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THE SCIENCE OF IMPROVING LIVES

Quality Improvement Handbook

A Guide for Enhancing the Performance of Health Care Systems

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Photo credit: Christine Kim, FHI 360

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About This Handbook

The Quality Improvement Handbook is a guide to enhancing the performance of health care systems using evidence-based models derived from improvement science. Primarily intended for program managers and technical staff members of FHI 360 projects, it may be useful to others interested in applying quality improvement (QI) strategies to strengthen health programs. Developed by the experts of the FHI 360 Health Systems Strengthening unit, who have provided technical assistance to multiple countries to improve service delivery for patients and communities, this handbook can be used as a reference to accompany FHI 360 QI training and independently as a job aid for designing, implementing, and sustaining improvement efforts.

Since 2009, FHI 360 has implemented numerous QI efforts in more than 20 countries, assisting partners at sites ranging from individual health facilities to multiple facilities across many districts and provinces. These efforts have addressed various health issues, such as HIV, nutrition, non-communicable diseases (NCDs), and tuberculosis. We have learned that success in improvement requires a committed program leader combined with an improvement team that is regularly mentored by a quality improvement (QI) coach to implement scientifically grounded QI models. In most programs, FHI 360 staff members mentor QI coaches or serve as coaches to QI teams formed at management, service delivery, or community levels of the health system. This handbook is designed to help staff develop the QI skills essential to coaching improvement teams and designing effective improvement strategies.

Many of the approaches described in this handbook were influenced by the Institute for Healthcare Improvement (IHI). The IHI has been a leader in the field of quality improvement for more than 25 years and has made fundamental contributions to the evolving science of improvement. The IHI transformed improvement science with practical, easy-to-understand models and tools that can be applied to any health care system. The handbook is based on existing improvement methods and tools (see the Reference section), which have been adapted for FHI 360 programs and refined based on lessons learned from our application of improvement models for various topics.

Because the QI methodology is universal and can be applied to very different contexts and health systems, the handbook provides examples from high-income as well as low- and middle-income countries (LMICs). However, the majority of the case studies and examples of FHI 360's experiences came from our public health programs in Asia, Africa, and Eastern Europe.

Organization and recommended use of the handbook

This handbook consists of four parts:

- Part 1 introduces the fundamental concepts of QI and describes the improvement models.
- Part 2 focuses on the design of improvement efforts.
- Part 3 describes the process of testing and implementing changes.
- Part 4 explores how to sustain and scale up improvement in a health system.

Each part contains chapters that offer details and tools to help program managers and coaches lead specific stages of the improvement effort. Each chapter is immediately followed by supplements with templates, examples, and other useful job aids. Five cases studies describe the process and results of FHI 360's application of the QI methodology in various contexts.

Supplement 3.1 in Chapter 3 (see page 22) is an overview of the three phases of the improvement effort. It lists the steps and sub-steps of the improvement process and provides references and links to the tools associated with each step in the handbook.

We suggest that you read the relevant part of the handbook before embarking on each phase of the improvement effort. For example, if you are considering whether to apply QI, read Part 1 to learn how this approach is relevant to your program. If you plan to design an improvement effort, read the chapters and use the tools in Part 2, and so on. Our experience shows that engaging a team of program managers and technical staff who discuss the progress of their QI work every two to three weeks, with mentorship of FHI 360 QI expert, is a key factor in the success of their improvement efforts. The handbook is designed to help you learn about the phases and steps of the QI model gradually and systematically as you proceed in your improvement journey.

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Acronym List

CHS	Commune health station
DM	Diabetes mellitus
HIV	Human immunodeficiency virus
HTN	Hypertension
IHI	Institute for Healthcare Improvement
IOM	Institute of Medicine
ISQUA	International Society for Quality in Health Care
LMIC	Low- and middle-income countries
M&E	Monitoring & evaluation
MFI	Model for Improvement
NCD	Non-communicable diseases
NGO	Nongovernmental organization
PDSA	Plan-Do-Study-Act
PH	Public health
PMTCT	Prevention of mother-to-child transmission
QI	Quality improvement
QM	Quality management
TB	Tuberculosis
USAID	United States Agency for International Development

Photo credit: RESPOND Project, Ukraine.

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Part 1

FUNDAMENTALS OF QUALITY IMPROVEMENT

Part 1 of the handbook includes three chapters. This section of the handbook describes how an improvement movement in health care has emerged as a science, explains the need to address the quality of health care, and explores the six dimensions that define the quality of care. It also describes the basic concepts involved in the design and implementation of an improvement effort. Quality improvement is operationalized under two fundamental models: (1) the Plan-Do-Study-Act (PDSA) Model for Improvement (MFI) by Associates in Process Improvement[1] and (2) the IHI's Collaborative Improvement Model.[2]

Chapter 1

Health care and quality improvement

In 1999, the Institute of Medicine (IOM) in Washington, DC, USA, released *To Err Is Human: Building a Safer Health System*, which drew public attention to the issue of patient safety in the United States.[3] In 2001, the IOM followed with *Crossing the Quality Chasm: A New Health System for the 21st Century*, a report that highlighted the gap between evidence based health care and the health care that people receive.[4] It became obvious that improving quality would require activities beyond the traditional approach of setting up standards of clinical practice and enforcing regulatory mechanisms of quality assurance, such as accreditation of facilities and supervision of health providers.

A landmark 2003 study by McGlynn et al.[5] found that only 54.9 percent of patients in the United States received the recommended care. McGlynn's findings and contemporaneous reports from the IOM, documenting quality and safety issues, provided focus and urgency to efforts to improve the quality of health care in the United States. To begin achieving real improvement in health care, the whole system had to change.

Recognizing the need to approach quality improvement in new ways, health care leaders drew lessons from the experiences of industries such as engineering and manufacturing. In the United States and other countries, health care leaders began adapting innovative models and systems thinking to improve the quality of health care.

Until recently, an emphasis on access to services in low- and middle-income countries (LMICs) overshadowed interest in the quality of the services that were provided.[6] Because the quality of care was neglected, expanding access did not necessarily result in improved health. For example, studies using mystery clients in India (Delhi and Madhya Pradesh) found that only 4 percent of patients received a correct diagnosis; 67 percent received no diagnosis at all.[7]

Efforts to expand health care coverage in many parts of the world have underscored the problem of poor quality care in LMICs. Universal coverage aims to make essential health services "of sufficient quality to be effective" and available at a cost that does not expose the user to the risk of financial hardship.[8] As governments and donors have begun to spend more on health, their interest in investing in quality improvement has grown.[9]

LMICs present unique challenges for QI efforts. These challenges include weak health systems arising from inadequate human resource capacity, low utilization of data for health care improvement, scarcity of state-of-the-art technology for diagnostic and therapeutic services, and minimal involvement of patients and civil society to demand better quality and safety. Furthermore, community and socioeconomic barriers, such as lack of access to evidence-based medicine resources, poor insurance systems, and varied disease burdens, compound the complexity of addressing health care quality in resource-limited settings.* These issues are deeply interconnected, and attempts to resolve any one of them may have little impact if the entire system is not considered.

Moreover, in an environment with limited resources, addressing a system's challenges requires creativity, flexibility, and consensus among multiple stakeholders. QI methodology is becoming an essential tool for addressing recurrent and complex performance issues in many LMIC health systems.

How do we define the quality of care?

The framework put forth by the IOM identifies **six dimensions of quality in health care**:

The first requirement of quality health care is that it must be **safe**. This means much more than "First, do no harm." That ancient maxim warned individual caregivers to be careful with their patients, but human-factors theory has shown that such admonitions are unproductive. Instead, safety must be a property of the health system itself. For example, blood transfusions introduce the risk of a blood-borne infection, but ensuring the safety of donated blood requires well-designed processes for blood management rather than blaming a physician who prescribes the procedure or simply addressing any issue with more training.

* Summary of points discussed by the participants at the ISQua Quality and Safety Fellowship Forum. http://www.isqua.org/education/programme-content/fellowship-forum

Health care must also be **effective**. It should match the best available scientific knowledge—neither under using nor overusing techniques, tests, and medicines. Every elderly heart patient who would benefit from beta-blockers should get them, but not every child with a simple ear infection should be systematically treated with antibiotics.

Health care should be **patient-centered**. The individual patient's culture, social context, and specific needs influence treatment decisions, and patients should play a key role in making decisions about their own care. This concept is especially vital today, when many people need chronic care that requires their active involvement and cooperation. For example, patients in West Africa sometimes prefer traditional healers to trained providers because they do not feel trusted or respected by the providers. This became particularly obvious during the 2014-16 Ebola outbreak. A patient-centered system gains patients' trust and responds to their needs and expectations.

Health care must also be **timely**. Unintended delays are a system defect that can have negative consequences for patients' health. Long waiting times, for example, can lead to poor retention in care.

The health care system should be **efficient**, constantly seeking to reduce the waste (and hence the cost) of supplies, equipment, space, capital, time, and opportunities. Collecting unnecessary data, documenting the same information in multiple registries, conducting supervisory visits that do not increase positive outcomes for patients, and having meetings with no clear agenda are common examples of inefficiency in health care systems. Reducing such waste provides space and time for effective practices.

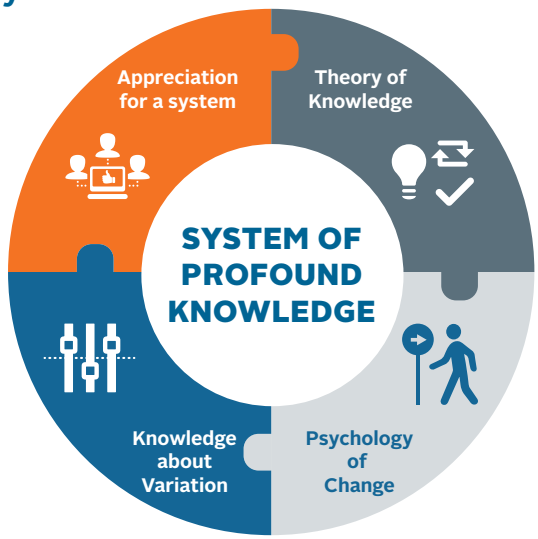
Finally, health care should be **equitable**. Patients' race, ethnicity, gender, language, disability, caste, income, sexual identity, or health status should not prevent them from receiving high-quality care. Advances in health care delivery must match advances in medical science, so the benefits of that science may reach everyone equally.

What is the fundamental theory of improvement?

The Central Law of Improvement[1] is that "every system is designed to deliver the results it produces." Therefore, a clear understanding of a system's nature and interdependencies is key to improving it.

What kind of knowledge is needed to develop and implement changes in health systems that result in improvement? The immediate and spontaneous answer is usually subject matter expertise on clinical care. However, another kind of knowledge is useful for developing, testing, and implementing changes in complex health systems: **Deming's Theory of Profound Knowledge (see Figure 1)**.[10] A fundamental improvement theory, it is grounded in systems thinking and based on the principle that each organization consists of interrelated processes and people that compose a system. The theory consists of four interconnected components, which are illustrated in the following example of improving the organization of district-based tuberculosis (TB) care in Kyrgyzstan.

Figure 1 Deming's Theory



Appreciation of a system. Health care systems are complex—consisting of many interrelated components involving people and processes with a clearly defined, shared aim or goal. For example, the goal of a primary health care center in relation to TB is to detect and treat TB cases through a set of processes, such as screening patients with a cough, diagnosing TB based on sputum smear microscopy, and providing directly observed therapy for TB patients.

Optimization of a system can occur when all interconnecting components are orchestrated to achieve the organization's goal. Medical providers, social workers, and volunteers should unite to make changes to optimize the system for the benefit of the patient. A flowchart or system model can be used to clearly illustrate the components of a system and their interconnections. Each person must understand his or her job, know how to do it well, and recognize the interdependent role he or she plays within the system.

In Kyrgyzstan, using a system model we demonstrated that the desired outcomes will be achieved if the necessary resources and processes function properly and in a coordinated manner (see **Table H** in **Chapter 9**). The system model helped bring district-level managers and primary care providers to a consensus that making changes in that system and in the roles and relationships of various players would increase the TB treatment success rate. For example, after examining each component of the system, they realized that communication among TB patients, family doctors, nurses, and social workers is vital to prevent patients missing appointments and defaulting on treatment. They also learned that a lack of sputum containers resulted in many patients missing the opportunity to be screened for TB.

Theory of knowledge. Within the context of QI, a change is based on a prediction or hypothesis: if the change is made, improvement(s) will occur. Knowledge is acquired as a result of testing those hypotheses. This learning process is embodied in Deming's Plan-Do-Study-Act cycle **Chapter 10**), a systematic, dynamic process that generates learning, and not simply data or information.11

Everybody has what Deming calls "views of the world" that drive human behavior. Changing individual behavior requires organizations to encourage new ways of working. For example, in Kyrgyzstan, family medicine physicians believed that if TB patients experienced side effects of a TB drug, they would tell a nurse or a doctor about them during directly observed therapy. However, out of 10 TB patients in one of the family medicine practices, none reported any side effects.

We proposed that a nurse or a doctor should proactively ask about the potential side effects of the drugs, because patients were not mentioning them and might not know the side effects were related to their treatment. We tested this idea using the PDSA cycle and found that seven out of 10 patients reported some side effects when asked proactively by a nurse or a doctor. The practice then easily adopted a new side effect screening tool. Thus, a PDSA method helped health workers test a new idea for achieving improvement and extract lessons learned based on the evidence.

The psychology of change. Effective management of people requires an understanding of what motivates them. Deming understood that people are primarily motivated by intrinsic needs, including pride in workmanship and working with others to achieve common goals, rather than monetary rewards.

