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Quality Improvement Teams in Morocco: An Evaluation of Functionality and Success





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The Quality Assurance Project (QAP) is funded by the U.S. Agency for International Development (USAID), under Contract Number HRN-C-00-96-90013. QAP serves countries eligible for USAID assistance, USAID Missions and Bureaus, and other agencies and nongovernmental organizations that cooperate with USAID. The QAP team consists of prime contractor Center for Human Services (CHS); Joint Commission Resources, Inc. (JCR); and the following entities at the Johns Hopkins University: the School of Hygiene and Public Health (JHSPH), Center for Communication Programs (JHU/CCP), and the Program for International Education and Training in Reproductive Health (JHPIEGO). QAP provides comprehensive, leading-edge technical expertise in the design, management, and implementation of quality assurance programs in developing countries. CHS, the nonprofit affiliate of University Research Co., LLC (URC), provides technical assistance in the design, management, improvement, and monitoring of healthcare systems in over 30 countries.

Abstract

Background: Research was undertaken to evaluate the implementation of quality improvement teams established by the Ministry of Health at the facility level in Morocco with assistance from John Snow, Inc.; University Research Co., LLC; and the Quality Assurance Project. This research addresses the following primary questions:

1. What are the factors that lead to a successful quality improvement (QI) team, particularly concerning the impact of coaching received by QI teams on their performance?
2. What is the cost of establishing and supporting QI teams?

Methods: The research was a cross-sectional evaluation of the team “functionality” and the factors affecting team functionality. QA team functionality is defined as the degree to which teams complete quality improvement work according to a “standard” QI methodology. A preliminary data collection was conducted in June 1999 in order to validate the study tools. The main data collection was conducted in June 2000. The data collection consisted of gathering information from three sources of data; namely, QI teams, QI team facilitators, and regional coordinators or délégués, using five separate data collection tools.

Results: In general, teams were well versed in the QI methodology, and both team leaders and team members showed unusual—in comparison to other QAP team evaluations—facility with QI terms and tools. Overall, teams in all of the regions were highly motivated in their QI work, even in the face of implementation problems. In terms of the team’s functionality as measured by the team data collection tool, the evaluation team found that teams did quite well in the identification of problems and in the analysis of problems. Across all of the regions, teams rated 72 percent and 74 percent, respectively, in terms of how they completed these steps of the QI cycle. Teams did slightly less well on developing solutions, with only 48 percent of teams following “proper” practice.

Overall, the evaluation team found that teams were highly satisfied with their work on QI and that they rate their facilitators highly across a range of indicators. In terms of coaching skills, it appears that facilitators themselves in Morocco feel relatively confident in their abilities to help teams work through a variety of problems. Areas where coaches feel that they could improve their work are in developing and implementing solutions and beginning work on new problems.

In a regression analysis of factors related to getting results, it appears that the most significant factor is how well teams follow the standard steps of QI, termed in the study team “functionality” with QI ($p < .05$). Other factors examined but found not to be significant were: resources consumed, team climate and satisfaction, and coach rating (by team).

Discussion: The research team found a high level of proficiency with the standard QI methodology and a real interest in the use of QI tools. Teams genuinely seemed

energized by the methodology and had found many benefits to its use. Future work will need to concentrate on better understanding of monitoring and the need for close facilitation during the solutions implementation and monitoring phase. Concerning the factors related to team success, there is little research available that has evaluated the process of doing QI. This research contributes an important finding that “successful” QI is not just any collection of general approaches to thinking about problems. It may make a difference if teams follow the steps in QI and use QI tools correctly; however, further prospective, intervention studies comparing different methods of doing QI will be necessary in order to answer that question. Finally, this report presents specific recommendations for the QA program in Morocco.

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OPERATIONS RESEARCH RESULTS

Quality Improvement Teams in Morocco: An Evaluation of Functionality and Success

1 Background

This report summarizes the results of an operations research project undertaken by the Quality Assurance (QA) Project in Morocco from June 1999 to June 2000. This project was an evaluation of quality improvement (QI) teams in four regions in Morocco. It also interprets the findings and offers a set of recommendations for the National QA Program of Morocco as it moves forward to support existing teams and establish new teams.

1.1 Objectives of Research

This research was undertaken in order to evaluate the implementation of quality improvement teams at the facility level in Morocco. University Research Co., LLC (URC), under a subcontract to John Snow, Inc., worked with local counterparts in the Ministry of Health of Morocco to establish a set of QI teams, supported by a system of “facilitators” or coaches. The QA Project, managed by URC and the Center for Human Services (CHS), was asked to assist in the evaluation of this work. Under its own operations research program, the QA Project developed a research protocol that evaluated QI team success and the factors that were most strongly related to success.

1.2 Assessing Teams and Their Success

While this report does not summarize the literature on teams, it is clear that there has been a growing interest in the business literature on the role of teams in the workplace in the past 10 years. Numerous quality authors discuss the benefits of teams and the role that teams can play in the multidisciplinary improvement of work processes and systems (Harrington 1996; Donabedian 1980; Juran 1992). The use of teams to address gaps in the delivery of healthcare is one of the QA Project’s key tenets (Franco et al. 1997). However, while the team approach to work improvement and redesign has produced results in developing world health system contexts (Kelley et al. 2000), these results have not been universal, and little has been done to examine how to improve team functioning.

Part of the reason for a lack of information in the area of analyzing team functioning is that there is little agreement on the measures by which to evaluate team success. This project defined team success in two ways. First, teams were assessed in how completely they followed through with the QI methodology taught to them through either formal QI training or just-in-time, on-the-job QI training. Training included the identification of problems, the prioritization and selection

Abbreviations

CHS	Center for Human Services
GNP	Gross National Product
JSI	John Snow, Inc.
GIQua	Gestion Integrale de la Qualite (Quality Management Project)
MOH	Ministry of Health
QA	Quality assurance
QI	Quality improvement
QM	Quality management
URC	University Research Co., LLC

of a key problem, and the analysis of causes. This set of three activities was termed QI team “functionality.” Secondly, teams were assessed regarding how well they developed and implemented solutions to the problems they identified and what results they achieved, as measured through self-reporting to the evaluation team. This was termed team “success.” The specific questions asked are detailed in the Methods section.

Finally, team members were interviewed as to their feelings about the team climate and their satisfaction with their QI work. This variable was analyzed both as an explanatory variable for the first two indicators (functionality and success) and as its own measure of success. This was termed QI team “satisfaction.” While the Methods section deals more specifically with the data collection instruments and procedures, the two key indicators of a team’s work and their derivation are detailed below.

