The Zambia Quality Assurance Program: successes and challenges

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Abstract

Objectives. The objectives of the evaluation were to review the performance of the Zambia Quality Assurance Program (ZQAP) and provide recommendations to help design its next phase.

Design and methods. Topics for evaluation were identified from a systems analysis of what an ‘ideal’ quality assurance (QA) program might look like. The evaluation team was made up of six experts who developed questionnaires to guide the interviews and related scoring tools. The evaluation team visited 24 health facilities in nine districts, representing all four regions of Zambia, and interviewed 140 persons, including health personnel from the public and private sectors, and non-health personnel.

Findings. In 5 years, senior staff built a QA structure and capacity throughout Zambia, generated enthusiasm for QA, and initiated teamwork on quality care issues by motivated health staff. Some challenges remain: lack of integration of QA, uncoordinated standards, weak methods of standards communication, poor measurement of compliance with clinical care standards, constraints on the work of the quality improvement teams, and inconsistent support systems.

Recommendations. The evaluation team made recommendations regarding a national QA policy, mechanisms to develop standards of care, monitoring of health providers’ performance, needs of quality improvement teams, training in QA, and documentation of QA activities.

Conclusions. Despite its success in covering the entire country with a network of QA coaches and trainers, the capacity of the public sector to sustain QA activities at the central and district levels remains a challenge. Lessons from the Zambia experience can benefit QA programs in other developing countries.

Keywords: quality assurance, quality improvement, program evaluation, Zambia

In 1993, Zambia started to reform its health sector. As part of the reform, a Zambia Quality Assurance Program (ZQAP) was established to improve the quality of health care, with support from the Danish Cooperation (DANIDA). The ZQAP strategy was to build quality assurance (QA) capacity at the district and health center levels by training staff in: (1) setting standards for health services; (2) monitoring indicators of achievement; and (3) team-based problem solving. A network of coaches (district-level facilitators for the health center-based quality improvement teams) and link facilitators (QA trainers providing support to coaches and managing several districts) covered almost the entire country. The United Stated Agency for International Development (USAID) QA Project provided technical support to the Central Board of Health (CBoH) in training the future QA staff, some of whom would become trainers of the others.

Before 1996, the ZQAP was the responsibility of the Quality Assurance Unit of the Health Reform Implementation Team. Since the creation of the CBoH in late 1996, QA activities were coordinated by the Directorate of Monitoring and Evaluation, through its Service Quality and Performance Audit Unit. Important milestones and achievements of the ZQAP were:

1. Establishment of quality committees at provincial, district, and hospital levels in 1994
2. Piloting of QA training in standard setting and indicator development
3. Livingstone district training and pilot testing of problem solving and peer review system in six health centers in 1996

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Establishment of a national network of district coaches and regional link facilitators

Establishment of neighborhood health committees as a mechanism for the communities to participate in solving quality-of-care issues

Linkage of the health management information system with the problem-solving process

Initiation of a national accreditation program for hospitals in 1998

Objectives

In 1998, the CBoH requested that the first evaluation of the ZQAP take place. With financial support from USAID, the Bethesda-based QA Project was selected to lead an international evaluation team. The evaluation took place from September 14 to October 2, 1998. Evaluation objectives were to examine the performance of QA activities in Zambia, to identify challenges facing the program, and to make recommendations that would shape the vision of the CBoH for future work to institutionalize QA. The evaluation focused on three main aspects of the ZQAP: (1) development and communication of standards of care, and measurement of compliance with those standards; (2) productivity of quality improvement teams using a problem-solving method; and (3) the existence and effectiveness of the support systems for QA activities.

At the time of the evaluation, the ZQAP consisted of two or three staff at the central unit, at least 30 regional link facilitators, two to four coaches per district, and 150 to 300 active problem-solving teams. The last figure is an estimate of the total number of teams that might have been active at the time of the evaluation, derived from the sample districts included in the evaluation. Except for the central level staff, the QA responsibilities were only part of the overall staff responsibilities and not their full-time jobs.

