



USAID
FROM THE AMERICAN PEOPLE

TB CARE II

Quality Improvement Handbook for TB and MDR-TB Programs

University Research CO., LLC
Funded by United States Agency for international Development

JUNE 2013

This guide is made possible by the support of the American people through the United States Agency for International Development (USAID). The information provided in this guide are the sole responsibility of University Research Co., LLC, and do not necessarily reflect the views of USAID or the United States Government.

Acknowledgements

TB CARE II is funded by United States Agency for International Development (USAID) under Cooperative Agreement Number AID-OAA-A-10-00021. The project team includes prime recipient, University Research Co., LLC (URC), and sub-recipient organizations Jhpiego, Partners in Health, Project HOPE along with the Canadian Lung Association; Clinical and Laboratory Standards Institute; Dartmouth Medical School: The Section of Infectious Disease and International Health; Euro Health Group; MASS Design Group; and The New Jersey Medical School Global Tuberculosis Institute.

This document was produced for review by the United States Agency for International Development. It was prepared by University Research Co., LLC, and was authored by Swati Sadaphal, MBBS, Neeraj Kak PhD, Silvia Holschneider DrPH, MPH, Alisha Smith-Arthur, MSc, and Refiloe Matji MD, MPH.

Table of Contents

Section 1: Introduction	1
Section 2: Quality of Care	3
What is Quality of TB care?.....	3
Framework for improving quality of TB control services.....	3
Section 3: Quality Improvement System	6
What is Quality Improvement?	6
Key components in establishing Quality Improvement Systems	7
1. Establishing standards of TB care and necessary interventions.....	7
2. Using data to identify gaps in quality of services	7
3. Training staff to implement QI system.....	8
4. Creating QI teams to identify and solve problems	9
5. Monitoring performance on a continual basis.....	9
6. Documenting efforts for internal and external use	10
Challenges and barriers to QI system for TB Program	10
Section 4: Implementing Quality Improvement Cycle at your health facility	11
Step 1: Setting improvement priorities	11
Step 2: Define a QI measure and collect data.....	12
Collecting and Using TB data for Improvement	14
Step 3: Establish improvement team	18
Step 4: Understand the underlying process or system	19
Step 5: Make changes to improve TB care	24
Conclusion	25
References	26
Worksheets	27

List of Tables

Table 1. Dimensions of Quality of TB Services.....	4
Table 2. QI team composition and responsibilities.....	8
Table 3. Tips for promoting a culture of quality improvement.....	10
Table 4. Sample Work plan worksheet	28
Table 5. Decision Matrix Form	29
Table 6. Form for Identifying Critical Activities Transformed into Indicators.....	30
Table 7. Sample size chart.....	31
Table 8. Quality improvement template.....	32
Table 9. Rules for conducting a brainstorming session.....	19
Table 10. Gantt chart template	34

List of Figures

Figure 1. Contextualized Improvement Strategies	5
Figure 2. Bridging the quality of care gap.....	6
Figure 3. Inputs, Processes, and Outputs/Outcomes.....	7
Figure 4. Four Basic Steps of QI.....	9
Figure 5. Continuous Quality Improvement Cycle.....	9
Figure 6. District Rapid Assessment TB-tool (DRAT)	33
Figure 7. Process mapping styles for display.....	19
Figure 8. Fishbone diagram template	20
Figure 9. Plan Do Study Act Cycle	24
Figure 10. Sample annotated run chart	25

Acronym List

ART	Anti-retroviral therapy	NTP	National TB Program
CHW	Community Health Worker	PDSA	Plan Do Study Act
DOTS	Directly Observed Treatment, short-course	QI	Quality Improvement
EQA	External Quality Assurance	TB	Tuberculosis
HIV	Human immunodeficiency virus	URC	University Research Co., LLC
MDR-TB	Multi-drug resistant TB	USAID	United States Agency for International Development
MNCH	Maternal, Newborn and Child Health		

In recent years, national health programs have expanded their focus to include not only improving access to care, but also improving the quality of care received by patients and communities. As part of quality assurance for many clinical diseases, including tuberculosis (TB), international and national evidence-based standards and guidelines have been developed. Having explicit standards and guidelines helps ensure high-quality care, better health outcomes, and cost effective treatments. In addition, they provide a reference point for assessing provider or system performance and quality of care. Identifying the current and expected levels of quality in health care makes it much easier to measure adherence with such standards. Evidence-based standards and guidelines are vital to improving the effectiveness and efficiency of the care that health systems deliver. It is important to note, however, that adherence to these guidelines is not just a result of the development and dissemination of them, but of integrating the guidelines as part of a quality management program.

In most cases, provider adherence to guidelines is not a problem of individual performance, but rather a problem located in the health system itself. For guidelines to be effective, they need to be accompanied by improvements at every level of health systems – including political, health services, community, and patient. Research has shown that there are multiple causal factors influencing providers' adherence to guidelines. These include: providers' insufficient knowledge reference of TB management; greater focus on training and support to government providers while limited efforts are put on integrating private providers in the TB service provision; and policies and TB guidelines that sometimes fail to include the management of MDR/XDR, E-PTB, and paediatric TB, or coordination of services between programs such as TB-HIV, TB-Diabetes, and TB-MNCH. In addition, many countries lack a sufficient amount of human resources which are needed to provide clinical care as well as laboratory services for timely and quality assured TB diagnosis and for continuous

monitoring and supervision. Even after patients have been correctly diagnosed with TB, difficulties often arise in attempting to procure TB drugs free of cost, and properly explaining treatment regimens to patients in a way they will understand and follow.

Patient adherence can often be a reflection of poor provider counselling and follow up reference. In many programs, patients drop out before completing treatment fully thereby increasing chances of developing drug resistant strains of bacilli. Although a number of these programs are not able to capture information related to causal factors for poor patient adherence, many put proactive measures in place to improve adherence.

Recent assessments conducted by TB CARE II in Bangladesh, Zambia, and Kenya to investigate factors influencing provider adherence to evidence-based TB guidelines and standards highlighted numerous factors that affected adherence (please visit www.tbcare2.org for more details about these studies). Some general findings included:

Access to TB-related guidelines

- While all health facility managers had access to adult TB guidelines, fewer had access to specific guidelines, such as for MDR-TB and TB-HIV.
- Some new guidelines had been developed by the NTP but not yet disseminated, illustrating system delays in disseminating guidelines from the NTP to facility levels.

Health systems challenges

- While most facilities had functioning TB register systems in place, data often were not analysed regularly to track trends in treatment outcomes at the facility level. For example, data collected from monitoring TB activities was not always used in the decision-making process. In addition, providers often failed to schedule follow ups, record symptoms, and trace contacts.

- TB drug shortages were reported by many health facility managers.

Knowledge, skill and competency gaps

- There appeared to be a training-knowledge gap: most providers had been trained but many did not have adequate knowledge about TB, including which populations are at the highest risk of TB; treatment of TB in pregnancy; and TB testing in HIV+ patients.
- While all countries had a functional TB supervisory system in place, supervision was not always done as often as stipulated by guidelines and adequate follow-up was not always being provided.

Counseling and education for patients

- There were also gaps in the information health providers communicated to TB patients or those with TB symptoms—especially having to do with information about side-effects of TB treatment, the need to have family members and close contacts screened for TB, not linking all patients to DOTS support, and, for the countries with high HIV prevalence, offering HIV counselling and testing to patients with unknown HIV status and referring HIV positive patients for ART.

Overall, it is clear that a number of challenges continue to affect the quality of TB services being administered worldwide. These challenges are related to provider skills and knowledge gaps, a lack of monitoring and supervision, and regular reviews of performance data.

The present Quality Improvement Handbook provides key principles and operational steps that will assist in improving the quality of TB and MDR-TB services in resource-constrained settings.

The handbook is based on the following key principles:

- Focussing on the needs of TB patients;
- Understanding the current systems, available resources, and gaps that may be affecting performance;
- Engaging key staff that are affecting how the services are currently provided and/or can influence how the services should be provided in the future;
- Creating teams that look at current data to identify gaps; and
- Implementing an improvement model that includes: measuring, testing change, re-measuring, and applying change.

Intended audience:

Quality Improvement requires a multi-disciplinary, systematic and continuous effort to identify and tackle the causes of poor quality in healthcare, which can extend far beyond TB services. Ideally, a health facility or hospital may institute QI initiatives to tackle a range of issues, and the processes and tools described in this manual have applications beyond TB care. Although considerable guidance exists to describe the development of QI systems, as seen by the provider compliance studies conducted by TB CARE II, there is still frequently a considerable “know-do” gap when it comes to provision of TB services according to guidelines. This manual is meant therefore to provide context and guidance on the application of QI tools to target quality issues in the delivery of TB services and is intended to be used by health personnel with a role in implementing QI as well as by staff working in health facilities that diagnose and treat TB patients and administrative staff (TB focal persons, program coordinators or similar) working in the management of TB services at the health facility, sub district, or district levels. The purpose of this manual is to explain how to apply quality assurance and improvement strategies to help decrease the gap between TB quality of care standards and actual performance. Specifically, it provides guidance to Quality Improvement Coordinators to: 1) Identify and prioritize problems based on data and 2) develop and monitor action plans to solve problems

The manual is intended for health personnel working in health facilities that diagnose and treat TB patients as well as for administrative staff working in the management of health services at the health facility, sub district, or district levels. The purpose of this manual is to explain how to apply quality QA improvement strategies to help decrease the gap between TB quality of care standards and actual performance. Specifically, it provides guidance to Quality Improvement Coordinators to: 1) Identify and prioritize problems based on data and 2) develop and monitor action plans to solve problems.

What is Quality TB care?

Quality of TB care can mean different things when viewed from different perspectives, including: the patient, the service provider, or the facility management. For example, when quality is seen from the **perspective of a patient** coming to the clinic with TB, the following components may be important:

- The patient expects to be greeted and treated with respect by a knowledgeable staff;
- The patient expects to be diagnosed and treated correctly;
- The patient expects to have information on TB and instructions on what he/she can do;
- The patient expects not to wait for a long time, or to have to come back again many times;
- The patient expects not to be stigmatized; and
- The patient expects to get better and ultimately to be cured of TB.

However, from the **perspective of a service provider** in that clinic, quality may mean:

- The provider is competent and confident to be able to provide TB services to the client;
- Providers also recognize the importance of waiting time, being respectful of the client, providing proper education and treatment;
- The provider is able to apply principles of TB management;
- The provider is able to work with a team;
- The provider has a good supervision system and is motivated to do things better;
- The provider is able to register and analyse the patient and provider data to make decisions about patient diagnosis, follow up, referrals and treatment outcomes;

- The provider has all the necessary resources to provide quality/good care.
- Patients comply with their treatment.

And, from the **perspective of the health facility management**, quality may mean:

- The health facility is offering services and patients are being seen at the facility;
- The community is satisfied with the services – there are few complaints about the facility from the community;
- The health facility is performing well on TB monitoring indicators;
- The health facility is being recognized by clients, NTP and/or media as a model TB facility.

The quality of care delivered in a health centre is determined by many factors, including: how services are organized, leadership, monitoring systems, adequate infrastructure, and available resources - both human and material. These different dimensions of quality in the provision of TB services are summarized in **Table 1** on the following page.

