

Quality in Action in
Rwanda



Case Studies



Ministry of Health
Rwanda

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July 2003

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Table of Contents

Preface	iv
Acknowledgements	iv
Introduction	v
Improving the Rate of Curative Care Utilization at Taré Health Center	1
Improving the Family Planning Acceptance Rate at Rubona Health Center	9
Improving the Frequency of First Trimester Prenatal Care Visits at N'zige Health Center	17
Improving Measles Vaccination Coverage at Mukarangé Health Center	26
Case Management of Patients in Shock at Kigali Central Hospital	33
References	45

Preface

Quality improvement via the identification of problems and team-based problem solving is one of the main pillars of quality assurance. Through this method, medical, technical, and administrative personnel directly involved in the provision of health services and sometimes representatives of the population being served—those who best understand the interests of that population—form multidisciplinary teams that identify gaps between actual service and what implicit or explicit norms advocate. These teams use the tools and methods of quality assurance (QA) to close those gaps.

The case studies in this collection present the results of five teams that 1) increased curative consultations and revenues while lowering fees, 2) improved family planning rates, 3) increased the percentage of pregnant women who attended first trimester consultations, 4) increased vaccination coverage, and 5) improved the quality of care for shock victims during their first 48 hours at the hospital. These results confirm that quality is not always linked to additional resources but instead often lies in simple, low-cost measures, well adapted to the development level of each country.

This publication is therefore intended for everyone, for healthcare consumers who need to understand how quality healthcare is provided, for policy makers and planners who must institutionalize the QA approach, but above all for frontline (or first-line) healthcare providers, from whom results are demanded on a daily basis, and consequently, must achieve similar concrete results.

Dr. Ezéchias RWABUHIHI
Minister of Health of Rwanda

Acknowledgements

This collection of case studies describes the quality assurance efforts of the Ministry of Health of Rwanda, with technical assistance by Dr. Bruno Bouchet, Dr. Maina Boucar, and Mr. Sabou Djibrini, advisors to the Quality Assurance Project (QAP).

This document was written by Ya-Shin Lin, Communication and Research Specialist at QAP in Bethesda, MD, after discussion with Dr. Boucar and Léonard Bagilishya (QAP/Rwanda) and staff at the health centers in Taré, Rubona, N'zige, and Mukarangé and at Kigali Central Hospital. Ms. Lin also took the photographs. Mr. Bagilishya and David Rutinduka (QAP/Rwanda) helped in collecting data. Drs. Bouchet and Boucar provided technical review.

This project would not have been possible without the help of QAP/Rwanda.

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Introduction

The Rwandan Ministry of Health (MOH) and its development partners combined forces to improve healthcare quality at five urban and rural facilities in Rwanda. The U.S. Agency for International Development (USAID) mission supported the MOH through the Quality Assurance Project (QAP), then managed by Center for Human Services (CHS) and now managed by University Research Co., LLC (URC).

QAP applied quality assurance (QA) methods, a collection of activities that supports the defining of standards and the measuring and improvement of performance such that healthcare services are as efficient and safe as possible. This approach relies on four principles:

- Client satisfaction, which requires that healthcare providers and patients engage in a dialogue over their respective needs and expectations
- Working in teams, which allows the sharing of knowledge and information, and consensus building, which overcomes resistance to change
- Understanding work as processes and systems
- Continuous improvement

Starting in June 1998, QAP worked in six health districts (Gisenyi, Kubongo, Muhima, Remera, Ruhengeri, and Rwamagana) and at the Central Hospital of Kigali, the Kigali Health Institute, and the MOH Division for the Promotion of Quality Health. QAP pursued two objectives: to demonstrate the feasibility of concrete healthcare improvement despite limited resources and to build local capacity to assure the integration and permanence of QA methods in Rwanda's healthcare system.

In the second quarter of 2002, 30 teams had completed or were working on 50 quality improvement (QI) projects. The projects focused on improving the quality of services by increasing the use of preventive and curative services, increasing family planning and vaccination rates, increasing revenues, reducing waiting times, or improving clinical performance (managing shock trauma, diabetes, etc.).

The QI teams included—but were not limited to—healthcare providers who had been trained in team-based problem solving. This method has four basic steps (identify the opportunity for improvement, analyze the system involved, develop hypotheses regarding changes that might result in improvement, and test the proposed changes and measure their results) and allows teams to improve the quality of services by making changes to those aspects of the system that are under their control. The teams received support from district facilitators trained in modern coaching methods.

This document presents the history and results of the application of team-based problem solving in Rwanda through the detailed documentation of the work of five teams representing all the QI teams.

Improving the Rate of Curative Care Utilization at Taré Health Center

Team Members

Thomas Budurégé, health center in-charge

Rose Uwizeyimana, deputy in-charge, responsible for curative care

Tharcisse Uwimana, health auxiliary, curative care

Félélicité Mukanyandwi, social worker

Denys Habineza, president of health committee, representing the community

In-charges of Rukozo and Tumba health centers

Background

The Taré health center is located in a mountainous region of Rwanda, 13 kilometers from the district hospital of Nembe. It serves a population of over 13,500 inhabitants in three prefectures: Kigali Rural, Ruhengeri, and Byumba. The surrounding community is actively involved with the health center. It constructed the health center in 1973–78 in a project organized by the sector representative and partly financed by a community businessman. A health committee, meeting every three months, represents the community at the health center. The committee comprises an elected representative from each of six sectors, the health center in-charge, and the cashier and has fiscal oversight of the health center, setting prices for health services and controlling the budget. A management subcommittee meets monthly.

Taré is staffed by two nurses, a social worker, a medical auxiliary, one laboratory assistant, two health workers, a cashier, and two guards. In late 1999, two nurses, including the in-charge, were trained in the basic principles of quality assurance (QA) and systematic team-based problem solving. Team-based problem solving is one of four approaches to quality improvement (QI) fully described in Massoud et al. (2001).

In February 2000, the QA-trained nurses initiated a team problem-solving cycle, starting with an all-staff meeting.

Identifying the Opportunity for Improvement

During this meeting, the QA-trained nurses presented basic quality concepts to the rest of the staff. They led the staff through the process of problem identification by facilitating the development of a list of problems the health center faced. The list included two problems that had been raised in a quality assessment conducted by the Ministry of Health (MOH) in 1999 (Kerstiëns 1999). These problems were that women had to wait for up to four hours for prenatal and vaccination services. The staff added other problems they developed from brainstorming. Once the list was compiled, staff crossed out those problems that seemed to be of secondary importance relative to the others, resulting in a list of three problems. To decide among the remaining three, the staff used a decision matrix that allowed each staff member to evaluate the frequency, severity, and vulnerability of each problem on a scale of one to three (see Table 1). The total scores were then added to identify the problem with the most points: the low curative care utilization rate. (Curative care refers to all health center services that are not preventive.)

Table 1 Decision Matrix Used by the Taré Health Center Team

Problems	Criteria			Total	Rank
	Frequency	Severity	Vulnerability		
Poor utilization rate in curative care services	26	27	27	80	1 st
Long waiting times at prenatal care clinic	22	17	21	50	3 rd
Long waiting times at vaccination clinic	19	22	20	61	2 nd

Score: 1 = weak; 2 = average; 3 = strong

Although the staff knew that the utilization rate was low, it did not have exact figures. They located an administrative survey that showed that the catchment area population was 13,602 and an MOH standard that anticipated that on average each person would visit a health center once a year. This meant that the clinic could expect 13,602 clinic visits per year. The following calculation, incorporating the fact that the clinic was open seven days a week, provided the number of visits that could be expected per day:

$$13,602 \text{ curative care visits/year} \div 365 \text{ days/year} = 37 \text{ curative care visits/day}$$

The QA-trained nurses led the staff in examining health center data on the curative care utilization rate. To calculate the average daily number of curative visits, they examined all monthly reports for 1999 to determine the number of curative clients seen that year. They divided the total by 365 days to find that they had seen an average of seven clients per day, only about one-fifth the number called for by the MOH standard.

The two nurses then led the staff to define how large an increase they could expect to achieve by the end of the year. Each staff member suggested a target, and the average was set as the final goal. They wrote the following operational definition of the problem:

An analysis of monthly reports for 1999 at the Taré health center, conducted in January 2000, revealed a low curative care utilization rate. On average, seven clients were seen per day, 20 percent of the MOH standards (defined as 37 consultations per day). Since curative consultations are an important activity for clients, an improvement is necessary to increase the utilization rate to a monthly average of 53 percent (20 clients per day) by the end of 2000.

Next, staff decided who should serve on a team that would address the problem. In addition to staff providing curative care, they selected the social worker, because she knew details about client needs through her work. To gain insight from outside the health center and to represent the community perspective, the team invited the president of the health committee and the in-charges of two neighboring health centers.

The team agreed to meet weekly for an hour and a half. The Taré in-charge facilitated meetings, and each meeting was recorded by a secretary and timed by a rotating timekeeper. When available and needed, a district-level supervisor and a representative from the MOH Division of Promotion of Health Quality provided supervision to the team; they attended one to four times every two months.

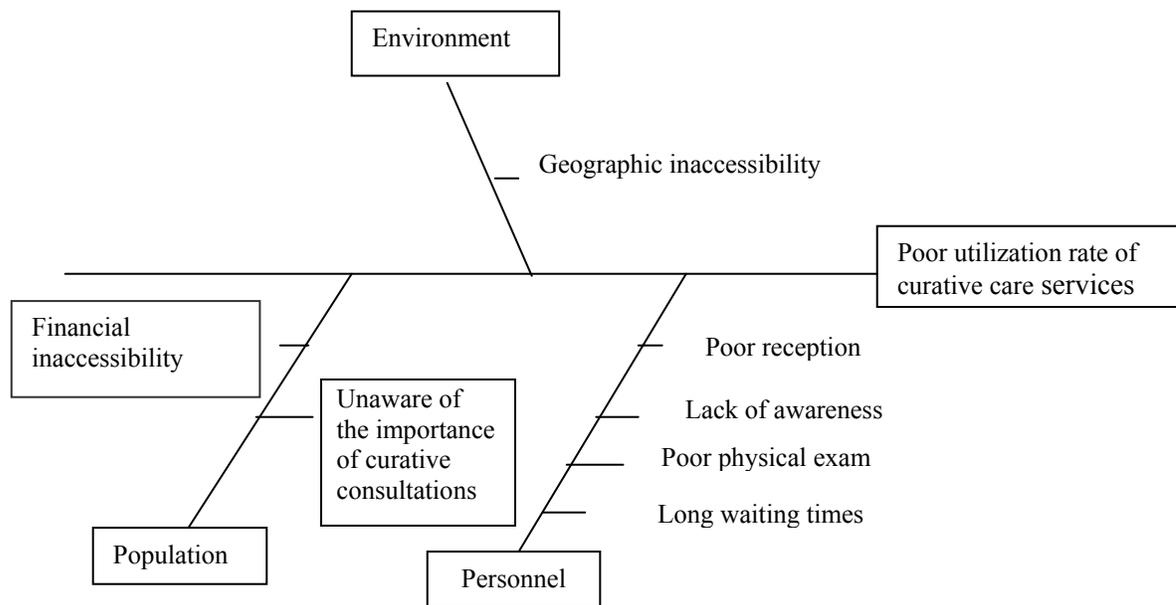
Analyzing the Opportunity for Improvement

The next step was to analyze the root causes of the low curative care utilization rate, which would shed light on how to improve these rates. To examine the activities surrounding the problem as a system, the team constructed a flowchart showing the sequence of activities of the curative care services. From this exercise, they identified the steps in the process that were unclear,

inconsistent, or that they believed could be improved. For example, they did not know what clients did between their arrival and consultation. In addition, some thought the group information, education, and communication (IEC) session, which was given by the social worker or a health provider, was inefficient and ineffective: IEC sessions were held when a certain number of clients had accumulated, and its topic did not necessarily relate to all patients' informational needs. The team thought individualized counseling would be more appropriate.

Next, the team constructed a cause-and-effect diagram, which would facilitate brainstorming and grouping a list of hypothetical causes that could help explain the low curative care rate (Figure 1). At the staff level, the team thought that inadequate reception and sensitization could be contributing to the low utilization rate. The team also believed that some potential clients faced obstacles, such as long distances to the health center and lack of awareness of the importance of consultations. The team knew that some community members believed that certain illnesses required sorcery and could not be treated at the health center. In addition, an in-charge from a neighboring health center noted that the consultation fee was higher at Taré than at his health center. The cause of Taré's higher fees was historical. The health center had been pillaged by rebels in 1997, causing the loss of lives, medicine, and equipment. To recover from the losses, the health committee, without consulting the community, judged it necessary to raise its prices, making them unaffordable to many.

Figure 1 Cause-and-Effect Diagram: Low Curative Care Utilization Rate at Taré



Next, the team investigated some of the hypothesized causes to determine which ones were actually and significantly causing the low rate. To examine the hypothesized causes related to the staff, the team observed six curative care consultations. Using a guide from the 1999 QA assessment and their flowchart, the team observed how each patient was received, examined, treated, and counseled at each step: reception, curative consultation, pharmacy, laboratory, and cashier. The team identified the following weaknesses in the consultations:

Only three out of six patients received proper physical examinations

The healthcare provider looked for other signs and symptoms in only four patients
Providers did not explain diagnoses to any patients
Providers did not give demonstrations of how to take medication to any patients
Providers gave follow-up appointments to only two patients

When providers were asked why they did not perform some of these tasks, some said they did not know or had forgotten some of the norms.

To examine the hypothesized causes related to the community, the health committee administered a survey to 100 households. A questionnaire was written in Kinyarwanda, the language most Rwandans speak at home. The administrator of each *cellule*, an administrative unit, conducted the survey. Since the health center covered 20 *cellules*, each administrator applied the questionnaire in five households by a deadline set by the health committee.