- **Functionality:** the degree to which team members followed the steps for QI and applied QI tools correctly according to the standard training material developed and disseminated in Morocco. This indicator is derived by dividing the number of QI process steps done correctly by the number of total steps for each phase of the QI process. The steps are: (a) identifying problems, (b) prioritizing and defining a key problem, and (c) developing solutions. An index was developed for each step. Functionality was measured using a composite index for all three steps.
- **Success:** the degree to which teams got results and accomplished their objectives. This measure is made up of two elements. First, the evaluators assessed whether teams measured their indicator of interest and saw: (a) an improvement, (b) no change, or (c) a decline. This was measured on a three-point scale. Secondly, there was a concern from local counterparts and those familiar with the implementation of QI teams in Morocco that a solely “numbers-based” assessment of success would be insufficient as a measure of progress. The evaluators assessed whether the team “achieved its objective.” Only a “yes” or “no” response was accepted for this question. These two measures were combined into an overall index that defined a successful team.

Overall, this assessment of teams attempted to do what is rarely done in the quality assurance literature, namely, to apply the methodology of assessing compliance with standards to QI work. The QA Project and CHS have over 30 years of experience in the field of QA and improving performance through teams in developing country settings. A description of the standard steps used in the QA Project’s QI approach is presented in the text box on team-based QI. While this study breaks new ground in the evaluation of teams, it is by no means the first attempt by the QA Project and CHS to analyze how teams work. Evaluations of QAP’s work in Niger, Zambia, and Chile (Legros et al. 2000a; Bouchet 2001; and Legros 2000b, respectively) have shown that team-based QI, the same model that was used in Morocco, can have important effects on the quality of healthcare. The research team attempted to evaluate how well the teams in the sample “complied” with what it believes to be an effective problem-solving methodology “standard.” At the same time, however, the team acknowledges that this research was undertaken to examine areas for improvement in the QI methodology. The Discussion section details this assessment methodology, its strengths, weaknesses, and lessons for defining “successful” teams.

Identify the problem: Improving the quality of health services can begin with identifying problems that affect the quality of services. The objective of this first step is to select a specific problem or process on which to focus.

Define the problem: The purpose of this step is to state clearly the targeted "problem." An operational definition of a problem or quality deficiency expresses the difference, in specific and observable terms, between the current and desired state of affairs. A clear problem statement helps to focus problem-solving efforts throughout the remaining steps.

Analyze the problem: This is the step in which the team (or individual) will attempt to understand more about the problem or quality deficiency: Why does it happen? The causes of a problem are not always obvious. Good problem solving means resisting the temptation to jump to conclusions. This step is the crux of the quality improvement process because it addresses the question: What is really going on here?

Identify the solution: Once a problem-solving team identifies the root cause(s), it is ready to develop and evaluate potential solutions, and then to select among the options. Finding the correct solution requires a combination of creative thinking and disciplined analysis.

Plan – Do – Monitor: In the Plan step, team members are first asked to develop the two key tools that will guide the implementation process: a timeline and a budget. These two items essentially comprise the implementation plan.

In the Do step, the work plan that was developed in the Plan stage is implemented.

In the Monitor step, the periodic collection and analysis of selected indicators enables managers to determine whether key activities are being carried out as planned and are having the expected effects on the target population. Monitoring provides feedback to project management in order to improve operational plans and to take corrective action.

1.3 Health System Context in Morocco

Morocco is a country of approximately 27,867,000 (UNFPA 1999) located in North Africa. The Gross National Product (GNP) per capita is \$1,260, and its growth rate is –3.9 percent (World Bank 1997). While significant progress has been made there in a wide range of health indicators, there are still important problems in terms of access to health for the rural poor and the quality of health services. In addition, Morocco has embarked on an aggressive system of decentralization that includes the health system. Currently, the development of regional authorities, below the national government and above the existing provincial authorities, is a high priority. The National QA Program was developed in part to assist in the development of management capacity and local quality improvement initiatives in such a decentralization context. Table 1 summarizes information about the study setting.

¹ This is the QI methodology as used in the first stage of the Moroccan QA program. Both the QA Project and the Morocco QA Program have since experimented with alternate methodologies.

Table 1 Health Situation in Morocco

Indicators	Year	Estimate	Source
Total population (thousands)	1999	27,867	UNPOP
GNP per capita (US\$)	1997	1,260	World Bank
Adult male literacy rate	1995	57%	UNESCO
Adult female literacy rate	1995	31%	UNESCO
Maternal mortality rate (per 100,000 live births)	1997	228	Papchild (ENSME)
Life expectancy at birth	1998	67	UNPOP
Total fertility rate	1997	3.1	Papchild (ENSME)
Infant mortality rate (per 1,000 live births)	1999	37	Papchild (ENSME)

1.4 Quality Improvement Teams and QA in Morocco

URC provided quality management (QM) technical assistance to the Morocco Family Planning and Maternal and Child Health-PHASE V Project in which URC was a sub-contractor to John Snow, Inc. (JSI). The Quality Management Project (or *Gestion Integrale de la Qualite: GIQua*) began with the selection of 13 demonstration settings and the establishment of corresponding quality improvement teams, each of which received training in QA. Teams were to apply QA methods and techniques to the delivery of family planning and maternal and child health services. After noting the success of this pilot program, the Ministry of Health (MOH) decided to make QM an official part of the Ministry's regionalization and decentralization strategy. In response, the GIQua extended its program, first to five regions and later to include services other than family planning and maternal and child health. The MOH is now taking steps to establish a national QM program. The outcomes of the program can be summarized as follows:

- There are 53 quality improvement teams working in eight regions
- Site-specific quality of care improvements have been documented, such as a decrease in neonatal mortality, improved drug prescription procedures, and higher utilization of family planning methods
- A QA documentation and resource center has been established

The design of the National QA Program and an implementation strategy document have been completed.

1.5 Key Questions

This research addressed the following primary questions:

1. What are the factors that lead to a successful QI team, particularly concerning the impact of coaching received by QI teams on their performance?
2. What is the cost of establishing and supporting QI teams?

2 Methods

2.1 Design Description

The research was a cross-sectional evaluation of the team functionality and the factors affecting team functionality. A preliminary data collection was conducted in June 1999 in order to validate the study tools. The main data collection was conducted in June 2000.