In Kyrgyzstan, we worked with district stakeholders who agreed to make TB care more patient-centered by adopting a case-management approach. We also empowered the actors—providers, volunteers, and social workers—in the TB system to work in teams and share information. Encouraging teamwork, organizing forums, allowing people to express creativity, and developing communication and interpersonal skills enabled the team members to reach their goals. Following the QI model empowered and motivated all to improve the TB system of care.

Knowledge about variation. Variation is a natural, inevitable part of life. The goal of continuous quality improvement is to reduce the range of unacceptable and damaging variations while raising the quality of the services. All processes exhibit variations, due to common causes, which are inherent to the design of the process. The use of a "run chart" tool (see **Chapter 11**) enables actors to visualize the variations, observe whether the process is improving, and make appropriate decisions.

Continuing with the Kyrgyzstan example, primary care providers assessed their own performance and found variations in practicing directly observed therapy. Some providers stressed that patients needed to come every day to the clinic to take TB drugs under the direct observation of a nurse; some providers felt it was acceptable for a relative to pick up a TB drug for a patient; and other providers approved patients for pickup of a three-day supply of TB drugs to take at home, rather than coming to the clinic every day. By measuring a percentage of patients who were taking treatment under direct observation every day, and by analyzing their own performance, the providers were able to standardize the practice and reduce variation.

In summary, the ability to make improvements is enhanced by combining subject matter expertise and systems' improvement knowledge and skills. The improvement model described in the next chapter serves to operationalize this concept.

Chapter 2

The fundamental models

How does FHI 360 use QI to address gaps in the performance of its programs?

Our experience shows that formal quality improvement efforts are necessary to address complex and recurring performance issues. Such challenges typically have multiple causes and require the involvement of many stakeholders to identify the parts of the system that need to be redesigned. With Deming's Theory of Profound Knowledge in mind, FHI 360 uses a combination of a "Model for Improvement" (MFI) framework as the logical basis of any quality improvement effort[1] and IHI's Collaborative Model,[2] to set up, manage, and replicate large-scale QI efforts.

The MFI. As we learned from Deming's appreciation of a system, change is the central concept of any improvement effort. However, not every change leads to improvement. The effects of changes must be tested and validated, usually through a four-phase cycle of planning, doing, studying, and acting—the PDSA cycle, a key element (step) of the MFI—before they are implemented, sustained, and scaled up.

Every improvement attempt requires a compass that provides direction. FHI 360 adapted the MFI to its programs, transforming the questions in the original framework into actions.

The FHI 360 Quality Improvement Model (**Figure 2**) contains the following questions and steps:

- ***What are we trying to accomplish?*** We identify the improvement aim and objectives that express, in measurable terms, a benefit to the community/population (see **Chapter 5**).
- ***How will we know a change is an improvement?*** We develop a system that measures progress toward the aim and objectives (see **Chapter 8**).
- ***What change can we make that will result in improvement?*** We generate ideas for changes, using a list of known change concepts or other methods (see **Chapter 9**).

- ***Test and implement system changes*** with the PDSA cycle (see **Chapter 10**): We assess the effects of changes, based on the improvement aim and objectives. If a specific change yields improvement, it is sustained and replicated. If not, it is abandoned and another change is tested.
- ***Sustain and spread the new system:*** FHI 360 adapted the original MFI by adding this step, which involves actions to sustain and spread improvement processes and effective changes in the system (see **Chapters 12-13**).

Table A shows an example of the application of the MFI for Abundant Health, an FHI 360 health program designed to expand access to quality hypertension and diabetes mellitus services in Ho Chi Minh City, Vietnam, across primary care sites known as commune health stations (CHSs).

Figure 2. FHI 360 QI Model

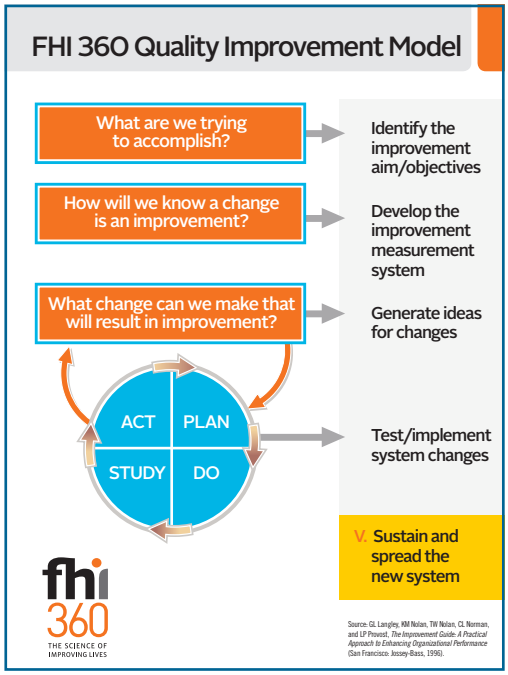


Table A. Application of the QI Model in Vietnam

QI Model questions/steps	Hypertension and diabetes project
What are we trying to accomplish? (Aim)	• We will increase the percentage of eligible patients screened, counseled, and treated for diabetes mellitus (DM) and hypertension (HTN) at the five commune health stations (CHSs) in district X.
How will we know if a change is an improvement? (Measure)	• ↑ in the percentage of patients screened for DM and HTN • ↑ in the percentage of patients retained in care at the CHSs
What change can we make that will result in improvement? (Change idea)	• Conduct mass routine screening for DM and HTN at the CHSs to increase the percentage of patients screened. • Offer frequent counseling to increase patients' retention in care.
Test changes	• Test the process of routine screening for blood pressure and body mass index for two days at one CHS. • Assess the feasibility of the change and its effect. • For one day, mentor a nurse to counsel diabetic patients and hypertensive patients on retention in care.
Sustain and spread	• Make screening and counseling routine tasks at the CHSs and expand the routine to similar CHSs based on lessons learned about how to reorganize the services.

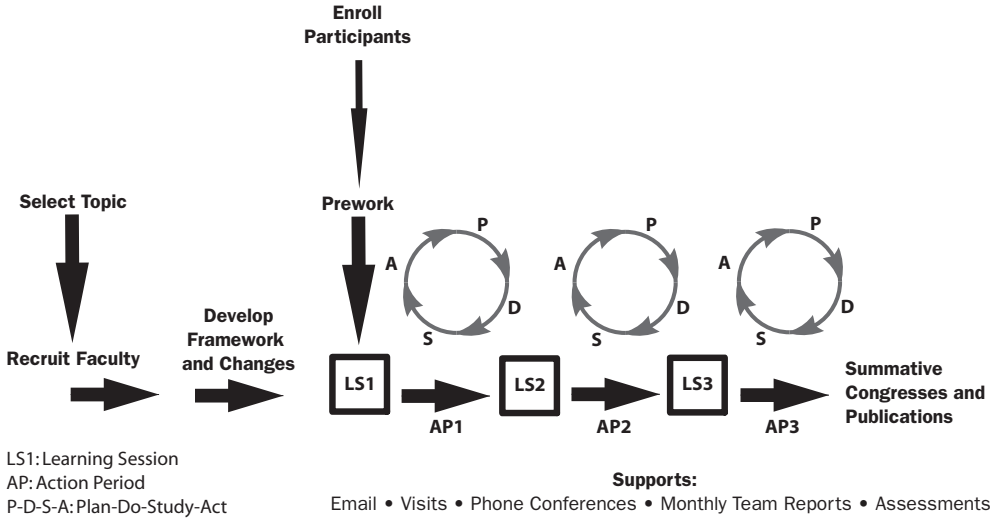
How can improvements be implemented at larger scales?

The collaborative model designed by IHI is used to manage and replicate improvements on a large scale, involving many service delivery sites or QI teams. It is a time-limited strategy (nine to 24 months) that brings together a "collaborative" consisting of teams from a large number of sites and communities to rapidly test many changes and scale up significant improvements. These teams go through a structured learning process that consists of alternating "action periods" (testing changes through PDSA) and "learning sessions" to exchange change ideas and report on progress. **Figure 3** displays the original IHI Collaborative Framework from the IHI white paper series.[2]

According to this framework, improvement starts with the selection of an improvement topic. A group of experts, called the "faculty," explores different ideas and available information and develops ideas for changes to meet the desired goal. Teams from multiple

improvement sites (such as health centers, hospitals, and district units) are enrolled to implement the interventions developed by the faculty. Over the course of a year, participants attend three two-day learning sessions to learn about QI models and tools and to share results and practices. In the framework, we also see the action periods when participants implement the interventions at their places of work using the PDSA tool. In the intervals between these sessions, collaborative participants communicate by weekly conference calls and sometimes through a dedicated Internet site.

Figure 3. IHI Collaborative Framework, Breakthrough Series Model



Based on literature reviews and our experience, we identified seven key features of the IHI Collaborative Improvement Model:

1. **Common improvement aims and objectives,** which are shared by multiple service delivery units or teams
2. **A common improvement monitoring system** with measures or indicators that are shared by all teams to help them compare and learn from each other
3. **An operational structure** organized around teams that perform specific roles and responsibilities: (a) QI teams that directly implement changes; (b) a quality management team that plays a strategic leadership role and manages the collaborative; and (c) various experts in QI and the content of care (or topic area under improvement)
4. **A coaching system** that supports the teams to implement changes and measure the effects; on-site providers can be trained to work as internal coaches for their teams
5. **A PDSA-based** model for improvement to identify and implement changes and test their impact during specific action periods

6. **A change package,** which is a combination of explicit, evidence-based standards and best practices that are known to be effective in the local context (or have been tested and shown to be effective) and that can be scaled up
7. **Learning sessions.** Regular learning sessions provide the opportunity for teams to share their experiences (supported by monitoring data) and to learn about best practices and how they can be replicated.

Box 1. Definitions

Improvement collaborative: *an organized network of many sites (districts, facilities, communities) that work together as teams for a limited time to rapidly achieve a common aim.*

Improvement coaches: *local system representatives or program staff trained in quality improvement who support QI teams through the steps of the improvement process.*

QI teams: *multidisciplinary groups of service providers (doctors, nurses, social workers, and others), management staff at health care facilities, data analysts, and staff members who represent stakeholders involved in providing services to patients.*

The use of collaborative improvement model requires a phased approach to design, support for implementation, sustainability of results, and scale up of the changes. The next chapter addresses these phases.

Chapter 3

Introduction to the phases of the improvement effort

The MFI provides a framework for any improvement effort, whereas the IHI Collaborative Improvement Model provides the management tools for initiating, implementing, and scaling up improvements. FHI 360's approach combines both to maximize impact. We adapted the original collaborative model by dividing it into three phases, which are described in the next three sections of this handbook:

1. Designing the improvement effort (**Part 2**)
2. Supporting transformation through tests and implementation of changes (**Part 3**)
3. Sustaining and scaling up improvements in the system (**Part 4**)

The design phase (see **Part 2**) sets the stage. It involves conducting an assessment, creating an aim, setting measures of progress, and establishing the management structure, which may include coaches and QI teams.

In the transformation phase (see **Part 3**), teams use various system analysis tools, with a coach's facilitation, to identify ideas for changes and begin testing and implementing them. Teams meet for learning sessions, followed by action periods, and are coached throughout the process. The progress of the teams is recorded and analyzed using data that are often displayed in run charts. Learning sessions and coaching visits are conducted throughout the lifecycle of the collaborative.

In the sustaining and scale-up phase, the teams summarize the results and the lessons learned with a coach's guidance. This summary synthesis helps the teams refine the changes for further scale-up and institutionalization. The successful teams play the role of "champions" and spread the changes to new sites in various ways, such as through supportive supervision and mentoring. Institutionalization and scale-up may require a whole series of policy, administrative, and management changes that will depend on the country context.

The average duration of a collaborative is nine to 24 months, according to the original description. From our experience, implementation often continues throughout a project. During the first few months, teams go through a prototyping phase, when the members learn how to work as a team and how to measure, and test the changes on a small scale. During the following year(s), the teams work on sustaining and scaling up the improvement process and the changes to the larger system and multiple sites. The exact duration of the effort depends on the geographical scale, how ambitious the targets are, and the complexity of the system.

FHI 360 has developed a toolbox of resources to help QI teams and coaches lead improvement efforts through the three phases. The table in **Supplement 3.1** organizes the specific tools that are described in this handbook under the three phases of a QI effort and follows the steps of the MFI model. The table also lists substeps for each phase and describes the coach's role in the steps and phases of improvement. Note that the sequence of these steps may vary: some teams start with a comprehensive baseline assessment to identify improvement opportunities, the results of which will inform the final composition of the team, while others form an improvement team first to address and investigate a known issue. Not all steps and substeps are necessary for each QI effort. More detailed descriptions of each of these phases are provided in subsequent chapters.