The survey results indicated that:

The majority of respondents (90 percent) complained about the high cost of drugs
A few (3 percent) believed that certain conditions can be treated only by sorcery
A few (4 percent) felt that the reception at the health center was poor
A few (3 percent) answered “no” to the question, “Can you get to the health center easily?”

The team had not expected these results. While they realized that drugs were expensive for some clients, they did not realize expense was a major obstacle. They concluded that the two main problems that should be addressed were the lack of respect for certain clinical norms and the high drug prices. The survey also revealed community beliefs about treatment. For example, community practices provided that a child with convulsions might be given milk to determine whether spirits possessed him/her. Children who vomited were believed to be possessed and would not be taken to the health center. There was also belief that an injection could kill a possessed child.

Developing and Selecting Solutions

With the insights obtained from verifying the causes of the problem, the team developed solutions that would address each obstacle:

1. Ensure financial affordability. This action implies:

- a. Price reductions for some drugs (e.g., 50 percent reduction in serum and cotrimoxazole costs and 30 percent in chloroquine): The team identified the drugs that were most used. For some drugs, such as Vermox (antiparasite) and acetaminophen (antipyretic and analgesic), they set the price at the health center cost. The team decided that for such drugs, the profits from the consultations, lab exams, prenatal care, deliveries, and hospitalizations would make up for the lack of profit on the drug itself. For other drugs, the team added 5 percent, which the team thought would be largely affordable.
- b. Giving short-term credit to clients who cannot pay on the day of the consultation: To obtain credit, the client would ask his or her *cellule* representative on the health committee. The representative would issue a note, which the client would take to the health center. This debt would be registered and had to be paid back within two weeks. A *cellule* representative, the *nymbakumi*, would follow up on overdue payments as necessary.

c. Making a list of indigent households in the coverage area: The *nyumbakumi* would nominate households for this list, using agreed-upon criteria, such as lack of cultivable land, lack of employment, advanced age coupled with known chronic illnesses and no children, and orphans. The list would be compiled by the administrative structure until reaching the health committee.

2. Inform everyone of the new health center fees and the advantages of using the health center. Target audiences were:

Staff, who learned and were reminded of their responsibilities toward clients during staff meetings

Health committee members and health promoters in meetings at the precinct, committee, and *nyumbakumi* (highest level of local administration) levels

Political and administrative officials: *nyumbakumi*, group leaders, counselors, and the mayor in committee, precinct, and district meetings

Religious leaders in churches. This included a health center satellite run by nuns who conducted growth monitoring. The growth monitoring sessions became an IEC opportunity to inform the community of changes at the health center.

3. Establish and train staff on clinical norms, including norms on how to receive clients, through group discussions and by posting those norms. For example, the team decided that every client should be greeted and oriented to the services they sought. Good reception was defined as treating the patient with respect, empathy, and using clear and courteous language, as well as advising clients about services. Previously, clients would not know where to go and would sometimes knock on the wrong consultation door. The team also decided that every client would receive individual counseling in addition to group IEC and that the pharmacist would explain how to take medications, a step that had not been done consistently before.

The team also tried to open lines of communication by installing a suggestion box (see Figure 2).

Figure 2 Suggestion Box



Implementing Solutions

In March, the team began to implement the different solutions, tracking the implementation using a Gantt chart.¹ They found that the debt system and indigent list worked fairly well. Most debts were repaid. The list of indigents started with 160 people; after a trial period, the team reduced it to about 30.

Results

The team followed the effects of the implementation of the solutions by tracking selected indicators, including: 1) indicators of changes implemented, such as the price reductions (Table 2) and the number of IEC sessions presented monthly relative to the number scheduled; 2) outcome indicators, such as the utilization rate; and 3) indicators of the viability of the credit system (see Table 3).

Table 2 Examples of Reductions in Medications Prices (July 2000; in RwF)

Drugs	Original Price	Reduced Price	Reduction
Serum (glucose 5 percent)	1000	500	50 percent
Cotrimoxazole	300/episode	150/episode	50 percent
Quinine	900/episode	600/episode	33 percent

Note: RwF = Rwandan francs

Table 3 Community Debts to the Taré Health Center (2000; in RwF)

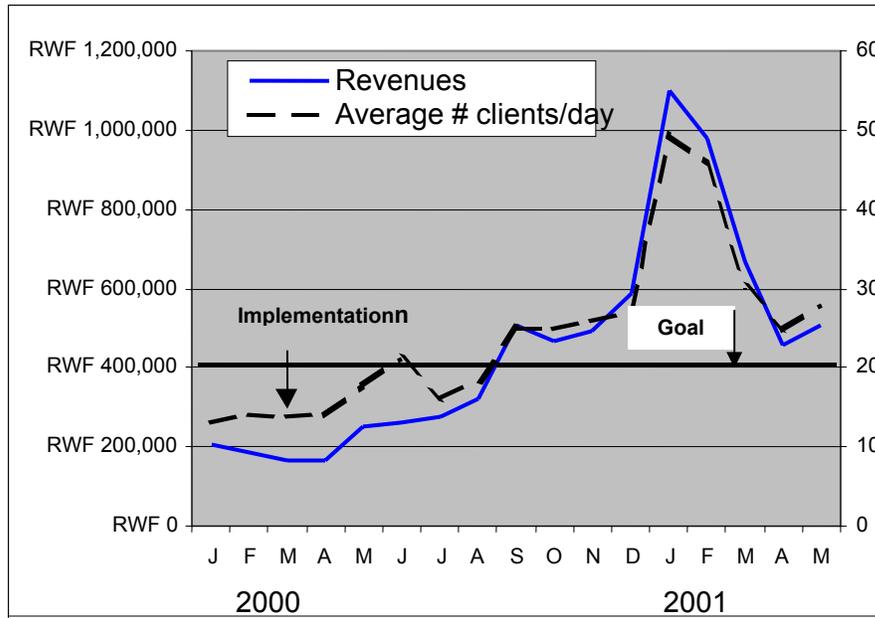
	Month									
	M	A	M	J	J	A	S	O	N	D
	7800	3000	19900	17900	27450	30050	25250	33300	64300	57520
Revenue	168000	164960	248915	259030	275130	321800	507660	466150	492380	587410
Percentage of clients who took loans	5	2	8	7	10	10	5	7	13	7
Percentage of clients who paid back their loans	44	84	47	83	46	32	51	50	44	28

Notes: Percentage of clients who took loans = number of clients who took loans / number of clients x 100. Percentage of clients who paid back their loans = number of clients who paid back their loans within a month / number of clients who took loans

The team was particularly interested in the number of clients per day. As Figure 3 shows, they met and surpassed their goal in six months. In the four months immediately preceding and during the implementation of solutions, the center saw an average of 14 clients each day. During the same period a year later, the average was 37. In the latest year for which data were available (May 2000–April 2001), the health center averaged 29 clients a day.

¹ The Gantt chart is a tool that displays a schedule in a graphic format, either paper-based or electronic. It enables people to track progress of work plans by plotting the projected start and end dates of each activity.

Figure 3 Utilization and Revenue at Taré (January 2000–May 2001)



While the team had envisioned finishing the IEC effort in December 2000, they decided to continue their efforts since they had not yet attained all their goals. With the increased revenues, the health center began construction of an extension to offer private rooms for clients (Figure 4). The team has since finished a second QI cycle and was working on a third as this report was written. They have learned from their experiences and have decided to move faster, meeting twice a week to accelerate the process.

Figure 4 Extension under Construction, Funded by Increased Revenues from Increased Utilization



Quality Improvement Insights

The following are some of the lessons learned from the Taré health center QI team:

New problem-solving teams may have a tendency to follow QI steps procedurally. The problem of low utilization does not necessarily lead to drawing a flowchart. If in the process of investigating reasons for low utilization the team had learned that clients found services too slow or disorganized, a flowchart might have been warranted. Instead, it appears that the team drew a flowchart of the service because this procedure was presented in training, rather than due to direct analysis of their problem. Since Rwandese teams have found systematic team problem solving difficult to conceptualize initially, this procedural approach may have been necessary during a team's first cycle. In such cases, the cycle should be followed by a facilitator-led team analysis of the problem-solving process. This manner would better enable teams to judge the utility of a flowchart in future cycles.

The unexamined process can always be improved. The team changed how IEC was conducted at the health center and improved client orientation at reception. The result was that the health center measured a decrease in waiting times from three hours to an hour. Thus, even though clients did not specifically comment on waiting times, the flowchart exercise led to improving the quality of services to benefit clients.

Quality improvement can improve the dialogue between providers and the community. Team members did not expect that the high cost of drugs was a major obstacle for the community. The lesson one may take from this is that health center staff are not always aware of what clients need, even though they work with them everyday. This realization led to the installation of a suggestion box, which clients have since used to share both complaints and praise.

Comments on the problem-solving experience from Taré included:

Initially, I was only concerned about staff presence at the center. Now I feel that we are useful; we are proud to see that our center is more used and our clients do not wait.

In-charge, Taré health center

I used to complain about coming to the health center for these meetings, because I live three kilometers away. Now [after seeing all the changes that have happened], I don't complain anymore.

Health committee president

Improving the Family Planning Acceptance Rate at Rubona Health Center

Team members

Néhémie Uwimana, health center in-charge
Appolinaire Uwimana, nurse in charge of family planning
Judith Mukarubibi, health auxiliary, laboratory
Edith Uwanyiligira, health auxiliary, curative care
Antoinette Kantarama, midwife aide
Annonciate Ntabanganyimana, nutrition monitor
Emmanuel Kimonyo, president, management committee
Amina Kayitesi, traditional midwife

Background

The Rubona Health Center is located 60 kilometers from Rwanda's capital, Kigali, and 15 from the nearest district referral hospital, Rwamagana Hospital. It serves residents of 24 *cellules*, each of which has an administrative representative and a health promoter. The health center covers a population of 16,630 inhabitants (2000 census), including approximately 2700 children under five and about 3900 women of child-bearing age. Most adults are farmers, including some who sell their bananas, beans, sweet potatoes, sorghum, manioc, and rice locally. A few work for the state as teachers, administrators, and nurses. The health center staff of 12 includes two nurses, two health auxiliaries, a midwife assistant, a nutrition assistant, a cashier, and five general support staff.

Like elsewhere in Rwanda, the health center works with a health committee, this one established in 1996. It is comprised of three health center staff and five sector representatives, who rotate the two-year positions of president, vice-president, secretary, and treasurer. These positions comprise an executive subcommittee, which meets once a month.

In April 1999, the Ministry of Health assessed the quality of healthcare and services at the center with the support of the Quality Assurance Project. A year later, in April 2000, the two nurses were trained in quality assurance and the method of systematic team problem solving. Two days after the training, they called an all-staff meeting to share their experience and initiate the first problem-solving, or quality improvement (QI), cycle.

Identifying the Opportunity for Improvement

The two nurses explained each step of the problem-solving cycle to their colleagues and began to apply it with all staff. The first activity was a brainstorming session where staff gave suggestions on what health center problem they could take on as a team, based on their experience and memory of monthly reports. They identified four problems: the low proportion of babies delivered at the health center, poor outpatient care attendance, low family planning (FP) acceptance rate, and long waiting times for nutrition consultations.

Using a decision matrix, each staff member judged each problem according to selection criteria set by consensus: high cost, facility to solve, impact on the population, and importance. For each criterion, staff discussed and agreed on the relative weight of each problem, giving it a score of one to three. The score of three represented a problem that should be selected relative to the others (i.e., one that is the least costly to solve, easiest to solve, most serious, and has greatest impact on the population). For instance, while staff agreed that all four problems were of about equal and average difficulty to solve, they thought that the low FP acceptance rate had a much greater impact on the population than the other three. They reasoned that in smaller families,

malnutrition would be lower and spendable income higher. In fact, when all scores were added up, family planning was identified as the problem they should work on.

When the staff examined the FP consultation record book, they found an acceptance rate of 0.8 percent in 1998; 1 percent in 1999,² and an average of 0.9 percent for January through April 2000, which was far from the national target of 25 percent. (At the time, the national guideline for estimating the number of women of child-bearing age was 22 percent of the population.) Staff discussed what they thought the goal should be and took the average of what all team members believed would be a reasonable acceptance rate for first-time users: 10 percent. This would mean that they would have to see 3659 first-time FP clients per year or 30 per month (the 22 percent guideline would have required 46 per month).

Staff wrote the operational definition of the problem as follows:

The analysis of the family planning consultation register shows a poor acceptance rate, even though the service is free (the client pays nothing). This rate was at 0.8 percent in 1998 and 1 percent in 1999. An improvement of our services would allow this rate to increase to 10% by the end of 2000.

The indicator the team used to measure the rate was:

$$\frac{\text{Number of first-time family planning users each month}}{\text{Number of women of reproductive age/12 months}}$$

Having selected the problem and defined it operationally, the staff decided who should be part of the problem-solving team. After some discussion, they agreed that all six clinical staff should participate, a traditional midwife who was already actively working with the health center, and the president of the executive subcommittee of the health committee.

Analyzing the Opportunity for Improvement

In May 2000, the team began to analyze the issues surrounding the problem, seeking insight that would help to develop solutions. First, they flowcharted what happens to a client who comes in for FP services for the first time (see Figure 1). While drawing the flowchart, the team realized it had two “clouds,” areas where the process was unknown, inconsistent, or not systematically done (Figure 1 shows the cloudy areas as starbursts). These clouds were the introductory FP orientation and the counseling session on side effects.

Next, the team brainstormed to try to identify the root cause for the low FP acceptance rate and used a cause-and-effect (or fishbone) diagram to organize their hypotheses. They found that the reasons why women did not go to the health center for FP services could be grouped into four areas: services, logistics, personnel, and client population. For example, two hypothesized service-related causes were the lack of continuously available FP services and the lack of home visits. The cause-and-effect diagram in Figure 2 presents the possible root causes the team brainstormed and the four categories.