Study design and methods

The evaluation team was made up of six QA experts divided into three subteams: a standards subteam, a quality improvement subteam, and a support systems subteam. Each subteam had two experts: two from the USA, two from Norway and Denmark, and two from Zambia. The evaluation team first developed a preliminary guide for the program evaluation based on a systems view of what an ‘ideal’ QA program might look like and a consensus of the priorities for evaluation in Zambia: development and communication of standards, measurement of quality, performance of the quality improvement teams, and support systems for the QA efforts (training in QA, coaching of teams, and the documentation of QA activities). The evaluation steps were:

(1) A preparation visit to finalize the objectives of the evaluation and the scope of work

(2) In-country assembling of ZQAP documentation by the CBoH

(3) In-country planning meeting of the evaluation team

(4) Design of questionnaires and data collection forms

(5) Oral presentation of relevant surveys/studies

(6) Data collection through field visits, meetings, and document reviews

(7) Daily team meetings

(8) Weekly synthesis/discussion of the information collected

(9) In-country validation and dissemination meeting of preliminary findings

(10) Finalization of the evaluation report with stakeholders

The evaluation team selected nine districts for the field interviews, purposely choosing districts with health centers that had active QA teams or staff who had received some degree of QA training. In these nine districts, representing all four regions of Zambia, 24 health facilities were visited, and a total of 140 persons were interviewed. The selection of the teams came from indications given by the district officers about health center teams that had either been trained or known to be active in QA. Although the evaluation team met with all stakeholder representatives of the public and private sectors (including patients’ associations), it focused its work on the QA activities of the CBoH.

Information was collected primarily through semi-structured interviews, focus group discussions, and review of documents. Each subteam developed its own instruments, which were refined further in the field. The standards subteam developed a questionnaire to guide its interviews with staff regarding the development and communication of standards, and the measurement of performance against standards. The quality improvement subteam developed two instruments: a semi-structured questionnaire to guide interviews with team members and coaches, and a ‘risk of team failure index’ to predict the likelihood of a team’s forming after training and successfully completing a problem-solving cycle, based on the evaluators’ assessment of how well they used the problem-solving method. The support systems subteam designed a questionnaire to guide the interviews of relevant staff on QA training, the coaching of teams, and the documentation of QA activities.

Results

In only 5 years, a small team of senior CBoH staff built a QA structure and capacity throughout the country, generated enthusiasm in QA, and initiated teamwork by health center staff on quality-of-care issues.

QA policy

The evaluation team could not identify an official policy document that described the vision, strategy, and objectives of the ZQAP, and therefore could not evaluate the program against government policy and objectives. Although the CBoH made some attempts to link the ZQAP with other
health institutions and stakeholders, the ZQAP remained relatively isolated in its efforts to improve quality of care.

**Developing standards**

The evaluation team documented four distinct efforts to develop standards. Firstly, before the QA Project assistance, the ZQAP trained 300 staff (mainly health center nurses and physicians) to develop their own standards using the Dynamic Standard Setting System [DySSSy; developed by the British Royal College of Nursing (http://www.northbristol.nhs.uk)], a step-by-step approach for developing realistic, action-oriented standards that would provide targets to achieve by a certain deadline and would support a rapid problem-solving approach through systems modeling. However, the staff trained in DySSSy faced 'peer inertia' in their facilities, influenced by the following factors: small proportion of staff trained in each facility, lack of trainee capacity to transfer their knowledge to their peers, lack of authority of the trainee over the rest of the staff, and lack of follow-up and technical support. Despite these constraints, the personnel said that DySSSy training helped them develop action plans for districts and health centers; its impact on quality of care remains undocumented.

Secondly, the CBoH developed the Integrated Technical Guidelines for Frontline Health Workers (ITG) for the management of six priority public health problems. The ITG is a pocket-sized reference book for health workers. The ZQAP was not formally involved in the development of the ITG, nor were frontline health workers. Health workers mentioned that the ITG had a limited impact on changing their everyday practice, one reason being the discomfort of looking ignorant if one consulted the ITG in front of a patient.

Thirdly, the CBoH and the Joint Commission International developed standards for accreditation of hospitals that were being tested in 20 hospitals at the time of the evaluation.

Finally, every national public health program had its own set of guidelines, but there was no clear mechanism to coordinate the development and revision of standards between programs.

**Communicating standards**

After clinical standards have been set, the health workers who are supposed to comply with them must know them, understand them, have the skills to apply them, and accept them. A standards communication strategy must go beyond the simple use of classic information and dissemination channels, and must include activities aimed at inducing and sustaining a change in clinical practice behavior. In Zambia, the plan to communicate standards relied entirely on classroom training. For example, the ITG was being communicated as part of the training of staff in the new health management information system (HMIS).