Framework for improving quality of TB control services

Neither patients nor health care providers work or live in a vacuum. The dimensions of quality described in the table above are the result of many interwoven factors, and can be impacted by challenges large and small. As the ultimate goal of quality improvement is to improve patient outcomes and reduce the burden of TB, quality improvement interventions need to be designed around the environment and circumstances in which patients and health care services interact. Another way to think about quality improvement is as a way to balance necessary inputs geared at improving not just the content of care, but the process and context of care as well.

Table 1. Dimensions of Quality of TB Services

Dimensions of Quality of TB Services

Technical performance: The degree to which the tasks carried out by health workers and facilities meet expectations of technical quality (e.g. adherence to TB standards).

Access to services: The degree to which health care services are unrestricted by geographic, economic, social, organizational, or linguistic barriers. (e.g. able to reach at-risk groups such as poor, home-less persons)

Effectiveness of care: The degree to which desired results (outcomes) of care are achieved. (e.g. achieving target TB treatment cure rates)

Interpersonal relations: Trust, respect, confidentiality, courtesy, responsiveness, empathy, effective listening, and communication between providers and patients. (e.g. TB services are provided in non-discriminating and non-stigmatizing environment)

Efficiency of service delivery: Efficient services provide optimal rather than maximum care to the patient and community; they provide the greatest benefit within the resources available. (e.g. service providers do not perform unnecessary expensive TB diagnostic tests or treatments)

Continuity of services: Continuity means that the patient receives the complete range of TB services that he or she needs, without interruption, or unnecessary repetition of diagnosis or treatment. (e.g. provision of counselling, psychosocial support either on-site or through referral)

Safety: Safety means minimizing the risks of injury, infection, harmful side effects, or other dangers related to service delivery. (e.g. facility is implementing TB infection control activities to ensure safety for patients as well as staff)

Physical infrastructure and comfort: This relates to the physical appearance of the facility, cleanliness, comfort, privacy, and other aspects important to patients. (e.g. the physical set-up allow for patients to wait in well-ventilated waiting areas avoiding overcrowding of hallways).

Choice: As appropriate and feasible, patients' choice of access to health services when needed, and to be informed of the choice of free TB quality services when patients access DOT facilities instead of non-DOT or untrained providers.

A comprehensive improvement program should aim to address the three elements described in Figure 1. The process of care will be improved through a better understanding of the system, reorganization to increase effectiveness and efficiency, improved monitoring, and introduction of strategies that boost health worker motivation.

The *Content* of care: To improve quality of clinical and interpersonal communications, the program must address gaps in knowledge and skills of providers at all levels of the programs. This may include a rapid gap analysis, followed by building capacity of providers through training, mentoring and coaching. The program also needs to ensure that there is mechanisms put in place for ongoing professional development of staff. Specific activities may include:

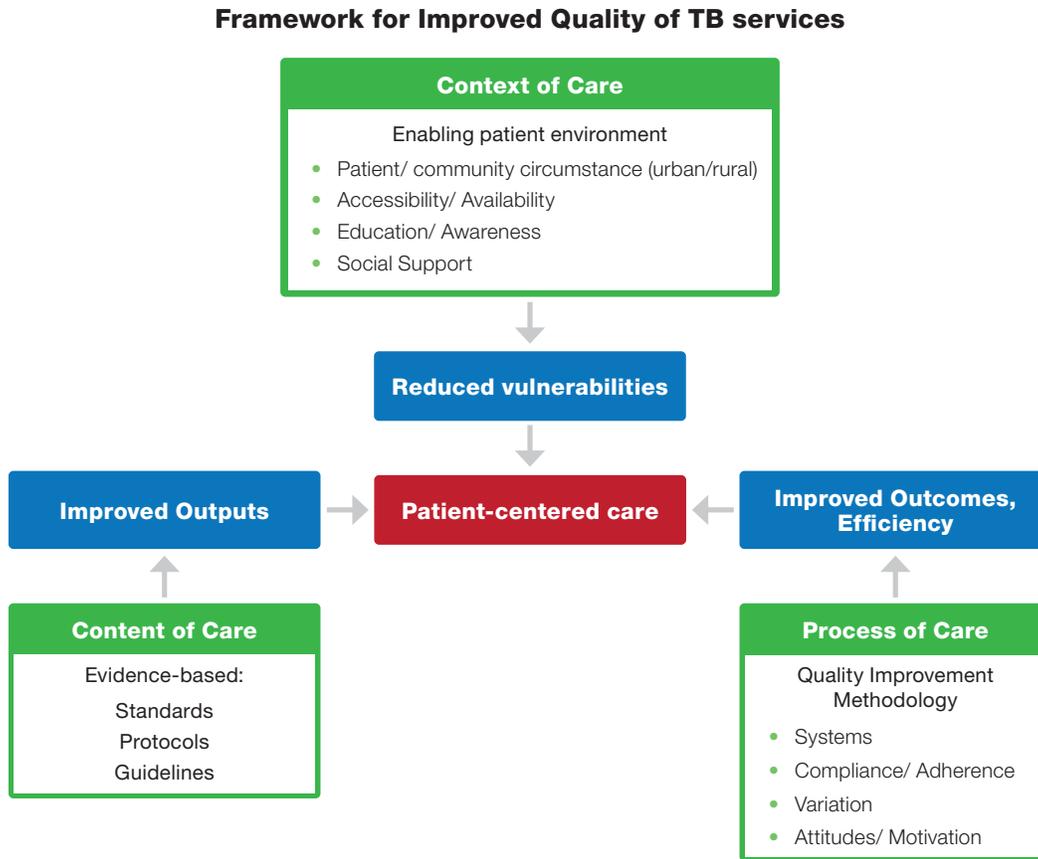
- Gap analysis of knowledge and skills
- Developing and disseminating standards and guidelines, i.e., for MDR TB clinical services

- Ongoing professional development through training, mentoring and coaching. This should include the use of practical training using models, standardized patients and other adult learning approaches.

The *Process* of care: To improve efficiency and effectiveness of a program, a focus on the process for organizing and delivering care is needed. This includes creating an understanding of the system among all providers, reorganization of care to increase effectiveness and efficiency, improved monitoring, and the introduction of strategies that boost health worker motivation and ensure positive/ enabling attitudes. Specific activities may include:

- Understanding patient flow in a clinic to reduce bottlenecks and reducing unnecessary steps, including use of patient triaging to reduce opportunities for hospital-acquired infections;
- Active case management to identify patients who are not adhering to treatment regimens;

Figure 1. Contextualized Improvement Strategies



Adapted from: Paul Batalden, Patricia Stoltz
A Framework for Continual Improvement in Healthcare. The Joint Commission Journal on Quality Improvement. October 1997

- Implementing innovative activities to improve patient adherence including use of m-Health solutions, community- or family-based support;
- Ensuring that all providers are complying with the national/ international guidelines to reduce variability in care;
- Regular review of data through cohort analysis to identify specific gaps and implement solutions to overcoming the gaps;
- Ensuring systems operate efficiently to allow services to consistently reach patients;
- Developing/implementing solutions that improve health worker motivation and increase their compliance with national guidelines;
- Reducing variability in patient care.

The *Context* of care: The context of care plays a significant role since it directly affects a patient’s capacity to access and follow guidance related to TB prevention or treatment.

Vulnerabilities experienced by patients, including economic barriers, gender or cultural norms of behaviour, and stigma can make it difficult for patients and their families to visit facilities or follow specific treatment regimens without appropriate psycho-social support. Specific activities may include:

- Addressing barriers which keep a patient from seeking and accessing care;
- Eliminating social and economic health-care related burdens, including providing conditional cash grants for accessing care, nutrition and/or transport support;
- Working with other sectors (including housing, labor, etc.) to reduce vulnerabilities which lead to health risks.
- Facilitating service delivery strategies based on patient and community circumstances, i.e., urban/rural, youth-based, etc.
- Connecting patients with other social development services and programs to further enhance positive treatment outcomes.

What is Quality Improvement?

Quality Improvement (QI) is an approach aimed at systematically improving the quality of care by addressing gaps between current practices and desired standards, through management decisions, rapid cycle and team-based problem solving, process improvement, and quality redesign.

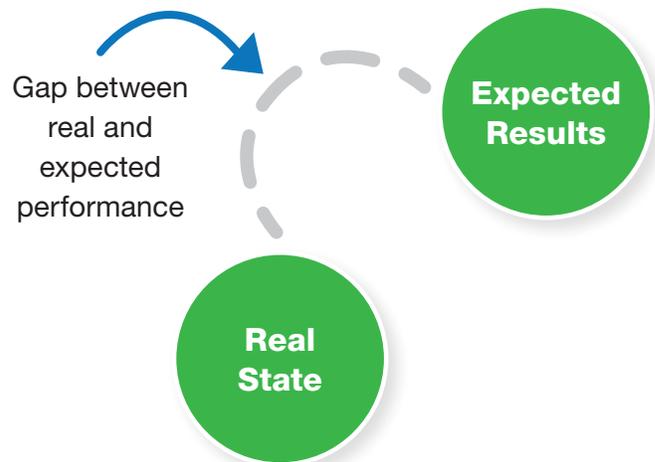
Quality improvement works to identify existing gaps between the TB services actually provided and expectations for these services (see **Figure 2**). The philosophy behind QI is that both the resources (inputs) and activities (processes) carried out must be addressed together to ensure or improve the quality of care (output/outcome) (see **Figure 3**).

1. evidence based guidelines on the management of TB patients need to be developed and made available at health care facilities (inputs);
2. the existing health system needs to allow for the availability and implementation of these guidelines (process of care) – e.g. staff trainings to properly manage and communicate with TB patients according to the standards, laboratories with resources to perform necessary tests; availability of quality TB drugs; etc.; and
3. as a consequence, there should be changes in health services delivered (e.g., improved diagnosis and treatment of TB patients); or changes in health behaviour (e.g., family members of TB patients are getting screened for TB); or greater patient satisfaction, etc. (outputs/outcomes).

Reducing waste in TB programs: The use of QI tools and approaches can also be useful in reducing waste that a system may have due to inefficiencies. The waste in a TB program setting may occur due to the following:

- Waste due to poor delivery of services: Often TB programs fail to adopt best practices that could result in improved provider compliance and/or patient adherence.

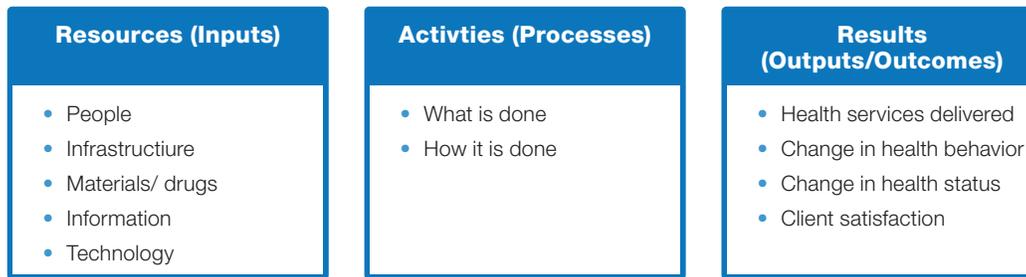
Figure 2. Bridging the quality of care gap



As a result, the programs end up with high dropout rates or treatment failures. Also, poor infection control practices at facilities could result in patients getting infected with either drug sensitive or drug resistant strains of TB.