² These statistics were not verified for this case study.

Figure 1 Flowchart for First-Time Family Planning Clients, Rubona Health Center

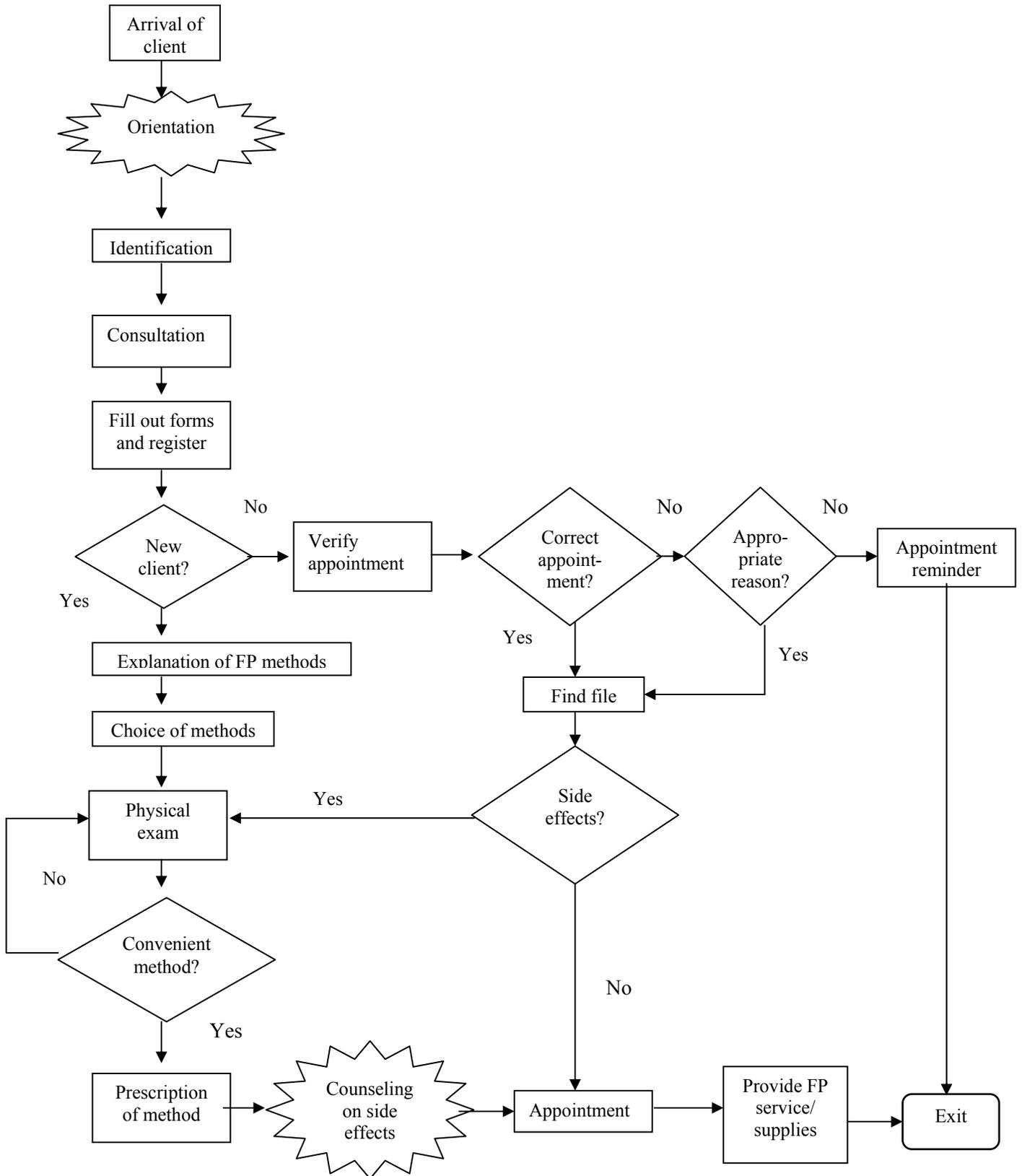
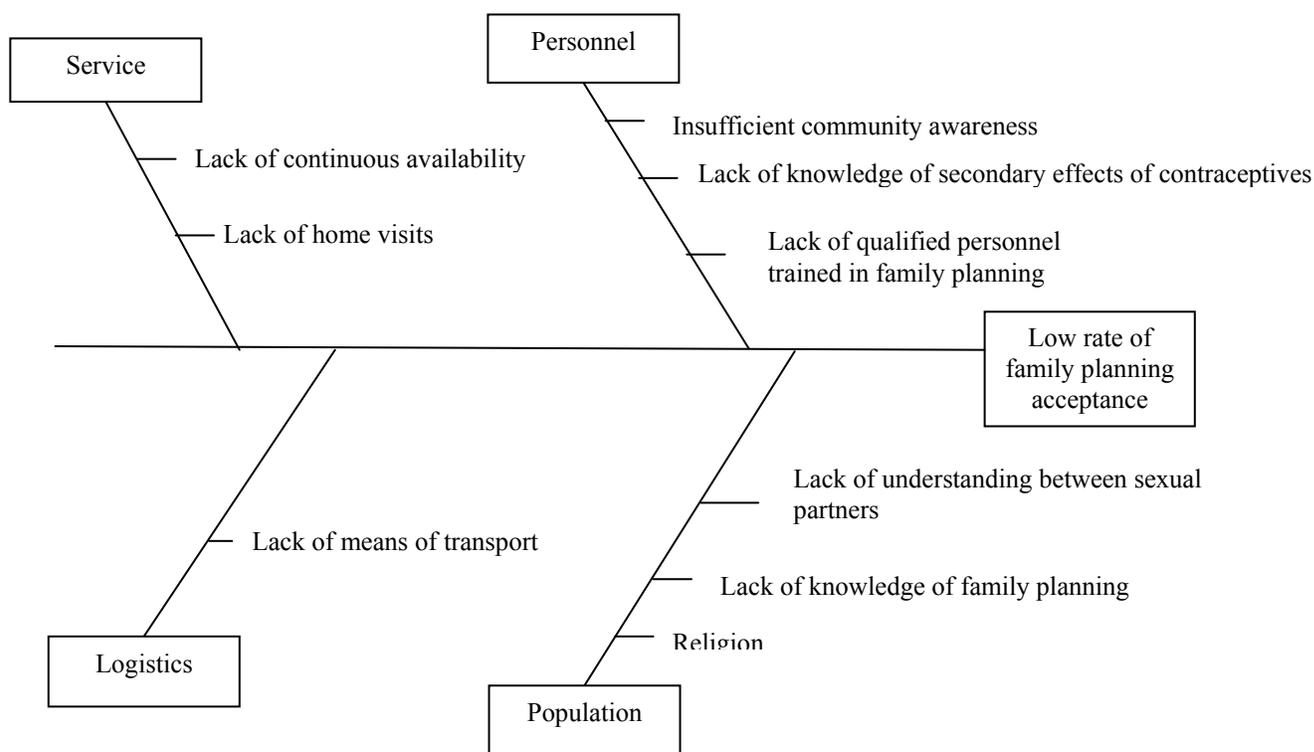


Figure 2 Cause-and-Effect Diagram for Low Family Planning Acceptance, Rubona Health Center



Developing and Selecting Solutions

To determine whether these reasons were indeed the real causes of the problem, the team proceeded to test their hypotheses. They believed that the logistical cause was beyond their scope, so they concentrated on the population and personnel reasons. For the former, they conducted a survey directed at three kinds of clients: women who visited the health center for prenatal care consultations, women who visited it for vaccination services, and men who visited the center for any reason. The team drafted a questionnaire they could use with all three types (see Appendix, Page 16). The questionnaires were administered to 20 of each type of client over the course of a week.

Table 1 Results of Client Survey on Why People Do Not Use Family Planning, Rubona Health Center

	Women (N=40)	Men (N=20)
Do not know the purpose of family planning	20 (50%)	12 (60%)
Men object that women use family planning methods	15 (38%)	
Women are responsible for implementing FP methods		6 (30%)
Church	5 (12%)	2 (10%)

As Table 1 shows, over half the people interviewed said they did not know the purpose of family planning. Over one in three men indicated that their partners were responsible for FP, while nearly one in eight gave church-related concerns. In addition, both men and women cited the loss of children during the civil war as another reason not to seek family planning services: many wanted to “quickly make up for lost children.”

To investigate the possible personnel-related causes, four health workers were interviewed after providing a family planning session. The team found that only one of the four was actually trained in FP and many did not know the side effects of contraceptives.

Another possible cause was that the center no longer provided home visits due to the lack of transportation.

The team decided to implement the following solutions:

Sensitize local authorities, who are in close contact with the population. First, the team met with the representative of each *cellule*. They discussed the importance of FP and the need to sensitize the population on family planning.

Provide continuous training for staff and community health promoters on FP methods, including standards, administration, and side effects. Since the survey determined that there was little understanding of family planning, training health center staff and promoters was an important step to ensure that the community would have reliable resources, both at the health center and in the community. Training for the two groups was provided separately, since they had different health backgrounds.

Sensitize the population on the importance of family planning through meetings on family planning at each cellule and a video show at the health center. Next, the team organized a family planning informational session in each *cellule*. A health center staff member, the *cellule* representative, and the health promoter led the sessions. During these sessions, the leaders invited participants to watch educational videos in Kinyarwanda.³ Produced by the government, these videos dramatize the issue of family planning. One describes a couple who did not use family planning methods. The father realized that he could not afford everything his children wanted. After being visited by a team from the health center, the mother went to the health center to initiate family planning. The video was shown 16 times to audiences of about 40 who attended prenatal care and vaccination clinics and others who came from the community.

Organize home visits to at least half the households in the catchment area. To reach anyone who missed the informational sessions, the team organized home visits. A team consisting of a health center nurse and community health promoter visited homes to talk with adult residents about family planning, asking whether they used family planning, why, and why they stopped using it if they had.

Discuss family planning with religious leaders. Since religious beliefs were cited as one of the reasons for not using family planning, the team organized a discussion session with four religious leaders from the Adventist, Catholic, Pentecostal, and Islamic traditions. The discussion centered on whether they supported or opposed the use of family planning and why. One reason given was that “God tells man to multiply ‘like the sands of the sea.’” Other reasons were related to side effects: concerns over weight gain, weight loss, and decreases in maternal milk. One argued that family planning is the equivalent of killing children while another was concerned that Norplant implants may be irretrievable. Rubona staff explained the current public health findings on side effects and came away believing that the meeting had improved understanding and support of family planning by religious leaders.

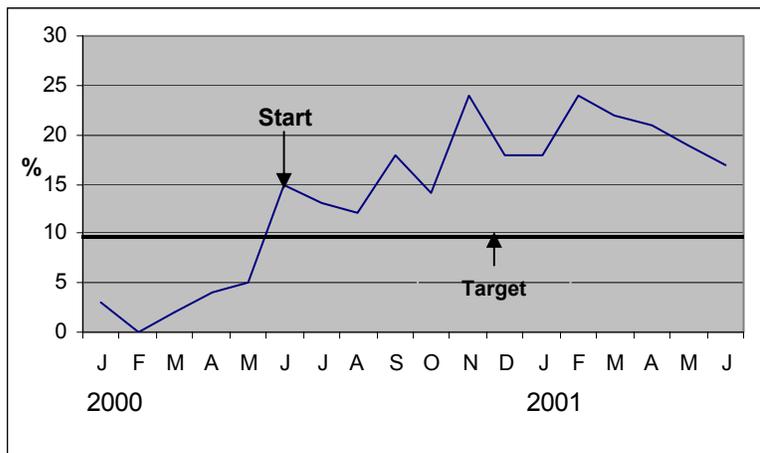
³ Kinyarwanda is the first language of the great majority of Rwandans. Two videotapes were used, *Urugamba Rurakomeye* and *Ndazigarukiye*.

Integrate family planning services at all consultation rooms. Once word spread on the purpose and availability of family planning, the team noticed that some mothers came in clandestinely for family planning services. Realizing that women wanted privacy regarding their FP decisions, the team stocked all consultation rooms with FP supplies so that women could visit the health center for any reason and receive FP services confidentially.

Results

The team began implementing the sensitization and training solutions in June and home visits in October. First-time family planning acceptance rates rose from an average of 0.9 percent for January to April 2000 to 6.8 percent for January to April 2001, a 7.5-fold increase. Managers from two other health centers have visited Rubona to learn how to increase their FP rates.

Figure 3 New Family Planning Acceptance Rates, Rubona Health Center, 2000–01



Over a year later, family planning services were still integrated with other consultation services, and training for staff and community health promoters still took place. The manager also instituted a policy of checking with family planning clients to learn whether they needed vaccination or prenatal care services, thus further integrating services. The home visits, however, were found to be too problematical given the lack of money for fuel and staff investment. The team decided to discontinue this activity after visiting fewer than 20 homes.

Before the QA work, staff would stand around idle during the afternoon, when there are fewer clients. Now, people try to keep busier and are more likely to find things to do in the afternoons.

Clients have also changed; they have started to ask about family planning immediately after giving birth.

Nurse, Rubona health center

Quality Improvement Insights

The following are some of the lessons learned from the family planning cycle of the Rubona problem-solving team:

The leadership of the health center in-charge greatly contributed to the team's success, while accelerating the QI cycle. He directly shared his experience in QI methodology with other members and facilitated the organization of regular meetings. His leadership also helped the team to work through all the steps of the improvement process within two months (from identification of the problem to the beginning of the implementation of solutions).

One of the in-charge's characteristics that particularly added to the team's success was simply his long-time interest in improving the quality of health center services. Before the QA work initiated, he had already tried to change things. For example, he had noticed that appointments for children needing nutritional consultations were too closely spaced. To alleviate this problem, he instituted scheduling clients by geographical sector. This reduced waiting time from approximately four hours to one. He also started a list of children who initiated but did not complete vaccinations and had health promoters follow up with these children. This resulted in increased BCG and measles vaccination coverage.