**Measurement of compliance with standards**

The evaluation team focused on the technical quality of the health care delivery process, trying to answer the question ‘How do we know that patients are receiving care according to standards?’. Various levels of the health system were involved in monitoring the performance. Regional directorates audited the district teams who, in turn, supervised the health centers. There were four formal mechanisms to monitor performance: performance audits, supervision visits, the HMIS, and quarterly progress reports. Performance audits consisted of a quarterly inspection of District Health Management Teams (DHMTs), hospitals, and health centers by the regional directorates using four different forms. Performance audits collected information on management, finances, accounting procedures, and facility conditions. The audits included a few indicators related to process of care standards: pattern of antibiotic prescription, investigation of maternal deaths, and proportion of patients diagnosed and treated according to standards. The last was assessed through review of a sample of 10 patient records. Since information in medical records was limited, their review allowed only determination of the appropriateness of the treatment without knowing the accuracy of the diagnosis. There was no direct observation of the delivery of care, so other aspects of clinical performance by health workers were unknown.

Supervision visits to health centers were carried out irregularly. All DHMTs visits to all health centers monthly or quarterly, but this was not confirmed by the health centers themselves or by a review of supervision reports. A 1997 survey by the CBoH Statistical Office found that in 6 months, 32% of health centers were supervised three times, 23% two times, 23% once, and 22% had not been visited. Teams of three or four supervisors carried out formal supervision visits. They visited two to three health centers per day for 1–2 hours each.

The evaluation team reviewed four different supervision checklists to assess the quality of clinical care and found that all had serious shortcomings. The CBoH had attempted to develop an integrated checklist involving direct observation of care, but the work was not completed. Although most districts had received a draft of the first integrated checklist, only one was currently using it.

There was also a consistent pattern among DHMT staff to avoid the assessment of clinical performance of the health workers through direct observation. A review of supervision reports confirmed this. The main reasons expressed by supervisors for not observing clinical performance of staff were: lack of time, absence of a clinical case corresponding to the checklist they intended to use, and the belief that supervisors do not need a formal instrument to assess quality (this last example is a reason not to use the checklist, but is not a reason for failure to observe clinical performance). The evaluation team felt that there were additional reasons: supervisors did not feel competent in the technical service they would observe, were uncomfortable observing providers, and did not know how to address performance gaps.

The HMIS was also being redesigned to help local teams make decisions based on data. The evaluation team reviewed quarterly HMIS self-assessment forms that health centers and districts completed to monitor their own performance against national and local targets. The forms were designed to allow...
the teams to identify easily the areas of low performance and to take action. The health center forms collected information on 15 input and output indicators related to utilization of services and coverage statistics. The only indicator directly related to clinical performance was the ‘daily staff load for curative and preventive care’. When indicators did not meet the threshold, it triggered the use of a triple-A approach (assessment, analysis, and action). The links between expected performance and quality improvement activities were made explicit. Self-assessment of performance might help QA teams focus on problems directly related to the quality of health services, but it did not collect information on clinical performance.

Each district sent quarterly progress reports to two CBoH directorates: Monitoring and Evaluation, and Health Services Commissioning. The reports described the achievements of the district in meeting its targets, covering all areas of administration (e.g. number of meetings held), service activities (e.g. coverage and utilization rates), and purchase of supplies and equipment. The information was used to disburse grant money to the district. This reporting mechanism was supposed to be replaced by the self-assessment forms designed by the HMIS.

Table 1 shows the types of data collected through performance audits, supervision visits, and the self-assessment forms of the HMIS, as a percentage of the total number of items checked at the health center level. The focus of performance monitoring is on input and outcome data. None of the monitoring mechanisms that we analyzed captured information that would allow assessment of health providers’ compliance with clinical care standards. Finally, there was no systematic investigation of causes of poor performance. As a result, competency issues could not be differentiated from other causes. This might lead to identifying in-service training as a solution, when, in fact, lack of knowledge and skills might not be the root cause of poor performance.

### Effectiveness of the facility-based quality improvement teams

The ZQAP defines a quality improvement team (QIT) as two or more people meeting to identify and solve a quality problem by working through a series of steps (the problem-solving cycle), and using simple QA methods and tools.