Supplement 3.1: Quality Improvement Phases and Tools

Stages	Phases of a QI initiative	Examples of substeps	Coach's role	Tools and resources available in the Handbook
Design of the improvement effort	Designing the improvement effort: The rapid assessment (**Chapter 4**)	• Design the rapid assessment tool. • Conduct a rapid assessment. • Share the report on the rapid assessment.	Participate in all steps, particularly in conducting the assessment and reporting the results to stakeholders.	Rapid Assessment Steps (Table B) and Clarifying the Problem (Table C)
	Developing a charter (**Chapter 5**)	Develop a QI charter based on consensus on performance issues and improvement aim	Participate in the QI charter meeting.	QI Charter with Instructions and Examples (Supplement 5.1) and QI Charter Meeting Agenda (Supplement 5.2)
	Establishing the structure (**Chapter 6**)	• Enroll team members. • Form a team and identify roles and responsibilities. • Facilitate team meetings.	Facilitate team meetings and test changes.	Sample Position Description for an Improvement Coaches (Supplement 6.1)
	Establishing a measurement system (**Chapter 8**)	• Develop QI measures and an improvement monitoring system. • Test and implement the monitoring system. • Routinely collect QI measures. • Display data as run charts. • Assure quality of the collected data. • Interpret run charts and variation.	Support the development of QI measures, testing measures, and quality assurance of data; help the team to interpret run charts and variation.	Template for collecting quality improvement indicators (Supplement 8.1) Excel spreadsheet that automatically generates run charts [provided by FHI 360]

Stages	Phases of a QI initiative	Sub-steps	Examples of substeps Coach's role	Tools and resources available in the Handbook
Supporting transformation: Testing and implementation of changes	Identifying changes (**Chapter 9**)	• Develop a system view through system modeling. • Analyze current patient flow to identify bottlenecks. • Conduct a root-cause analysis to identify the main causes of the issues. • Generate ideas for changes using a driver diagram or change concepts.	Facilitate generating ideas for changes through the application of the tools.	System modelling (Table H, Figure 7) Examining patient flow (flowchart) (Figure 8, Figure 9, Figure 10) Cause and effect analysis (fishbone and driver diagrams) (Figure 11, Figure 12) Change concepts (Table I)
	Testing and implementing the changes (**Chapter 10**)	• Plan the testing of changes. • Monitor the implementation of the changes according to plan.	Monitor the implementation of the changes based on the plan and support the team to act based on the test.	PDSA cycle and plan template (Supplement 10.1, Supplement 10.2)
	Assessing the effects of the changes (**Chapter 11**)	• Interpret run charts. • Modify or sustain changes.	Support the team in the interpretation of run charts and in making decisions on the effect of changes (the "Act" of the PDSA).	Article on run chart interpretation[12]

Stages	Phases Steps of a QI initiative	Examples of substeps	Coach's role	Tools and resources available in the Handbook
Supporting transformation: Testing and implementation of changes **and** **Sustaining and scaling up improvements in the system** **[The steps, sub-steps, and tools in the rows in gray are shared across these two phases]**	Supporting regular coaching sessions (**Chapter 14**)	• Assess team performance	Assessment will be done by external coaches during monthly or bimonthly visits Generic agenda for a 3-hour coaching visit (Supplement 11)	Generic agenda for a 3-hour coaching visit (Supplement 14.1) Improvement Project Monitoring Form (Supplement 14.2) Team performance tracking form (Supplement 14.3)
	Facilitating learning sessions (**Chapter 15**)	• Prepare materials or storyboards to present in the learning sessions • Prepare agenda • Facilitate breakout sessions	Participate in organizing and facilitating learning sessions	Quality improvement learning Session illustrative agenda (Supplement 15.1) Storyboard template (Supplement 15.2)
Sustaining and scaling up improvements in the system	Planning scale-up (**Chapter 13**)	• Identify scale-up sites and get buy-in at the new locations • Develop a scale-up plan • Adapt the change package for new context if needed • Scale- up improvement from pilot to new sites	Participate in all steps	Change Package for Improving the Quality of CBFP Services (Supplement 13.1) Spread Planner (Supplement 13.2)

= Learning sessions and coaching visits are part of both " Supporting transformation: Testing and Implementation of changes" and "Sustaining, scaling up changes system."

Part 2

DESIGNING AN IMPROVEMENT EFFORT

The improvement field uses the scientific method to understand and improve processes and systems. Instead of management by impulse, or by preconception, the experienced improvement expert (coach) should be able to guide partners to manage based on facts about processes and the larger system of care that includes these processes.[13] Everyone who is part of that system at all levels can play an active role in understanding the gaps, developing improvement aims, agreeing on new roles to support improvement, and collecting and analyzing data. Part 2 of the handbook focuses on the design of an improvement effort, with chapters that cover (1) how to conduct a rapid assessment; (2) how to agree on the aims and objectives of a project during a charter meeting; (3) how to establish a structure (the human and material resources) for improvement; and (4) how to design a system to monitor the improvement process. Part 2 also describes the profile of an improvement coach, the nature of the role, job expectations, and criteria for selecting a coach.

Chapter 4

Designing the improvement effort: The rapid assessment

In most cases, the project has a clear mandate from the local health authorities or donor to address a certain health issue and clear objectives to achieve. Designing the quality improvement effort will often require a situation analysis or rapid assessment to define the borders of the system that needs to be improved. The assessment process requires a combination of gathering information, defining expectations, and obtaining a consensus among stakeholders of the system that is the focus on the improvement. Steps in table below provide guidance to the rapid assessment.[14]

Table B. Rapid Assessment Steps

Steps	Guiding questions and recommendations	Method
Identify the problem	Is this problem a priority in the current policy environment? How has this problem manifested itself in the past (based on available data)? What is currently being done to address the problem?	Meet and interview government stakeholders, representatives of the community, and health providers.
Stakeholder mapping (and identification of potential coaches)	Who is best positioned to be the champion and the leader of the collaborative? Who has the clinical knowledge and leadership skills to serve as project leader? Who—outside of the core team—has an interest or stake in this issue? Is the stakeholder group inclusive and representative of different perspectives? How will the collaborative engage this stakeholder group? What are the roles and responsibilities of the stakeholder group? Which partners will participate in the core collaborative and actively work to improve quality?	
Gather all relevant information on the problem—clinical and administrative data, case studies, promising practices, standard metrics	What does the evidence suggest about factors contributing to the problem? What does the evidence suggest for achieving the targets? What is unknown? What are the current standards of care and best practice examples?	Conduct a desk review of local and country-specific documents and, if needed, a literature review.
Understand the system and processes related to the issue	Use Donabedian's[15] quality assessment framework, which focuses on structures/inputs (human and material resources), processes (implementation of and adherence to national guidelines), and outcomes (client satisfaction, retention, etc.).	Meet with stakeholders who are part of the system to develop a system map.

At this stage, the program also clarifies the problem to be addressed. **Table C** is an example of how the Abundant Health project team in Vietnam focused on non-communicable diseases and developed a more precise definition of the problem using rapid assessment findings.

Table C. Clarifying the Problem

Questions	Answers
What problem do you want to address?	Hypertension and diabetes are not identified during the early stages by staff at the commune health stations (CHSs), so people receive care only at hospitals.
How do you know it is a problem? Do you have evidence from assessments or reports?	From the 2015 national survey: only 50% of patients with hypertension were aware of their status, only 61% of those who knew their status were treated, and only 36% of those on treatment had their blood pressure under control.
How often does the problem occur?	Continual
How does the problem affect the health of the target clients?	Higher rates of hospitalization; high rates of mortality at younger ages from complications (stroke, myocardial infarction, and cardiac arrest).
What measure or outcome will indicate that the problem has been resolved?	Improved compliance with WHO non-communicable disease (NCD) guidelines by the CHSs staff.
What is the interest and commitment of the leaders?	To start managing hypertension and diabetes care at the CHS level and gain more trust of the community.

The main purpose of the rapid assessment results is to give direction to the improvement effort by defining opportunities for improvement. The results should identify gaps in the system, suggest a potential aim and objectives for improvement, and provide information to guide the design of the improvement monitoring system and the selection of local QI teams. Often, stakeholders who are not familiar with QI understand quality issues only as poor compliance with standards. However, improvement is primarily an effort to enhance the performance of a health care system and not just individual providers. This opportunity may be expressed as a problem that needs a solution or as a process or system that needs to be improved. Overall, we can organize these opportunities under three broad categories:

- **Effectiveness issues:** The system does not deliver the expected performance. Possible issues: low cure rates; increased case-fatality rates; high rates of patients lost to follow-up; incomplete medical records; and canceled appointments and patient visits

- **Efficiency issues:** The system uses too many resources to deliver optimal performance. Possible issues: long waits to receive care; lost laboratory exams that must be repeated; over-prescription of antibiotics or other drugs; and excessive administrative costs
- **Responsiveness issues:** The system does not address the needs of its clients in a satisfactory way. Possible issues: slow delivery of positive test results to caregivers of HIV-exposed children; rudeness of service providers; discrimination and stigmatization of patients; culturally insensitive care; and gender-based biases in the delivery of care

The next step is to ensure that the improvement aim is clearly expressed and that stakeholders agree on how to achieve it. Consensus is commonly achieved by gathering representatives from local government, the health management and service delivery system, and nongovernmental organizations, as well as client representatives, to collaborate on a QI charter.[16] This important document outlines the aims, objectives, and structure of the improvement effort. The development of a QI charter is described in **Chapter 5**.

Chapter 5

Developing a charter

A QI charter is an effective way to reach a consensus on an improvement effort.

A quality improvement charter is a document that states the aim of the improvement effort and provides a roadmap based on the QI model. A multidisciplinary team implements the strategy according to agreed-upon roles and responsibilities. The use of the charter as a reference keeps the teams focused on the aim of the improvement effort. The charter is a great tool to help the team players manage expectations and ensure that the improvement effort stays on course. It describes the collaborative and the facilitates at the launch of the effort by establishing a common vision for the work.

A good charter guides the team to consider the most essential parts of the design of the improvement effort. It helps the team to (1) develop the problem statement and mission, and (2) identify the aims, measures, initial change ideas, and operational structure of the collaborative. Going through that exercise at the beginning of the effort prepares the team even if some parts of the design are later modified. Most importantly, it helps to clarify the expectations of the stakeholders at the very beginning.

How do we develop a QI charter?

The charter is the first document a team should develop once its members agree to address an issue through a structured QI effort. Quality improvement charters vary in length and level of detail. FHI 360 has developed a standardized template that captures all the essential aspects of the collaborative design. This QI charter template is provided, with examples, in **Supplement 5.1**.

The program staff should use this template to create a first draft of the charter, and should then convene a workshop to reach a consensus on the final elements of the charter. Drafting the charter before holding a workshop with local stakeholders (the charter meeting) will help to guide the group and save time. Charters can be signed to reinforce the commitment of the stakeholders to work as a team.

How do we conduct a charter meeting?

The charter meeting should be designed to enable stakeholders to reach a consensus on the aim, the measures, and the structure of the improvement effort. Use clear messages to explain the purpose of the charter, with examples from other projects. Provide an opportunity for stakeholders to express their opinions and concerns. Use group work to achieve a consensus.

It is also very important to ensure broad participation in the charter meeting. For example, various stakeholders—the district health management team, the head of the participating health facility, a midwife, community volunteers who collaborate with health facilities, and patient representatives—were invited to design an improvement effort for a community-based family planning program in Busia, Uganda.

Stakeholders gathered for the charter meeting in Busia, Uganda, 2015. Photo credit: APC CBFP project.

Limiting the charter meeting invitations only to potential members of the improvement team means that the opportunity to engage and gain the buy-in of higher-level authorities is lost. Similarly, including decision-makers only eliminates those who are familiar with the resources, capacities, and realities of the front-line workers. Invite all potential actors in the effort—potential team members, decision-makers, and clients—to reach a consensus and launch the design of the improvement effort with the charter. **Supplement 5.2** provides an example of a charter meeting agenda that was designed by FHI 360 to launch an effort to improve the health care system for addressing noncommunicable diseases in Vietnam.

Why is the development of an improvement aim so critical?

The development of the aim is the most important part of the charter meeting and the overall design of the improvement effort. If the team members believe that they have the

right aim, all the other parts of the design will follow. The participants should develop the aim by the end of the first day of the charter meeting, and then review it at the beginning of second day.

At first, participants should not worry about the wording of the aim, but should focus on its content. A good improvement aim focuses on the health of patients, responds to patients' needs and expectations, and often includes an intervention that will produce a change in outcomes.

Stakeholders developing an improvement aim in Kyrgyzstan, 2016. Photo credit: Defeat TB.

A well-formulated aim often takes the form of a **"what-by-when"** statement, such as "I am going to get a driver's license by the end of the month." The aims must suit the project and the groups or individuals who are doing the work (see the box at left). For example, a hospital's chief might embrace the aim of improving the hospital's safety (item 1 in the box). In contrast, the medical and nursing staff at a health facility might wish to improve patient satisfaction or the efficiency of the services (see items 2 and 3 in the box). All three aims have something in common—they benefit the patient's health and wellbeing. If the teams propose, for example, an aim to improve staff

Box. 2 What-by-when: Examples of improvement aims

1. We will improve safety by reducing hospital infections by half within one year.

2. We will improve patient satisfaction with counseling practices by 50% in our primary health care clinic by December 2016.

3. We will increase the percentage of eligible patients screened, counseled, and treated for diabetes and hypertension at the five commune health stations in the Tan Phu District of Ho Chi Minh City.

morale or the supervisory system, the coach should ask the teams whether the aim has any benefits for the patient.

It is important to balance the team's desire to perfect the aim and any tendency to be paralyzed by that desire. Don Berwick, President Emeritus and Senior Fellow at IHI, offered this advice about developing an aim:

> So set an aim now... Make a decision about what you're going to try. Remember, there's no such thing as a perfect aim statement. The only real risk is to get stuck at this step. This is a very bad time for obsessive thinking. Second, make sure your aim has what I call heart. It should feel important; it should feel meaningful to you and the people you're going to work with to get to that aim. And last, be ambitious. If the aim makes the status quo not a good answer, then you're going to be much more curious about new things to try.[16]

What are the risks in creating the charter?

The main risk with the development of the charter is that if it lacks the detail of a useful roadmap, teams may question their purpose and lose their commitment. On the other hand, waiting until the charter has been "perfected" with too many details can delay the start of the QI effort. The right balance is achieved when team members have a shared understanding and commitment to continuous improvement and are ready to take specific steps, such as measurement or testing changes.

Supplement 5.1: QI Charter with Instructions and Examples

Title of the improvement project:
Start date:
End date:

I. IMPROVEMENT AIM AND OBJECTIVE

Target clients:

[Indicate the target clients for the improvement effort. Indicate the population's size, if possible.]
Example: adults older than 40 in the Ho Chi Minh District

Institutions and communities:

[Indicate the exact names of the facilities, organizations, and communities that will be involved in the improvement effort.]