Integrating community representatives into the problem-solving team facilitated the social integration of solutions and the sustainability of changes. On the other hand, it also made the initial stages of the teamwork more difficult, since the team had to work around the availability of the community representatives, who had to travel to the health center for meetings. In the beginning, the health center in-charge sent reminders to community representatives three days in advance of meetings.

Exchanging experiences between problem-solving teams is a viable method for teams to benchmark from one another. In December 2000, teams from different health centers exchanged their experiences at a conference. The Rubona in-charge found that some of the solutions—such as the credit system at Taré—could be implemented at Rubona.

Creative solutions stimulate more effective and sustainable change. The team went beyond just sensitizing the target population: it changed the way it delivered services and initiated a dialogue with religious leaders who might influence the population. Integrating FP services with all other services emerged from observation and discussion of client needs among staff. In short, the very cost-effective solution of integrating services was a product of organizing staff to focus on the problem and opening up the channels of communication.

Appendix: Questionnaire Regarding Family Planning

Date:/...../.....

Name:

Cellule:

Age:

Number of children:

Number of children <5 years old:

Age interval between last two children:

Marital status:

Profession:

Religion:

1. Have you heard of family planning? Yes _____ No _____
2. If yes, what family planning methods do you know?
3. What is the purpose of family planning?
4. Have you used a method of family planning at least once?
5. If yes, which? _____ Where? _____
6. If not, why?
7. Do you have questions about family planning? Yes _____ No _____
8. If yes, what are they?

Improving the Frequency of First Trimester Prenatal Care Visits at N'zige Health Center

Team Members

Innocent Kabera, nurse and health in-charge
Innocent Rutoyisire, nurse and adjunct in-charge
Mama Vèreène, nurse, responsible for maternal and child health, and family planning (MCH/FP)
Mme Xavérine, social worker
Jeanette Nikuze, receptionist/cashier
Véronique Nyirabahutu, traditional birth attendant
François Kalisa, vice president of health committee and health promoter
Community health promoters

Background

Located 30 kilometers from Rwamagana District Hospital, the N'zige health center serves a population of over 24,000. About 75 percent live more than a 90-minute walk away. Like the catchment population of many rural health centers in Rwanda, most are farmers, who in this region plant bananas, plantains, sorghum, beans, sweet potatoes, coffee, and vegetables. The population is spread across five precincts (N'zige, Murama, Nyamatete, Gahengeli, Bicumbi) and 11 communes. It includes an estimated 4000 children age five and under and 5700 women of childbearing age; 1050 pregnancies would be expected annually.

Built in 1973, the health center has ten staff: three nurses, two health auxiliaries, one social worker, one lab aid, one cashier, and two laborers. It has 14 beds, a motorbike, and an ambulance. The last was purchased in 1996 through an initiative from the local commune authority, which organized for each resident to contribute 300 RwF, about US\$ 0.70. The ambulance is used when the district ambulance is not available to transfer patients to the Rwamagana District hospital. The health center plans to start a mutual insurance association (URAKIRE-TWESE) with a prepayment scheme to help clients pay for services.

Two nurses were trained in quality assurance (QA) in December 1999 and May 2000. They called a staff meeting that May to begin the QA activities. The staff formed a team, including the vice president of the health committee, and started a quality improvement (QI) cycle to improve services at the health center.

Identifying the Opportunity for Improvement

During the first meeting, the QA-trained nurses explained to the other staff that they would begin a QI cycle and what that would encompass. As part of the first step of the cycle, the staff brainstormed on what problems the health center should address. One of the nurses recorded the ideas on a flipchart. After some discussion, the staff decided that since some health problems initiate outside the health center, the community health promoters should participate in brainstorming. Soon, another meeting took place with both health center staff and three health promoters to discuss the complete list of problems from both groups. Three main problems were identified: the low rate of outpatient attendance, the low prenatal care (PNC) utilization rate during the first trimester of pregnancy, and the lack of postnatal consultations. To choose the problem they would focus on first, the staff discussed and arrived at a consensus on the score each problem would receive (on a scale of one to three) in each of four criteria (see Table 1). Then, using a decision matrix, they added the scores and identified the problem with the highest score: low attendance rate for prenatal care in the first trimester.

Table 1 Decision Matrix for Prioritizing the Problem, N'zige Health Center

Problems	Criteria				Total	Rank
	Frequency	Severity	Vulnerability	Impact on clients		
Low attendance rate for curative services	2	2	1	2	7	2 nd
Low attendance rate for prenatal care services during first trimester	1	3	2	2	8	1 st
No postnatal consultations	1	1	1	1	4	3 rd

Score: 1 = weak; 2 = medium; 3 = strong

Once the problem was selected, the staff wrote an “operational definition,” describing the problem and stating how it would be measured. They set their objective as a rate of at least 20 percent by December 2000. The resulting operational definition stated:

An analysis of the monthly reports of activities and the prenatal care registers from January to April 2000 at the N'zige Health Center showed a low rate of prenatal care (PNC) by pregnant women in their first trimester. In effect in the year 2000, we registered 0/73 (0 percent) women who came for their first visit in January, 1/99 (1 percent) for February, 1/78 (1.3 percent) in March, and 0/64 (0 percent) in April, while the national objective is 100 percent. Taking into account the weakness of these numbers and the importance of PNC for the woman and her future child, we have confirmed that an improvement is necessary to bring the frequency to at least 20 percent by December 2000.

Readers may find the 20 percent goal modest, but it reflected the expectations of the team. Those expectations would change with QA experience, as related below.

The team developed the following indicator:

$$\frac{\text{Number of first-time PNC visits by women in their 1st trimester of pregnancy}}{\text{Total number of first-time PNC visits}}$$

Next, the staff identified those who were directly involved with PNC visits, since they would form the QI team that would address the problem. They decided to include all three nurses, since they all provided PNC; the social worker; the receptionist; a traditional birth attendant (TBA); and a community health promoter who was also member of the health committee. They also defined specific roles for some team members: the in-charge functioned as team coach and supervisor, the second QA-trained nurse took the role of facilitator, and two other team members served as timekeeper and secretary.

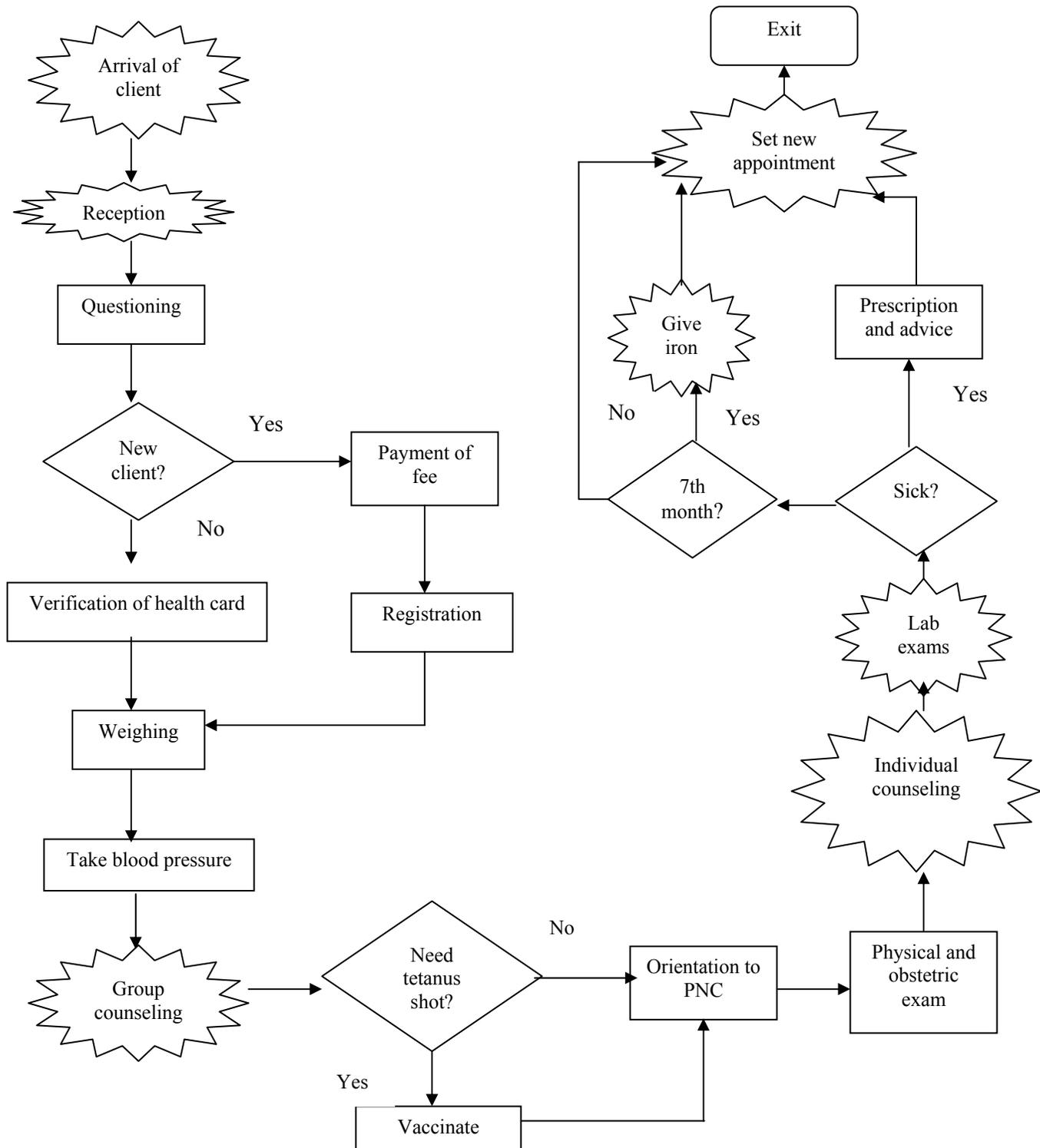
In the following months, the team met regularly to find ways to address the low PNC problem, at first every week or two and later, with the guidance of district-level supervision and coaching visits, every Tuesday and Friday.

Analyzing the Opportunity for Improvement

In late May 2000, the team met to analyze the problem. The first step was to diagram the prenatal care process using a flowchart. This proved to be rather difficult, because the concept of flowcharting was new to the team. Figure 1 shows their flowchart. Each “cloud” step (shown here as starbursts) in the flowchart denotes a step that lacked clarity, consistency, or simply needed to be improved. For instance, “arrival of client” was represented as a cloud because PNC patients were not arriving—team members speculated that this represented insufficient

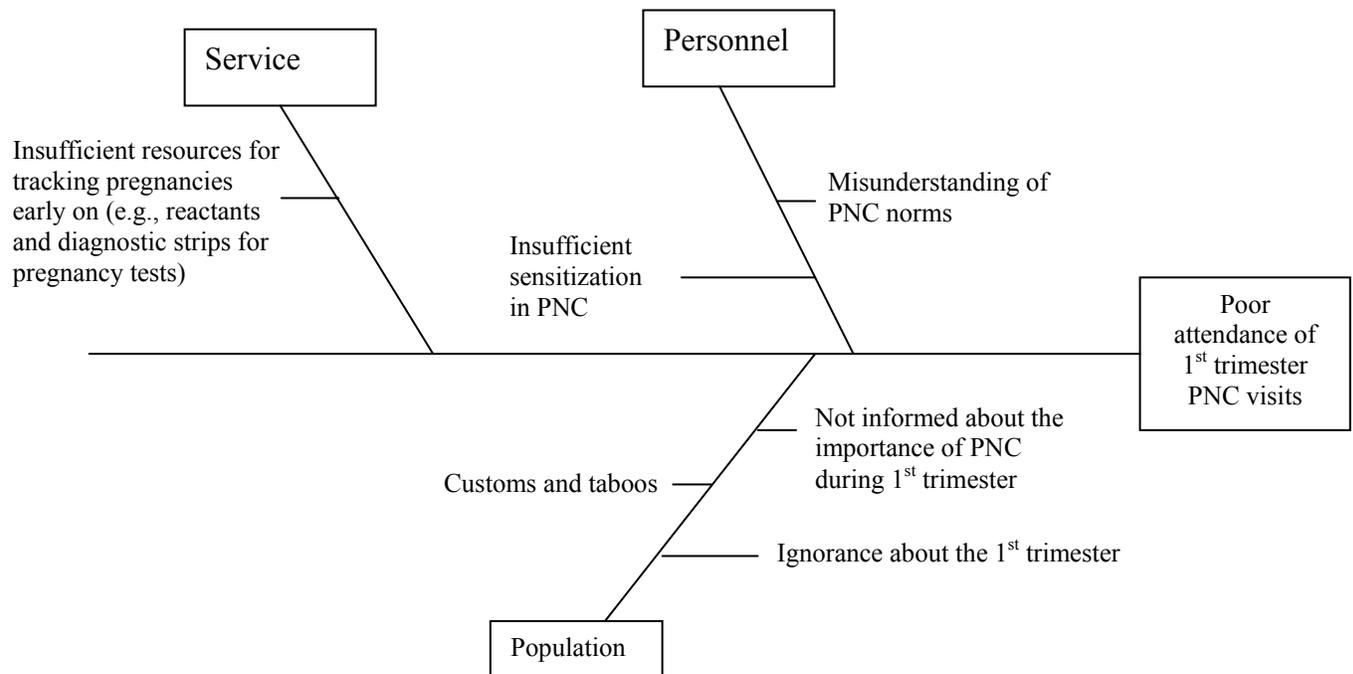
sensitization on the part of the staff, as well as lack of community understanding of the importance of PNC. Counseling steps were also depicted as clouds because some team members gave individual counseling, while others relied on group counseling. This service was not provided uniformly.