- Waste due to poor coordination among health services: Often services at health care facilities are not integrated or well-coordinated resulting in missed opportunities for identifying TB cases.
- Improper diagnosis of patients or delayed diagnosis also results in additional costs to both patient and the health system.
- Waste due to improper supply chain processes: Many programs lose resources due to improper supply chain process.
- Elaborate but unnecessary administrative processes: Often resources are wasted due to unnecessary steps involved in laboratory and patient care. Similarly, lack of standardized forms and procedures can result in complex and time consuming processes that do not help in improving case detection or cure rates.

Figure 3. Inputs, Processes, and Outputs/Outcomes



Key components in establishing Quality Improvement Systems

TB health facilities must establish comprehensive quality improvement systems that include the following six key components:

1. Establish/use input, process and outcome standards of TB care and necessary interventions.
2. Use data to identify gaps in quality of services with reference to the established standards.
3. Train health providers to implement the quality improvement system.
4. Create improvement teams to identify problems and implement solutions.
5. Monitor performance on a continual basis.
6. Document quality improvement efforts for internal and external audience.

1 Establishing standards of TB care and necessary interventions:

Standards and guidelines form an extremely important part of quality improvement. They define quality of care by identifying what inputs and activities are needed to ensure and improve health outcomes. Most TB programs have adapted WHO or other international TB standards for their specific programmatic settings. Often these standards are translated into training programs and supervision protocols.

The international/national TB standards help to define, establish, and/or improve the quality of TB services, TB-related products, as well as provider practices and procedures. These standards are translated into operational protocols so that services are offered to the TB patients and their caregivers, ensuring that each service meets patient needs and expectations.

The quality of TB services is unlikely to improve without designing specific interventions to implement TB standards. For example, interventions to implement TB treatment guidelines may include:

- Providing competency-based TB clinical guidelines, trainings, job-aids, manuals etc.
- Developing a TB drug management system to prevent drug shortages
- Providing incentives, supervision, and feedback to motivate staff to follow guidelines

2 Using data to identify gaps in quality of services:

Quality improvement is a data-driven approach involving performance review processes and tools to properly identify strengths and weaknesses in the provision of care at health facilities. Specific data collection and review methods are applied to establish baseline performance levels. These methods are subsequently used to track performance improvements following the implementation of QI interventions. There are many indicators that the TB program can use to measure the quality of services provided by a TB provider or TB service centre. For example, the quality of TB services could be determined by reviewing patient charts to see if they are complete and if any patients have dropped out or defaulted. Similarly, the treatment success rate could be used a proxy of the quality of services.

Examples of data collection and review methods utilized in health facilities providing TB services are as follows:

- **Review sputum or lab registers:** This data could be used to determine whether the number of TB suspects identified by the health care facility is low or high. For example, if data shows that the facility is sending only 20 TB suspects (or “presumptive TB” cases as suggested in the WHO 2013 - http://apps.who.int/iris/bitstream/10665/79199/1/9789241505345_eng.pdf) a month,

Table 2. QI team composition and responsibilities

QI Team Composition

A team is generally composed of 5 to 6 staff members representing different functions.

Selected members should:

- Have interest in improving quality
- Have good communication skills, ability to work with and listen to others
- Represent key services, such as TB case management, counseling, nursing, pharmacy and outreach such as Contact tracing.

QI Team Responsibilities

- Using performance review checklists and other data sources to continually identify problems and develop corrective action plans
- Holding and documenting meetings to review progress and discuss quality issues
- Informing, training and involving other staff in the Quality Improvement Process
- Monitoring and documenting corrective actions to assess whether they meet expectations
- Publicizing quality changes for staff and patients
- Collecting and recording information on key TB indicators

and almost all of these cases are smear positive, this can be seen as an indicator that the facility is focussing on identifying obvious TB cases, which are probably in advanced stages of the disease. This would mean that contacts of TB cases or others who may be showing early signs or symptoms are being left out. In general, the program should have a 1 to 10 ratio between smear positive and TB suspects.

- **Review clinic registers:** The clinic staff could do cohort analysis retroactively to determine smear conversion at the end of the intensive phase as well as track treatment outcomes upon completion. In addition, clinic registers could be useful in determining gender distribution, HIV screening rates, retreatment rates, as well as referral rates for screening for MDR TB etc.

- **Knowledge quiz:** Facility staff could be asked to complete a quiz in order to expose any existing knowledge gaps.
- **Patient-client observations:** Using observation checklists, the team could look at the quality of counselling as well as compliance with other key TB service delivery standards.
- **Exit interviews:** These could be conducted with patients to gauge patient perceptions, as well as their understanding about treatment and the steps they should take to reduce infections within the households, etc.

Analysis of data obtained through observations, interviews, and clinic record reviews assists in the identification of gaps/problems with adherence to quality standards, leading to the development of QI plans.

3 Training staff to implement QI system:

Quality Improvement is a 'total' staff process and as such should engage all staff who either influence or are affected by a process. In order for change to occur, all staff should be aware of the purpose, objective, and methods for improving quality. In addition, they should understand that improvements in quality will concurrently improve working conditions, hopefully leading to an increase in overall job satisfaction. Explaining the QI process to staff helps to reduce, or possibly eliminate, the potential for problems in data collection along with increasing people's willingness to be involved in problem solving.

The key training elements for preparing the staff to implement the QI system should include:

- Creating a mutual understanding of basic QA/QI methodology and principles
- How to collect data using tools
 - Aggregating data and performing cohort analysis
 - Provider Knowledge Quiz
 - Provider-Patient Observations
 - Patient exit interviews
- How to analyse data using frequencies, graphs, etc.
- How to use data to carry out root causes of the problems (fish-bone diagram)
- How to develop solutions or QI action plans (See Section 4 for details for using these tools and methods)

Figure 4. Four Basic Steps of QI

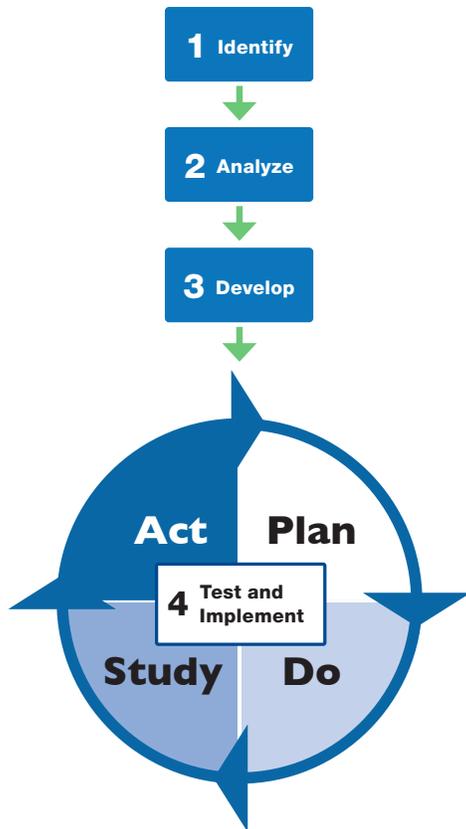
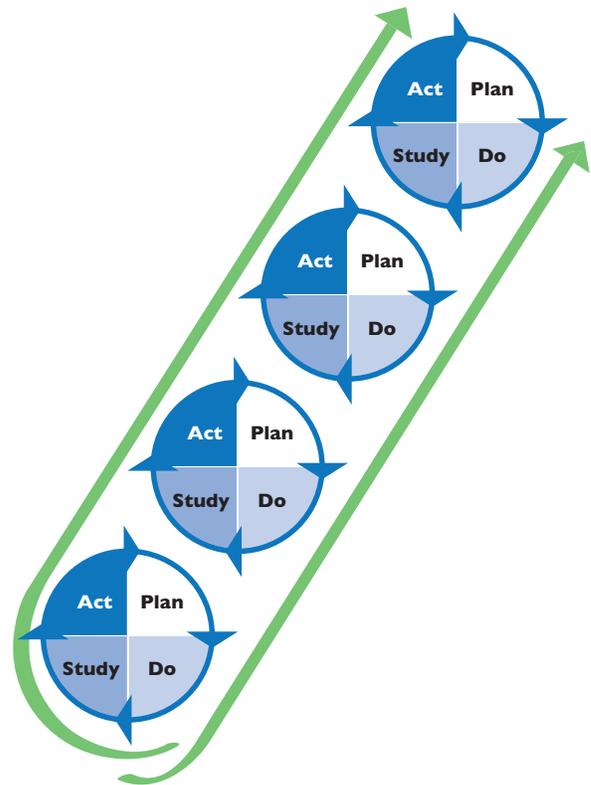


Figure 5. Continuous Quality Improvement Cycle



4 Creating QI teams to identify and solve problems:

To effectively improve care, all staff must accept quality improvement as their responsibility. As QI is most effective when it is internally driven, responsibility for implementing it should fall on a group of staff members who will ideally form a Quality Improvement team (**Table 2**). To create a QI team, two or more people should be chosen from the health facility where TB services need to be improved. The team members should either share similar tasks or be responsible for complimentary tasks that affect the quality of services. These teams could also include counterparts (e.g., supervisors) from the district or, if necessary, personnel from the referring facility (TB Hospital, etc.). Middle and/or high management should always be involved in a QI team when feasible. The QI team may decide to have a rotational membership system, giving other staff members the opportunity to participate as team members. Non-QI team staff members can participate in monitoring and analyzing results, and promoting change in

their service areas. Teams could meet on a weekly, biweekly, or monthly basis depending on the volume of activities necessary to measure indicators and analyse progress toward goals.

5 Monitoring performance on a continual basis:

A fundamental concept of quality improvement is to be able to measure the degree to which the implementation of TB guidelines/standards or best practices is taking place. To implement QI, initially, it is important to establish a baseline of the actual adherence of providers to the standards. Secondly, the gap between current adherence and expected adherence needs to be determined. Finally, a QI plan should be created aimed at improving compliance with standards. This plan should include an outline detailing how to best measure incremental changes in a facility's compliance with standards through benchmarks with set targets for achievement.

Table 3. Tips for promoting a culture of quality improvement

Tips for promoting a culture of quality improvement

- Educate staff about QI and provide them with the skills to participate in QI processes.
- Set a routine schedule for monitoring and reviewing data.
- Communicate results from improvement projects throughout the clinic and the community.
- Display data where patients can see them.
- Celebrate successes.
- Articulate the values of QI in meetings.
- Provide opportunities for all staff to participate in QI teams.
- Reward staff members by mentioning their QI contributions in their performance evaluations.

There are many different approaches to QI; however most of them follow the same basic four steps (see **Figure 4**):

1. Identify – Determine what to improve
2. Analyse – Understand the problem
3. Develop – Hypothesize about what changes will improve the problem
4. Test/Implement – Test the hypothesized solution to see if it yields improvement; based on the results, decide whether to abandon, modify, or implement the solution

The point of QI is not to just accomplish these four steps with only the specific problem identified, but to continuously strive for further improvements in the provision of quality services. This means attempting to apply knowledge gained to other problems, or finding other opportunities for improvement. This concept is often referred to as continuous QI (see **Figure 5**).

6 Documenting efforts for internal and external use:

Quality Improvement is a ‘total’ staff process and as such should engage all staff who either influence or are affected by a process. In order for change to occur, all staff should be aware of the purpose, objective, and methods for improving quality. In addition, they should understand that

improvements in quality will concurrently improve working conditions, hopefully leading to an increase in overall job satisfaction. Explaining the QI process to staff helps to reduce, or possibly eliminate, the potential for problems in data collection along with increasing people’s willingness to be involved in problem solving.