Business case:

[Indicate the justification for the initiation of the improvement effort.]

Example: a new Ministry of Health order that calls for addressing non-communicable diseases at the primary care level.

Improvement aim:

[Develop a "what-by-when" aim statement.]

Example: Increase the percentage of patients screened, counseled, and treated for diabetes and hypertension) by 50% in compliance with evidence-based guidelines through introduction of the team-based care model, continual coaching, and community engagement from May 12, 2016, through February 2017 for eligible patients at the five commune health stations in the Tan Phu District of Ho Chi Minh City.

Objectives:

[List objectives that provide details about how processes need to be improved to achieve the aim.]

Example:

- Increase the number of community members who seek care at the commune health stations.
- Increase the number of patients who receive quality care for hypertension and diabetes (screening, diagnosing, counseling, treatment, and referral according to WHO standards).
- Increase retention in care for patients with hypertension and diabetes at the CHS.

II. MEASUREMENT AND IMPROVEMENT

[List the objectives in the "Aim and objectives" column of the table. Develop an indicator (a number or a percentage) that will reflect the objective.]

In some cases, as in the example below, there may be more than one indicator for one objective. Indicate the current value (if known) and a desirable target. Explain that the indicators will be further tested, and a more detailed job aid will be developed to guide participants in the collection of data. When developing an indicator, consider these characteristics: effectiveness, feasibility, and the level of effort required to collect information.

Example:

	Objectives	Indicator	Current value	Target
1	Increase retention in care for patients with hypertension and diabetes at the CHS	Number of patients with diabetes and hypertension who were counseled according to WHO guidelines Percentage of follow-up visits of patients with hypertension and diabetes	0 20%	100% 90%

III. POSSIBLE CHANGES

Possible changes for improvement:

[There are many ways to develop ideas for improvement. For example, the team can use a "driver diagram" or examine "root causes," as described here. Copy the objectives from Section II and paste them in the "objectives" column of the table below. Describe the gaps to be filled and the challenges to reaching each objective. Ask "Why?" and the root causes of the gaps, and then propose ideas for improvements to address the root causes.]

Example:

Objectives	Gap	Root causes of issues/ barriers	Potential changes for improvement
Increase retention in care for patients with hypertension and diabetes at the CHS.	Adults diagnosed with hypertension and diabetes do not come for routine care.	Adults diagnosed with hypertension and diabetes prefer going to the hospital and do not trust primary care.	Work with the community to increase awareness of routine care for chronic conditions like hypertension and diabetes at primary care centers.

IV. COLLABORATIVE TEAMS AND MANAGEMENT STRUCTURE

Quality management team:

Organization	Name and position	Role
[List organizations that will provide leadership and technical assistance to the improvement effort.]	[List names and positions of people who will be involved on behalf of each organization.]	[List the role and responsibilities of each person or group listed.] **Example**: Provide leadership and management support to the QI collaborative. Main responsibilities: • Sign charter and monitor implementation according to plan. • Identify the structures and partners to include. • Support the QI effort through allocation of human, material, and financial resources, and through policy changes. • Approve the change package to be tested and the final package to be replicated. • Coordinate team meetings and regular learning sessions. • Communicate results and issues with the coordination council and national-level stakeholders. • Support the sustainability of the implemented changes if they demonstrate expected results.

Quality improvement coaches: [List names and positions of people who will be supporting teams in the improvement journey. If possible, assign at least one coach per team and indicate frequency of the coaching visits.]

Quality improvement teams:

Organization	Name and position	Role
[List facilities that will provide and improve the services.]	[List names and positions of people who will be involved on behalf of the organization.]	[List the role and responsibilities of each person or group.] **Example**: Follow QI model to improve processes: • Measure improvement indicators. • Conduct root-cause analysis. • Test changes using the PDSA cycle. • Present results during learning sessions.

V. RISK ASSESSMENT AND MITIGATION

[List the risks and how they should be reduced]

Example:

Anticipated issues/risks	Risk mitigation measures
Resistance from the clinicians because of the additional workload	Involve health facility champions and health facility leaders in advocating for the change and motivating clinicians

VI. LEARNING, SUSTAINABILITY, AND SCALE-UP

[Learning platform: [Identify regularly scheduled meetings of the involved institutions where the improvement effort can be discussed. List the first planned learning session.]

Example:

Type of meeting or visit	Frequency of meeting or visit	Date and time of the first meeting when QI will be discussed
Health facility internal meeting	Once every 2 weeks	March 16, 2016
Learning sessions at the provincial level	Once every quarter	September 2016

Scale-up strategy: [Provide a narrative of the scale-up strategy, e.g., increase the number of facilities that will provide a NCD service from 5 commune health stations to 10 more covering entire district number within a year.]

VII. IMPLEMENTATION SCHEDULE

Project milestones:

[The most essential activities of the improvement effort are listed here.]

Activities	Responsible	Deadline
Finalize and sign the charter		
Identify a mentor and coaches		
Enroll facilities		
Visit the sites, test the monitoring system, and collect baseline data		
Hold the official launch and learning session 1		
Provide QI training for coaches		
Start implementing changes		
Conduct coaching visits		
Hold learning sessions		
Evaluate and document the QI effort		

Signatures:

[Please make sure that at least one person from the involved institutions and a patient representative sign the charter.]

Supplement 5.2: QI Charter Meeting Agenda

Hypertension and Diabetes QI Charter Meeting

Workshop objectives

The main goal of this meeting is to help the health system representatives of Ho Chi Minh City to develop a charter. The charter serves as a framework for the integration of hypertension and diabetes management into the five commune health stations using the Collaborative Improvement Model. The collaborative will consist of the five commune health stations, and their goal will be to increase the percentage of eligible patients who are screened and treated for diabetes and hypertension.

The objectives of the meeting are to reach a consensus on: (1) the overall design of the hypertension and diabetes demonstration project and (2) the roles and responsibilities of the stakeholders. The output of the meeting will be a district-specific charter that defines the:

- Aim statement and objectives
- Hypertension and diabetes quality improvement measures
- Stakeholders and their roles and responsibilities

Workshop schedule

Day 1		
TIME	ACTIVITY	FACILITATORS
8:30	Participant registration	Project Manager, FHI 360
9:00	Charter meeting opening	Department of Health (DOH) representative: Director (or Vice Director)
WHERE WE ARE NOW?		
9:20	Current status of the hypertension and diabetes prevention and control implementation programs in Ho Chi Min City	Representatives from DOH and nutrition center
10:00	Rapid assessment findings from commune health stations	Project Manager, FHI 360
WHAT DO WE HOPE TO ACCOMPLISH?		
10:15	Introduction: Abundant Health Project; Q&A; group photo	Project Manager, FHI 360
10:30	Tea break	
GETTING STARTED		
10:50	Participant introductions, agenda review, and ground rules	Quality Improvement (QI) Advisor, FHI 360
11:45	Lunch break	
13:00	Ice breaker	QI Advisor, FHI 360
WHAT IS OUR STRATEGY?		
13:15	Introduction to the quality improvement model and the use of a charter for hypertension and diabetes	QI Advisor, FHI 360
14:10	WHO standards on hypertension and diabetes for primary care level	Subject matter expert, University of Medicine and Pharmacy (UMP)
GROUP WORK		
14:40	GROUP WORK 1: Using the charter, groups review the problem statement and agree on the improvement aim	QI Advisor, FHI 360
15:30	Tea break	
WHAT IS OUR THEORY OF CHANGE?		
15:45	Introduction to driver diagrams and to the driver diagram for this project	Harvard Center for Primary Care
16:25	Your CHS theory of change: • Present aims and objectives • GROUP WORK (2): Agree on improvement aims and objectives	Project Manager, FHI 360
17:00	Evaluation of Day 1 and wrap up	Project Manager, FHI 360

Day 2		
TIME	ACTIVITY	FACILITATORS
8:30	Review aims and objectives of the improvement collaborative	Project Manager, FHI 360
8:45	Group presentation on aims and objectives	
HOW WILL WE KNOW THAT CHANGE IS AN IMPROVEMENT?		
9:15	Measurement for the Abundant Health project	All facilitators
WHAT CHANGES CAN WE MAKE FOR IMPROVEMENT?		
10:15	GROUP WORK (3): Interactive exercise to identify possible changes using a driver diagram	All facilitators
10:30	Tea break	
WHERE TO START?		
10:45	GROUP WORK (4): Exercise to prioritize changes	All facilitators
11:45	Lunch Break	
13:00	Icebreaker	
WHO IS ON THE TEAM?		
13:10	Defining roles and responsibilities: the structure of the demonstration project	QI Advisor, FHI 360
13:40	GROUP WORK (5): Review of coach's job description	All facilitators
14:10	Project timeline review	Project Manager, FHI 360
14:25	Wrap up and closure. Evaluation of Day 2	Department of Health (DOH) representative: Director
15:00	Tea Break	

Chapter 6

Establishing the structure

What needs to be considered when we build a structure for an improvement effort?

The "structure" of an improvement effort is comprised of all its human and material resources. It should be noted that quality improvement projects often involve many stakeholders. These groups and individuals are usually involved in the delivery of services and the management of the health and social service delivery systems.

The specific structure needed to implement the QI activities can vary greatly from one project to another and will evolve as a program matures. Organizations in more centralized environments may have different structures from those that operate in more decentralized environments. There is no: "correct" or "best" structure.

According to Deming's Theory of Profound Knowledge, people must be motivated to improve the system and leaders must be pragmatic in their QI efforts. Smart leaders will identify a specific motivation to engage the teams, give them a feeling of ownership, and provide an opportunity to test proposed changes. Even if the test results are unsuccessful at first, leaders should fortify the spirit of ownership and support the teams in their efforts to achieve their goals.

Typical quality improvement structures include the QI team, the quality management (QM) team, the beneficiaries, and the coach(es). (See **Figure 4** for an example.) Subject matter experts (in this context, an expert in the area of medicine or public health that is the subject for improvement) may be added at any time as members of these groups.

We should note that an effective structure may combine different forms. For example, quality improvement teams may be located at the health facilities, whereas the management team may be part of the district or provincial level of the health system. Regardless of the structure's form, its effectiveness depends on five key characteristics:

- Enthusiastic participation by local QI teams
- Genuine interest in the project's management and motivational support from system leaders (district or province)
- Coaching support to local QI teams with expertise in quality improvement
- Expertise in the technical content of the improvement topic
- Inclusion of the voices of empowered clients and other beneficiaries

Supplement 6.1 provides a general description of the roles and responsibilities of the organizations and individuals involved in a QI project. Teams should use **Supplement 6.1** as a template for listing the names of these individuals and organizations. The case study in this chapter describes how an HIV testing and counseling project formed QI teams.

Anticipated risks and mitigation measures

Stakeholders who are part of the QI structure but are not involved in the daily routine can feel frustrated because they are unclear about their roles or because they have been asked to do something that they have not done before (such as measuring the quality of services). In such instances, the roles and responsibilities must be clarified up front, ideally during the charter meeting.

Another common risk is the loss of key individuals during the improvement effort. It is not unusual for some roles to change because of staff rotation at a health facility. The team must address the following questions to mitigate such events: How can the team rapidly engage new staff in the improvement effort? What training (capacity strengthening) is needed for the team members? Who will keep a record of team meetings?

The coach can help clarify these questions for the team. Even if the coach is an internal staff member, he or she must be able to provide what Deming calls "the outside view." A coach should monitor the team's performance and offer suggestions on improving its efforts. The next chapter focuses on the profile selection and the role of the improvement coaches.

Case study: Team Formation in an HIV Counseling and Testing Project

The USAID RESPOND Project is using a collaborative model to improve HIV services for key populations in Ukraine.

In most projects, an improvement effort starts with just a few teams (2 to 5), mostly represented by health facility staff who are asked to try a new approach to their work. In this example, the collaborative model was introduced in a project in Ukraine. The system representatives agreed on the aim during a charter meeting.

Problem statement:
The clients of tuberculosis (TB) specialists in TB dispensaries are not offered HIV counseling and testing (HCT), which results in missed diagnoses and inadequate management of patients who are co-infected with TB and HIV.

Aim:
The aim is to increase the HCT coverage of TB patients (suspected, new, and chronic cases) in the city of Chervonograd.

Improvement objectives:
1. Increase the percentage of clients who receive HIV pretest counseling when they are screened for TB.
2. Increase the percentage of TB facility clients (both suspected TB and confirmed TB cases) who are tested for HIV after they receive HIV pretest counseling.
3. Increase the percentage of confirmed HIV-positive clients who are enrolled in care at a specialized clinic.

Leaders who were associated with HIV and TB care in the city were enrolled as members of the quality management team during the charter meeting. A very committed TB expert who worked at the AIDS Center volunteered to be a coach. Members of the QI teams were enrolled later by members of the project's staff who approached two TB dispensaries in town and asked them to join the improvement effort. Initially, only one doctor and one nurse from each TB dispensary volunteered to be part of the team. Later, with each follow-up visit by the coach, the remaining staff members became engaged in the effort. The team further expanded when an infectious-disease specialist from a primary care center and a social worker joined the effort (see **Figure 4**). The composition of an improvement team and the individual relationships among its members evolve over time.

The role of the QI teams was to improve the services in a process that involved testing and measuring changes aimed at increasing HCT coverage of TB patients. The management team supported the QI teams to develop and expand effective changes across the city. The QI coach interacted regularly with the management and the QI teams. The coach's role was critical in shaping, motivating, and supporting the teams during the visits. The coach also joined in the analysis of the improvement measures and contributed ideas to the improvement effort.