Figure 1 Flowchart of Prenatal Care Services, N'zige Health Center



After examining the flowchart and especially the clouds, the team hypothesized reasons for the low PNC rate. They then organized those possible reasons using a cause-and-effect diagram (Figure 2).

Figure 2 Cause-and-Effect Diagram of Prenatal Care Services, N'zige Health Center



Next, two nurses and the social worker verified the possible causes shown in the cause-and-effect diagram by conducting a survey of 100 women, accomplished in two stages. First, during a two-week period, 60 mothers who came to the health center for vaccinations or PNC were asked to respond to a questionnaire. The results showed that:

- 48 women out of 60 (80 percent) misunderstood the benefit of PNC during the first trimester
- 9 out of 60 (15 percent) said they did not know first trimester PNC existed
- 3 out of 60 (5 percent) raised issues related to tradition and social taboos

Second, the TBA and community health promoter surveyed 40 women at their homes in Murama, about four kilometers from the health center. They chose Murama for the second stage because its residents were not represented in the first one. The same trends were found: the primary reason for the lack of prenatal visits during the first trimester stemmed from lack of information. (Upon returning from Murama, the TBA and health promoter reported that they would have been received better had a nurse accompanied them.)

Finally, the in-charge and another nurse conducted an observation of 10 prenatal consultations, usually provided by a nurse and a health auxiliary. They used a checklist (see Appendix, Page 25) as a guide. The staff they observed did not know they were being observed. Areas that could be improved included:

1 out of 10 women were greeted by the health worker
0 out of 10 health cards were checked for information
0 out of 10 women were screened for vaccination status
7 out of 10 women were not referred for vaccination
5 out of 10 women did not receive a pre-tibial edema test
9 out of 10 women did not have lab tests (albumin, glucose)
5 out of 10 women did not receive a prescription for iron
0 out of 10 women received adequate counseling on pregnancy danger signs requiring medical attention

In addition, by talking to the PNC clients, the observers learned of other client concerns. For instance, they were surprised to find that the clients felt the waiting times for PNC visits were too long.

Developing and Selecting Solutions

In June, the team developed a list of solutions (possible interventions) based on the information they had collected and their understanding of what they could do about the problem. After discussion the them decided to implement all of them. A synthesis of the five main interventions follows.

1. Continuous sensitization on the importance of PNC during first trimester to:

Clients, through both individual counseling and group health education talks at the health center on the advantages of PNC during the first trimester (see more details in #4)
Local authorities, who will in turn sensitize their communities on the importance of early PNC visits: twice a month
Traditional midwives, so that they can counsel women on the importance of PNC and increase their involvement in prenatal care: monthly
Community health promoters, via *cellule* meetings, to encourage women to get early PNC: monthly

2. Continuous training of staff on PNC standards

3. Home visits conducted by a team of one or two nurses and the social worker at remote communities via motorcycle: twice a month

4. Improving the prenatal care process:

Systematic assessment for all clients, including monitoring vital signs, taking blood pressure, and measuring height. Previously, some of these procedures were only performed for new cases.

Systematic lab tests, such as pregnancy, albumin, and glucose tests, for all new clients. Previously, such tests were administered only to women with certain danger signs, such as edema.

Immediate care for clients as they arrive, with most receiving individual counseling. This step addressed the client complaint of long waiting times. Previously, clients had to wait for a large group to assemble to hear a group health education talk.

Increasing the frequency of health education talks to two or three times a week for clients in the PNC and vaccination clinics. Before, health education talks were not given regularly, perhaps once a week, and only on the day PNC services were offered at the

health center. The team organized a new schedule of health education talks to take place at least on Mondays (vaccination day) and Thursdays (PNC day). Topics included the importance of PNC, importance of anti-tetanus vaccine and vaccine calendar, hygiene for pregnant woman, causes and case management of abortion, causes and case management of premature deliveries, evolution of a normal pregnancy, and preparation for delivery.

5. Doubling the number of staff assigned to the prenatal care clinic (which takes place once a week) to three or four people. This measure was intended to decrease waiting times.

Implementing Solutions

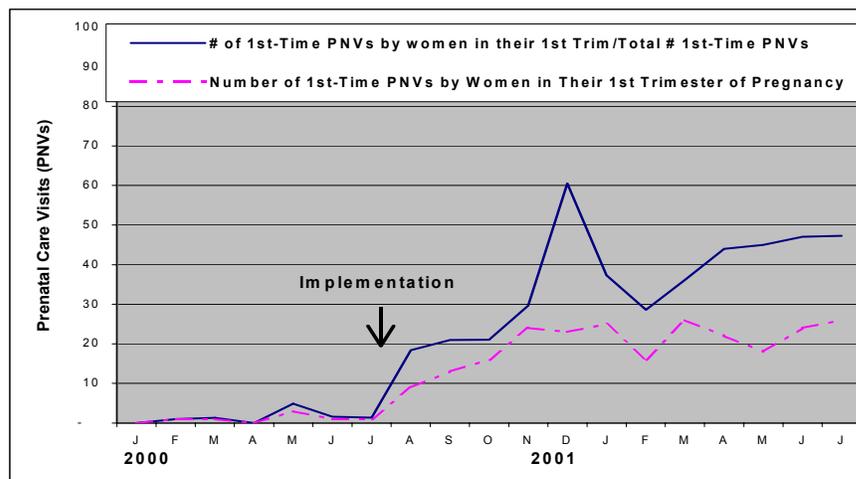
In July 2000, the team began to implement the solutions. Since they implemented all solutions simultaneously, they were able to bundle some activities to increase efficiency. For instance, the meeting with traditional midwives took place at same time as home visits and other community sensitization meetings. In addition to the PNC visit indicator, the team also monitored other indicators of solution implementation: the number of education talks, the number of women visited during home visits, overall PNC coverage, etc.

The team found that the implementation of each solution could change over time. For instance, during the first home visits, the two-person team visited every woman door-to-door within a limited region, which was not very efficient, since many women they visited were not pregnant. Later, staff began to ask PNC clients at the health center to sensitize other women about the importance of first trimester PNC and the schedule of home visits. Soon, they were able to give prenatal consultations to 10–15 women on each outing. Similarly, staff training also changed with time. Initially, the plan called for the nurse who was most experienced in PNC to train other staff once a week. Over time, this developed into an informal supervision role for the PNC nurse, who would demonstrate a procedure to colleagues if she noticed unusual practices. A year after the initial implementation of solutions, all activities were still in place, albeit not at full measure. Home visits occurred about monthly, and health education talk sessions took place at about 75 percent of the planned rate.

Results

A month after implementation, the team found that 19 percent of PNC visits were with women in their first trimester. Since the team's original goal was 20 percent, they decided to increase it to 50 percent. By December, they had also surpassed this goal.

Figure 3 Proportion of First Trimester PNC Visits, N'zige Health Center



In addition, the team estimated that they had reduced waiting times from three or four hours to a half to one hour. Clients noticed these changes, as evidenced by the sharp increase in first trimester visits. In fact, the health center began to receive women who traveled from the catchment area of other health centers who had heard of the shorter waiting time at N'zige. In addition, after brainstorming ways to decrease waiting times for prenatal consultations, the team successfully applied similar changes at the vaccination clinic.

Encouraged by the results of this problem-solving cycle, the team decided to start a second cycle: to reduce the case fatality rate for malaria.

Quality Improvement Insights

The following are some lessons learned from the N'zige team:

Conducting “secret” observations of staff conducting consultations using a checklist of clinical norms was a very easy way to identify areas that needed improvement. The in-charge noted: “We thought we conducted the activities correctly, but after observing 10 women, we saw that the services were not good quality, which may well have played a role in the low frequency of first trimester prenatal care visits.”

Systematic team problem solving can be difficult for health center staff to understand initially. The learning curve is steep for teams tackling their first problem. The two nurses who received the initial training reported that it was very difficult to explain to the rest of the staff what systematic team problem solving was. This made it difficult to motivate staff, so the work moved slowly in the beginning. They felt that more supervision would have been beneficial, especially early on.

As another example, all six teams visited by QAP staff in August 2001 drew flowcharts to describe the process containing the problem they selected, independent of the nature of the problem. This suggests a tendency for teams to apply tools that were taught during training in a mechanistic way, particularly when teams are new to systematic team problem solving. For instance, for the N'zige team, a flowchart of the service does not reveal why women are not coming to the health center for prenatal care during the first trimester. It would be reasonable to postulate that this problem occurs before the client enters the health center. However, the process

of drawing the flowchart was still beneficial, as it focused staff attention on systematically analyzing the service to identify areas for improvement. Even if poor quality service is not a root cause, an improvement in the quality of services will usually help to attract and retain clients. When asked about the decision to draw a flowchart, the health center in-charge said that the team wanted to concentrate on issues within their scope of influence. Finally, collecting lessons learned after each problem-solving cycle would be an important method of decreasing the likelihood of such apparent “problem-analysis disconnect” in subsequent cycles.

Including community members as team members facilitates working with the community.

Since a component of the team’s solution was to inform the community of the importance of early prenatal care, having a health committee officer/health promoter and a traditional midwife on the team helped in the implementing the health education campaign at the community level. Though the two community members had to travel to the health center to attend meetings and occasionally found it difficult to do so, their participation facilitated much of the subsequent work.

When learning the method of systematic team problem solving, applying new concepts immediately helps teams to learn more quickly. The QI cycle in N’zige was short, taking about two months from the first meeting to beginning of implementation of solutions. Nevertheless, the two nurses who received QA training felt that had the cycle been initiated immediately—rather than a month—after the training, the process would have been even more efficient. They believed the same was true for coaching visits: the team should review the coach’s comments as soon as possible.

One of the advantages of working in teams is the harnessing of knowledge, experience, and ideas from team members. The N’zige team seemed to work very well together. When interviewed for this case study, they chose to represent themselves by three members. They suggested that more team members be trained in QA and even that corrective feedback should be given to the team, rather than to individuals. The following are some quotes from the team:

When one works in teams there are more results.

There are always different opinions, so one finds the solutions more easily.

Working in teams facilitates the work that needs to be executed: the work is shared by everyone; a richness of knowledge is shared.

Working in teams also reinforces the ties of friendship: one feels at ease; there is no inferiority or superiority complex.

Appendix: Observation Guide and Results of Ten Observed Consultations, N'zige Health Center

	Yes Answers
Reception: Did the healthcare provider:	
1. Politely greet the client?	9/10
2. Ask for the reason for the visit?	10/10
3. Ask for the age of the client?	10/10
4. Ask for the prenatal care card?	10/10
5. Consult the prenatal card to find information?	0/10
Vaccination status: Did the healthcare provider:	
6. Verify the woman's vaccination status?	0/10
7. Determine whether the woman needs vaccination?	10/10
8. Refer the woman to vaccination?	3/10
Consultation: Did the healthcare provider:	
9. Ask at least two questions related to her obstetrical history in the case of a first prenatal care visit?	9/10
10. Take a blood pressure reading?	10/10
11. Examine for pretibial edema (by touching)?	5/10
12. Prescribed routine laboratory examinations (albumin)?	1/10
Diagnosis of at-risk pregnancy:	
13. Did the healthcare provider identify a woman having the signs of a high-risk pregnancy?	10/10
14. If yes, did he/she identify the risk factors according to the flowchart?	10/10
15. Did the healthcare provider explain the diagnosis of high-risk pregnancy to the client?	10/10
16. Did the healthcare provider give advice about healthcare during pregnancy?	7/10
Case management:	
17. Did the healthcare provider administer or prescribe folic acid or iron to the patient?	5/10
18. Other treatments (specify): Buscopan, Paracetamol?	3/10
19. Did the healthcare provider identify one or several danger signs?	7/10
20. If so, was the client referred to another level of care?	10/10
21. If not, why?	
Communication: Did the healthcare provider:	
22. Explain to the client when to return for the next prenatal care visit?	10/10
Did the healthcare provider advise the client to return in the event of:	
23. Bleeding?	
24. Headaches/vision troubles?	0/10
25. Edema of the legs?	0/10
26. High fever?	1/10
Did the healthcare provider:	
27. Ask the client where she was planning to give birth?	6/10
28. Discuss the organization of an emergency evacuation plan?	8/10
29. Talk about the importance of the anti-tetanus vaccination and Expanded Programme on Immunization?	9/10
30. Ask an open question to verify that the client has understood?	8/10
31. Ask the client if she has questions?	9/10

Improving Measles Vaccination Coverage at Mukarangé Health Center

Team Members

Samuel Ruzindana, A2 nurse, in-charge
Célestin Mutsinzi, health auxiliary
Colette Mukagatsinzi, health auxiliary
Flaura Mukakamanzi, nutritionist aide
Prudencienne Mukangoga, social worker
Pascasie Musaniwabo, cashier
Louis Byihorere, community health promoter

Background

The Mukarangé health center is 15 kilometers from the Rwamagana District Hospital, close to the Ugandan border. The 21-bed health center opened in 1974 in collaboration with the government and the population it serves, which helped to fund the construction. Unlike most health centers in Rwanda, Mukarangé is located off an asphalt road, and it also manages two health posts. Some of its clients are farmers who harvest beans, sorghum, corn, bananas, peanuts, and sweet potatoes. Others make their living from cattle and goat herding. Health center staff estimate that about 20 percent of their clients are new to the region, having moved back to Rwanda from neighboring countries after the civil war. Providing care to the population of over 24,000 (government estimate, 2000), Mukarangé has 14 staff members: a nurse, two health auxiliaries, three nutritionist aides, a social worker, a cashier, two watchmen, and four laborers.

In September 1995, a health committee formed to give voice to the community's needs vis-à-vis the health center and manage the health center budget. While 10 staff members are paid by the state, four are paid by the health committee. The health committee has ten members: the health center in-charge, the cashier, and a representative for each of the eight sectors the center serves. The committee structure provides for a president, vice-president, a secretary/advisor (who is also the health center in-charge), and an accountant (who monitors and controls the health center budget).