Twenty-seven percent of the health centers we visited had a functional QIT. The evaluation team identified six predictive factors that seem to positively influence the formation of teams after training in problem solving: (1) 10 or more staff; (2) a coach in the team or regular coaching visits; (3) an officer in charge trained in or actively supporting the work; (4) more than three people on the QIT; (5) at least 5 person-days of QA training represented on the team; and (6) a reasonable morale and a culture of professionalism. If these findings are valid, then it is questionable whether teams should be formed where any of these conditions are absent, as the risk of failure appears high. However, what seem to be pre-conditions of success need to be validated through operations research.

Thirty-six percent of the QITs did not finish the first cycle, and 75% did not continue on to further problems. The evaluation team also predicted the conditions under which a QIT, once formed, would successfully complete a first problem-solving cycle: (1) 50% of team members remaining on staff for 1 year; (2) meetings at least once a month; (3) reasonably focused problem; (4) good problem statement; (5) <4 months spent on one step; and (6) achievement of perceptible or measurable results.

The value of all these factors remains to be tested through research. Fifty percent of the teams chose physical and facility problems, and 40% chose clinical problems. Most QITs worked on meaningful problems for patients, community, and staff (Table 2).

Most teams used the QA tools and methods correctly, but data collection and following all steps posed challenges to teams. QIT members tended to score their performance slightly lower than the evaluation team. Table 3 summarizes the difficulty scores and main issues that the QITs experienced with each of the problem-solving steps. The scores are an average of those recorded for the teams at all of the 25 centers we studied. The average duration of teams’ first problem-solving cycle was 9–12 months.

Teams did not always document their results. Five QITs (20%) achieved measurable changes in quality. In addition, 30% of the teams reported that they had achieved significant quality improvements, but did not possess the data to show it. About 60% of the problem-solving cycles did not produce results that were perceivable within 6 months or that could be attributed solely to the teams. In some cases the problems chosen could only be partially solved by the team. Among measurable improvements were lower malaria incidence, increased immunization, and reduced waiting time.

### QA training

The ZQAP had trained many staff in QA, but they were unevenly distributed. The CBoH had planned to provide training to the regional offices to develop regional QA trainers and/or coaches, but this was not possible due to a ban on workshops, delays in appointing regional office staff, and the simultaneous introduction of hospital accreditation activities. At the district level, several DHMT staff had been trained specifically as QA coaches/link facilitators, or had otherwise participated in some level of QA training. The extent of QA training given to health center staff varied by district, since facilitators and coaches devised training plans to suit their own individual motivations and circumstances. Staff reported that the main constraints to delivering QA training were the funding limitations, lack of transport, and the physical location of the coaches. Overall, no formal system for the identification of QA training needs existed, nor was there a system to track those trained in QA when they were relocated.

### Coaching the quality improvement teams in problem solving

Coaches or ‘link facilitators’ play an important role in the success of the QITs. Ideally, coaching visits to the health
Table 1 Percentage of input, process, and outcome data reported on each form used to measure health center performance, among all data collected on the same form

<table>
<thead>
<tr>
<th>Type of form</th>
<th>Type of data</th>
<th>Input data (%)</th>
<th>Process data (%)</th>
<th>Output and outcome data (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance audit</td>
<td></td>
<td>22</td>
<td>7</td>
<td>71</td>
<td>100</td>
</tr>
<tr>
<td>Health center supervision checklist</td>
<td></td>
<td>76</td>
<td>20</td>
<td>4</td>
<td>100</td>
</tr>
<tr>
<td>Checklist for assessing basic quality of care at the health center level</td>
<td></td>
<td>65</td>
<td>5</td>
<td>30</td>
<td>100</td>
</tr>
<tr>
<td>A supervisory checklist for the six health priorities</td>
<td></td>
<td>66</td>
<td>29</td>
<td>5</td>
<td>100</td>
</tr>
<tr>
<td>Health center self-assessment form (HIQ.1)</td>
<td></td>
<td>33</td>
<td>0</td>
<td>67</td>
<td>100</td>
</tr>
</tbody>
</table>

1Data on the availability and condition of the facility, equipment, and consumables.
2Data on direct observation of the care delivered or proxy indicator.
3Data on coverage rates, utilization rates, and health statistics.