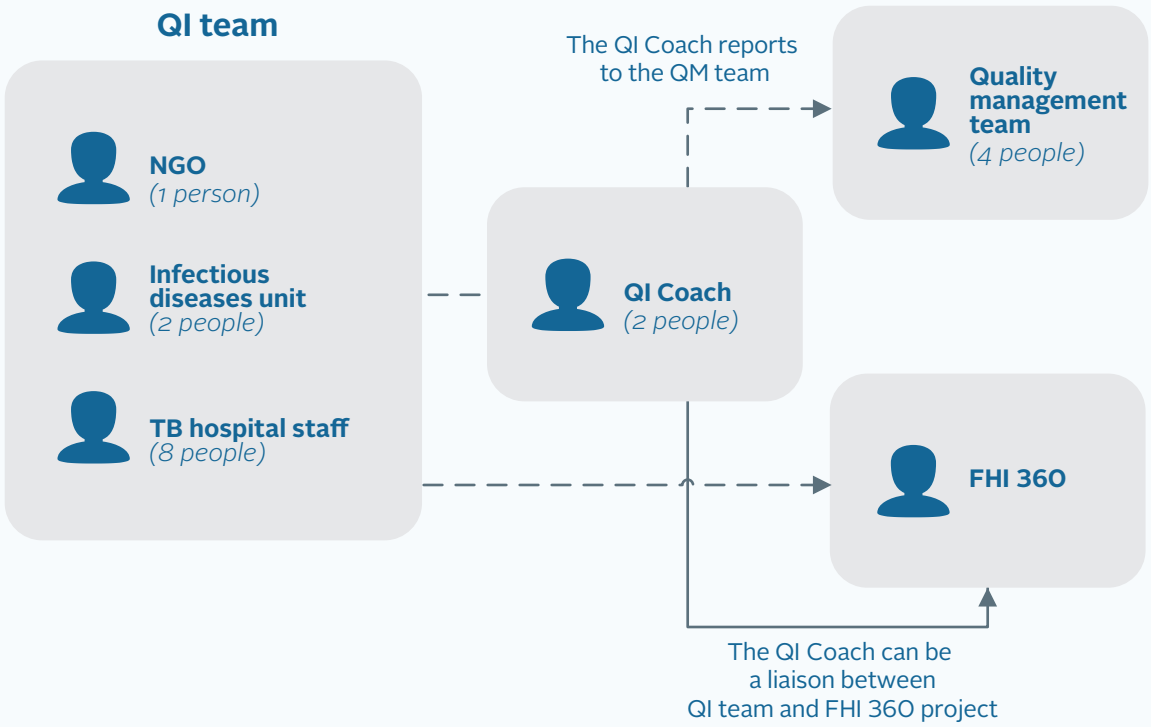
The leader of the team—often the head of a health facility or district—plays a critical role in shaping the team's strength and commitment. The head of the team in the Ukrainian project ensured that the team stayed on course. She reminded the team: We are in the spotlight; we need to show that we are the best!" As the head of a large facility, the leader had a strong reputation and an extensive network that helped the team establish good collaborations with outside facilities. Under the leader's

influence, the team members understood and fulfilled their roles and responsibilities for data collection, communication with outside facilities on HCT, and the provision of counseling.

It is important to include a patient representative on the team. However, QI team members found this requirement challenging to implement in practice and struggled to determine the patient's role. They invited patients to learning sessions but grappled with which sessions were appropriate and how to make the participating patient comfortable in the role.

The infectious-diseases doctor, the nurse, the social worker held monthly meetings and were joined occasionally by the coach and the FHI 360 QI advisors. The management team that was involved in the scale-up of the QI efforts attended the quarterly learning sessions.

Figure 4. Organogram of an Improvement Effort in a TB/HIV Project



Supplement 6.1: Roles and Responsibilities in the Improvement Effort

Region/District:_____Project Title:_____
Facilities:_____Other Organizations:_____

Quality Management Team		• Stay informed about the progress of the QI effort. • Support scale-up of an effective intervention. • Enable institutionalization of effective changes.	• Address issues of sustainability. • Support necessary policy changes. • Attend learning sessions. • Communicate with policymakers. • Provide necessary resources.
Quality Improvement Teams	Team Leader	• Keep the team focused on the aim and charter. • Plan and organize team meetings. • Identify needs for and request additional support. • Document the process (meeting minutes).	• Assign responsibilities to team members. • Liaise with the management team. • Represent the team during the learning sessions.
	Team Members	• Identify the leader of the QI team. • Agree on the improvement topic and aim. • Collect baseline information. • Learn about the improvement model and its tools. • Generate ideas for change.	• Develop an implementation plan for the changes. • Implement changes and monitor their effects. • Provide ideas for modifying the change package during learning sessions. • Serve as coaches to new teams during the scale-up process.
Quality Improvement Experts/ Coaches		• Guide management and QI teams through the steps of the scientific method. • Participate in the development of the QI charter (topic, aim, change package, and measurement strategy). • Teach and coach teams in the scientific method and QI tools during quarterly learning sessions and monthly visits. • Perform quality assurance procedures for collected data during the coaching visits.	• Assist the team in running effective tests of changes. • Assess the project's progress and the team's performance, and identify necessary changes. • Support collective learning throughout the project by sharing reports and information. • Document and evaluate the project and write technical reports. • Identify the need for additional technical assistance and materials.
Subject Knowledge Experts (often part of the management team)		• Participate in developing an improvement charter. • Teach and share evidence-based information at learning sessions.	• Mentor the teams' implementation of technical changes. • Help develop standards of care.
Clients and Beneficiaries (often part of the QI team)		• Identify issues of access and service quality, and communicate these to the QI team. • Provide expert patient opinion on designing user-friendly services. • Help identify changes to test.	• Identify changes in patient behavior and promote them through a network of patients. • Attend learning sessions. • Report on progress to peers.

Chapter 7

QI Coaches

What is the value of a coach?

Building the capacity of local health system partners in improvement coaching is a strategy that increases ownership of the improvement effort and the institutionalization of QI capacity in the system.

In our experience, QI teams rarely succeed without the support of a coach. A QI coach is a person trained in improvement knowledge and skills to guide the work of the QI teams and support the implementation of improvement strategies throughout an organization or system. The contributions of the coach can be seen in the following areas:

- Coaches can bring content-knowledge expertise on specific topics, as well as improvement models and tools to facilitate the implementation of proposed changes.
- Coaches can help organizations sequence and manage the fundamental changes in operation required for improvement.

> *Improvement coaches need to appreciate the human side of change and have an absolute love of being with people.*
>
> *—Robert Lloyd, PhD*

Figure 5. Multiple Roles of the Coach

As in sports, QI coaches inspire confidence, impart knowledge, and motivate their teams. The discipline of coaching focuses on how to help other people develop insights, skills, and capabilities to assess and improve their current health care experiences and system. Coaching is not about "telling" health care professional groups what to do, but rather engaging them in conversations and developing relationships to support self-reflection, exploration of innovations, and actions that result in the desired improvements in health care.[12] Coaches perform multiple functions to support teams in the improvement journey.[13]

Table D lists the characteristics of a good coach. It can be used as an aid in selecting the right coach and in building a coach's skills.

Coach Galina uses a flowchart to clarify an issue with her team. Photo credit: RESPOND Project, Ukraine.

Table D. What To Look for in a Coach

Communication and people skills	System knowledge	Quality improvement skills
• Open to new ideas and experimenting with new ways of doing things • Enjoys working with and empowering people • Active listener • Constructive • Skilled at facilitating discussions and meetings • Able to explain complex ideas	• Has knowledge of the system that is under improvement • Expert in some areas of the work	• Knows how to apply the model for improvement to service delivery problems • Able to use system analysis tools (e.g., flowchart, root-cause analysis) • Skilled in data analysis and interpretation

How are coaches identified?

Establishing a network of QI coaches requires an investment in capacity building through different strategies, starting with the identification of people who have the potential for and interest in coaching.

Approach system leaders for recommendations. In Vietnam, during implementation of the Abundant Health project to improve hypertension and diabetes care, we approached the district health management team to explain our aim of integrating services at the primary-care level. After we shared the ideal characteristics needed in a coach, the district management proposed internal medicine experts from the hospital who conducted supervisory visits to primary care centers and were knowledgeable about hypertension and diabetes. A potential drawback of this approach is that district health managers may not select those who are motivated to act as coaches.

Identify coaches during the charter development meeting. In our experience, it can be very helpful to identify a coach during the charter development meeting. This two-day meeting provides sufficient time to observe and identify participants who exhibit the qualities needed in a coach. Participants in the charter meeting may also volunteer to be a coach (see **Chapter 5** for a description of the charter meeting).

Consider external and internal coaches. The pool of available coaches should include individuals from the facility level and the management level because they have complementary responsibilities. Internal coaches are typically part of a facility's staff (such as nurses or clinicians in a health center), whereas external coaches are typically part

of the management team outside the health facility. Ideally, an external coach has some decision-making power to address issues that are beyond the control of the QI team.

In certain instances, coaches may be active community representatives. For example, in a program designed to strengthen community-based family planning services in Uganda, volunteers were nominated to be coaches by their communities.

What do improvement coaches do?

Coaches can play various roles during each improvement phase (**Table E** and also summarized in column 4 of **Supplement 3.1**).

Table E. Roles of Improvement Coaches

Design phase	Transformation phase	Scale-up and sustainability phase
• Assist teams to identify an improvement aim and objectives. • Promote the roles of specific technical experts in the area to be improved by engaging them in QI efforts. • Help prepare the organizational structure for QI implementation through such activities as advising on team-building, improving communication, and facilitating meetings. • Help people to better understand how their practice compares to the ideal and where it might be improved.	• Help the team plan the changes to be made by (1) encouraging them and suggesting ideas; (2) providing menus of possible strategies or innovations; (3) and helping them choose among all options. • Enable the team to execute changes by (1) providing tools; (2) guiding them through PDSA tests of change; and (3) assisting them when obstacles arise. • Help practitioners to (1) collect and use measurement data; (2) assess the effectiveness of changes that were made; and (3) undertake certain activities (such as run chart review). • Facilitate communication with leaders to promote and support the improvement process.	• Help teams to customize processes to fit their situation and incorporate changes into their day-to-day routines, to increase the likelihood that the changes will be sustained. • Document effective changes and promote them in various forums to enable their adoption at new sites. • Disseminate best practices among the sites.

A frequent challenge for coaches is to maintain clarity on their duties. Coaches often struggle (especially at the beginning) to understand their roles, whereas teams struggle to understand the benefits of having a coach. To help clarify the coach's roles and the expectations of the team at the outset of the project, we created descriptions of the coach's roles and responsibilities (see **Supplement 7.1**) that can be adapted to the needs and context of the situation. It can also be used by the recruiters to describe the job of a coach during interviews.

Coaches should recognize that they are not solely responsible for the success of the improvement effort. It is a complex effort involving the cooperation of the stakeholders, the resources of the system, and the system's openness to change.

How do we build the capacity of a coach?

One should not expect to become a coach after a single training experience, regardless of its duration, the quality of the content, or the skills of the trainers. From our experience, learning and retention of coaching skills are maximized through access to tools and resources, sustained mentoring from a QI expert, and peer support. The development of a good coach takes time and input. FHI 360 has a three-stage strategy for building the capacity of a QI coach that can be adapted to suit a program's resources and context.

Stage 1: Build the individual's interest in being a coach (1–2 months). In the beginning, it can be difficult to identify a willing and capable coach. If you start the training immediately, you may waste resources on individuals who lack the necessary interest or skills. If possible, invest resources in activities that will increase the interest of potential coaches. Get these individuals involved early in the rapid assessment of a facility or program. Make sure you have a mix of leaders and service providers in the process. For example, an improvement advisor in Dushanbe, Tajikistan, engaged district leaders, the deputy chief of a primary care center, a therapist, and a nurse in the design of an assessment tool for hypertension services at primary care facilities. These individuals also used the tool in an assessment and came to recognize that they could improve hypertension services by altering factors that were under their control. The process increased their desire to improve and to be considered as potential coaches.

There are many ways to build the interest of potential coaches before conducting QI training. For example, an experienced QI expert can (1) lead potential coaches on visits to health facilities that need improvement, and then discuss the quality of care; (2) conduct a study tour to a facility or organization where improvement is already part of the system; (3) invite participants to a QI conference; and (4) invite potential coaches to a QI charter meeting, where they can express their knowledge, experience, and ideas for potential improvements, and disseminate a questionnaire at the end of the meeting to identify people who are interested in becoming a coach. These approaches can be very effective. In Fergana, Uzbekistan, for example, a chief of the pediatric unit in the district hospital used QI to improve pediatric care after attending a QI conference. And an HIV collaborative improvement project in Ukraine conducted regional meetings to sensitize stakeholders and identify coaches.

Stage 2: Build capacity building through a three-day training for coaches. After the coaches have been identified, FHI 360 staff members will deliver a three-day training program that combines lectures, practice in the use of tools, and a site visit to practice coaching skills. The training also provides an opportunity to discuss the design of the improvement effort.

By the end of the training, participants will have gained knowledge, increased their interest in QI, and refined their skills in three areas (see **Table F**).

Table F. Outcomes of QI Coaches Training

Quality improvement	QI data collection and interpretation	Communication and facilitation
Participants will be able to: • Explain the MFI model • Develop an aim and improvement objectives • Conduct a system analysis using a flowchart, root-cause analysis, and run charts	Participants will be able to: • Demonstrate the kind of data they will be collecting, how these data will be collected, and how they can analyze and interpret those data for improvement • Test indicators during a health facility visit	Participants will be able to: • Conduct a QI coaching visit • Facilitate a team meeting and explain the goals and objectives of the improvement effort

FHI 360 developed two additional courses that represent a series of eight QI e-learning training modules. The first course, "Journey to Improve Health Care Quality," is grounded on the PDSA-based generic model, and the second course, "Improvement Collaborative," is based on the IHI Collaborative Improvement Model.