In November 1999 and April 2000, the health center in-charge and another staff member, respectively, were trained in quality assurance (QA) methods. Soon thereafter, the in-charge called a staff meeting to begin a quality improvement (QI), or team-based problem-solving, cycle.

Identifying the Opportunity for Improvement

During the first meeting, the QA-trained nurses explained to the remaining staff what they had learned about quality assurance, its importance, and what the work would entail. Following this, the staff brainstormed four potential problems they could work on:

1. Low coverage rate for measles vaccine,
2. Long waiting times for antenatal consultations,
3. Low family planning attendance rate, and
4. Low outpatient care attendance.

Next, the staff looked for information on each problem in monthly reports, which provide statistics and are sent to the Ministry of Health (MOH). Using this information, they discussed and agreed on the relative weight each of the four problems based on three criteria: impact on the population, frequency, and whether the problem was within the staff's influence. The problem that scored most was the low coverage rate for measles vaccine.

Next, the staff worked on defining the problem in a way that made it quantifiable so that an improvement could be detected. The team analyzed the data to determine how much they could realistically expect to increase the vaccination rate. To estimate the number of children 0–11 months old, they multiplied the population of their catchment area by the government estimate of the percentage of children 0–11 months old (4.3%). They divided the result by 12 to obtain the number of children they would need to vaccinate each month to vaccinate all children in a year:

$$\begin{aligned} 24,093 \text{ total population} \times 4.3\% &= 1036 \text{ children } 0\text{--}11 \text{ months} \\ &= 86 \text{ children to vaccinate/ month to achieve full (100 percent) coverage} \end{aligned}$$

Then, they multiplied the number of vaccination sessions held each month (eight) by the number of children they believed they could vaccinate per session:

$$8 \text{ vaccination sessions} \times 9 \text{ children/session} = 72 \text{ children} \div 86 \text{ children for full coverage} = 82.5\%$$

Their operational definition of the problem stated:

A problem was identified from the results of an analysis of monthly reports of vaccination activities at the Mukarangé health center, showing a coverage rate of 49.9 percent in 1998; 24.4 percent in 1999; and 41 percent from January to April 2000, as compared to a national target of 100 percent. The staff suggested that the opportunity for improvement be considered achieved when this rate reached at least 80 percent; they set the end of 2001 as the completion date.

All staff who play a role in the vaccination process and anyone who had means to or ideas of how to increase the coverage rate formed a team: A2 nurse/in-charge, two health auxiliaries, a nutritionist aide, a social worker, the cashier, and a community health promoter. The team would meet twice a week for two hours. Roles were created for some team members: president, vice-president, secretary, timekeeper, and facilitator.

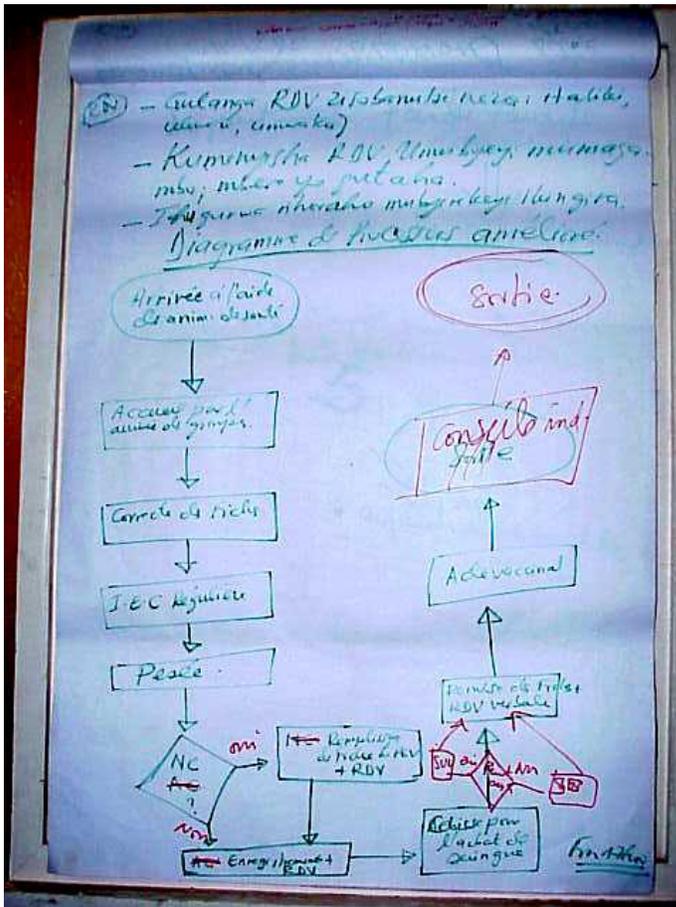
Analyzing the Opportunity for Improvement

The team started to analyze the problem in mid-June. They began by making a flowchart of the problem to show all the steps of the process from the arrival of the mother at the health center to her departure (Figure 1). They found that staff did not always follow the steps in exactly the same way; when they encountered such situations, they discussed them and agreed on what to draw on the flowchart.

As they did this, they also identified “clouds,” i.e., steps in the vaccination process that were either unclear or could be improved. The flowchart clouds were:

1. Not enough mothers are coming in to have their children vaccinated,
2. Mothers experience long waiting times,
3. Some mothers arrive without the means to buy a syringe,
4. Information, education, and communication (IEC) sessions are given irregularly, sometimes as seldom as once a month, and
5. In making appointments, staff sometimes tell mothers to return in a given number of months, rather than indicating the exact date they should return.

Figure 1 Flowchart of Measles Vaccination Process, Mukarangé Health Center



Next, the team brainstormed possible reasons for the low measles vaccination coverage. Reasons varied widely. For instance, one team member said that some clients who emigrated from Uganda after the civil war did not believe that vaccination was important: “In Uganda, we don’t vaccinate a child if she is not sick,” someone had said.

Another team member noted that a new health center had opened nearby that might be vaccinating children from Mukarangé’s catchment area, thus decreasing the Mukarangé center’s vaccinations. Another team member added that Mukarangé could improve its collaboration with community health educators: health center staff were usually not invited to community meetings, but could be.

Using a cause-and-effect diagram, the team classified—under the areas of environment, population, personnel, and service—all the probable causes of the low vaccination coverage rate. Next, the team conducted a survey with 30 community members in order to determine the relevance of those causes. The survey was designed by the health center staff and administered by both staff and community health educators. To achieve a broad representation of the community, the survey was administered to 15 mothers and fathers in the community, 5 mothers who were interviewed at the health center, and 10 community health educators. Results appear in Table 1.

Table 1 Results of Informal Survey to Verify Causes of Low Vaccination Coverage, Mukarange Health Center

Yes	No	No Response
Do you usually bring your children to the vaccination clinic to receive measles vaccination?		
5/30 (17%)	20/30 (67%)	5/30 (17%)
If the child's mother cannot bring the child to be vaccinated, can the child continue the vaccinations on schedule?		
	30/30 (100%)	
Can you afford to vaccinate your children at the health center (cost is 50 RwF)?		
25/30 (83%)	5/30 (17%)	
Are you satisfied with the location of the vaccination clinic in terms of its convenience for vaccinating your children?		
13/30 (43%)	17/30 (57%)	No

Developing and Selecting Solutions

In order to improve the situation, the team returned to the flowchart and used the information from the survey to determine how the cloudy steps could be improved.

Table 2 Solutions Derived from Flowchart Clouds, Mukarange

Flowchart Cloud	Solution
Not enough mothers are coming in to have their children vaccinated.	<p>Continuously sensitize mothers about the importance of vaccinating against measles and the consequences of not vaccinating. Health center staff will perform this activity at the outpatient clinic, and community health educators will do so during monthly community meetings.</p> <p>Continuously sensitize men on the importance of vaccination to encourage them to ensure the child is vaccinated if the mother cannot. This activity will be carried out by health center staff during clinic and outreach home visits and community health educators during community meetings.</p> <p>Collaborate with community health educators at all levels (<i>cellules</i>, sectors, <i>communes</i>) to check the vaccination status of children (door-to-door) and to help send unvaccinated children to the health center.</p> <p>Continuously train staff on vaccination. The in-charge and district supervisors will perform this activity during clinic staff meetings and vaccination sessions twice a week.</p>
Mothers experience long waiting times.	<p>Improve the vaccination process (reception, waiting line management, counseling for mothers along with feedback from them, appointments).</p> <p>Receive and vaccinate children upon their arrival at the center.</p> <p>Give numbered cards to clients to prioritize those who arrive earlier at the clinic.</p>
Some mothers arrive without the means to buy a syringe.	<p>Vaccinate children from indigent families with reusable syringes that are given by the district. A nyumbakumi, who represents about 10 houses, will identify indigent families.</p>
IEC sessions are irregular.	<p>Always give IEC. Conduct health talks on the importance of measles vaccination, and provide individual counseling on the next appointment and the secondary effects of the vaccination.</p> <p>Improve the group IEC on measles prevention, showing the steps.</p>
In making appointments staff tell mothers to return in a certain number of months, rather than the date.	<p>Give precise appointments, with specific dates, for all children.</p> <p>Verify the mother's comprehension of appointment information before she leaves</p>

The main indicator that the team used to track their progress was:

Rate of measles vaccine coverage:

$$\frac{\text{Number of children vaccinated for measles per month}}{\text{Estimated number of children 0–11 months}}$$

In addition, the team selected indicators to monitor the implementation of solutions:

Rate of outreach home visit sessions. Number of outreach sessions per month/number planned x 100. *Objective:* Two outreach sessions per week starting in September for a total of eight outings per month).

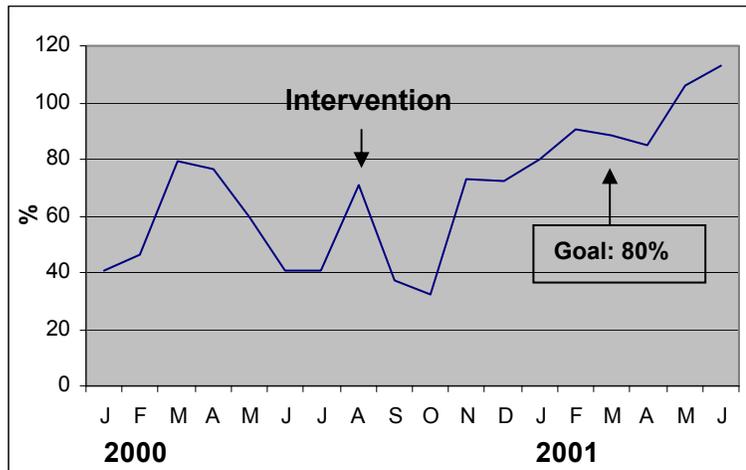
Number of meetings with community health educators. This count would measure the level of effort to verify the vaccination status of children in their respective zones. *Objective:* One meeting two months after the implementation of solutions.

Results

In August 2000, the team started to implement the solutions. The run chart in Figure 2 shows the change in the measles coverage rate before and after the implementation of solutions. As team members introduced changes to increase the measles coverage rate, they also noticed opportunities for quick improvements and implemented them as well. For instance, the team noticed that the long waiting time was exacerbated by late staff arrivals. In response, the team started a register for staff to log their arrival and departure times. In addition, the team thought that improving cleanliness at the health center might attract more clients, so they ensured that cleaning staff had the necessary tools and gave them an earlier starting time. This way, the health center would be clean when clients arrived.

Some of the solutions also affected other clinical areas. For instance, PNC staff took note of the long waiting times for their services. Using the same solutions as the vaccination team, they gave clients numbered cards to be seen in order of arrival and offered individual as well as group IEC. While overall clinic utilization does not appear to have increased, its revenues have. Comparison of the revenues for the seven months immediately preceding the implementation of solutions and the same period a year later show a 38 percent increase, though it is not possible to attribute this change solely to improvements at the immunization clinic.

Figure 2 Measles Vaccination Coverage Rate, Mukarangé⁴



Quality Improvement Insights

Some of the difficulties the team encountered included:

- Lack of understanding of the QA process, particularly in the initial stages, despite explanations given by the nurses who attended the QA workshop
- Lack of materials, such as notebooks and pens, which were finally purchased with health center funds
- Lack of funds to support the door-to-door effort by community health educators to check vaccination status. (The health center ultimately bought two bicycles that are now shared among the community health educators.)
- Local elections brought in new community health educators

Health center teams could use more technical support in designing surveys. To verify hypothesized causes, the Mukarangé team interviewed 30 people, including women at the health center, women in the community, and community health educators. Since office supplies were lacking, interviews were performed in groups: an interviewer would gather several women together and ask each question out loud. The women would call out “yes” or “no.” While the survey gave the team more information about the community, interviewing each woman separately would have lessened any social influence on the answers. Tabulating each segment of the interviewees separately would have revealed how they differed, and asking open-ended questions would have enriched the data.

Analysis of hypothetical causes for the fluctuation in vaccination coverage rates could have better focused the development of solutions. Although the team was pleased with the results, the data do not show a clear increase in coverage rates immediately following the beginning of the implementation of solutions in August 2000. The rate dropped by 50 percent in September and October, regained August levels in November and December, and only in January 2001 began a

⁴ The greater than 100 percent levels reached in May 2001 suggest that there may have been a population shift such that the *actual* number of children under 5 decreased after the estimate for the denominator was made, or that people from outside the catchment area were using health center services. The International Red Cross started a growth monitoring program in May 2001 and took this opportunity to vaccinate children.

sustained climb. In fact, vaccination coverage rates had fluctuated wildly before the team started its work. During the half-year ending in July, the coverage rate fluctuated between 40 and 80 percent. The team also reported a coverage rate of 49.9 percent for 1998 and 24.4 percent in 1999 (the rate for 2000 was 55.6 percent). While the in-charge reported not knowing the reason for this fluctuation, the team apparently had not brainstormed around this specific issue. The team could have examined monthly data of the previous years during their root-cause analysis. Hypothetical causes might have included whether highs (or lows) in coverage rates coincided with staffing or policy changes, seasonal variations, or whether there might be reasons to expect a certain pattern in the variation of the size of the infant population throughout the year. Such theories could have helped in the development of solutions and interpretation of the post-intervention run chart.