Table 2 Problems selected by the quality improvement teams and number of teams working on each problem

<table>
<thead>
<tr>
<th>Quality issues selected by the teams (No. of teams working on the problem)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management and administrative</td>
</tr>
<tr>
<td>Long waiting times (8)</td>
</tr>
<tr>
<td>Low patient fee collection (1)</td>
</tr>
<tr>
<td>Congestion at tea time (1)</td>
</tr>
<tr>
<td>Staff reporting late (1)</td>
</tr>
<tr>
<td>Careless disposal of sharps (1)</td>
</tr>
<tr>
<td>Need for a shelter for mothers (1)</td>
</tr>
<tr>
<td>Need to extend the rural health center (1)</td>
</tr>
<tr>
<td>No regular fresh water (1)</td>
</tr>
<tr>
<td>Shortage of casual workers (1)</td>
</tr>
<tr>
<td>Lack of discipline and absenteeism (1)</td>
</tr>
<tr>
<td>Stolen manhole covers, blocked sewer line, and ceased soaker way (1)</td>
</tr>
<tr>
<td>No staff houses near the center (1)</td>
</tr>
<tr>
<td>Inadequate maintenance (1)</td>
</tr>
<tr>
<td>Inadequate maintenance of water supply (1)</td>
</tr>
<tr>
<td>Patient records missing (1)</td>
</tr>
</tbody>
</table>

Numbers in parentheses indicate the number of teams that addressed the type of problem listed.

Centers are meant to provide ‘just-in-time training’ or technical guidance to the teams, and should include a review of the team’s work, corrective intervention, and planning for next steps. As reported by some link facilitators, more often the motivation and ability of the QITs to work through the problem-solving process appeared to be externally driven, i.e. a visit by the coach/facilitator would prompt a team to complete one or more steps in the process.

As reported by the health centers, however, most coaching visits were not regularly carried out because of many constraints. For example, some coaches felt that they did not have enough time for QA activities, particularly since many were managers or held other positions at the DHMT. The degree of coaching support to the teams seemed to depend on the willingness and ability of individual coaches and on the resources, such as transport, committed to train health center staff and support coaching visits.

Documentation of QA activities

Information on QA activities was unevenly shared among levels of the health system. At the regional level, specific knowledge regarding QA activities was limited. Reports of QA activities were not submitted to the regional office, and...
Table 3 The types of difficulties experienced by the quality improvement teams and related scores for performing the problem-solving steps¹

<table>
<thead>
<tr>
<th>Step</th>
<th>Average score (n = 25)</th>
<th>Difficulties cited/errors observed (% of teams)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identifying the problem</td>
<td>3</td>
<td>No inclusion of users’ concerns (84%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No selection of priority issues according to results of decision matrix (50%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Several problems selected at the same time (16%)</td>
</tr>
<tr>
<td>Constructing the problem</td>
<td>2</td>
<td>No indicators defined for measuring improvement (50%)</td>
</tr>
<tr>
<td>statement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recruiting the team</td>
<td>2</td>
<td>Team members identified before selection of the problem (92%)</td>
</tr>
<tr>
<td>Analyzing the problem</td>
<td>1</td>
<td>Teams did not gather data to confirm the causes (60%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Teams had difficulties in deciding which data to gather</td>
</tr>
<tr>
<td></td>
<td></td>
<td>and then collecting valid data (50%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Teams did not use the data collected to find the real root cause</td>
</tr>
<tr>
<td>Developing the solution</td>
<td>2</td>
<td>Most teams developed solutions that were not linked to the root causes (80%)</td>
</tr>
<tr>
<td>Implementing the solution</td>
<td>2</td>
<td>Most teams did not measure improvement indicators after interventions (70%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No team kept monitoring improvement after 12 months</td>
</tr>
</tbody>
</table>

¹Both the members of the quality improvement teams (QIT) and the evaluators assessed the performance of the QITs in the use of the problem-solving method. They reached consensus on a score from 0 to 5, based on explicit criteria such as difficulties encountered with the completion of the step and the correct use of specific tools for each step.