Stage 3: Mentor coaches (6–9 months). Further capacity building involves various forms of technical support provided by an experienced QI expert: (1) on-the-job mentoring by a QI expert; (2) assessment and feedback (peer-to-peer, direct observation by a QI expert); and (3) guided implementation of QI demonstration projects.

Supplement 7.1: Sample Position Description for an Improvement Coach

Job Title: District Quality Improvement Coach (25% of job effort)

Basic Function: The Quality Improvement Coach will oversee the effort of multiple teams working to improve the delivery of services.

Job Description:

Support QI teams in the QI effort	• Develop the improvement charter—the aim, objectives, and indicators—and orient new teams or new staff members in the use of the charter. • Support the staff to test and implement changes using a "Plan-Do-Study-Act" template. • Help the facilities and the district tackle challenges that arise during the improvement effort.
Conduct regular coaching visits	• Conduct regular (at least 1 every 2 months) coaching visits and mentor the team to improve services through role playing, observation, and immediate feedback. • Work with the team to validate the data and analyze QI measures using run charts. • Asses the performance/functionality of the team.
Maintain regular communication with the management team and the project	• Maintain regular communication on QI activities via meetings, email, or phone with the management team and the project officer.
Organize and facilitate learning session	• Help teams to prepare for the presentation of their results (storyboards or PowerPoint presentations) at learning sessions. • Facilitate discussions during learning sessions.
Document and report on the QI effort	• After each coaching visit, complete a report and forward it to the team, the project officers, and the district and provincial managers.

Chapter 8

Designing the improvement effort: Establishing a measurement system

Health care is challenged by an information problem—the nature of the data that are collected and the interpretation of those data.[18] The questions posed by the QI model guide users in applying the scientific method to use the data to guide decisions. Such information can help people see what is actually happening in a system—a reality that may differ from their assumptions.

Coaches need to help the teams track their progress toward their improvement goals and monitor their performance on key indicators, or measures, of quality. QI monitoring is an essential part of the improvement effort because it provides the evidence that the changes being tested are effective (or ineffective). As the frontline staff members measure their own performance, their behavior may also change. This process—known as the Hawthorne effect—happens when providers modify their own performance because of frequent self-measurement.

"One of the first tasks for a coach is encouraging a measuring culture among the improvement team members," noted one of our coaches. "The entire team should understand the importance of measurement and work towards institutionalizing the process. Demonstrating how to use measurement data to analyze root causes, empower teams to test changes, and congratulate them on the progress based on data are the ways that will make the measurement meaningful for the team."

QI measurement differs from the more traditional monitoring and evaluation (M&E) approach. Typically, M&E experts design and establish measurement systems for data use

and reporting, but not necessarily to interpret tests of changes to the system. The main goal of measurement in an improvement effort is to quantify the effect of the change(s) being tested.

Coaches should help their teams automate the reports; data collection should become a natural part of the team's existing duties.[18] FHI 360 has developed tools to collect data and develop run charts (see **Chapter 11**) through a simple Excel-based data sheet.

After the coach and the team have designed the measures following a template (see **Supplement 8.1**, Template for Collecting Quality Improvement Indicators), they should test the improvement measures and the data-collection process. The coach will need to help the team identify the information needed for the QI measurement reports and the time needed to accomplish the task, which often includes data collection and calculation of percentages. The coach will also need to help with the training of staff members on these tasks.

The QI teams can follow their progress with a QI "dashboard" (also called a "data wall") or a brief (one- to three-page) graphic summary of the metrics that track each team's processes and outcomes. The metrics are displayed as a "family of measures" on one "board" that reveals overall progress and potential trends. It can be useful to include copies of PDSA cycles (in progress or completed) with the dashboard, so the QI team can easily interpret the effect of the changes.

What are the characteristics of a good QI monitoring system?

The monitoring system should have the following characteristics:

Alignment with the QI aim: Indicators should reflect the aim of the improvement effort, as they do in the following example:

- **Aim:** By March 2017, the program will increase the percentage of eligible patients older than 25 who are screened and treated for diabetes and hypertension at five commune health stations in a Ho Chi Minh City district.
- **Measures:** (1) Percentage of patients older than 25 who are screened for diabetes and hypertension at five commune health stations in a Ho Chi Minh City district; (2) Percentage of patients with hypertension and diabetes who are treated at five commune health stations in a Ho Chi Minh City district.

A systems framework: Indicators can be developed according to Donabedian's Quality of Care Framework,[15] which recommends the measurement of structures (human

resources, buildings, and supplies), processes (health care provision) and outcomes (client satisfaction and health outcomes). IHI recommends also considering balance measures to ensure an improvement in one area isn't negatively affecting another area. **Table G** shows how this framework was used to assess the quality of services for hypertension during a QI effort.

Table G. Indicators of QI in Hypertension Services: A Systems Framework

Structure	Process	Balance	Outcome
Are sufficient resources available to support quality effort?	Are the processes, norms, and functions of our system performing with quality reliably?	What's happening to the parts of the system we aren't currently focused on	How is the overall system performing? What is the result?
Indicators:			
Number of CHS staff trained in hypertension	% of patients screened for hypertension at CHS	% of patients that had to wait to be seen by a doctor at the CHS	% of patients identified as hypertensive

A limited number of measures: The use of no more than five to seven measures will make data collection more feasible. These measures should be clearly focused on the improvement aims and objectives.

Frequent measurements of small samples: Measurements should be made at least once a month; frequent measurement will help the team observe the effects of their changes sooner. It is not necessary to measure the indicators for all the patients (or all the "improvement units"); small samples can provide a sufficient level of precision.

A random sample may be appropriate in some situations, but a judgment sample should be considered first. For example, assume the aim is to reduce waiting times for patients, and the longest waits usually affect patients who arrive after 10:00 am. In this case, the sample should be drawn from this segment of patients only, and it might focus on the first five patients who arrive after 10:00 am. If random sampling is used, a monthly random sample of all registered patients who visited the health facility (the sampling database) should consist of no less than 30 individuals.

Coaches ensure the quality control of data: Teams might make measurement errors at the beginning if the indicators are not part of the usual health information system. The QI coaches should verify the accuracy of the data through a quality assurance process. The quality assurance should be based on samples of the data, and analysis of these data should be included in the coaching visits.

Appropriate job aids are used to collect data: QI teams should use an indicator form (see **Supplement 8.1**, Template for Collecting Quality Improvement Indicators) to facilitate data collection and minimize errors.

Plot data on run charts: A run chart providing a visual display of the data is commonly used by QI professionals as an analytical tool. Run charts provide an objective overview of the changes and potential improvements with minimal mathematical complexity. This method of analyzing and reporting data is more useful than traditional aggregate summary statistics, which do not reflect the chronological order of events. Because of its utility and simplicity, a run chart has a wide range of applications in health care for practitioners and decision-makers. (See **Chapter 11** for more on developing and analyzing run charts for QI.) All members of the team should be involved in the collection and interpretation of the data on a run chart.[17] (See the case study, *Measuring an improvement effort in Ukraine*.)

What templates are available for the collection of data?

The indicator form (see **Supplement 8.2**) standardizes the QI monitoring system so that all users can measure the indicators in the same way, eliminating the risks of personal interpretations and differing data-collection methods. In **Supplement 8.1**, the fourth column describes the step-by-step process and the sources of the data for determining the denominator (to be collected first) and the numerator.

The indicator form covers a year of monthly tracking for each indicator; the form can be easily automated with software (such as Excel) to generate the run charts automatically.

Who collects the data?

We encourage the whole improvement team to be engaged in data collection, but teams can decide to delegate this task to one or two members well-versed in data collection. For example, in the Ukraine HIV project, a nurse who was involved in the QI effort was appointed as a collector of improvement data and was trained by the coach to do so.

What are some of the risks and mitigation measures?

Some health providers may resist the practice of measuring and discussing their own performance. In most instances, however, the activity rapidly becomes an engaging tool for generating ideas for improvement. There is also a risk of data collection errors that can be minimized by simplifying data collection and keeping samples small.

Case study: Measuring an Improvement Effort in Ukraine

A QI team developed several improvement measures (see the box below) with the assistance of their coach. The measures were tested at the primary care facility to make sure they were useful, clear, and feasible to collect.

Process measures

- Percentage of clients who received HIV pre-test counseling after a TB screening
- Percentage of facility clients (with suspected or confirmed TB) tested for HIV after HIV pretest counseling
- Percentage of clients who received post-test counseling with test results

Outcome measures

- Percentage of confirmed HIV-positive clients who enrolled in care at a specialized clinic

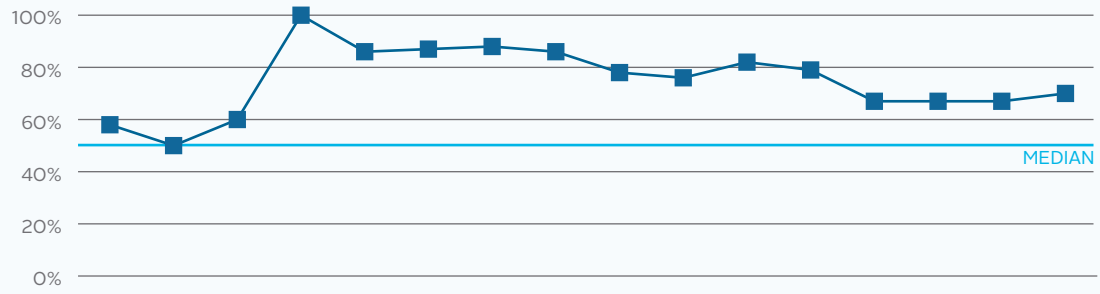
The simple act of collecting data can empower staff members to improve and change their practices. For example, a nurse who was responsible for data collection developed the habit of making weekly calls to the nurse at the infectious disease unit. These calls helped to ensure that all TB clients who were referred for HIV testing reached the unit for a blood test; the nurse would also ask whether the test results were ready. The same nurse established check-in calls with the AIDS center to ensure that people living with HIV were enrolled in care. According to the nurse, "Measuring motivates people to work better; it makes them more organized and gives them the opportunity to be proud of results."

The measures that were displayed as run charts helped the team compare the trends before and after the intervention. They were able to brainstorm new ideas for other changes and test them using the PDSA cycle. For example, the run chart below (**Figure 6**) shows the percentage of TB patients who received pre-test counseling, a service that was not offered before the improvement effort. The boxes in the run chart show the different changes that were introduced and tested. The trend line allows the team to make inferences about the effectiveness of their changes.

The analysis of the run chart shows that just measuring triggered the staff to offer counseling at to about half of the TB patients. Further changes, such as introducing a local HIV counseling protocol and shifting the task of counseling from doctors to nurses enabled them to ensure that at least 80 percent of TB patients received counseling. Later there was a decline in counseling coverage related to the increased volume of patients at the facility.

Team members and their coach review data at a primary care facility in Zaporojye, Ukraine, 2015. Photo credit: RESPOND project.

Figure 6. Percentage of Chervonograd TB Dispensary Clients Who Received HIV Pretest Counseling



	Apr '13	May '13	Jun '13	Jul '13	Aug '13	Sep '13	Oct '13	Nov '13	Dec '13	Jan '14	Feb '14	Mar '14	Apr '14	May '14	Jun '14	Jul '14
Measure 1	58%	50%	60%	100%	86%	87%	88%	86%	78%	76%	82%	79%	67%	67%	67%	70%
Denominator	12	6	5	6	14	23	32	22	9	17	11	29	6	9	6	10
Numerator	7	3	3	6	12	12	20	28	19	7	13	9	23	4	6	4

Supplement 8.1: Template for Collecting Quality Improvement Indicators and Example

Name of Indicator: _____
Indicator #: _____
Template:

Improvement Objective or Standard	Operational Definition of Indicator	Composition of the Indicator	Calculation: Steps and Sources of Data

Example:

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Numerator (N)												
Denominator (D)												
N/D x 100												

Unit of the indicator (number, percent, other):
Frequency of data collection:
Person(s) responsible for data collection:
Potential issues:

Name of Indicator: STI cure rate
Indicator #: STIQual 1

Improvement Objective or Standard	Operational Definition of Indicator	Composition of the Indicator	Calculation: Steps and Sources of Data
Patients diagnosed with an STI are treated according to the national guidelines of the Ministry of Health; patients are cured within 7 to 14 days after beginning the medical treatment.	The cure rate expresses the proportion of people with an STI whose clinical signs and symptoms have disappeared within 7 to 14 days after beginning the medical treatment.	**Denominator (D):** Total number of patients treated for an STI at the facility during the month prior to the previous month (2 months ago). For example: In June, collect this information on STI patients who were seen in April.	1. Use the register of the facility. 2. Count the number of patients treated for an STI 2 months earlier. 3. If more than 30 patients were treated, randomly select 30 patients from the list and retrieve their medical records; record "30" as the denominator (**D**) in the table below. 4. If less than 30 patients were treated, retrieve all their medical records and record this number as the denominator.
		Numerator (N): Number of STI patients seen at a follow-up visit in the previous month who were determined to be cured.	5. Review all the retrieved medical records and count the number of patients who came back for follow-up and were cured. 6. Record this number as the numerator (**N**) in the table below.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Numerator (N)												
Denominator (D)												
N/D x 100												

Unit of the indicator (number, percent, other):
Frequency of data collection:
Person(s) responsible for data collection:
Potential issues:

Part 3

SUPPORTING TRANSFORMATION BY TESTING CHANGES

Confronted with an issue, many health managers first respond by attempting more of the same (more resources, more supervision, more training, and so on) or they become so preoccupied with trying to define the perfect solution that nothing gets done. Generating new ideas and testing changes are some of the most important processes in an improvement effort. These change ideas should also be detailed enough to be tested. Part 3 consists of three chapters that focus on making the changes needed to improve a health system. These chapters will explore different ways to identify potentially useful changes, how to test the changes, and how to assess the results of the tests. This section includes various tools that provide an opportunity for a coach to practice improvement approaches and to build rapport with his or her team. In turn, the tools can provide the team with a different perspective on issues, to stimulate new ideas and generate alternative solutions.