Time invested in gathering lessons learned from one's previous experiences and that of other teams can motivate teams to try new approaches. The Mukarangé team embarked on a second quality improvement cycle, working on the problem of case management of malaria. From its experience with the first cycle, it incorporated new ideas, such as involving local authorities as team members to increase their involvement in addressing community health concerns.

Also, teams at different health centers participated in a conference in December 2000 to exchange experiences. The Mukarangé team took advantage of the experience and solutions from other health centers to make opportune improvements. For example, it created full staff job descriptions and adopted some of the solutions from the N'zige team for identifying pregnant women in their first trimester to encourage prenatal care consultations.

Case Management of Patients in Shock at Kigali Central Hospital

Team Members

Bonaventure N'zeyimana, MD, national level trainer
Florence Mukarugwiza Nuyuzee, head nurse
Esther Mundamukirize, adjunct head nurse
Chirstine Uwineza, nurse
Perpetue Mukasewabo, nurse
Marthe Kanziga, nurse
Thérèse Mukorwema, nurse
Violette Mukaranyange, nurse

Background

As Rwanda's national referral hospital, the Kigali Central Hospital (CHK) receives referrals from the entire country. The emergency care department sees 40 to 60 patients every day, of which fewer than 20 percent are referred by a primary-level facility. The department comprises five units: orientation, reception for medical pathologies (four beds), minor surgery and resuscitation (two beds), plaster cast room, and acute illnesses (seven beds). In 1999, this department had 30 staff, including 19 nurses, 4 physicians, 6 support staff, and a cashier.

Between November 1999 and February 2000, six nurses were trained in quality assurance (QA) methods. Six months later, they convened a meeting to start a quality improvement (QI) effort. Two additional staff members, a doctor and a nurse, also participated.

Identifying the Opportunity for Improvement

During the first team meeting, the QA-trained nurses explained to the others what they had learned and led them through the different steps of the QI problem-solving method. After brainstorming on what problems to work on, they examined the available statistics on each condition mentioned during the brainstorming. After discussion, each staff member voted on the relative weight of each problem according to four criteria (see Table 1). After adding the total scores, they saw that case management of patients in polytraumatic shock had the highest score.

Table 1 Decision Matrix to Prioritize Problem, Kigali Central Hospital

Problem	Importance	Vulnerability	Frequency	Impact on Quality	Total
Case management of patients with cranial trauma	3.66	3.33	3.66	4.00	14.65
Case management of patients in polytraumatic shock	4.50	4.00	4.66	4.33	17.49
Case management of patients in diabetic coma	4.22	4.75	1.00	4.50	14.47
Case management of patients with meningococcal meningitis	3.00	2.25	3.00	3.75	12.00
Case management of patients with acute broncho-pneumonia	3.75	2.75	5.00	3.75	15.25

The next step was to write an operational definition of the problem, a difficult process that required a month. Defining the problem involved expressing how the team knew there was a problem and how they expected to detect any improvement. Since patients were usually transferred to intensive care or surgery after emergency care, emergency personnel generally would not learn their patients' health outcomes (i.e., whether they recovered). This disconnect made it exceptionally difficult for emergency staff to know the outcomes of the care they provided or to use the statistics from those outcomes to measure the quality of that care.

The staff ultimately decided to focus on the first 48 hours after a patient's arrival. To examine the quality of care during this period, team members secretly observed the case management of all patients arriving in polytraumatic shock over four days. The observation results were compared to norms for reception, orientation, and cardio-pulmonary resuscitation. From these observations, the team decided that adherence to norms needed significant improvement; they also decided to measure the improvement by tracking the case fatality rate.

They defined the problem as follows:

The poor case management of patients in polytraumatic shock in emergency services at CHK during the first 48 hours:

Observations of all patients in polytraumatic shock treated between 7/09 and 11/09, 2000, revealed that the case management of the majority of patients is not performed according to emergency services norms. In effect, only three out of the seven patients observed during this period were managed according to norms. In 2000, 35 out of 95 patients in polytraumatic shock died within 48 hours, a case fatality rate of 37 percent. Given this situation, it is imperative that we reduce the mortality rate by 50 percent by July 2001.

Analyzing the Opportunity for Improvement

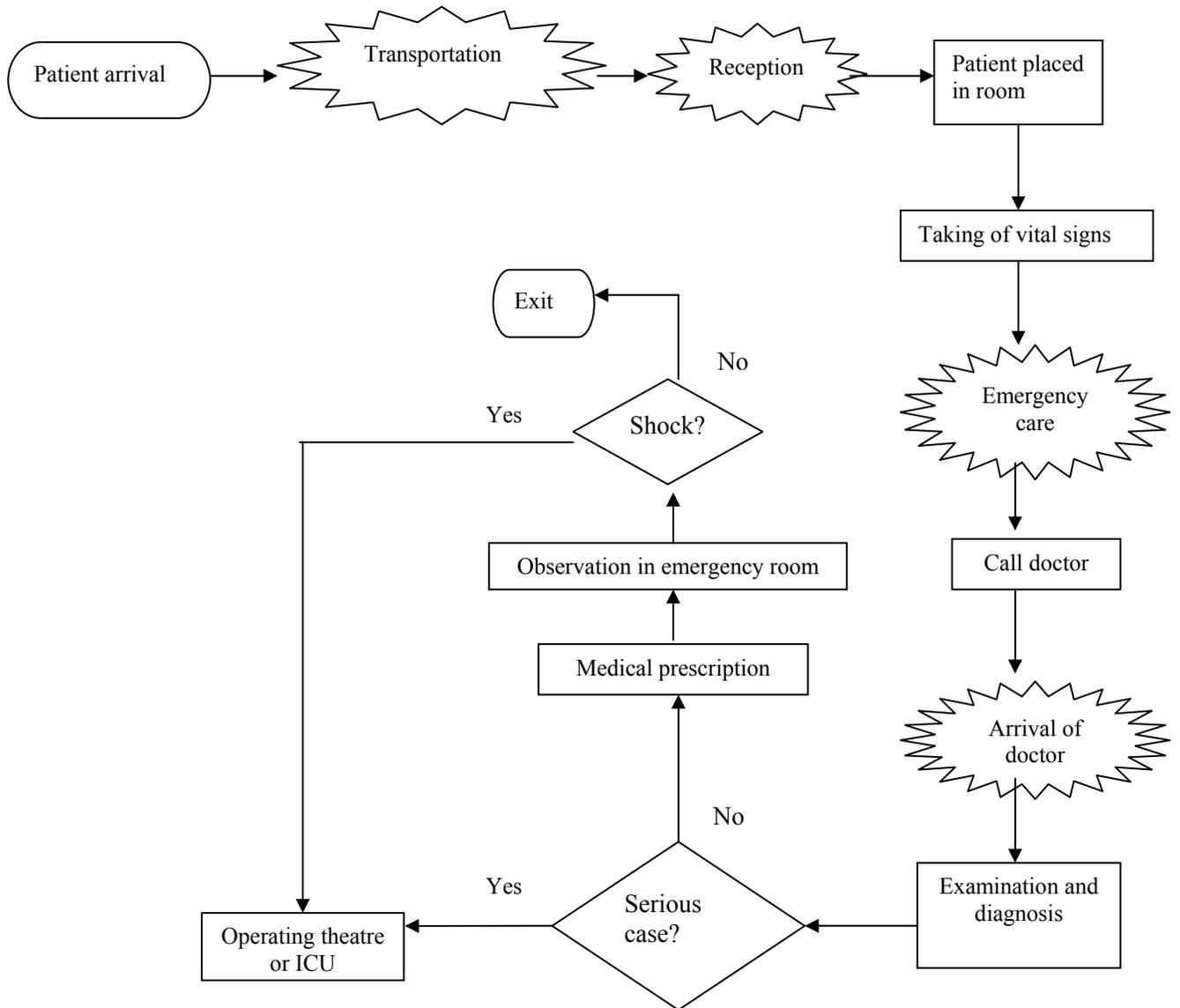
Next, the team organized itself to analyze the case management of patients in shock. They assigned roles for different members: president, secretary, timekeeper, and two staff responsible for monitoring data. They set a regular meeting time between the day and night shifts when staff were most available (every Monday at 8:15 for 30 minutes). They arranged to have the night shift bus wait so that night staff could attend meetings.

The first step in the analysis was to construct a flowchart of the case management process, which required three meetings. This was difficult since the concept of a flowchart was new. During the process, the team identified areas that they did not understand well, that could be improved, or that were inconsistent. This helped them see where in the case management process the problems were. They paid particular attention to areas where they could not answer the questions "Who?" "Where?" and "When?" These areas are represented as clouds in their flowchart (Figure 1).

This step [constructing the flowchart] brought some reflection on what we did, . . . and it brought to our attention to the fact that maybe we weren't as good as we thought.

Dr. Bonaventure, team member

Figure 1 Flowchart of Case Management of Patients in Polytraumatic Shock, Kigali Central Hospital



The troubling areas or clouds were:

- 1) Reception: Having only one reception table to handle 40–60 cases a day caused a long waiting time between arrival and reception.
- 2) Transport:

Nurses who were supposed to triage had other primary responsibilities, both within and outside the unit.

Nurses who transported patients often did not know how to handle them (for example, a nurse may not know whether a patient should be on stretcher or a wheelchair).

Lack of continuity of care resulted in at least one case where a patient who was waiting to be transported died in his chair. One hallway where patients waited to be seen was dubbed the “corridor of death” by staff.

- 3) Emergency care: Procedures nurses should be capable of performing were not handled by nurses because of lack of knowledge (e.g., first aid, recognition of a patient’s level of shock).
- 4) Arrival of the doctor: Nurses thought some doctors did not give enough importance to emergencies, even when they were not busy. This led to inter-staff conflict with nurses and doctors accusing each other of negligence.

Next, the team tried to determine what factors might have led to the poor case management of patients in shock. They brainstormed reasons in four categories: clients, the service, personnel, and equipment and materials.

Clients: The emergency unit was overburdened by 40–60 clients per day. Exacerbating the situation were: urban residents preferred seeing doctors, so they tended to go to the hospital, even in non-referral cases that would have been more appropriately handled at the city health center; CHK services were considerably cheaper than those at private hospitals; and patients who could be treated at the health center were often referred to the hospital anyway.

Service: The team thought the main weaknesses of the service were the poor transport, lack of organization, and absence of an oxygen-equipped stabilization room. In particular, the need to reorganize the services had already been recognized when the department attempted to remedy the problem of long patient waiting times. This problem-solving effort, initiated in July 2000 by nurses from a Belgian nongovernmental organization (NGO), had never progressed beyond root-cause analysis. However, in investigating the long waiting times at the emergency department, the nurses had identified the lack of triage and orientation as main causes.

Personnel: In addition to the insufficient staff for the patient volume, norms were lacking, leading to a great variation in staff practices—and skills. Some nurses could not recognize shock, and many doctors would call the anesthesiologist or resuscitation specialist for intubation because they had forgotten how to perform this procedure. Team members also noted that negligence was a problem, as revealed by accounts of different incidents. Doctors cited negligence among nurses, such as those who did not adequately monitor patients in shock—i.e., not knowing a patient’s arrival time or condition, so that a critical condition would not be addressed. Similarly, nurses pointed out cases of negligence among doctors, such as one who fell asleep when he was needed.

Equipment/Materials: Some essential equipment was poorly adapted to the needs of the unit. For instance, the resuscitation table had fittings for children only, although few patients were children. Foldable hospital beds were also not available.

The next step was to see if the hypothesized causes that had been brainstormed were actually root causes. To examine the personnel-related causes, the team conducted formal observation of 38 cases to further investigate staff competence, negligence, and respect for norms. First, the team, resuscitation specialist, and transport surgeon agreed on a checklist of 33 tasks that should be performed once a patient in polytraumatic shock is admitted (Table 2). In November 2000, four nurses used the checklist to observe 38 cases. Since the team wanted the observations to cover all shifts, the process took a month.

To investigate causes related to materials, the team assembled a list of essential equipment and other materials that they agreed were necessary for correct case management of patients in shock. They compared that list to a list of the equipment, materials, and staff in each work area during their work shifts.