²Performance was scored on a scale of 0 to 5: 0, were not able to do it; 1, wrong use of the tool resulted in ineffective step; 2, delayed completion of the step due to major errors with the tool; 3, were able to complete the step after overcoming initial difficulties with the tool; 4, completed the step with minor errors with the tool; 5, could not imagine how to do it better.

existing reporting forms did not capture information about QA. At the district level, a summary report of health center activities was completed by the link facilitator and forwarded to CBoH. Quarterly meetings of all link facilitators were then held to disseminate results and share experiences regarding the work of their teams. The CBoH used the results of these meetings to identify opportunities for improvement and to track numbers and locations of active QITs. When the link facilitator is not part of the DHMT, the districts know little about QA activities.

At the health center level, a storybook was developed to facilitate more efficient and complete documentation of the activities of QITs. The storybook format followed the six steps of the problem-solving cycle, guiding the documentation of how the steps were performed and the end result of each step. Many were incomplete or had not been regularly updated by the teams, and the supply of storybooks was inadequate. In addition, problems encountered while implementing the QA steps were not recorded.

Recommendations

To support further QA work and the institutionalization of QA within the Zambian health system, the team that conducted the evaluation recommended that a national QA policy that includes the private sector, and describes the vision, strategy, and objectives of a ZQAP, be developed. For QA to be integrated into all levels of the health system, links between the ZQAP and the facilities, districts, regions, directorates, and units of the CBoH, regulatory bodies, training institutions, and private associations should either be created or, if they exist already, reinforced. Other recommendations included:

1. Establish a mechanism to develop, adapt, and revise clinical care standards that are consistent with pre- and in-service training curricula and that can be used to develop job aids and instruments to measure compliance with standards
2. Develop cost-effective strategies for the communication and continuous reinforcement of standards that draw on principles of behavior change, in order to improve clinical practice
3. Regularly assess health workers’ compliance with process of care standards through direct observation of the delivery of care, and systematically investigate the causes of poor performance
4. Investigate methods for improving quality in health centers with five or fewer staff
(5) Continue using the problem-solving method, but with simplifications and with modifications to training
(6) Design a cost-effective documentation and reporting system of QA activities at all levels

The importance of QA training and a district-based coaching system were also stressed in the recommendations. The recommendations noted that a training program established by the ZQAP must be adequately planned and budgeted, and provided at all levels to develop an adequate pool of QA trainers and experts, and involve the relevant professional regulatory boards, as well as the pre-service training institutions. The ZQAP should also establish a district-based coaching system that responds to the needs of the QITs, and is supported by the regional and central levels.

Further research is needed on: (1) appropriate strategies for standards development and communication that best influence health workers’ practices; (2) factors that influence the acceptability and feasibility of direct observation of clinical performance during supervision; (3) testing the factors that influence the productivity of the quality improvement teams; and (4) factors that influence health workers’ use of job aids.

Conclusions

The evaluation of the ZQAP provided an opportunity to draw lessons that will benefit Zambia and other countries. Despite its success in covering the whole country with a network of coaches and QA trainers, the CBoH remains weak in its capacity to sustain and expand the QA Program, partly because only two people at the central level manage the program and provide technical assistance. As already mentioned, the development of a national QA policy should help boost the interest in QA and its contribution to the health sector reform. Setting some milestones for the institutionalization of QA would help the CBoH and its partners implement a national strategy for improving quality of health care services. The lack of QA expertise in most of the DHMTs prevents them from taking ownership for quality improvement and supporting the work of the quality improvement teams through coaching. Finally, the supervision system was an important function of the DHMT and represents an opportunity to address quality issues through QA.

QA is more than a set of tools and methods. It is a spirit, where clients become demanding and express their expectations, where health providers question their own performance, and where managers make client-oriented decisions, based on data, to redesign and improve a system continuously. It does not happen overnight. It took 5 years to initiate change and the emergence of a quality culture in Zambia.

Acknowledgements

The core team would like especially to thank the Zambia Ministry of Health, the Zambia General Nursing Council, and the Royal Danish Ministry of Foreign Affairs, and to the key individuals who played important roles in this project and who contributed significantly to this article. The core team is indebted to the Central Board of Health staff for assistance throughout the mission. This work was undertaken by the Quality Assurance Project with funding from USAID (contract No. HRN-C-00-96-90013) with the Center for Human Services, the non-profit affiliate of University Research Co., LLC. The full evaluation report of the Zambia Quality Assurance Program can be found on the Quality Assurance Project website (http://www.qaproject.org).

Accepted for publication 16 July 2002