2.2 Data Collection Description

The data collection consisted of gathering information from three sources of data using five separate data collection tools. The data sources were:

- QI teams – including team leaders and team members
- QI team facilitators
- Regional coordinators or délégués

The five data collection tools were:

- **QI Team Evaluation Tool:** This tool consisted of a set of approximately 113 questions regarding the team's work in QI. The team was asked to describe its last completed QI cycle (or almost completed: to the point of implementing a solution). Questions were then posed by an external expert evaluator from the QA Project regarding the team, its membership, and training. The evaluator then posed questions regarding the identification of problems, prioritization and selection of a problem, analysis of causes, and the development and monitoring of a solution. Questions were also posed as to the type and amount of resources consumed during the cycle, such as photocopies, meeting time, and communication. Questions were both structured and open-ended.
- **QI Team Member Self-Assessment:** This tool consisted of a series of structured questions regarding individual team members' assessments of the team climate and their satisfaction with the QI work. Approximately 67 questions were structured ones with a rating scale from 1 to 3, with 1 typically being "False" and 3 typically being "Generally True."² The questionnaire also had two open-ended questions on what pleased and displeased team members about their work in QI.
- **Facilitator Interview Tool:** This tool consisted of approximately 23 questions for facilitators regarding their experience with coaching teams. These questions were all open-ended. Approximately four questions involved the resources and time used by the facilitator to monitor his or her teams.
- **Facilitator Self-Assessment:** This tool was a mirror of the QI Team Member Self-Assessment, consisting of approximately 23 structured and two open-ended

² This format varied with the question. There were three negative questions and three positive ones, generally, in each subsection of the questionnaire. This was done to ensure that team members did not become mechanical in their responses. The scales were, of course, altered to fit the negative or positive nature of the questions so that all "3" responses corresponded with the "best" response.

questions. It asked a series of structured questions regarding the climate of facilitation and the abilities, self-assessed, of the facilitator.

- **Regional Coordinator Interview Tool:** This tool was used to gather information from the Regional Directors regarding their opinions of the QI work going on at QI sites in their regions. This tool had 14 open-ended questions on the teams, their accomplishments, the facilitators, and the future of QI work in the region.

2.3 Sample

The original sampling methodology for this research project was a two-stage sampling design intended to include all teams who had completed a QI cycle. The first stage of sampling was at the regional level, where a purposive sample of four of the five regions was made. The fifth region had an extremely limited number of active teams and, upon review of the progress of these teams, there was only one team that would have been included had the fifth region been included in the sample. It is not believed that the omission of this data point has significantly biased the sample. Table 2 presents basic data on the regions surveyed.

Table 2 Description of Regions

Region	Number of Délégués Interviewed	Number of Coaches Interviewed	Experience Level of Coaches	
			Avg. number of teams facilitated	Avg. number of times facilitated
Fès-Boulemane	1	4	1.75	30
Méknès-Fasilalet	0	4	2	39
Tanger-Tetuoan	2	3	12.7	20.7
Souss-Massa-Draa	1	0	na	na
Total	4	11	4.8	27.7

The second stage of sampling consisted of selecting all teams that had “significant experience in QI.” A team was defined as having “significant experience” if it had completed a QI cycle through Step Three of the cycle or through the development of solutions. This definition would ensure that all teams who had valuable experience in QI were surveyed, not just the most successful teams that had completed all steps of their cycle(s). Table 3 summarizes information about QI teams surveyed.

Table 3 Description of Teams

Region	Number of Health Center QI Sites	Number of Hospital QI Sites	Total Number of QI cycles ³
Fès-Boulemane	3	3	2
Méknès-Faflalet	6	3	5
Tanger-Tetuoan	7	3	8
Souss-Massa-Draa	2	0	2
Total	18	9	17

A caveat can be added here regarding the generalizability of the findings in this report. Firstly, within each of the above sites, there is variation as to the pace of implementation of QI teams. In Tanger-Tetuoan, for instance, new teams are constantly forming, with a total of over 30 operational teams, many of which have just begun QI work. In Souss-Massa-Draa, on the other hand, the QI approach has primarily been implemented by teams that were trained during the first round of QI training, and only two teams are still in operation. However, the widest possible range of types of regional profiles for QI team implementation is included. Also included, in each of those regions, is the entire universe of teams, both original GIQua sites and all new extension sites that were available for study. This process renders the results in this research report as generalizable to other regions and to new teams entering the program as possible.

3 Results

3.1 Team Characteristics

The evaluation team collected certain information about QI teams that was thought to be important in terms of sustaining the teams. These included factors such as the staff level of the teams, the frequency of training for the teams versus on-the-job learning of QI, participation through the cycle, and overall team composition. Overall, formal or just-in-time training has reached most teams in Morocco working on QI. However, a number of teams stated the need for more formal instruction on QI as a priority. Overall, 63 percent of teams surveyed had had all members of the team trained. In terms of participation in QI, only 15 percent of teams were able to complete the entire cycle with all members participating in all meetings, although 44 percent had at least 90 percent of team members to all team meetings. Once again, however, there were notable outliers to this, with hospital-based QI teams citing the difficulty of bringing staff together for meetings as a key blockage to their QI work. Overall team composition is summarized in Table 4.

³ As noted, QI cycles are those for which the team had reached at least the implementation and monitoring of the solutions stage.

Table 4 Overall Team Composition

Grade	Percentage of Team Members
Nurse	36
Nurse assistant – level 1	24
Doctor	23
Nurse assistant – level 2	13
Laboratory technician	1
Aide/auxiliary staff	3
Total	100

3.2 Findings on Team Work: Processes and Results

3.2.1 Findings on team process: Functionality in QI

In general, teams were well versed in the QI methodology, and both team leaders and team members showed unusual facility with QI terms and tools in relation to other QA Project evaluations of teams. Overall, teams in all of the regions were highly motivated in their QI work, even in the face of implementation problems. In terms of the team’s functionality as measured by the team data collection tool, the evaluators found that teams did quite well in identifying and analyzing problems. Across all regions, teams rated 80 percent and 90 percent, respectively, in terms of how they completed these two steps of the QI cycle. Teams did markedly poorer on developing solutions, with only 55 percent of teams following “proper” practice. Proper practice here included selecting solutions that were linked to the problem causes and under the control of the team, developing an action plan for realizing the solutions, and planning for an evaluation of the solutions. Table 5 summarizes the findings on team functionality.

Table 5 Summary of Findings on Team Functionality

	Team Functionality Scores (n=23)		
	Step 1: Identify Problem	Step 2: Analyze Problem	Step 3: Develop Solutions
Total	80.3%	89.9%	55.3%

In general, team members themselves self-reported a relatively high level of competence with the different QI tools. While these figures cannot be taken as precise indicators of their QI competence, they are indicative of the teams’ generally high level of comfort with and interest in different elements of QI. Table 6 shows the percentage of team members who stated that they could or could not easily use a particular QI tool.

