team's next step was to choose the right team members for the problem. They drew the following high level flowchart to ensure they included the key people.



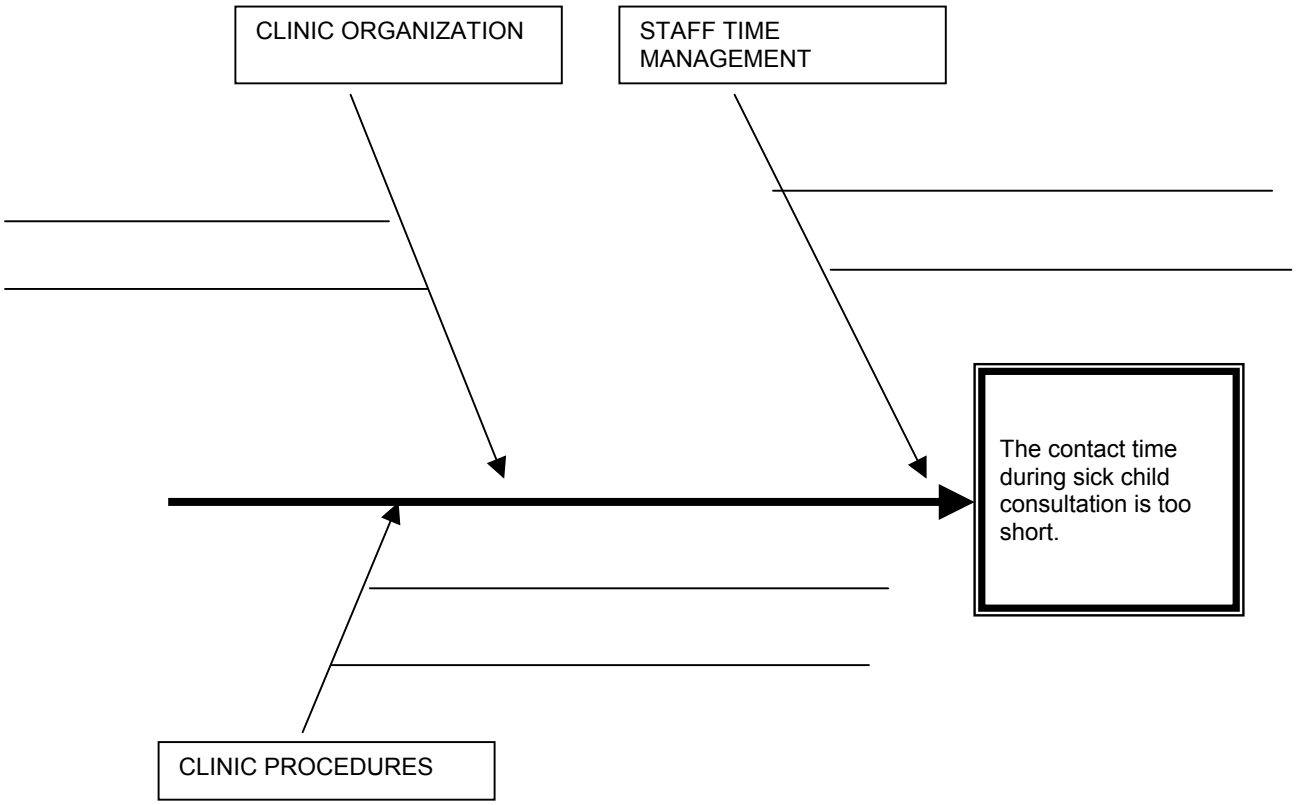
Here is a list of possible people that Sawasawa could include in the team:

1. _____ Facility in-charge
2. _____ Clinical officer: IMCI trained
3. _____ Nurse (#1): non-IMCI trained
4. _____ Nurse (#2): IMCI Trained
5. _____ Midwife
6. _____ Watchman
7. _____ Patient representative
8. _____ Cleaner
9. _____ Chairman of the Health Center Development Committee
10. _____ Family health field educator

Which of these people do you think Sawasawa should include on the team? Use these criteria to decide: (A) works in the process; (B) affected by the problem; (C) makes decisions related to the problem; and (D) has important technical expertise. Put your criteria (A, B, C, or D) for including the team members in the spaces provided. Remember to leave blanks next to the people not to be included in the team. You will have a maximum of five minutes to decide.

STEP 4: Analyze the Problem to Identify Major Causes

The Sawasawa Team used the fishbone to brainstorm the possible causes of their problem. Please fill in the empty fishbone developed by the Team. Remember that each bone represents a cause of the problem, which appears in the big box. You will need to write six possible causes. You will have a maximum of **10 minutes**.



Thank you for working on this case study. We hope it has refreshed your understanding about team problem solving.

Name of Facility:_____ Teamwork Codes: H= High, M=Medium, L=Low

Date of Scoring_____ Name of Evaluator:_____

Steps	Maximum Time Allowed (Minutes)	Actual Time Taken (Minutes)	Issues	Number of Items Correct	Scoring	Ability Score	Teamwork Score H=20,M=10,L=0 H,M,L Points
Step 1a Identify problems	5		One point for every problem identified correctly; max=5	_____/5	*1 = ___	*3 = ____ (max 15)	_____ = _____
Step 1b Prioritization criteria	10		1) Scoring is done correctly? Y=1 2) Scoring is appropriate? Y=1 3) Rankings done correctly? Y=1	_____/3	*2 = ___	*3 = ____ (max 18)	_____ = _____
Step 2 Problem statement	15		1) Does NOT include solution, blame, or cause ? Y=1 2) States what is to be improved? Y=1 3) States desired performance? Y=1 4) Understands verifying indicators? Y=1	_____/4	*2 = ___	*3 = ____ (max 24)	_____ = _____
Step 3 Team composition	5		One point for every correct answer; max=10.	_____/10	*0.5= ___	*3 = ____ (max 15)	_____ = _____
Step 4 Fishbone	10		1.5 points for each correct cause identified and put on fishbone; max=6	_____/6	*1.5= ___	*3 = ____ (max 27)	_____ = _____
Add 1 point to reach 100						+ 1	
TOTAL	45	____	XXXXXXXXXXXXXXXXXXXX	_____/28	XXXXX	= _____	=_____

Appendix B: Coaching Checklist for Quality Improvement Teams

BUNGOMA AND VIHIGA DISTRICTS

Facility: _____ Coach: _____ Date: __/__/__

1. **Objectives of visit:** _____

_____

	Done	Not Done	N/A
2. Before visit			
A. Review previous report	_____	_____	_____
• Resolve any outstanding issues from the report	_____	_____	_____
3. At the facility			
A. Meet team leader and in-charge	_____	_____	_____
• Review progress			
• Check:			
-Teams are meeting as planned	_____	_____	_____
-Story book/story boards are being completed	_____	_____	_____
-Minutes being kept	_____	_____	_____
B. Observe team meeting			
1. Provide coaching as appropriate	_____	_____	_____
2. Problem selection	_____	_____	_____
3. Problem definition	_____	_____	_____
4. Problem analysis	_____	_____	_____
5. Solution selection	_____	_____	_____
6. Solution implementation	_____	_____	_____
7. Solution evaluation	_____	_____	_____
C. Provide feedback			
• Give or plan for just-in-time training, if needed	_____	_____	_____

4. **Comments:**

_____

_____

_____

_____

_____

_____