Challenges and barriers to QI system for TB Program

Many of the above measures have been used extensively in high-burden TB countries. However, often these interventions are implemented individually, rather than by analysing the processes as a whole. This makes it difficult to determine weaknesses which would then lead to making necessary improvements to the system. Improvement work also needs to be integrated with efforts at district and national levels. Available resources may include tools to measure quality, training in QI, and ongoing support through clinical mentoring, coaching and supportive supervision. This communication with health officials and mentors is important because it also provides a way for you to let them know about problems at the centre beyond your control that affect the quality of services you provide. These problems often include broken equipment, medication and supply stock depletions, and infrastructure difficulties.

Sharing your experiences with others is a valuable way to strengthen improvement. Opportunities for exchanging information and learning from others may speed up the improvement process. Once the cycles of measurement and improvement begin, you may find it difficult to keep them going. Often external events occur that disrupt routine activities. If your clinic has made a commitment to improving care continuously as part of your regular discussions and meetings, and has engaged both staff and patients in improvement work, you will find that an expectation to continue has been created. Simple steps, such as setting aside even small periods of time to discuss performance, review data and to plan changes will keep quality improvement work going, and will result in better care for your patients.

Section 4

Implementing Quality Improvement Cycle at your Health Facility

Note: Many example tables and worksheets referenced in this section can be found at the back of the guide, for ease of use.

The quality improvement cycle is an ongoing process that draws on multiple knowledge bases (i.e., assessment reports, observations, statistical data reviews) and employs many tools (e.g., run charts, control charts, root-cause analysis) to identify and understand problems and redesign care processes. This section focuses on the key steps in the implementation of a quality improvement cycle, including:

1. Setting priorities to identify specific areas for improvement.
2. Defining a performance measurement method for your improvement project and using existing data, or collecting data that you will use to monitor your successes.
3. Establishing an improvement team.
4. Understanding the processes of the underlying system of care so that improvements can be implemented to effectively address problems.
5. Making changes to improve care, and continually measuring whether those changes actually produce the improvements in service delivery that you wish to achieve.

For each step, the guide will discuss the purpose or goal of the step, some of the action items involved, and potential tools which can assist.

Step 1. Setting improvement priorities

Purpose:

To first assist in identifying health facility processes in need of improvement, and subsequently sort these choices using specific criteria that can ultimately help decide the most important target areas for improvement. The key training elements for preparing the staff to implement the QI system should include:

Actions:

Action 1: Develop a work plan including a timeline for QI intervention

Documentation is an important part of the process. Not only does it help to keep the group organized and on track, it also provides a record of your efforts. A sample Work Plan worksheet is provided below (**Table 4**), or you can create your own for developing and recording your plan.

Action 2: Use existing data to help identify gaps that need to be addressed.

Key existing sources of quality gap information include patient chart audits; data from various registers and facility logbooks (sputum/lab; patient logs; lab reports); health information system reports; and/or existing survey data (i.e., exit interviews, QI assessments, and other reports that may have been done).

Action 3: Ask staff and patients for ideas about what needs to be improved.

Conduct interviews with clients, patients, community, and/or staff members to identify what is working well and what needs to be changed.

Action 4: Prioritize key opportunities for improvement.

Given that your health facility likely has limited time and resources, you should focus on areas that are most important to TB patient care in your community.

Begin by asking yourself:

- What is the problem?
- How do you know that it is a problem?
- How frequently does it occur, and/or how long has it existed?
- What are the effects of this problem?
- How will you know when it is resolved?

Example from the field:

The TB CARE II provider assessments in Bangladesh, Kenya, and Zambia showed that there was a gap in screening family members (including children) for TB symptoms. In addition, the assessments found that the mechanism for recording of contacts was poor and that health care providers are not following up with TB contacts. In this example, the problem identification for contact tracing may look like this:

Step 1: Setting improvement priorities

What is the problem?

The TB contact tracing mechanism isn't working properly, both in terms of information provision, recording of TB contacts, and following up with TB contacts.

How do you know it is a problem?

This was shown through provider observational assessments and chart audits.

How frequently does it occur?

We don't know. We need to conduct additional assessment to find out whether we are missing opportunities to trace contacts during the first visit and follow-up visits.

What are the effects of this problem?

Continue transmission of TB due to patients not being diagnosed.

How will you know when it is resolved?

The problem will be resolved when there is a system in place that allows providers and facility managers to record and assess whether patients were asked about presence of TB symptoms in family members at each visit.

The leader, a clinical officer, worked with staff to see what information was available to examine the health centre's quality of care. Since the health centre did not have a data clerk, the pharmacy workers and nurses reviewed their existing documents and registers. During a regular patient education group that week, the nurses asked the patients, 'what can we do to improve care to you and other family members at our health centre?' The staff then met to discuss the data findings and the patient feedback. The team then contributed their ideas. When the various options were reviewed, the group decided to focus on making sure that all TB patients are followed-up at their home at least once during their intensive phase of treatment. The team also decided it was important that both adult and child family members are screened for TB symptoms and their results documented on patient's case records.

Action 5: Select one specific improvement at a time on which to focus your work.

Use decision matrix (**Table 5**) for selecting QI projects.

Step 2.

Define a QI measure and collect data

Purpose:

To help document what is really happening, as opposed to what you think is happening. This will tell you what is currently being documented in the clinic records, and can assist with providers' decision-making when they see a patient. This can also tell you whether certain tasks are actually being completed, and how efficient this completion is. Even in small centres where the team knows their patients well, measuring performance will often result in surprising findings when data is compiled.

Actions:

Action 1: Define the time period to include in your measure.

Performance is measured over a specific time frame. As a result, only patients who were actively seen during the specified time period should be included in the measured group. These subjects should be chosen from the case list or register.

Action 2: Define the eligible population to be measured.

Define who among the staff or patients will be interviewed or observed, and when this will occur. Depending on what you wish to examine, only certain groups of patients or staff may be eligible for inclusion in the review (**Table 6**). For example, the indicator may apply men, and women, and children, or to the latter only in certain clinical conditions. Another basis for inclusion could be whether a patient is newly diagnosed or has already been enrolled in treatment.

Action 3: Decide how many subjects to include in the review: should you measure only a sample of all patients or staff?

Although it would be ideal to include all of your patients when measuring the indicator (100% sample), the burden of doing this could be overwhelming if you have a large patient population unless there is an existing electronic tracking system that can produce data. If you do have such a system, you should use it. Most health centres will not have one, and therefore you need to either look at every patient chart (if the number involved is small) or use a sampling methodology (See **Table 7**).

Example from the field:

The TB CARE II provider assessments in Bangladesh, Kenya, and Zambia showed that there was a gap in information provision by providers to patients about possible side effects of TB treatment. In this example, the step 2 may look like this:

Step 2: Define a QI measure and collect data

As per the TB guidelines, counselling for adverse events is recommended for all patients receiving TB medications. The denominator would be the number of patients currently on TB medications and the numerator would be those provided counselling for adverse events. Facility A decided to improve this indicator. Agreement about how to define whether a patient has received adverse events counselling involved discussion about how that information should be documented to show that it was actually provided. Data collection tools and methods were finalized. It was decided that the sample would be taken from all patients currently on TB medications. The staff reviewed the registers and identified patients who were seen in the last month. The data was collected from review of records from all 100 enrolled TB patients currently on treatment in last month (100% sample).

When data collection was complete, calculations were done to get a rate (score). 65 of 100 TB patients were counselled for adverse events in the past 12 months. The baseline rate of performance for counselling was reported as 65%. This is the first point on the tracking chart (run chart).

The QI team decided to repeat step 2 each month to show changes in performance or to know the trend in rates for TB patients counselled for adverse events.

Action 4: Define a clear and specific measure.

It is important for the QI team to develop indicators to measure achievements in the provision of services in those areas that they previously identified as needing improvement. It should be noted that these are not outcome program indicators, but rather are intended to measure the effectiveness of processes in reaching determined benchmarks. It is important that your indicator be well-defined.

To define a sound indicator you will need to:

- Set the denominator: which patients should receive the service on which you are focusing? In this case, it will be the sample of patients you have identified from your active case list, register(s) or sample of patient cards.
- Set the numerator: which patients received the service? For example, the number of patients from your denominator group who were provided counselling on adverse events to treatment.
- You are now ready to collect your data!

Action 5: Collect data

Start by developing a data collection plan.

If data is not already being collected as part of the standard monitoring system, you will need to do the following:

- Define how the data will be recorded
- Decide who will record the data

- Determine when the data will be collected
- Decide how the sample will be selected

Sources of information should be identified in the collection plan. It is important to note that some indicators will require more detail than others.

Once your plan is complete, you are ready to collect data. Be sure to allow enough time for collection, and recognize that this process may require some staff members to have time set aside to review records or other data sources. It is also important to ensure that employees are adequately trained to collect data.

In the case that your database does not produce reports automatically, you should develop a form for capturing the collected data. This form will then be used to calculate your clinic performance score when the results are tallied. Time required for data collection will vary depending on sample size. If several hours each day are set aside to review the charts, the process should only take several days to one week. Once you have finished collecting data, calculate rates and document the results. Data should then be displayed on walls in the clinic where they will be visible for staff to see how the system is working - including areas where improvements have been made, and those where further gaps exist.

Collecting and Using TB data for Improvement:

I. TB Program Indicators

The TB QI teams could use the laboratory or sputum register as well as the TB register for collecting information on the following indicators to identify gaps and problem areas at local, district and levels above:

A. TB Sputum Registers

The TB Sputum Registers are a good source of data to determine the case detection effectiveness:

Key Indicators:

- Percent suspects with specimens collected per national guideline
Numerator: Number of patients for whom sputum specimens collected per national guidelines
Denominator: Total number of records examined for whom sputum specimens were collected
- Percent suspects with smear results received within 48 hours
Numerator: Number patients who received their results within 48 hours
Denominator: Number patients for whom sputum specimens were collected
- Smear Positivity Rate: Number of suspects with SS+ results
Numerator: Number of suspects with SS+ results (within a specified time period)
Denominator: Number of suspects for whom sputum specimens were collected (within a specified time period)
- New Pulmonary TB cases with no sputum result: **The percentage of new pulmonary cases registered that do not have results of sputum smear examinations on diagnosis**
Numerator: Number of new pulmonary cases registered during a specified time period that do not have results of sputum smear examinations on diagnosis
Denominator: Total number of new pulmonary TB cases registered during the same period
New TB Cases with no smear conversion result: The percentage of new smear-positive pulmonary TB cases registered in a specified period that were not examined by sputum microscopy at the end of the initial phase of treatment.