Table 6 Use of QI Tools

Team Members' Use of Tools	Percentage Who State They Can Use the Tool Easily		
	Yes	No	Don't Know the Tool
Brainstorming	66	31	2
Flow charting	65	32	3
Cause-and-effect diagrams	65	29	6
Prioritization matrices	54	36	10

Note: Percentages may not total 100 due to rounding.

3.2.2 Findings on team success: Implementing solutions and getting results

Despite prescreening teams for inclusion in the study with regional facilitators based on whether the team had completed a QI cycle or not, the evaluators found that not all of the teams surveyed had completed a cycle. Most teams that did not either needed additional financial inputs for the final implementation of a solution (at one site physical plant improvements were part of the team's solution) or believed that they had not adequately monitored the solution to be able to state that an improvement had occurred. The data collectors had been instructed to note where teams had not completed the cycle, but to collect all available information.

In comparison with the relatively high scores on the first three steps of the QI cycle, teams had difficulty in following procedures for implementing and monitoring solutions. Overall, the evaluators found that 14 out of 23 teams interviewed had completely finished at least one QI cycle, and one team had finished three. Of the teams that had completed an entire cycle, 67 percent engaged in "proper" monitoring technique, meaning they enumerated indicators clearly, assessed these indicators, attempted to present their results using simple tables or graphs, and followed their solution implementation schedule, if one existed.

In terms of achieving results, however, QI teams have had a significant impact. The evaluators found that among teams that had completed at least one cycle through to the stage of measuring improvements and monitoring the solution, approximately 80 percent had achieved a measurable improvement in their indicator of interest. The evaluators were concerned that this figure, being self-reported, would tend to be inflated. Unfortunately, the research team did not have the resources to verify each indicator of interest for each team, and several teams had more than one. The expert evaluators were asked to conduct spot checks of improvements in indicators of interest. Of the teams that reported an improvement, approximately 20 percent were spot checked and the indicators were found to be valid. In addition, evaluators were asked to mark, for all teams, whether the indicator of interest for the team's solution was "verifiable," that is, whether the indicator could be checked using another data source outside of the team and its QI storybook. Of the teams that had completed their QI cycle and reported results, 67 percent of the indicators were "verifiable" by an outside data source.

3.2.3 Common issues in QI cycles

Selecting problems: One criticism that has been noted in other QA Project evaluations in Zambia and Niger (Bouchet 2001; Legros 2000a, b) is the need for selection of high-priority health problems by QI teams. Often, teams select administrative problems or use problem types used in training as their own priority problem. The evaluators analyzed whether the problems that teams selected were part of the health priorities for their region and whether the problem was within the control of the teams. In general, teams did a fair job of selecting problems, concentrating on key clinical areas more often than many QI teams in other programs. Approximately 48 percent of teams selected a QI problem that was within the health priorities for their region, and nearly 82 percent of teams selected a problem that was within the team's control.

Using data: The teams surveyed as part of this research were exceptionally well versed in the use of data. The evaluators were impressed with their interest in analyzing problems on the basis of data and found that nearly 70 percent of teams surveyed collected data to verify causes of problems. Also impressive was the energy with which teams pursued a range of data types, both quantitative and qualitative, as part of their QI cycles. Two main issues emerged in the use of data within QI work for these teams.

- **Overemphasis on problem identification at the expense of solution monitoring:** Virtually all of the teams, to a certain degree, had made an effort to analyze their problem by using data. However, a minority of teams made a serious commitment to assess the impact of their solution on their key indicator of interest.
- **Data collection instruments:** In general, the data collection instruments devised by the teams were extraordinarily useful. Some teams even made use of regional intersite visits to learn from the data collection practices of other sites and jump start their own data collection. However, opportunities exist to improve the sophistication level of certain data collection tools, particularly regarding qualitative data collection.

Developing solutions: In general, teams do reasonably well in developing solutions based upon data. However, in some cases teams validate the causes of their selected problem and then develop solutions to all of the major causes in their cause-and-effect diagrams. In other cases, team solutions do not always follow from the data that indicate which cause is most at fault for a particular problem. Finally, in some instances, teams simply seemed to lose focus at the end of the cycle. For example, one team proposed the problem of noncontinuation of women through all three prenatal visits. The main solution that team proposed was to construct a new operating room at the health center built cooperatively with local community officials.

Another team, dealing with the general problem of incomplete case management patients, did an excellent job of studying the problem through an "activity-based" study of where standards of patient care were not followed. Finding a certain number of gaps in the support services by the laboratory and nursing staff, the QI team proposed to improve the support they received from the laboratory and radiology for their patients, as well as steps to reduce the fact that staff were overworked on the unit. Six indicators were elaborated, including compliance indicators for percentage of tests done according to standards and

number of patients who waited longer than a certain time for a test. However, the team never measured these indicators. They explained that some of the solutions required support from other departments and that they had not been able to generate that support.

3.3 Other Factors That Effect Team Results

3.3.1 Team satisfaction and climate

The research team asked team members to rate their team climate in terms of the atmosphere of team meetings, the leadership of the team, how creative the team was in solving problems, etc. Overall, teams were highly satisfied with their QI work. Teams rated their experience with QI tools and with their team members positively. Table 7 summarizes team members' overall rating of team climate and satisfaction by dimension of team climate.

Table 7 Summary of Team Satisfaction and Climate

Dimension of Team Climate	Team Members' Rating
Effective meetings	84.8
Effective leadership	87.0
Positive criticism	77.2
Creativity	82.6
Positive atmosphere	84.5
Team accomplishments	86.1
Overall rating for team climate and satisfaction	83.7

The evaluators also examined how team members' overall rating varied by region. It appears that there is some regional variation in overall team climate as rated by team members (F-test for differences between regions = 3.27, p=.039). However, all regions again rated quite high in terms of teams satisfaction with their work in QI. Table 8 summarizes this information.

Table 8 Overall Team Climate and Satisfaction by Region

Region	Team Members' Rating
Agadir	90.2
Fes	77.9
Meknes	86.4
Tetuoan	82.8
Total	83.5

3.3.2 Facilitation

Facilitation, or coaching, of teams is viewed as an important part of the implementation of QA in Morocco. The evaluators interviewed facilitators and teams regarding the importance and success of facilitation in Morocco and gathered information on topics including facilitation skills and facilitation approach. They also asked teams to assess their facilitator's skills and helpfulness.

In terms of skills, it appears that facilitators in Morocco feel relatively confident in their abilities to help teams work through a variety of problems. Coaches were asked to state whether they felt that they could, in a variety of situations, help a team: (a) themselves, (b) with help, or (c) not at all. They said that they could help teams by themselves with a variety of problems generally between 90 and 100 percent of the time. Areas where coaches feel that they could improve their work is in the area of developing and implementing solutions and beginning work on new problems. Table 9 summarizes the specific areas where coaches rated their ability.