Chapter 9

Identifying potential changes using QI tools

Although improvement requires change, not all changes lead to improvement. So, we must test any changes that we introduce to a system before deciding to adopt them. A team can generate ideas for changes using system analysis tools, recognized best practices, a list of change concepts, or literature reviews. In this chapter, we highlight several tools that coaches can use to facilitate discussions with their teams and identify potentially successful change ideas.

The American Society for Quality provides a list of fundamental QI tools—including procedures and examples—that are available from the society's website.[19] This chapter focuses on the tools we have found most useful: system modeling, flowcharts, root-cause analysis, and change concepts. Most of the descriptions have been adapted from *A Modern Paradigm for Improving Healthcare Quality*.[20]

SYSTEM MODELLING

What is system modeling?

By thinking about our daily work as a system, we gain insights for making improvements. **System modeling** shows how a system should work by examining how various parts are connected to produce a particular result. The term is specific to the QI field and has much in common with the logic model used in program management as well as by M&E experts. System modeling produces a visual representation and a holistic perspective on a system—often called a "systems view"—organized under three components: inputs, processes, and outcomes.

- **Inputs** are the resources used to carry out the activities. Inputs can be raw materials, products, or services produced by other systems. For example, in the TB outpatient treatment system, inputs include anti-TB drugs (the products of the drug- production system) and skilled health workers (products of the education system).

- **Processes** are the activities and tasks that turn the inputs into products and services. For TB management, this process would include the tasks of screening a coughing patient for TB, collecting sputum, making a diagnosis, prescribing treatment, and directly observing the intake of medicines by a patient.

- **Outcomes** are the results of processes and are of three types: outputs, effects, and impacts.
  - **Outputs** are the direct products or services produced by the process. The outputs of the TB treatment system are patients who receive TB treatment under direct observation of the health providers or patients who are identified because they experience side effects of TB treatment.
  - **Effects** are the changes in client knowledge, attitudes, behavior, or physiology that result from the outputs. For the TB treatment system, the desired effect is successful completion of treatment with no interruption.
  - **Impacts** are the long-term and still more indirect effects of the outputs on users and the community at large. For TB, the impact would be a decrease in TB mortality and in the number of resistant cases in the population.

When is system modeling used?

When teams are just beginning an improvement effort and are uncertain about where to start, system modeling can help them locate problem areas or analyze problems by showing the linkages among various parts of a system. System modeling can also identify the data needed to measure indicators of inputs, processes, and outcomes. Finally, system modeling is helpful for identifying the gaps between the ideal and the current system and for generating ideas for changes. For example, a team in Kyrgyzstan aiming to improve outpatient TB care developed an ideal system model (see **Table H**). They highlighted in blue areas that could be changed to improve the performance of the entire system of care.

Table H. Example of a System Model of TB Management at the Primary Care Level

Inputs	Processes	Outcome		
		Output	Effect	Impact
Primary care centers Laboratory Guidelines for TB treatment of patients at the outpatient level TB drugs Sputum containers **Drugs to manage side effects of TB treatment at the TB center** **Job aids to identify and manage side effects of TB treatment** Trained personnel TB registry and patient charts	Triage of coughing patients Sputum collection Confirmation of diagnosis Prescription of treatment **Directly observed therapy (DOT) by a nurse** **Management of side effects of TB treatment**	**Patients receiving TB treatment under DOT** **Side effects of treatment are identified**	Successful completion of treatment	Decreases in TB mortality and cases of resistant forms of TB

The system map

An alternative to a system model—a tool called a "system map"(adapted from QLA's What is Quality Learning?[21])—can help a team envision the players, processes, and other components of a new improvement effort. The system map is used to create a shared direction (purpose, vision, and values) and understanding among the key stakeholders of an organization.

The system map is a pictorial representation of the elements that comprise an organizational system. The map can facilitate understanding of the critical elements in such a system and their interrelationships within organizations. The system map is a powerful way to develop "systems thinking," and it provides an excellent foundation for the strategic planning of a new effort.

The system map in **Figure 7** was developed by district stakeholders in Kyrgyzstan who wanted to mobilize district-level organizations and resources to improve the TB treatment

success rate. The exercise became the foundation of the TB improvement charter. The team used the system map to reveal the district's activities and to advocate for additional support from the local government for TB patients' economic and social needs.

Figure 7. System Map of TB Treatment in Kyrgyzstan

How is a system model analyzed?

A coach can review the various elements of a system with the team and discuss whether the elements are functioning properly using questions in the box to the right. These questions can be used with a system model or a system map.

Teams tend to depict an ideal system model. By comparing the ideal with the current system, they can generate ideas for improvements. Teams can use the data to identify weak or missing components and broken connections between parts of the system.

Box 3. Questions for analyzing a system model

Are the inputs or resources adequate?

Are existing standards being met?

Are processes conducted as expected?

What data are needed to determine whether the system is working well enough to achieve the desired outcomes and impacts?

For example, in Kyrgyzstan, a systems view revealed a lack of job aids and medicines for managing the side effects of TB treatment at the primary care level. Because TB medicines were stored at the TB center, the primary care providers assumed that patients would go to a TB center if they experienced side effects. The team responded by developing a job aid to help family doctors and nurses identify and manage side effects and by making the drugs for the management of side effects available at primary care centers.

Preventing errors in modeling systems

To prevent errors in a modeling system, teams should involve people who know the system well and should ask external reviewers to validate the system.

The entry point for system modeling is either a process or the impact, depending on how your improvement aim is stated. The other components of the system are usually identified by working backwards, from impact to inputs. If team members start with the process (all steps at the facility level) instead, they can then develop a list of expected outcomes (outputs, effects, and impacts) and add the inputs necessary to perform the steps.

EXAMINING PATIENT FLOW

What is a flowchart and when should it be used?

A **flowchart** is a graphic representation of how a process works. A **process** is a series of sequential tasks, or steps, designed to achieve a defined outcome. Even the simplest flowchart includes a sequence of steps.

Most health providers know their part of each process they are involved in, but they rarely take the time to understand how the rest of the process works. This can lead to confusion, mistakes, needless complexity, and lack of agreement on how services are delivered.[20] Creating a flowchart through group discussions can help teams:

- Clarify current processes (the real process) and how they could be improved (the ideal process)
- Identify the key elements of a process
- Draw clear boundaries between the end of one process and the beginning of the next one
- Establish a common understanding about the process
- Reveal steps that are redundant, missing, or misplaced
- Identify team members who should be involved in the improvement process
- Identify those who provide and receive inputs or resources
- Establish key areas for monitoring or data collection
- Generate hypotheses about causes
- Examine the flow of patients, information, materials, clinical care, or various combinations of these elements
- Identify areas for improvement or increased efficiency

Examples of flowcharts

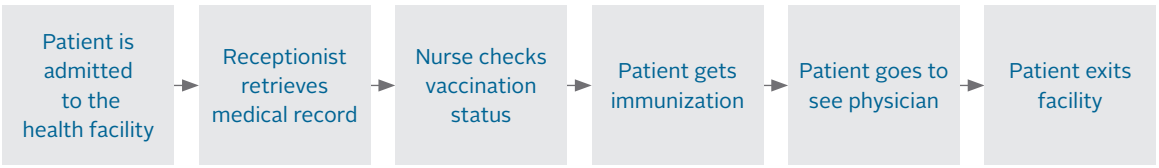
The types of flowcharts that can be used include: high-level, detailed, and deployment flowcharts.

A **high-level flowchart** shows the major steps in a process. It is useful for identifying appropriate members for the QI team. It can also be used to develop indicators to monitor a process.

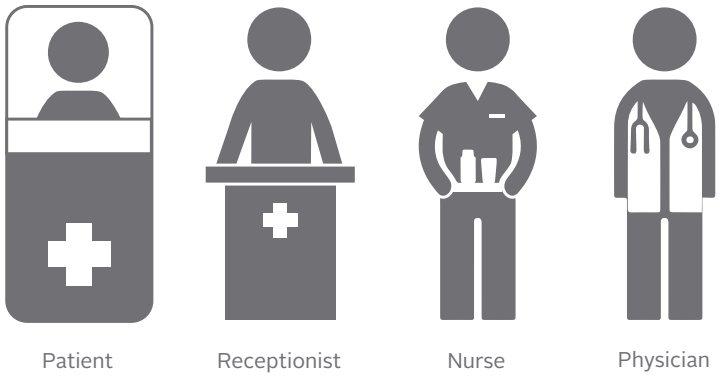
Most processes can be adequately portrayed in four or five boxes that represent the major steps or activities. In fact, it is a good idea to use only a few boxes, because doing so forces one to consider the most important steps. **Figure 8** shows an example of a process for immunizing children in a health facility and displays the staff in charge of important

support functions. Together, these staff members will form the QI team. Teams often start from the high-level flowchart, and then add details. For example, the QI team may start with the flowchart shown in **Figure 8**, and then explore the substeps between a patient receiving an immunization and exiting a facility.

Figure 8. The Immunization Process at the Health Facility



All who are involved in the immunization process at the health facility

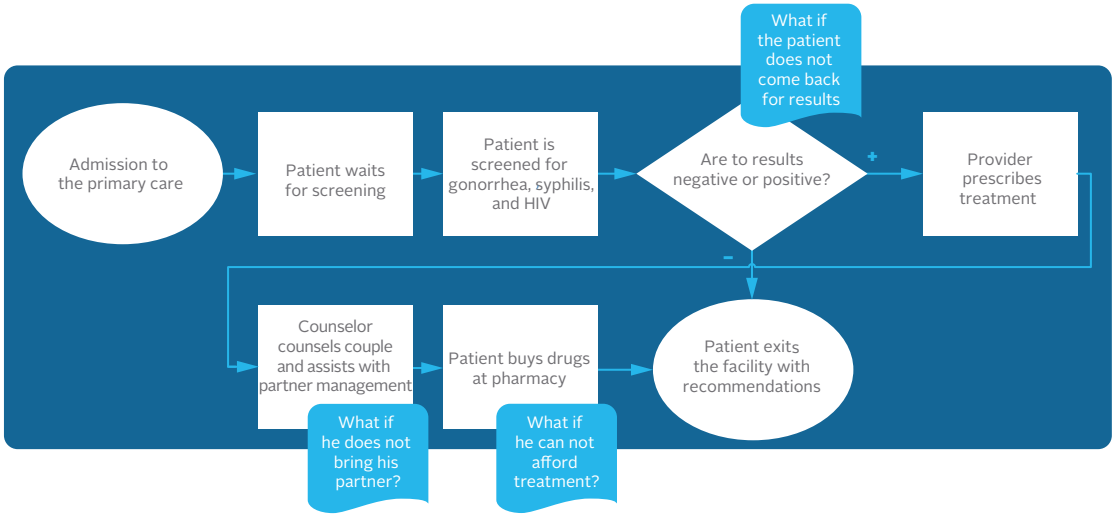


A **detailed flowchart** maps all the steps and activities that occur in a process, including such information as decision points, waiting periods, tasks that frequently must be redone, and bottlenecks. This type of flowchart is useful for examining a process in detail and for looking for inefficiency and other problems.

The detailed flowchart in **Figure 9** describes process of providing care to a male STI patient. The objective is that all males are screened for three STIs (gonorrhea, syphilis, and HIV), and those with positive test results receive treatment.

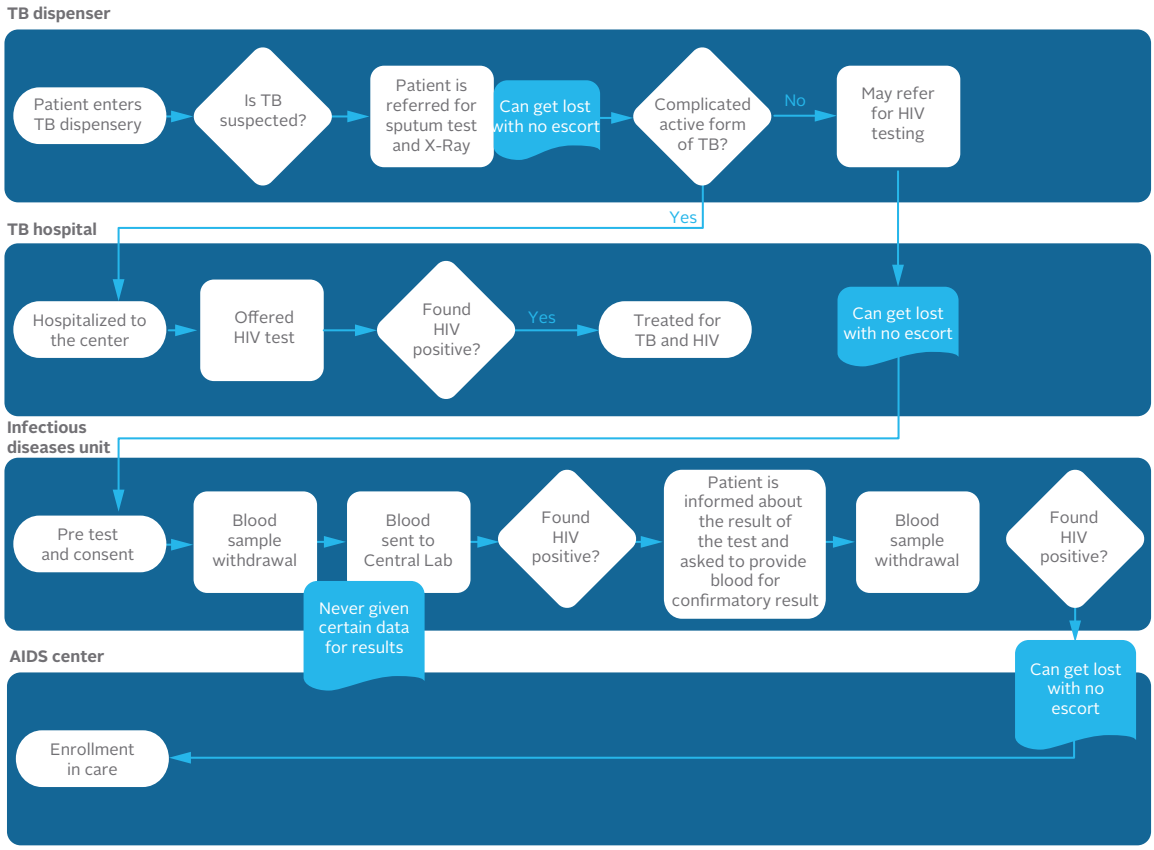
The blue boxes show where patients might encounter problems that could affect patient care. For example, patients often must wait for screening by a medical worker. After they are screened for STIs, some patients may not return for their results. Patients may not bring their partners for testing and care, making partner notification more difficult, and some patients may not be able to afford a full course of STI treatment.