Numerator: Number of new smear-positive pulmonary TB cases registered in a specified period that were not examined at the end of the initial phase of treatment

Denominator: Total number of new smear-positive pulmonary TB cases registered during the same period

- Smear-Negative Cases Properly Diagnosed: Percentage of all adult smear-negative pulmonary TB cases diagnosed according to national standards NTP-recommended diagnostic algorithm
Numerator: number of adult smear-negative pulmonary TB cases diagnosed with at least three negative smears and chest radiograph according to NTP-recommended algorithm during a specified time period
Denominator: Total number of adult pulmonary smear-negative cases diagnosed during the same period
- Xpert MTB/Rif Register
 - Algorithm developed and in place
 - % of eligible tested with GeneXpert at the site (disaggregated by indication: MDR suspect, HIV positive, TB suspect (smear negative))
 - Number/proportion of patients with Rif-resistant Xpert MTB/RIF results confirmed with DST FLD
 - Number/proportion of newly detected TB cases (Regular TB and MDR TB), tested with GeneXpert and put on treatment
 - Time from the test performed to treatment initiation
 - Proportion of GeneXpert unsuccessful results repeatedly tested by GeneXpert
 - Proportion of Rif Resistant GeneXpert patients tested by culture and DST

B. TB Registers

Information on following indicators could be generated from the TB Registers:

Key Indicators:

- Smear Conversion Rate – at the end of intensive phase
New SS+
 - Number cured
 - Number completed treatment
 - Number who were not evaluated
 - Number defaulted/interrupted/lost to follow up
 - Number not evaluated
 - Number died
 - Number with treatment failure

SS+ Retreatment Cases

- Number cured
- Number who completed treatment
- Number who were not evaluated
- Number defaulted/interrupted/lost to follow up
- Number not evaluated
- Number died
- Number with treatment failure

- **Detected Smear-Positive Cases Registered For Treatment:** Percentage of all detected smear-positive pulmonary TB cases that have initiated treatment

Numerator: Number of new smear-positive pulmonary TB cases that have initiated treatment during a specified time period

Denominator: Total number of new smear-positive cases detected during the same period

- **New TB Patients who were prescribed the correct regimen:** percentage of new TB patients who were prescribed the correct regimen of medications, as described by NTP guidelines

Numerator: Number of new TB patients who were prescribed the correct regimen of medications during a specified period

Denominator: Total number of new TB patients who completed treatment during the same period

C. Facility Utilization data

The following indicators will provide information on the effective use of resources:

- **Facility workload**
 - Count total number of patients on treatment in a quarter
 - Count number of new SS+ on treatment in the quarter
 - Count number of retreatment cases with SS+ results on treatment

- **Patient flow**

How well is the patient flow working to prioritize services for TB suspects as well as to reduce opportunities for infecting others

Based on the above, the QI team can identify the staff load and determine if more staff are needed.

D. HIV-TB

The following indicators should be used to determine how well TB-HIV coordination is working:

- **HIV Testing Rate among TB patients**
 - Number TB cases who were counseled and tested for HIV
 - Proportion of those tested HIV + who were put on CTX
 - Proportion of those tested HIV + referred for ARV or other services

E. Infection Control

- Does the facility have an IC Policy in place
- Does facility triage TB suspect when they come into clinics
- Are TB patients and suspects seated separately
- Are windows left open for circulating air
- Does facility staff know how to prevent TB transmission in community settings

F. Recording and Reporting

- **Accuracy of Reporting to NTP:**
Percentage of accurate TB case-finding and treatment outcome reports:
Numerator: Number of TB case-finding and treatment outcome reports that were recorded completely and accurately
Denominator: Total number of TB case-finding and treatment outcome reports examined

G. Other critical indicators

The program should periodically collect data on the following indicators to identify any programmatic gaps that need to be fixed:

- **Availability of drugs**
Has the facility experienced TB stock outages in the past 3 months
- **Accuracy of Stock Records for Anti TB drugs:**
percentage of stock records that correspond with physical counts for a set of anti-TB tracer drugs in drug storage facilities
- **Time anti TB drugs are out of stock – treatment facilities**
Average length of time that first-line anti-TB drugs are not available.

- **Availability of reagents for microscopy and cartridges for GeneXpert**
 - Has the microscopy site experienced shortages of reagents in the last three months
 - Has the site with GeneXpert run out of cartridges in the last three months
- **Contact tracing**

Does facility have a mechanism to trace contacts of TB patients (how and what is done)
- **Defaulter tracing**

Does the facility have a mechanism to trace defaulters
- **Community outreach**

Does facility have a mechanism in place to provide injections to the retreatment cases or MDR TB cases
- **Facility-Lab meetings**

Does facility staff/representative meet with the lab team to discuss issues related to turn around time, quality of specimens, results, etc
- **TB Support document**

Does the facility have a folder with information

 - Quarterly performance reports
 - Monthly supervisory visit reports
 - Training materials
 - Job aids
- **Availability of ACSM materials**
 - Does the facility have a ACSM plan
 - Does the facility have display materials
 - Does the TB team conduct education for general clinic patients on TB

II. District Program Improvement

The district TB team should address the following key questions periodically to identify problems and gaps.

- Does the TB supervisor meet with the district TB office team on a monthly/quarterly basis
- Are problems identified regarding TB service delivery during these meetings and are solutions developed to overcoming the gaps
- Is supervisor visiting the TB facilities on a regular basis and what reports are generated and what kind of problems are identified in there reports.

- Has the district supervisor developed a yearly plan for the district to improve TB outcomes
 - Training plan
 - ACSM strategy
 - Public-private partnership

III. Counselling TB patients

The QI team as well as the program supervisor should periodically look at the quality of inter-personal communications and counselling. The key areas to cover include:

- The QI team as well as the program supervisor should periodically look at the quality of inter-personal communications and counselling. The key areas to cover include:
 - Has the TB staff received training in Interpersonal Counseling?
 - When was the last training done?
 - Are facility staff engaged in effective counselling?
 - How much time is spent with a TB patient
 - What information is provided
 - Does the TB service provider use charts or other tools to educate patients about the following:
 - What are the signs and symptoms of TB
 - TB side effects and their management
 - Why the patient needs to continue taking the TB medication (adherence)
 - Who in the family (adults/children) need to be screened for TB actively
 - When should the patient come back for follow up visit

IV. District Supervisory Assessment Tool

The USAID-funded TASC TB developed a supervisory tool for regular monitoring of TB and TB/HIV outcomes at the facility levels. The objective of this supervisory tool, called the District Rapid Assessment TB-tool (DRAT) is to make sure that the project staff from national and district level are also looking at a number of indicators to ascertain as well as to track the quality of TB services at the facility and community levels. See Figure 6.

V. Data Collection Tools

Collecting accurate data is the first and most important step in identifying and analyzing real problems. It also helps maximize the usefulness of QI tools.

The collection of accurate data depends on minimizing biases. Bias is a “systematic error or change that makes the data you have collected not representative of the natural state of the process”.

Basic precautions can minimize the risk of introducing bias into the data collection.

- testing data collection instruments,
- training interviewers,
- auditing the collection process, and
- an impartial data collector

In addition to biases, common problems in data collection include:

- Failure to use existing data
- Misunderstanding
- Lacking needed information
- Complicated data forms that result in incomplete forms
- Incomplete information

Precautions that help prevent these problems in data collection are:

- Study existing data.
- Assess needs for analysis and data.
- Conduct a small trial of your data collection instrument.
- Make sure the instrument is easy to use and understand.
- Explain the purpose of the study and the need for data to those who will collect data.
- Review how to use the data collection instrument.
- Address concerns of people involved.
- Review the data as they arrive.
- Check that the data are complete by observing data collectors and cross-checking information with another source

Aggregating existing data and performing cohort analysis

Data collected on a regular basis may indicate the characteristics of TB patients or the percentage that return for follow-up visits. Examples of existing data include the data from patient medical records, facility logbooks, and health information system reports.

Conducting Clinic Records Review

Maintaining continuity of care is one of the measures of good patient care. To enable all providers to effectively follow a patient, the record should serve as a source of all information. Records should be chosen randomly (e.g., select every 5th record). These record reviews could be conducted in addition to the reviews of the records connected with other data collection methods such as patient-provider observations.

If existing data are not accurate or do not provide enough or the right kind of information, then actual data collection may be necessary. Common data collection methods include, but are not limited to, the following:

Conducting Exit Interviews or Knowledge quiz

The job of the interviewer is to make the process as non-threatening, respectful and comfortable as possible. The interviewer must follow the instructions, using the exact question listed on the instrument form to keep all data consistent.

It is important to ask the right questions to capture accurate and precise data. The process for collecting information should be:

- Focused and specific
- Process oriented
- Avoiding blame and fear
- Clearly stating what the data intends to collect
- Implying that decisions will be made
 - Introducing him or herself and greeting the interviewee respectfully
 - Explaining the interview is designed to help improve the quality of services at the health center;
 - Explain that all information is anonymous and confidential
 - If interviewing a staff member, explain that it is not an evaluation of staff performance;

- Asking questions exactly as they appear on the instrument forms, repeating and restating if necessary without changing the meaning
- Giving the respondent enough time to answer

Observations of Provider-Patient Interactions

Observations should be as unobtrusive as possible to help the staff member and patient act as normally as possible. The observer should:

- Introduce him or herself and ask permission of the patient before starting an observation
- Position him or herself in an unobtrusive place
- Listen carefully as the interaction proceeds, fill the observation format

If the observation requires verification from the record, the record should be found to see if the information was noted in the record.

Step 3. Establish improvement team

Purpose:

To involve all staff whose work is part of the process being improved.

Actions:

Action 1: Form an improvement team to work on the improvement area.

Identify staff who have the most knowledge of the selected area for improvement. Clinical providers, data managers and records clerks are routinely included on the team. When TB sputum examination is selected as your improvement measure, your laboratory technician should be included. When clinic visit rates are the focus, outreach workers and counselors should be consulted. In a small centre with fewer than 10 staff, nearly all will participate. To obtain the best results, the team should consider involving patients, staff and community leaders as participating members.

Example from the field:

Following data collection, Facility A developed an improvement team to improve counselling for adverse events among TB patients. In this example, the step 3 may look like this:

Step 3: Establish improvement team

After collecting baseline data, team members were selected. The team included:

- one clinical provider (who sees TB patients)
- one data clerk (who collects data from the patient records and fills in registers)
- one community health worker (who provides community education and supports treatment adherence)
- one nurse (who dispenses medication).

The score results showed that in June, only 65% of TB patients had been counselled for adverse events. This surprised the staff and resulted in many discussions about the problem. The group developed an aim statement to set a common goal for its work “We will conduct an improvement project to increase the number of TB patients who are provided counselling for adverse events to 90%.” The QI efforts were documented using quality improvement template (**Table 8**)

Action 2: Assign a team leader who will take responsibility for the team.

A leader should be designated to take responsibility for moving the work forward. The leader should assign roles and responsibilities to other team members and lead QI discussions. In small centres, quality improvement team discussions can occur during meetings that focus on patient management or on clinic business. In such cases, separate QI meetings are not needed. In larger clinics, on the other hand, a separate committee might be formed that will meet away from regularly scheduled meetings.

Step 4. Understand the underlying process or system

Purpose:

To develop an understanding of where improvements might be most successful. While data may show where gaps in performance exist, it does not account for why these gaps exist. It is important to understand how each service being measured is actually delivered in the clinic.

Actions:

Action 1: Exchange ideas about potential barriers to QI. Brainstorming is a creative discussion in which a group of people produce many ideas in a short amount of time about a specific topic. This is an effective way to get a group to work on a problem together. You can use this technique to elicit ideas from the group about what they consider to be the major problems of TB care in the health facility, to formulate theories about the causes of these problems, and to design potential solutions (**Table 9**).

Action 2: Develop a flowchart or a fish-bone diagram to understand and improve.

Flowcharts or fish-bone diagrams are an easy way to visualize a process so that it is easier to both understand and improve. A flowchart shows the steps of any process in sequential order and can be used to illustrate a sequence of events, activities or tasks for processes ranging from simple to complex (**Figure 7**).