Table 9 Facilitators' Rating of Their Ability to Help QI Teams (Percentage)

	Yes, Myself	Yes, with Help	No
Brainstorming	100	0	0
Flowcharting	100	0	0
Cause-and-effect diagrams	100	0	0
Prioritization matrices	91	9	0
Identifying and prioritizing opportunities for improvement	91	0	9
Defining the problem	91	0	9
Identifying who should work on problem	91	0	9
Analyzing problem	80	10	10
Choosing the solution	91	0	9
Implementing the solution	91	0	9
Evaluating the effects	82	9	9
Starting work on new problems	82	0	18

More importantly, their clients—the QI teams—rate their facilitators highly across a range of indicators. When asked how well their facilitator supported their work in a variety of areas—such as encouraging active participation, furnishing constructive advice and technical counseling, and assisting in conflicts—teams overall rated facilitators at 83.5 percent. Some improvement is possible in this, as the minimum score received by a facilitator was 66 percent and in several areas, such as staying neutral in conflicts, facilitators overall received quite low scores from their teams. Table 10 summarizes this information.

Table 10 Team Ratings of Facilitators

Area	Rating (Percentage)
Helping to elaborate and follow rules	97.1
Encouraging active participation	97.0
Helping the team make decisions	93.0
Staying neutral in conflicts	24.0
Helping the team stay on track	97.0
Providing advice and training	91.8
Overall rating	83.3

3.3.3 Resources

While it is difficult to collect information on costs retrospectively, the evaluation team wanted to determine approximately how much it would cost to have a QI team in a setting like the hospitals and clinics in Morocco. The team collected information on the types and range of resources that were consumed by the teams during their QI work. This included the following categories:

- Resources needed by the team while doing QI (excluding costs of implementing solutions). These included basic materials and supplies needed for didactic (e.g., just-in-time training) and problem-solving purposes. Other essential but one-time costs, such as the cost of an overhead projector or white board, were not included. A complete list showing the types of inputs is in Table 11.
- Training time
- Facilitation time

Resources for doing QI: The study found significant variations in the levels of resources consumed by teams during a QI cycle. This diverse pattern of resource use can be seen by examining the column on usage percentages in Table 11. All teams used QI manuals, 64 percent used transparencies, and 14 percent used projector bulbs, etc. Some teams used more transparencies than others, but on average, those teams that used transparencies used \$26 worth per cycle (“Average Usage Cost per Cycle”). Once the researchers determined the percentage of teams using each resource in a cycle and the average cost of each cycle’s consumption of each resource, calculating the expected average item cost per team required only multiplication (see note below Table 11). The research team acknowledges that because these calculations are based on averages, they are not fully reliable, but they are indicators of expected future costs.

Factoring in the diverse pattern of resource utilization, a complete cycle can be expected to cost about 994 dirhams (about \$105) on average per team. The total cost of individual inputs used by teams averaged about 3,341 dirhams (\$352). Estimates for the cost of a cycle ranged from 21 dirhams (\$2) per cycle to 4306 dirhams (\$453) per cycle. The diverse pattern of resources used by different teams accounts for a large part this variation.

Table 11 Actual and Expected Average Levels of Resources Used to Complete a QI Cycle

Resource	Percentage of Cycles Where Each Resource Was Used	Average Usage Cost per Cycle		Expected Average Usage Cost per Cycle	
		DHS	\$US	DHS	\$US
Manual on QI	100	134	14	134	14
Transparencies	64	244	26	157	16
Markers	50	85	9	43	4
Other written materials, photocopies	36	414	44	148	16
Transportation	29	194	20	55	6
Telecommunication	21	892	94	191	20
Graph paper	21	600	63	129	14
Other	21	312	33	67	7
Bulb for projector	14	400	42	57	6
Total		3,341	352	994	105

Note: “Expected Average Usage Cost per Cycle” = “Percentage of Cycles Where Each Resource Was Used” x “Average Usage Cost per Cycle.” This calculation is intended to guide planners in estimating the cost of resources that teams would use in the future.

Several factors contribute to the wide disparity between the highest and lowest cost per cycle, including the duration of the cycle and the types and quantity of resources available to and used by the teams. For instance, the average cost per meeting of a team cycle was about 50 dirhams (\$5) per meeting, and the median about 38 dirhams (\$4). Most teams (about 80 percent) conduct 8 to 24 meetings, and the cost per meeting for these teams averaged 28 dirhams (\$3). Not all teams used similar inputs, although all teams reported having a basic supply of QI manuals and most reported using transparencies. Some of the most costly inputs are also those that are less frequently used by teams, such as telephone communications (e.g., with the facilitator), bulb replacements where overhead projectors are used for QI cycles, and graph paper. Anecdotally, some teams indicated their choice of simpler, already-available tools; for instance, black boards instead of graph paper.

Only about 14 percent of the resources teams used to complete their cycles were supplied by the central level of the health system through the QA Unit. Primarily, this contribution included initial supplies for training and reference manuals. About two-thirds (67 percent) of the resources were provided primarily by the regional and local supporters of QI activities, including the regional coordinator’s office, hospital administration, and the health center. The remaining nearly one-fifth of the cost (19 percent) was provided by the team leader or the facilitator using personal funds, e.g. for transportation and some team supplies, such as markers.

Another important investment in the QI cycle is the level of staff and team time devoted to addressing a quality problem. An analysis of this time, based on the time spent by teams in QI meetings, suggests that a team spent an average of 33 hours to complete a

cycle (minimum: 12 hours; maximum: 48 to 124 hours). However, cycles are completed over a series of meetings, 22 on average (minimum: 7; maximum: 24⁴), each lasting an average of 1.5 hours, i.e., 1 to 2 hours. Teams are, on average, comprised 10 members, though on average only two-thirds of members appear to attend all team meetings. The attendance rate differs between hospitals and health centers, with either 44 or 75 percent of members attending all team meetings, respectively.

Training: All new teams usually receive an awareness workshop on QA. Following this, many teams receive a series of just-in-time (JIT) training sessions during the course of completing their problem-solving cycle. The awareness workshop generally lasts about four hours, often over two days and during low patient flow hours, and involves representation of the providers in the health center or hospital. In general, all members of a QI team, with very few exceptions, attend this workshop. Other than the time that personnel spend to attend or conduct the workshop, the cost of these workshops is fairly minimal, mostly involving the cost of transportation for the facilitator to the QI site. Communication and JIT training materials are usually re-used for multiple workshops.