As a result of these inquiries into personnel and materials, the team assembled a list of probable causes:

- Insufficient staff
- Incompetent staff
- Lack of adequate materials and equipment (e.g., resuscitation room)
- Lack of respect for norms
- Poor organization

Table 2 Observation Guide, Kigali Central Hospital

Activities	Tasks	Performance Criteria	
		Done	Not Done
Transport upon arrival of patient	1. Put on adapted brace or splint 2. Adjust the patient carefully 3. Accompany the patient		
Reception	4. Transportation service 5. Triage 6. Security service		
Physical exam	7. Verify state of consciousness 8. Verify vital signs 9. Examine soft tissue 10. Examination of limbs and organs 11. Evaluation of degree of damage		
Emergency care by nurse	12. Stop hemorrhage 13. Respiratory airway 14. Insert/check intravenous needle 15. Ventilation 16. Undress 17. Position on floor		
Arrival of doctor	18. Examine patient 19. Write orders to follow 20. Supervise all actions to be done to patient		
Transportation to x-ray room	21. Install on stretcher 22. Adapt brace or splint 23. Adjust patient carefully 24. Accompany the patient 25. Assist the installation of the patient on the x-ray table		
Appropriate care	26. Provide medical prescription 27. Give emergency care 28. Transport patient in accordance with norms		
Monitor continuously	29. Vital signs 30. Glasgow scale 31. Heart 32. Multidisciplinary observation 33. Hemodynamics		

Developing and Implementing Solutions

The team used the information derived from their analysis to develop solutions. They first implemented changes that were within their purview and brought issues of greater scope to the attention of hospital administration. The team developed the following list of solutions:

1) Training of all emergency staff (doctors, nurses, and support staff) in the following areas:

- Shock diagnosis
- Emergency care
- Elementary resuscitation (including intubation)
- Transport of patients in polytraumatic shock

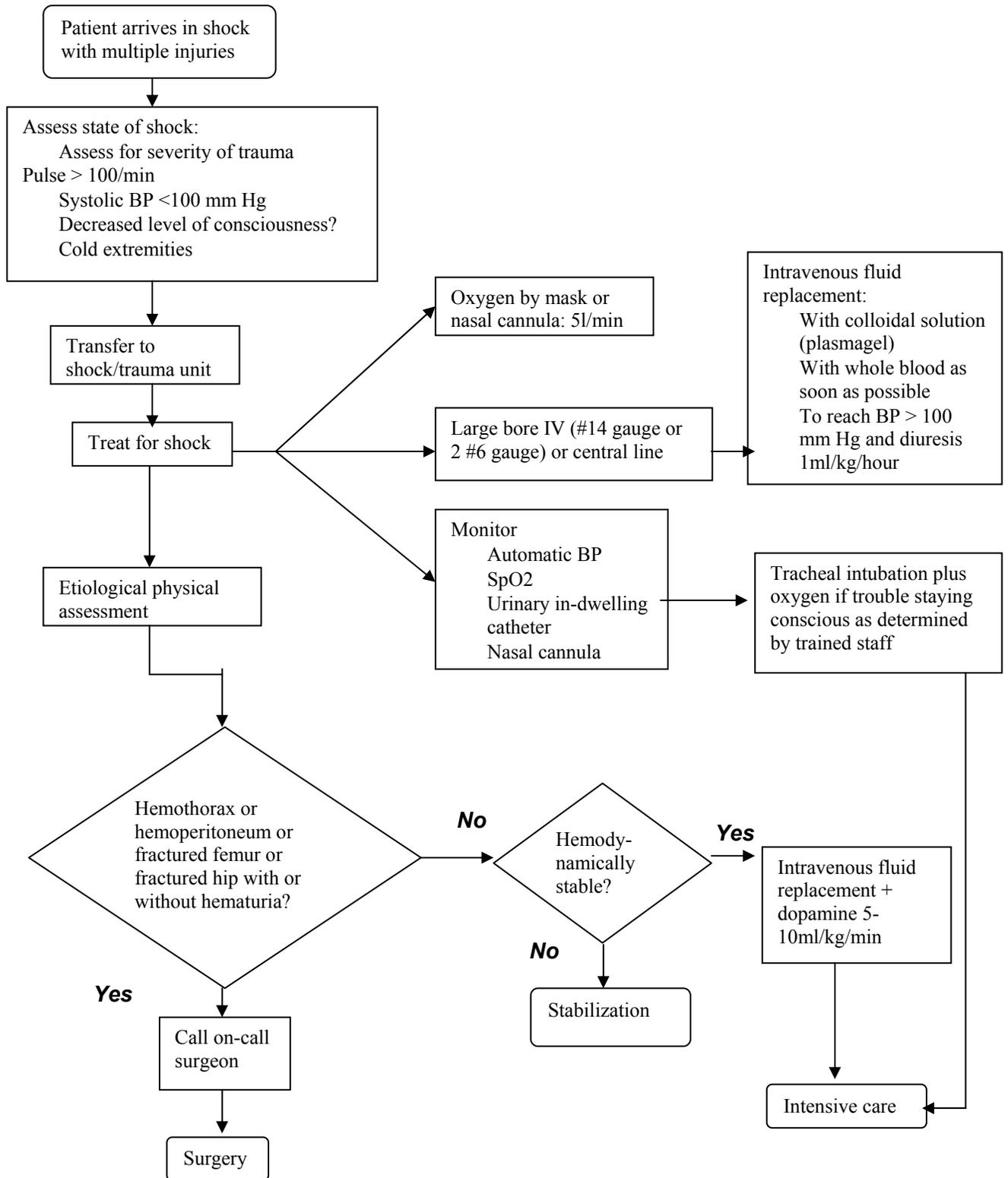
The surgeon and resuscitation specialist would lead the training sessions, working with mannequins first and later using the surgery theatre to practice intubation with supervision by the anesthesia team. A nurse also learned to intubate.

- 2) **Addition of new staff** (doctors, nurses, and support staff): Discussions with hospital administration led to the addition of three nurses, bringing the total to 22. At the same time, they lost an auxiliary, bringing that total to five.
- 3) **Establishment and communication of norms**, including general norms for the small surgery room and the case management of patients in polytraumatic shock (see Figure 2): The latter included norms for resuscitation in case of severe trauma.

The team, surgeons, and specialist reviewed national resuscitation norms and, based on their personal experiences, developed norms for this service.

Norms for case management for patients in polytraumatic shock were posted in rooms where patients were treated.

Figure 2 Diagram of Processes with Norms for Managing Shock, Kigali Central Hospital Emergency Department



4) Reorganization of staff:

Redistribution of staff within the service to increase efficiency and quality: The team identified the nodes on the flowchart where staff could be better used.

Assignment of specific responsibilities for each staff member: Before, nurses in a team had specifically assigned duties. To find a specific nurse, one had to search in all three subunits (reception, small surgery, and acute illnesses). To address this, the team convinced the administration that the small surgery and acute illnesses subunits needed at least two nurses and that reception needed one. In addition, one person should be responsible for each subunit during all shifts. The team posted staff assignments on a blackboard (see Figure 3).

The process of streamlining how the unit was organized also included making sure the unit had essential materials and equipment, as identified during the observations.

Figure 3 Staff Assignments, Kigali Central Hospital

Activités	Personnel	Responsable
Orientalion	- Frieda	- Frieda
Salle d'accueil	- Violette - Françoise	- Françoise
Ptchir. & Plâtre	- Flore - Jean	- Jean
Salle des grands malades	- Ancilla - Eric	- Ancilla
Transport	- Juvell - Daniel - Timothée	- Violette
Stérilisation	- Kadakagizi	- Flore

Medecin de garde: Dr. Bonaventure

5) Reorganization of the plaster cast room to be used as a stabilization room

6) Organization of a minimal resuscitation drug kit

One of the problems the team discussed was that drugs would often expire before they were used, and at the same time, nurses did not always know where specific drugs were because the room was disorganized. To remedy such poor use of resources and waste of time, the team assembled a drug kit with the minimal drugs necessary for treating patients in shock, as recommended by the resuscitation specialist. The kit was kept in a separate drawer in the plaster room for easy access (Figure 4).

Figure 4 Minimal Resuscitation Drug Kit, Kigali Central Hospital



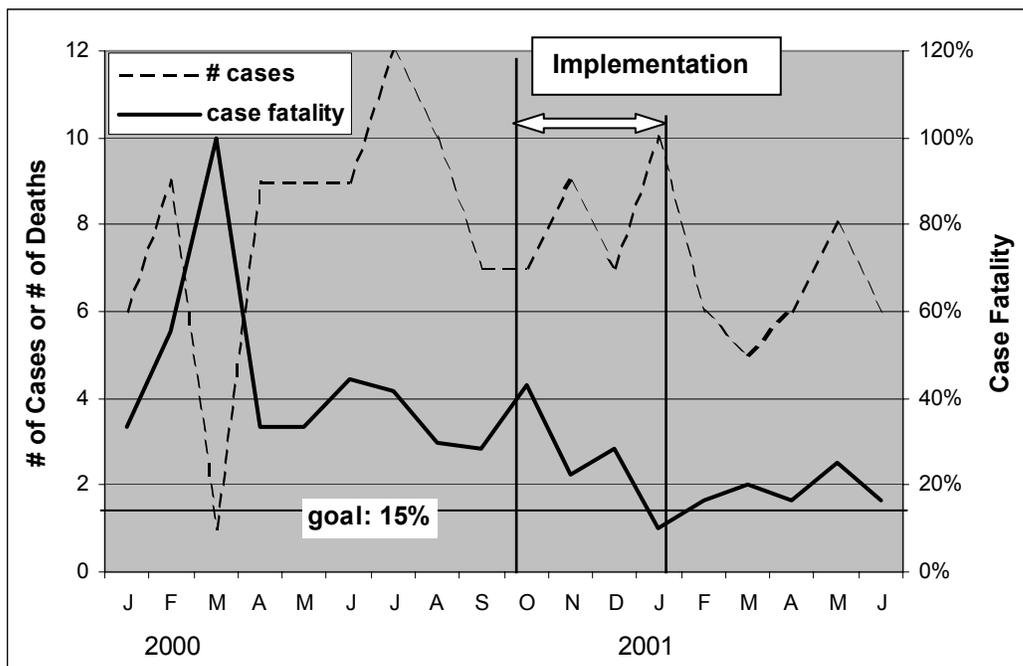
Between October and December 2000, the team tested and implemented their solutions, including staff training, procurement of equipment and materials, and service reorganization. They closely monitored the changes and their effect on staff, case fatality, and how the solutions changed how routine work was done. By the end of January 2001, all solutions were implemented.

Results

By June 2001, the average case fatality among patients in polytraumatic shock for the first six months after implementation began was 17 percent, a 20 percentage point drop compared to 2000.

By August 2001, the team had succeeded in implementing most of their solutions. Staff were trained and assigned specific responsibilities for each shift; nurses were added; norms were posted; the unit was reorganized; and the minimal resuscitation drug kit was assembled and in use. The team requested and obtained transportable oxygen, intubation equipment, and foldable transportable beds. They obtained transportation and resuscitation equipment from an NGO.

Figure 5 Case Fatality Rate for Patients in Polytraumatic Shock, Kigali Central Hospital, January 2000–June 2001



Note: Solid line shows percentage of case fatalities; dashed line shows number of fatalities.

No one knew that there would be numbers that would show the result of our efforts. Having data allowed people to see whether they were on track and gave them satisfaction. This led staff to see opportunities of creating other ad hoc teams. . . . When I saw the decrease in mortality, I realized that we did not work in vain.

Dr. Bonaventure

There were also several solutions that the team had not yet been able to implement. The conversion of the plaster cast room into a stabilization room was still in process, since the team was still procuring transportable oxygen and foldable, transportable beds. They were not able to continuously train staff, though continuous training for the entire hospital for each staff member in his or her area of expertise was being considered. A proposed training in echography was abandoned for lack of equipment and time. The physician in the team also felt that they had not succeeded in changing the level of motivation among staff, though he also recognized that there was no clear method for achieving this.

Quality Improvement Insights

The following are some lessons learned from the team:

The process of improving the case management of patients in polytraumatic shock resulted in benefits to both clients and the unit:

Benefits to the client:

- Lower case fatality rate for patients in polytraumatic shock
- Improved case management of other illnesses at the emergency unit due to the implementation of new norms and re-organization of the services
- Increase in client confidence in the service

Benefits to the unit:

- Improved materials (e.g., transportable oxygen, which would benefit other services as well)
- Better case management of patients in polytraumatic shock reduces cost of poor treatment
- Work is more organized and therefore less tiring
- Clarity in expectations and responsibilities
- Increased sense of self-satisfaction
- Reduction of double-scheduling of individual staff

Support from hospital administration is essential and must be secured from the beginning.

Once the team was able to outline what had to be done to improve the quality of services, they received support from the hospital administration. With clear political will for supporting QA activities, the administration facilitated the acquisition of materials, gave logistical support for meetings, and lent its authority to institute the new changes. Without this support, many changes may not have been adopted, such as the staff additions. Support from the administration also helped to mitigate some difficulties the team faced, such as problems with data collection, lack of adherence with the new norms, and insufficient materials.

Systematic team problem solving is not necessarily easy to implement. Even though most of the team members had been trained in QA, many of the steps that might have seemed evident to team members at first were not as easy to execute in practice. Many of the concepts—such as drawing a flowchart—were new. The relatively infrequent coaching and the lag time between the training and the first meeting of the team might have slowed the team's progress. Future QI cycles at the hospital will likely be more efficient: the doctor on the team has been trained as a national level QA coach.

Nurses can initiate change. Doctors were not initially interested in QA, which is why the first staff to be trained were nurses. However, the QA-trained nurses realized that creating change would be difficult, since they were only six nurses out of 33 staff members. Thus, they involved two additional staff—including a doctor—whom they believed would favor teamwork and were dynamic, amenable to change, and motivated. The team also found that making the effort to involve the most reticent doctors was the turning point for change. The polytraumatic shock team was one of the two pioneer teams at Kigali Central Hospital. After their results were presented to other hospital staff, doctors expressed much more interest. This has resulted in many more teams at the hospital: in December 2001, there were 10 teams at CHK.

The doctors always arrive last. . . . They thought QA was an empty shell, . . . but it started with punches and ended with accolades.

Dr. Bonaventure

Staff could implement most organizational changes themselves, without additional funds. Dr. Bonaventure reported that 60 to 75 percent of the changes were things the team could do themselves, such as reorganizing the service, staff training on surgery and resuscitation, and organizing the essential drug kit.

Nurses blamed doctors, but they needed to understand two things. First, both doctors and nurses must make an effort and second, doctors can't make stones fall from the sky (that is, do the impossible).

Dr. Bonaventure

References

- Kerstiëns, B. 1999. Rapport. Enquête sur la qualité des soins districts Muhima et Rwamagana. Rwanda. Bethesda, MD: Published by the Ministry of Health, Division for the Promotion of Health Quality in collaboration with the Quality Assurance Project (QAP).
- Massoud R, Askov K, Reinke J, Franco LM, Bornstein T, Knebel E, and MacAulay C. 2001. A Modern Paradigm for Improving Healthcare Quality. *QA Monograph Series* 1(1). Bethesda, MD: Published for the U.S. Agency for International Development (USAID) by the Quality Assurance Project (QAP).