Table 9. Rules for conducting a brainstorming session

Rules for conducting a brainstorming session

- All ideas proposed by participants in the brainstorming should be considered. The objective is to collect the greatest possible number of ideas during the session.
- As the session is for brainstorming only, detailed discussions or debates on an idea proposed are not needed (this will come later).
- Everyone should feel comfortable voicing ideas, thus no one should be criticized for his/her idea.
- People should be encouraged to elaborate and improve on each other's ideas. To make sure that everyone contributes, ideas can be given in turn.
- Each idea should be written on a flip-chart or chalkboard.

Flowchart or process mapping symbols:

Figure 7. Process mapping styles for display

Process Mapping Styles for Display		
Process	Rectangle	
Decision Point	Diamond	
Start or Stop Point	Oval	
Input or Output Data	Parallelogram	
Documentation	Document	
Delay	Bullet	
Database	Cylinder	
Unclear Step	Cloud	
Connector	Circle	

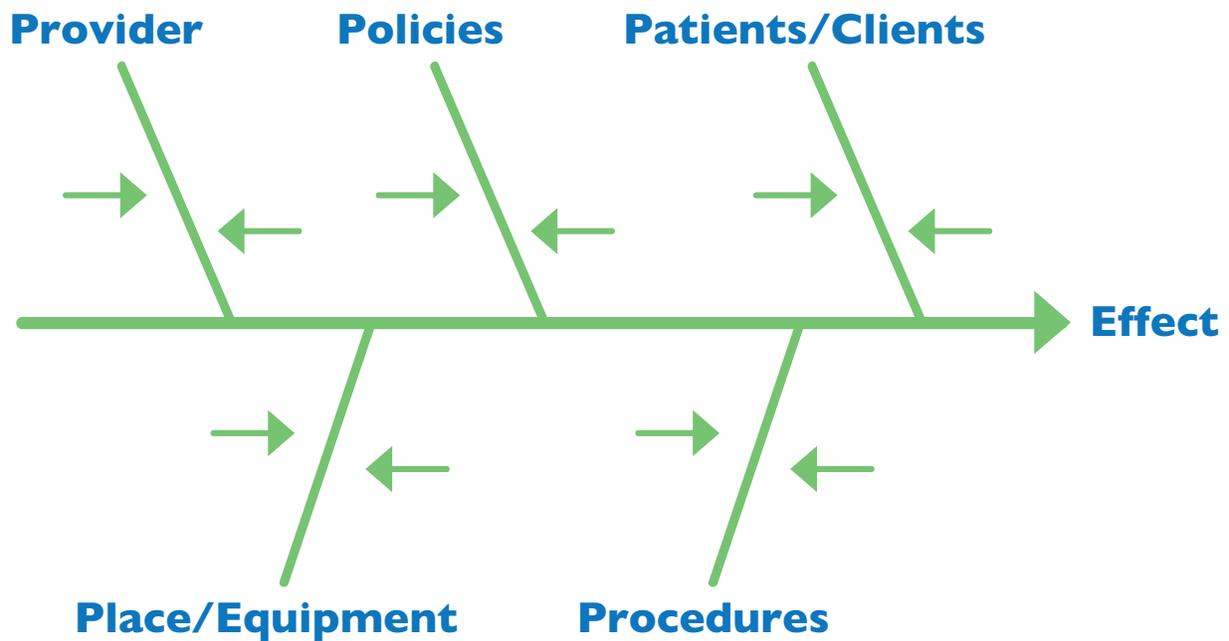
A fishbone diagram is another tool to help illustrate the process (Figure 8). Often used in combination with a flowchart, the fishbone diagram helps to sort out various categories of factors involved in a given process. It can also help differentiate factors that can be improved by

the team—such as delays in registration or inadequate documentation—from those which require outside help—such as with drug stock outs, inadequate staffing, and broken equipment.

Fishbone diagram template:

The branches (i.e., top and bottom boxes) represent main categories of potential causes that contribute to the origin or maintenance of the problem (the head of the fishbone) – these can include issues that are staff related, patient related, resource related, clinic related, etc.. The smaller arrows represent subcategories and are drawn off of the main branch.

Figure 8. Fishbone diagram template



Example from the field:

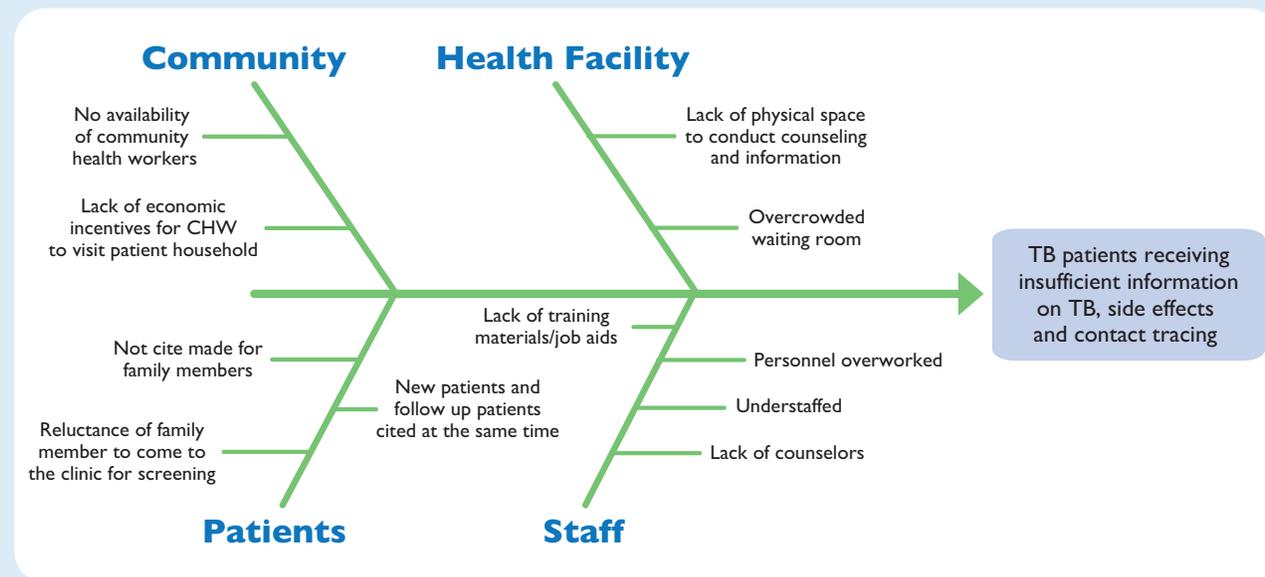
The QI team met at 9:00 AM to identify the causes of a problem that has been described by the district manager in the facility as involving: “poor information provided to TB patients regarding TB disease, side effects and contact tracing.” The team participants include: one doctor, 2 nurses, one registry assistant (schedules, data maintenance, etc), one nurse auxiliary, and one community worker. The health facility manager also assist with this QI meeting.

In this example, the step 4 may look like this:

Step 4: Understand the underlying process or system

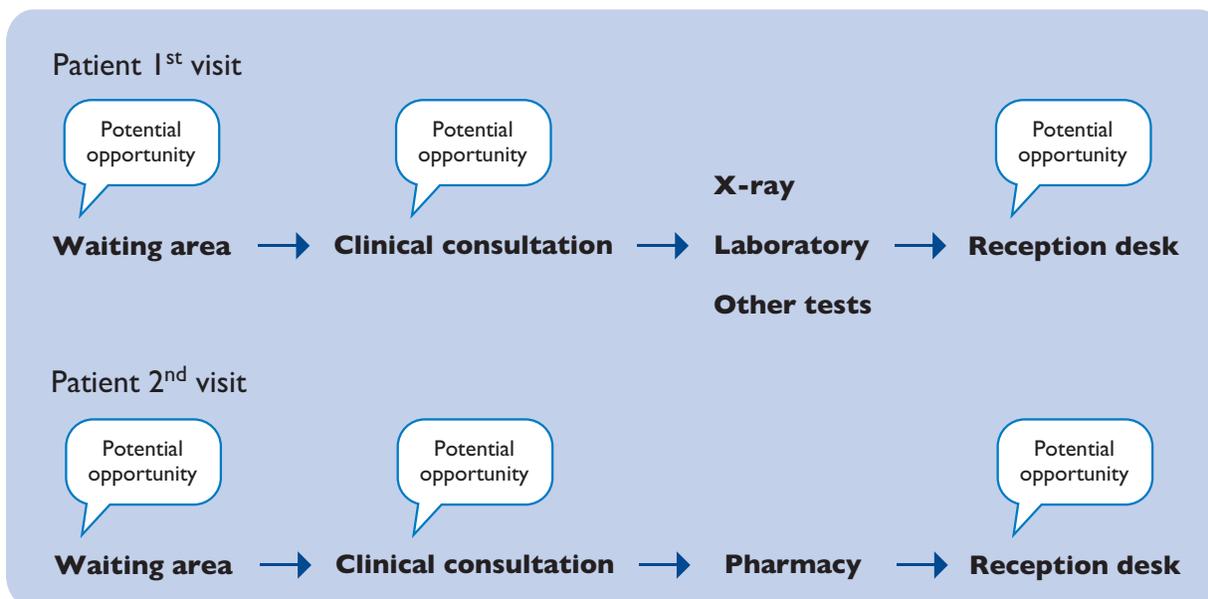
During the brainstorming, each participant was given two minutes to think of several reasons why he or she thought that insufficient contact tracing was done with patients’ families. Several causes were identified, these included: “Lack of time to provide information to patients”; “This is nobody’s specific responsibility”; “It is difficult for the patients to understand so much information in five minutes”; “Patient information should be done at the community level because community members have more time to spend with patients”; “There is no available space where we could provide information to patients. Additionally, there is no educational material to help us explain information to the patients”; “Sometimes patients live far away and we spend our own money for transportation to go to their houses.” The QI team decided that most causes identified were valid and decided to draw them up so that they could be better visualized. The facility manager had experience in QI tools and suggested using a fishbone diagram.

The QI team organized the causes of the problem (effect) under four areas or root causes: Community related causes, health facility related causes, and human causes from the patient as well as the staff in the clinic. An example of a cause-and-effect diagram dealing with TB patients not receiving sufficient information about TB side effects and contact tracing is shown in Figure below.



The manager of the clinic was able to identify which QI tools should be used from the training he received some months ago in QI methodology organized by the District Health Department. He created a flow chart illustrating the different steps that patients follow once they arrive at the clinic. During their first visit, patients go through a consultation and then proceed to the laboratory where sputum is collected. Sometimes the doctor also orders an x-ray or other tests. During the second visit, patients receive the test results and, if a diagnosis of TB is made, are sent to the pharmacy to collect TB medicines for a month’s worth of treatment. The manager included in his flowchart those “potential opportunities” where he thought that patients’ counselling and education could be done and/or improved (see Figure on the next page). During the next QI team meeting, the team can discuss which “potential opportunity” they may want to address for improvement.