The JIT trainings are didactic sessions carried out by a team leader, and often the facilitator is involved in order to convey principles of each step in a problem-solving cycle. Sessions occur at the beginning of each team meeting and last about one hour, from 15 minutes to a whole team meeting, depending upon the complexity of the topic. Some form of JIT occurs in all team meetings, especially for new teams, very few of whose members have received formal QA training. On average 55 percent of QI team members stated that they had received some form of training, including JIT and formal QA training.

Facilitation: Other than the technical support provided for JIT sessions, facilitation (or coaching) meetings are conducted by facilitators both informally and formally. This facilitation occurs in different ways, including discussions by phone initiated by the facilitator or the team leader and visits by the facilitator to the team leader or vice versa. The cost for sustaining facilitation is therefore difficult to assess precisely, particularly given the large variation of this cost, which depends on the proximity of the site to the facilitator's primary base.

The amount of time devoted to facilitation appears to be just as significant as the time to complete a QI cycle. On average, a facilitator provides 43 visits to the team during the course of a cycle, most of which occur during the team meetings themselves (this is mostly due to the fact that some facilitators play the role of team leader for new teams until a team member is trained to be a team leader). This is the equivalent of 55 hours devoted to facilitation. Table 12 summarizes the major findings on the average level of resources required to support QI activities.

⁴ One extreme value of 83 meetings was reported.

Table 12 Summary of Resources Associated with Supporting QI in Morocco

Resource Area	Indicator	Amount
Cost of completing QI cycle	Average essential materials and supplies costs	\$105/cycle (Min: \$2; Max: \$453)
	Total average meeting time	33 hours/cycle (Min: 12 hours; Max: 125 hours ⁵)
Facilitation	Total average facilitation time	52 hours/cycle (Min: 10; Max: 125)
	Average number of visits	43 visits/cycle (Min: 15; Max: 83)
Training	Average percentage of team members who have been trained (formal or JIT)	55%
	Average number JIT visits and time for JIT per team meeting	12.2 visits 1 hour per meeting

3.4 Factors in Team Success: Regression Analysis

Given the interest in developing recommendations for future QI work in Morocco, the evaluators attempted to analyze some of the different factors that seemed to be related to team “success.” As explained in the Background section, the evaluators defined a team as “successful” if it: (a) measured an indicator of interest and reported an improvement, and (b) reached its objectives in the judgement of the expert evaluator. The evaluators examined the relationship between this indicator of success and four factors:

- Resources consumed (excluding time and training manuals)⁶
- Team climate and satisfaction
- Coach rating (by team)
- Team functionality (described in Section 1.2)

In measuring which, among the above factors, seems to have the largest influence on whether teams are successful or not, a calculation is made of the regression coefficients for each factor. These coefficients indicate the amount of change in the dependent variable, here “success,” caused by each factor listed above. Since the importance of these coefficients is in part determined by their standard deviations, they were transformed to standardized coefficients termed “standardized beta coefficients.” These

⁵ This time for one team was significantly higher than all other values for other teams and should probably be seen as an outlier. The next highest value was 48 hours.

⁶ Time was not included as there is a disagreement as to whether time in QI work constitutes a cost or a gain for the health system: More detail is in the Discussion section. The cost of training manuals, a considerable cost for the number of individuals trained in Morocco, was not included in this indicator. This indicator examines the relationship between recurrent costs and QI success, and excludes one-time costs that are virtually uniform across teams.

coefficients are directly comparable. Secondly, the evaluation calculated how well the overall “model” describes “success.” In statistical terms, an attempt is made to predict the greatest possible variance in the dependent variable, success. Overall, the model explained a fair amount of variance in the dependent variable with an $R^2 = .26$. However, the evaluation team found that the only variable that was significantly related to team success out of the four entered into the model was team functionality, with a standardized beta coefficient of .463 ($p = .05$). Information on all of the variables is in Table 13.

Table 13 Regression Analysis of the Factors Linked to Success

Coefficients	Standardized Beta Coefficients
(Constant)	-
Resources	.099
Team satisfaction	-.015
Coach rating	.177
Functionality	.463*

* significant at $p = .05$

The evaluators also examined partial correlations between the factors in the model. One concern was that functionality might be serially correlated with team satisfaction and climate. However, an analysis of the partial correlations showed that these two variables are not significantly correlated.

4 Discussion

4.1 *Interpreting Findings on Process and Results of QI Teams*

The findings on QI teams in Morocco are both encouraging and unexpected. Having spent significant time during the period 1997 to 2000 with the teams, their facilitators, and Moroccan leaders of the National QA Program, the evaluators expected to find a certain level of familiarity with QI methods within the teams. However, the evaluators were pleasantly surprised to find such a high level of proficiency with the standard QI methodology and a real interest in the use of QI tools (based upon Table 6). Teams genuinely seemed energized by the methodology and had found many benefits to its use. As one team leader stated, “This approach has given us a sense of purpose in our work. Before I used to come to work and try and get the staff interested in important statistics, such as our rate of new family planning acceptors. Since introducing the QI approach, the whole staff of the health center has gotten involved in solving our problems.”

Such energy is born out in the general level of functionality in QI. Strong direction within the pilot QA program (GIQua) to select priority health problems means that QI teams in Morocco are exceptionally focused on key clinical problems in their work. Future work should concentrate on better understanding of monitoring and the need for close facilitation during the solutions implementation and monitoring phase. Too many teams lapsed in implementing their solution. One hospital-based team stated that they had not been able to measure their solution’s impact because they had not been able to

fully implement it, even after one year of devising the solution. One of the elements of the solution required coordination with the hospital director and other support departments, such as the hospital laboratory. This apparent lack of “empowerment” in the face of implementing solutions is entirely at odds with their energy in identifying problems using data they gather themselves. However, such lack was commonly seen, and less than half of all teams followed the standard in devising a solution and actually implementing the solution. Teams must be followed closely during this stage, and facilitators, who typically concentrate visits during the early stages of team work, may need to devise new visitation schedules. In addition, facilitators themselves may need additional training in monitoring techniques and how to coach teams in this stage. In terms of their areas of expertise, facilitators rated “evaluating the effects of solutions” among their lowest in terms of capability of helping teams.

Concerning the factors related to team success, little research is available that has evaluated the process of doing QI. The research described here contributes an important finding that “successful” QI is not just any collection of general approaches to thinking about problems. It may make a difference if teams follow the steps in QI and use QI tools correctly. The evaluators believe that this is especially true for teams like the teams the evaluators observed in this sample, namely teams that are early in their experience with QI and are engaging in their first, second, or even third QI cycle. By analyzing the correlations between factors, the evaluators hoped to isolate the importance of team “functionality” in achieving team success. One question that the data cannot answer is whether the functionality rating that teams received was indicative of some background construct. That is, were teams with higher functionality ratings more likely to succeed because they have, perhaps, a strong work ethic and better workmanship as a group, for instance? One would expect, if this were the case, for the team climate and satisfaction rating to correlate. While the finding that team functionality is significantly related to team success may show that there is a relationship between the two, it does not indicate how necessary or sufficient functionality is to team success. Further prospective, intervention studies comparing different QI methods will be necessary to answer that question.