Health Facility



Community

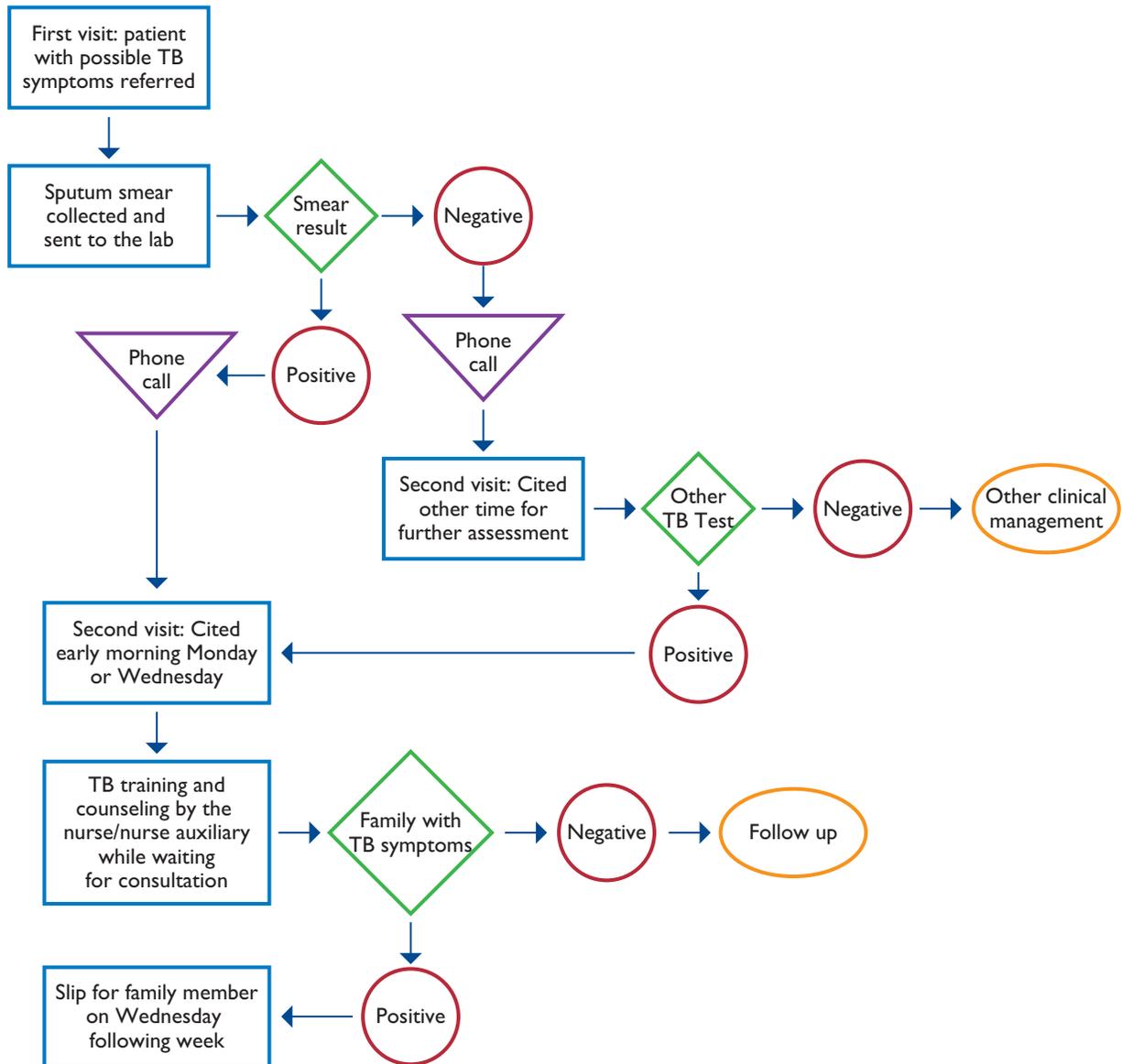


At the next meeting the team was able to agree upon the main reasons behind the provision of insufficient information about side effects and contact tracing to TB patients.

The team decided that they wanted to address these issues from two perspectives. First, they proposed to maximize the number of patients who receive information by providing group educational sessions. The facility manager agreed, for this purpose, to provide access to a room for two hours in the early morning on Mondays and Wednesdays where new TB patients could attend the informative session while waiting for their clinical consultation. These informative sessions would provide information to new TB patients on TB disease, side effects, and the need to bring family members to the clinic via an educational video to be watched while waiting to be seen by the doctor or nurse practitioner. Second, they proposed that the auxiliary nurse will call each household (cell phone if available) of patients diagnosed with TB to check for family members with possible TB symptoms. It was agreed that this strategy would be tested for two weeks, after which the results would be analysed. Additionally, a CHW would visit each household containing family members who had possible TB symptoms but who did not visit the health facility. The facility manager agreed to provide transportation support for the CHW to visit households for the first month. After this, information would be gathered to determine the effectiveness of this contact tracing method further provisions would be made based on the results.

The team was energized by their success in achieving common ground, and the way members from different departments were able to come together to solve the problem laid out by the district officer. To better understand the proposed processes, they decided to create a new flow chart outlining each step (see Figure below).

Process Flowchart for TB education of new patients



Step 5. Make changes to improve TB care

Purpose:

To determine whether your change works to improve quality of care. Your team may identify a variety of ideas for changes, and can test each idea to see if it results in improvement. This approach is repeated in a cycle of “measure- test change-re-measure” that forms a fundamental part of improvement work. The four step process included in the testing and implementation stage of every QI approach is called the Plan-Do-Study-Act (PDSA) cycle (Figure 9).

Actions:

Action 1: Implement and test changes

Implementing quality improvement requires careful planning. The team must determine the necessary resources, time frame, and persons responsible for implementation. Use the Gantt chart to plan and implement activities (Table 10: Gantt chart template).

Test a variety of changes; Start change on a small scale: for example, implement the change on one day or with one provider, and then expand accordingly.

Action 2: Routinely re-measure to analyze the impact on care

Check periodically that your test is going as planned. Communicate progress to all those involved, and have your team provide encouragement and assistance as needed. While conducting your test and results, check that data is complete and accurate.

Action 3: Plot results over time

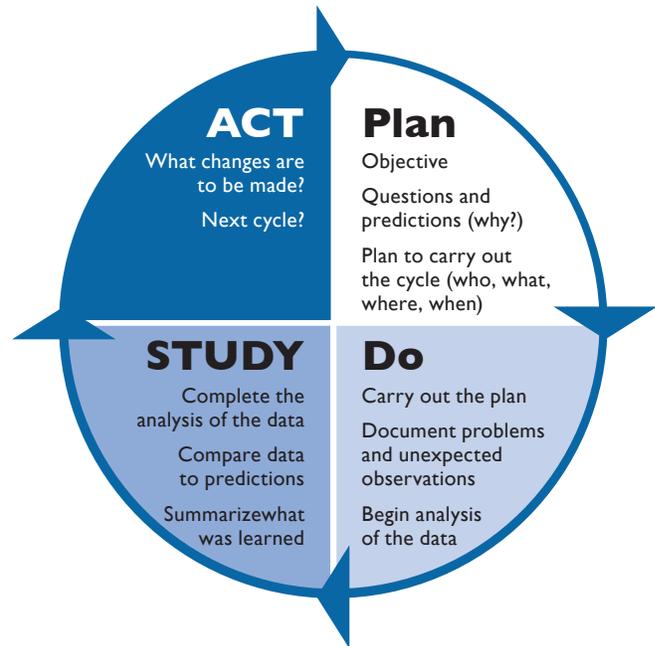
Document what worked and what did not work during the testing process – this information can help you in assessing the best solution for the problem you identified. Chart out and present the results of your solution using both formal (e.g., run charts) and informal data collection (e.g., observations about processes – what worked, what did not). Figure 10: Sample annotated run chart.

Action 4: Conduct tests of changes and analyse them to see if they result in improvement

Decide whether the solution proposed had the desired results. Compare baseline and follow-up data to measure the impact of the intervention. Ask yourself:

- Did we meet the criteria for success? Did the solution have the desired results? What did people think of the change?

Figure 9. Plan Do Study Act Cycle



- What aspects of the test went well? What aspects were difficult?
- Did the solution create unforeseen problems for others or other processes?
- What kind of resistance did we encounter?

Action 5: Scale up changes shown to result in improvements

Based on what was learned from the study result, your team can decide what action(s) to take moving forward. Not every solution tested will be adopted. Sometimes, a solution needs to be reassessed, modified, or abandoned altogether.

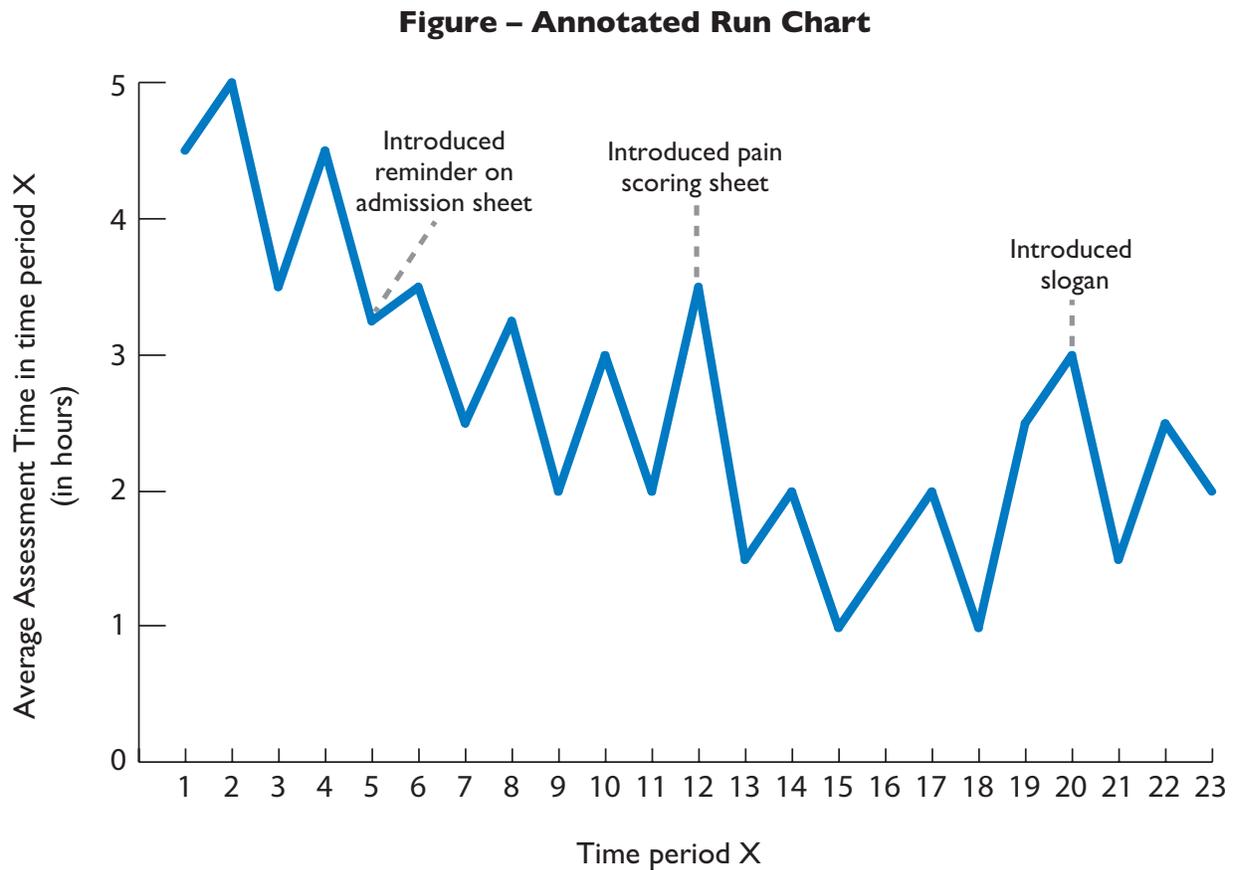
Solutions that are effective need to be made sustainable. To do so, steps may need to be taken such as developing/ changing job aids, inserting new material into pre- and in-service training, getting official policy statements, etc. In addition, the team needs to figure out how to remain vigilant in terms of monitoring indicators on an on-going basis, and should quickly identify the person/persons to be in charge of this so that the problem will not reoccur. Once the team feels comfortable that its quality improvement efforts on the particular issue at hand are effective, that solutions have become integrated into routine procedures, and that the problem has indeed been resolved, the QI team can focus on its next effort.