One would normally expect at least a positive, if not significant, relationship between team climate and team success. The QA Project’s experience in other settings has shown anecdotally at least that improved team spirit is one of the key benefits cited by teams of their QI work (Legros 2000a). It is possible that improved teamwork and achieving results are two independent outcomes of QI rather than teamwork being a necessary enabler for getting results. Again, however, more research is needed on both team climate and resource use (discussed below) and their relationship to getting results with QI.

QI Team Processes and Results: Key Recommendations

- Increase facilitation for QI teams during the solution implementation and monitoring phase of the QI cycle. Coaches should develop work plans for their coaching visits that include a schedule of planned visits with a view toward emphasizing solution implementation. In addition, the QA program should explore alternative QI methodologies that allow for rapid problem identification and quicker implementation of solutions.
- Emphasize the positive benefits of team building as one of the goals of QI work in and of itself. This could be done during coaching visits and through revisions in the core QA training curriculum.
- Develop coaching skills in facilitating the implementation of solutions and empowering team members to implement solutions. This should begin during coaching training. In addition, more work should be done to link individual department or clinic QI efforts with the larger goals of the healthcare organization. Coaches and the central QA unit should work with teams to ensure that they are communicating their results to hospital or health clinic supervisors so that solutions that may need additional resources receive proper consideration from organization management.
- Continue to encourage the linking of QI activities with the health plans and priorities of the regions. An emphasis on clinical and public health improvements will engender further support for the QA program, although administrative problems will always need to be addressed.
- Emphasize the importance of proper use of QI methods and tools, especially for new teams. This is especially important since teams that do well with the tools seem to do better in obtaining results.

4.2 Interpreting Findings on Coaching Practices

The evaluators were again pleasantly surprised by the level of commitment and competence among the facilitators surveyed for this research. Not only are the Moroccan facilitators motivated to help teams, they also go to considerable lengths to ensure that the QI teams in their charge have proper support, often to the point of spending considerable amounts of their own money on transportation and office supplies. In addition, some facilitators spent significant amounts of their weekends and evenings following up on QI work or helping teams document their activities. Virtually all facilitators interviewed indicated that they felt that they and their teams would definitely continue their work on QI following the termination of external funding. For the

facilitators interviewed, the work in QI was not just mechanical, but an intellectual pursuit of a “vast knowledge base” that brought “a lot of personal satisfaction,” as one facilitator stated. These facilitators are motivated not just to teach teams, but also to achieve results. As one facilitator said, “What pleases me about my facilitation work is to see the results achieved by the team itself, to feel as though I have rendered a service to the team, and to see the team take on, little by little, important decisions.” In addition, teams seem to be satisfied with their facilitators’ work, although opportunities exist for improving the content of facilitation in terms of staying above conflicts within the team.

There is a certain level of variation in terms of how often and for how long facilitators follow up with their teams. In addition, the data regarding how comfortable team members are with different tools show that JIT training needs are still high for many teams in terms of becoming more competent with basic tools, such as prioritization matrices and flowcharts. Such training will not be possible unless further resources are allocated for facilitators to follow teams. As one facilitator stated, “Even if things are going well with the QI teams, there are still numerous problems in the implementation of QI in our region. Finding the means for facilitators to transport themselves to their teams is a necessity. Right now, we have no real way to follow teams outside of our province, since funding for transportation outside of the province is not available.” Moreover, the documentation of teams’ work is an important function that many regional facilitators are assisting with now. In general, teams do a good job of documenting their progress in QI through storyboards, although often only with help from their facilitators. The evaluation team believes that an excellent aid in such work would be the availability of laptop computers for the regional facilitators. While the expense would exceed the normal budgetary requests of these facilitators, improved documentation of progress and monitoring of teams in the region would be worth it for the National QA Program. Documentation is one of the core functions outlined in the National QA Plan and the validity of that information is enhanced through its timely collection. Facilitators could be loaned the computers with the agreement for a certain number of case studies and a quarterly monitoring report. The QA Project and URC staff have made further recommendations on documentation and communication within the National QA Program in separate documentation (Knebel 2000).

Coaching Practices: Key Recommendations

- Encourage the use of JIT training and provide coaches with necessary materials for conducting such trainings. These might include handouts on key QI tools or on steps in the QI cycle that could be adapted from the basic QI training manual.
- Develop solutions to transportation problems for coaches, particularly in helping teams outside of their own province. This will require discussions with the regional délégués and provincial representatives. The QA Program will need to work within the system of decentralization in the Moroccan health system, but certain provisional rules for key tasks, such as coaching, could be settled within the QA Program prior to agreement on all funding flows between the regions and the provinces.
- Develop job descriptions for coaches. Coaches at different levels of the QA Program (provincial, regional, and national) need to understand what their roles are in terms of basic tasks (facilitating teams, reporting on progress, etc.) and advanced tasks (coordinating provincial coaching, training of new coaches). A job description would help considerably in this regard.
- Continue to emphasize the importance of coaches in the QI team system, including the intellectual and pedagogic aspects of coaching. This may entail study tours/visits between provinces and regions to observe exemplary coaching practices and using star coaches in training and other pedagogic activities.

4.3 Interpreting Findings on Costs

The methodology used to collect information on costs contains some weaknesses. First, by making the focus of the analysis mainly expenditures made to operate essential QA functions, valuable information on the cost of implementing QI solutions, as well as cost savings that can be realized by improving quality have been missed. This information would potentially have balanced the perspective on the cost of QA. Based on findings on quality improvements achieved by teams, the evaluators expect the net cost of a QA system/program to be lowered by short- and long-term benefits. Another weakness is the retrospective approach based on interviews and minimal record review used to assess costs and resources utilized for essential QA functions. Recommendations are made to consider a more prospective tracking of costs, ideally integrated within the general management of resources by the stakeholders at different levels of the health system.

Despite these weaknesses, the cost analysis revealed important insights on the cost and financing of QA in Morocco. While no two teams are identical, a basic package for

supporting the functioning of a QI team was estimated based on the pattern of resource utilization by teams and a projection of an essential package of materials and supplies. This package will cost about \$105 per team cycle.

The facilitation function demands both time and resources for travel and communication, a significant part of which has been at the expense of the individual facilitator or team. Particularly important is the question of funding and strategy for supporting distant sites not easily reached by regional or provincial facilitators. In addition, the JIT approach to coaching appears to be a cost-efficient approach, combining facilitation with training. It remains to be evaluated whether this approach is cost-effective relative to the success achieved by teams and the cost of providing JIT to remote sites.

This study originally planned to examine all of the resources consumed by QI, including facilitators' and team members' time, as costs to the Ministry of Health. After extensive discussions with local counterparts in Morocco, including the helpful input of regional directors, the evaluators realized that time for QI work was often being created out of currently nonproductive time when the team members would not be performing other duties. The evaluators therefore changed the focus of the analysis to concentrate on other recurrent costs for QI work. However, the evaluators still wished to assess the time being devoted to QI in order to show that, especially early in a team's QI experience, facilitators and their supervisors must expect a certain level of time commitment from both the teams and facilitators. The average meeting time per cycle for teams was 33 hours (or up to 330 person-hours) and was as high as 125 hours (or up to 1250 person-hours). The average visit for a facilitator conducting just-in-time training was 1.5 hours. These time commitments are in the face of already busy schedules and heavy patient loads for clinical staff.

The lack of a significant relationship between costs and team success is important. Although the regression analysis of factors linked to team success included only recurrent costs and did not include time, the evaluators believe that a certain minimum level of resources is needed to ensure successful QI teams. Frequently, a number of basic one-time inputs, such as training manuals, workshop costs, etc., are paid for by either an external donor (as was the case in Morocco) or a central-level quality unit. The analysis of the relationship between recurrent cycle-based costs, as opposed to one-time start-up costs, and team success shows that results in QI do not have to be expensive in the long run. It is clear, however, that commitment of targeted resources, especially in the form of support for new regional functions as well as support for the central-level QA unit, will be needed to sustain the gains made in QA in Morocco.

Costs and QI: Key Recommendations

- Encourage teams to collect information prospectively on the costs of their activities, as well as any cost savings that their quality improvements realize. While not every QI activity is designed to save money, an important element in decision makers' support for QI is how much value that it adds in terms of work eliminated or costs saved. By the same token, teams and coaches should also realize that QI work is not done for free. Teams cited repeatedly that QI work took time and that they had busy schedules even before QI. By tracking cost savings and expenses, teams can: (a) better understand where they themselves waste time and resources, and (b) better advocate for continued QI work.
- Continue to ensure that teams receive basic resources for QI work. The finding that the cost of resources used during QI work was not significantly related to achieving results should not be interpreted as meaning that resources are unimportant. The evaluators believe that teams need a basic level of inputs to do their work, after which additional resources may not significantly influence the success rate for simple problem solving. This will most likely change somewhat as teams address more complex problems.
- Encourage the use of just-in-time training as an efficient alternative to formal training. Numerous teams were supported using JIT and could implement QI reasonably well. However, JIT must still be complemented by other forms of support, such as intersite visits.

4.4 For Future Team Evaluations

This study attempted to evaluate a somewhat immeasurable technical area, the performance of teams. At the least, the data collection was complicated and involved a certain level of interpretation and subjectivity on the part of the expert evaluation team. However, local involvement with the Quality Unit of the Direction of Hospitals and Ambulatory Care within the Moroccan Ministry of Health and validation of all of the data tools helped raise the level of validity of the data collection.

Numerous recommendations can be made on data collection practices. Data collection tools were built from experience in other countries where the QA Project has worked and were validated locally, and expert evaluators participated on each data collection team. Even so, certain data entry omissions and errors were made that had to be corrected prior to data entry and analysis, which points out the difficulty of retrospective analysis, particularly in the areas of team process and team resource use. If ongoing monitoring of teams is to be done using the tools employed in this study, a much more limited team data collection tool must be constructed. Specifically, the background information section

should be completely revised, adding sections for data entry staff names and fewer open-ended questions about the sites. In addition, both the monitoring of solutions matrix and the cost data were poorly filled out in general and need either to be eliminated or significantly pared down. Finally, a more detailed training and training manual should accompany the new data collection tool. Despite the presence of expert evaluators, there was wide variation in completeness of data entry for open-ended questions.

The evaluation team and the QA Project are pleased that this research adds to the sparse scientific literature on the evaluation of teams. The work being done in Morocco in extending a small pilot QA project to a national QA program has the potential to be a major event in that country's health system and one that will change the delivery of healthcare for millions of Moroccans. This change will be based on the work of local QI teams. The evaluators hope that this report, through the generous support of USAID in Morocco and Washington, DC, will guide the work of these QI teams and support their efforts to improve the quality of care in Morocco.

5 References

- Bouchet, B. 2001. The Zambia Quality Assurance Program. *Technical Report Summary 1(3)*. Bethesda, MD: Published for the U.S. Agency for International Development by the Quality Assurance Project.
- Donabedian, A. 1980. *Explorations in Quality Assessment and Monitoring, Vol. 1: The Definition of Quality and Approaches to Its Assessment*. Ann Arbor, MI: Health Administration Press.
- Franco, L.M., J. Newman, G. Murphy, and E. Mariani. 1997. *Achieving Quality Through Problem Solving and Process Improvement*. Bethesda, MD: Published for the U.S. Agency for International Development by the Quality Assurance Project.
- Harrington, J.J. 1996. *High Performance Benchmarking: 20 Steps to Success*. New York: McGraw Hill.
- Juran, J.M. 1992. *Juran on Quality by Design*. New York: The Free Press.
- Kelley, E., C. Geslin, S. Djibrina, and M. Boucar. 2000. The impact of QA methods on compliance with the Integrated Management of Childhood Illness Algorithm in Niger. *Operations Research Results 1(2)*. Bethesda, MD: Published for the U.S. Agency for International Development by the Quality Assurance Project.
- Knebel, E. 2000. *Morocco: Trip Report*. Bethesda, MD: University Research Co., LLC.
- Legros, S., E. Goodrich, and H. Abdallah. 2000a. The Niger QA/BASICS Joint Project. *Technical Report Summary 1(1)*. Bethesda, MD: Published for the U.S. Agency for International Development by the Quality Assurance Project.
- Legros, S., R. Massoud, O. Urroz, and E. Kelley. 2000b. The Chile Quality Assurance Program: Final Evaluation. *Technical Report Summary 1(2)*. Bethesda, MD: Published for the U.S. Agency for International Development by the Quality Assurance Project.
- UNFPA (United Nations Population Fund). 1999. *The State of World Population 1999: 6 Billion, A Time for Choices*. New York: UNFPA.
- World Bank. 1997. *World Development Report 1997: The State in a Changing World*. New York: Oxford University Press.