Run Charts

A run chart is a graph that illustrates changes in quality over time. Measurements are taken at frequent points in time and connected with a line. This provides a graphical display of variation across time, and can help a team see if their changes have led to improvement.

An annotated run chart has comments with arrows pointing to times when different ideas for improvement were tested. This helps explain any sudden changes in quality that may have occurred:

Figure 10. Sample annotated run chart



Conclusion

To sustainably increase positive outcomes for TB patients, and to reduce the burden of TB disease on communities, it is crucial that adequate focus be put on quality of care, in coordination with efforts to increase access to services and increases in clinical and

programmatic skills. An emphasis on integrating simple quality improvement measures requires multiple small steps over time coordinated among many actors in the health sector, but ultimately should result in improved efficiency in the delivery of TB services.

References

1. Bouchet B. Monitoring the Quality of Primary Care: Health Manager's Guide. Bethesda, MD: Quality Assurance Project. Undated.
2. Dagli CE, Cetin TA, Hamit A, et al. A multicentre study of doctors' approaches to the diagnosis and treatment of tuberculosis in Turkey. *J Infect Dev Ctries* 2009; 3(5):357-64.
3. Chang C, Esterman A. Diagnostic delay among pulmonary tuberculosis patients in Sarawak, Malaysia: a cross-sectional study. *Rural and Remote Health* 2007. Accessible at <http://www.rrh.org.au/articles/subviewnew.asp?ArticleID=667/>.
4. Lienhardt C, Rowley J, Manneh K, Lahai G, Needham D, Milligan P, McAdam KPWJ. Factors affecting time delay to treatment in a tuberculosis control programme in a sub-Saharan African country: the experience of The Gambia. *Int J Tuberc Lung Dis* 2001; 5(3):233-39.
5. Gidado M, Ejembi CL. Tuberculosis case management and treatment outcome: assessment of the effectiveness of public-private mix of tuberculosis programme in Kaduna State, Nigeria. *Ann Afr Med* 2009; 8(1):25-31. Accessible at <http://www.annalsafmed.org/article.asp?issn=1596-3519;year=2009;volume=8;issue=1;spage=25;epage=31;aulast=Gidado/>.
6. Hussain A, Mirza Z, Qureshi FA, Hafeez A. Adherence of private practitioners with the National Tuberculosis Treatment Guidelines in Pakistan: a survey report. *J Pak Med Assoc* 2005; 55(1):17-9. Abstract online at <http://www.ncbi.nlm.nih.gov/pubmed/15816690/>.
7. Auer C, Lagahid JY, Tanner M, Weiss MG. Diagnosis and management of tuberculosis by private practitioners in Manila, Philippines. *Health Policy* 2006; 77(2):172-81. Accessible with membership at <http://www.healthpolicyjrnl.com/article/PIIS0168851005001624/fulltext/>.
8. Harries AD, Hargreaves NJ, Gausi F, Kwanjana JH, Salaniponi FM. Preventing tuberculosis among health workers in Malawi. *Bull World Health Organ* 2002; 80(7):526-31. Accessible at http://www.scielo.org/scielo.php?pid=S0042-96862002000700003&script=sci_arttext/.
9. Ferrara G, Richeldi L, Bugiani M, Cirillo D, Besozzi G, Nutini S, et al. Management of multidrug-resistant tuberculosis in Italy. *Int J Tuberc Lung Dis* 2005; 9(5):507-13. Accessible through <http://www.ncbi.nlm.nih.gov/pubmed/15875921/>.
10. USAID Health Care Improvement Project. 2008.
11. Pan American Health Organization (PAHO). 2008. Practical Guide to Improve Quality TB Patient Care: A Participatory Approach.
12. Quality Improvement Guide, Health Quality Ontario, 2012.
13. Operations Manual for Delivery of HIV Prevention, Care and Treatment at Primary Health Centres in High-Prevalence, Resource-Constrained Settings, WHO 2008.

Tables and Worksheets

Table 4. Sample Work Plan worksheet

Implementation Tasks	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
Identify Facilities in the district	█											
Conduct first meeting with facilities to identify priority services	█											
Conduct QA training for the teams		█										
Conduct baseline surveys in facilities		█										
Analyze data and identify/prioritize problems		█										
Develop/finalize change package/interventions with support of experts		█	█									
Begin implementing interventions/change package			█									
PDSA/Monitor			█	█	█	█	█	█	█	█	█	█
Provide support to teams at facility and district level			█	█	█	█	█	█	█	█	█	█
Conduct quaterly review sessions to provide training and guidance			█			█			█			█
Conduct community outreach to generate support				█	█	█	█	█	█	█	█	█
Evaluatr QI Interventions											█	
Disseminate results (omgoing)				█	█	█	█	█	█	█	█	█

Table 5. Decision Matrix Form

Rank the potential QI projects of each criterion on a scale of 1-5 (5=totally meets criteria)

- A. Under the column entitled “potential QI Projects”, make a list of areas or processes that should be considered for quality improvement projects
- B. Using a scale from 1-5 rate each project by using criteria (You may wish to revise the criteria to include other items such as cost)
- C. Select the project(s) with the highest score to undertake

Projects	Criteria				
	Issue seen as important	Realistic scope	Likelihood of success	Potential impact	Total
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					

Table 6. Form for Identifying Critical Activities Transformed into Indicators

Form for development of QI indicators:

To develop indicators, focus on 2-5 critical activities that you want to accomplish. Transform the activities into process indicators. Simple ways to create process indicators are as follows:

- Identify the critical activity that needs to be achieved
- Identify how to measure the critical activity
- Identify the source for the measurement

Critical Activity	Criteria	Source	Period and Sampling	Responsible Person

Sampling methodology:

The table below is an example of a 'look-up' sample size chart that tells you how many charts to include in your sample depending on how many patients you have in your eligible population defined above. It is based on a desired level of statistical precision. In many settings, it may be simpler to look at all charts if your patient population is up to 200 patients.

Table 7. Sampling size chart

Population Size up to 20	Sample size/All
30	26
40	32
50	38
60	43
70	48
80	53
90	57
100	61
101-119	67
120-139	73
140-159	78
160-179	82
180-199	86
200-249	94
250-299	101
300-349	106
350-399	110
400-449	113
450-499	116
500-749	127
750-999	131
1000-4999	146
5000 or more	150

Table 8. Quality improvement template

Quality Improvement Template:

This simple form can be used to include all of the information needed to capture the important elements of the project, define its purpose, and keep a record of improvement activities in the clinic.

Name of Centre:

Service or clinic within health centre:

Aim Statement:

Problem Statement:

QI Team:

- Team Leader
- Team Members

Measurement Description:

Baseline Data:

Figure 6. District Rapid Assessment TB-tool (DRAT)

District Rapid Assessment TB-tool (DRAT)

Sub-District: _____ District: _____ Facility: _____

Date of review: _____ Review Number: _____ Previous score: _____

1. General	2. Staffing	3. Headcount & Workload	4. TB Patients
Opening hours: _____ After hours: <input type="checkbox"/> Yes <input type="checkbox"/> No Staff name: _____ _____	CPN: _____ PN: _____ EN: _____ ENA: _____ Lay Couns: _____	Total headcount: _____ Adult headcount: _____ DOTS headcount: _____ Total workload: <u>1</u> in ... (pt/ PN/ day)	TB pts on RX: _____ New: _____ Re-Rx: _____ MDR: _____ Children: _____

5. Suspecting TB <small>(Q.../ 20...)</small>	6. Sputum TAT	7. SCR <small>(Q.../ 20...)</small>	8. Cure Rate <small>(Q.../ 20...)</small>																
Number of suspects: _____ Number of AFB pos: _____ TB Suspect rate: _____ Positivity rate: _____ Sm+ on Rx: _____ Score: _____	TAT: _____ Score: _____	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 50%;">New</th> <th style="width: 50%;">Re Rx</th> </tr> <tr> <td># converted: _____</td> <td>_____</td> </tr> <tr> <td># sm+ preRx: _____</td> <td>_____</td> </tr> <tr> <td>SCR: _____</td> <td>_____</td> </tr> </table> Score: _____	New	Re Rx	# converted: _____	_____	# sm+ preRx: _____	_____	SCR: _____	_____	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 50%;">New</th> <th style="width: 50%;">Re Rx</th> </tr> <tr> <td># cured: _____</td> <td>_____</td> </tr> <tr> <td># sm+ PTB: _____</td> <td>_____</td> </tr> <tr> <td>Rate: _____</td> <td>_____</td> </tr> </table> Score: _____	New	Re Rx	# cured: _____	_____	# sm+ PTB: _____	_____	Rate: _____	_____
New	Re Rx																		
# converted: _____	_____																		
# sm+ preRx: _____	_____																		
SCR: _____	_____																		
New	Re Rx																		
# cured: _____	_____																		
# sm+ PTB: _____	_____																		
Rate: _____	_____																		

9. Interruption Rate	10. DOT Support	11. Clinical Mx	12. R & R								
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 50%;">New</th> <th style="width: 50%;">Re Rx</th> </tr> <tr> <td># interrupted: _____</td> <td>_____</td> </tr> <tr> <td># sm+ PTB: _____</td> <td>_____</td> </tr> <tr> <td>Rate: _____</td> <td>_____</td> </tr> </table> Score: _____	New	Re Rx	# interrupted: _____	_____	# sm+ PTB: _____	_____	Rate: _____	_____	DOTS name: _____ Frequency: _____ Com DOTS: _____ Score: _____	Regimens: _____ C & S: _____ Score: _____	Card 1: _____ Card 2: _____ Card 3: _____ Card 4: _____ Score: _____
New	Re Rx										
# interrupted: _____	_____										
# sm+ PTB: _____	_____										
Rate: _____	_____										

13. TB-HIV	14. Advocacy/ IEC	15. Drug Mx	16. Total Score
# adult TB newly regist: _____ # TB offered VCT: _____ % # HIV+ diagnosed: _____ # HIV+ tested for TB: _____ % # HIV+ Dx TB: _____ # TB/ HIV started on Cotrim: _____ % Sub scores: <u>HIV:</u> _____ <u>TB:</u> _____ Score: _____	Posters: _____ Pamphlets: _____ Activities: _____ Score: _____	Drugs: _____ Bin cards: _____ Score: _____	_____

Task for facility staff to work on until the next quaterly TB programme review (3 to 5):

1. _____	Yes <input type="checkbox"/>
2. _____	No <input type="checkbox"/>
3. _____	Partly <input type="checkbox"/>
4. _____	
5. _____	

Previous tasks implemented (tick)?