Figure 9. Detailed Process of the Care Provided to a Male STI Patient



A **deployment flowchart** (also called a "cross-functional" flowchart) maps out the process in terms of who is doing the steps. It is in the form of a matrix, showing the various participants and the flow of steps among them. This type of flowchart is most useful in identifying who is providing inputs or services to whom and areas where different people may be needlessly doing the same task. In our experience, it is one of the most useful tools, especially for a health system where multiple staff members (and sometimes multiple facilities) are involved in the management of a condition. **Figure 10** shows a deployment flowchart depicting patient flow for HIV counseling and testing (HCT) of suspected TB patients in Ukraine.

Figure 10. Patient Flow for HIV Counseling and Testing for Suspected and Confirmed TB Patients in Chervonograd



Several aspects of the patient flow depicted in **Figure 10** created a substantial risk of patient loss (flagged in the blue boxes):

1. When suspected (or confirmed) TB patients reached a TB doctor, the TB doctor prescribed tests to confirm TB, but was reluctant to provide HIV counseling for several reasons: a lack of certified HCT training, a lack of job aids, and a lack of resources for HIV rapid tests at the TB facilities.
2. If a patient had the complicated active form of TB, the patient was referred to a regional TB center; HIV testing was offered only at this secondary level.
3. TB doctors could potentially refer a patient to a primary care center's infectious disease unit, which has a mandate to provide HCT and a laboratory for drawing blood. However, some referred patients did not go to the infectious disease unit, which is part of a separate primary health facility.

4. If a patient did arrive at the infectious disease unit, it typically took about two weeks to receive HIV test results based on an immunofluorescence assay (IFA).
5. Often the laboratory could not provide the exact date when the results would be ready, and some patients returned to find that their results were not available.
6. If a patient tested positive for HIV, she or he was again referred to the infectious disease unit for post-test counseling.
7. The patient was also asked to provide blood for a confirmatory test and to return for those results. If the positive result was confirmed, the patients were referred to the provincial AIDS center for enrollment in care.

As individuals from different parts of the system developed this flowchart together, they realized that the delivery of a fairly simple service—HCT—was fragmented and unnecessarily complicated, resulting in an increased risk of patient loss to follow-up. The deployment flowchart gave the team ideas for simplifying the patient pathways and decreasing the risk of patient loss to follow-up.

Each type of flowchart has its strengths and weaknesses. The high-level flowchart is the easiest to construct, but may not provide sufficient detail to identify targets and ideas for changes. If you are unsure which to use, start with the high-level flowchart, and then consider the detailed and deployment flowcharts.

Preventing errors in the flowchart's processes

Flowcharts for quality improvement should always reflect the actual process (what really happens), not the ideal process. Involve people who know the process—as consultants while the flowchart is developed or as reviewers when the chart has been completed.

Another common error is creating a flowchart of a process that is outside the focus of the improvement objective. For example, a flowchart of a facility-based care process would not help a team address loss to follow-up among patients who are not involved in facility-based care. Be sure that the flowchart focuses on the identified problem—the process that needs improvement.

ROOT-CAUSE ANALYSIS

What is root cause analysis and when should it be used?

Root-cause analysis (RCA) gives coaches and teams information about causal factors influencing the improvement aim and related processes. Constructing an RCA diagram allows them to develop a visual theory about potential causes and effects that can generate ideas worth testing empirically, using PDSA cycles.[20]

Root-cause analysis generates and sorts hypotheses about possible causes of problems within a process or system. The RCA lists all the possible causes and factors that affect a problem, validates them, and then prioritizes the ones most important for resolving the problem.

An RCA uses different graphic representations, such as a cause-and-effect diagram or a driver diagram. These diagrams organize large amounts of information by showing links between events and their potential or actual causes. The diagrams also provide a way to generate ideas about why a problem is occurring and its possible effects. They identify factors that, when addressed, would lead to the desired standard of system performance.

Each team member's ideas can find a place on the diagram, so a cause-and-effect analysis can help teams reach a consensus about the cause(s) of a problem. A cause-and-effect analysis can help focus attention on where a problem is occurring and allow for the constructive use of the facts revealed by reported events. However, it is important to remember that a cause-and-effect diagram is a structured way of expressing hypotheses about the causes of a problem (or why something is not happening as desired). It cannot replace empirical tests of the hypotheses, because it specifies possible causes rather than the root cause.

How is a root-cause analysis conducted?

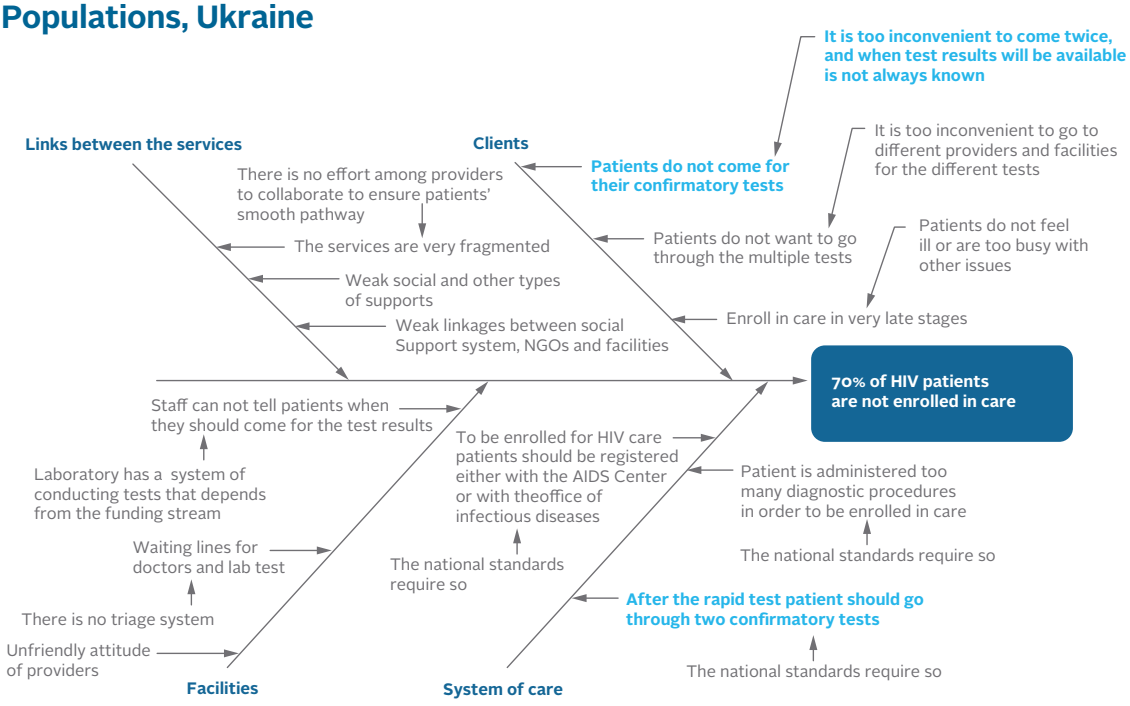
There are two ways to graphically organize ideas for a cause-and-effect analysis: a *fishbone* (or Ishikawa) *diagram* and a *driver diagram*. A fishbone diagram is useful when a team has mistakenly focused on "bad" people as the cause of a problem. A fishbone diagram can help broaden the team's thinking, because it is organized around categories of causes.

The **fishbone diagram** will help a team to brainstorm about possible causes of a problem, accumulate existing knowledge about the causal system surrounding that problem, and group causes into general categories. Several categories of causes can be applied in a fishbone diagram. Some commonly used categories include (a) human resources, methods, materials, measurements, and equipment; (b) clients, workers, supplies, environment, and procedures; and (c) what, how, when, and where. The group should choose the categories that are most relevant and add or drop categories as needed.

The categories can also be organized according to the building blocks of the health system: leadership/governance, human resources, health information systems, equipment and supplies, financing, service delivery, and community. This type of organization will promote systems thinking and cover all the functions of a health system.

The team in Ukraine conducted a fishbone analysis (see **Figure 11**) to explore the root causes of low enrollment of key populations in HIV care. The categories they chose were identified as follows: 1) system of care; 2) facilities; 3) clients; and, 4) links between health services. The analysis revealed that the roots of many issues could be found in rigid national standards and policies that should be tackled in the long term. But it also helped the team members identify at least two root causes that were under their control and could be addressed in the short term (highlighted in blue). Instead of asking a patient to return for a confirmatory test, providers offered to withdraw blood for the confirmatory test during the first visit. Secondly, a specialist at the primary care center and nurses at an AIDS center decided to have check-up calls to ensure that HIV-positive patients were not lost to follow-up.

Figure 11. Root-Cause Analysis of Low HIV Care Enrollment Among Key Populations, Ukraine



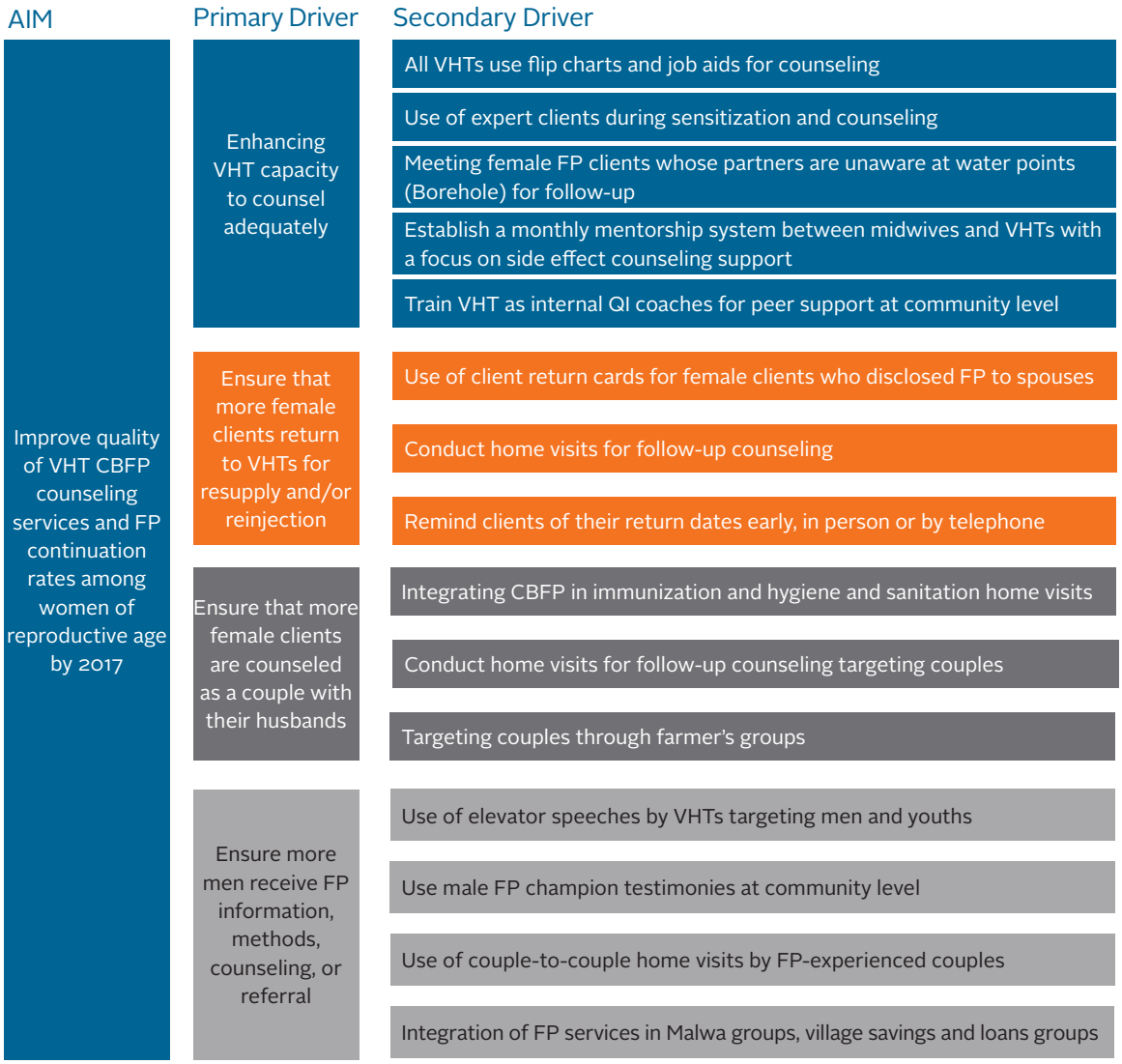
A **driver diagram** is another tool for displaying a team's theory for improvement that helps team members focus on the cause-and-effect relationships that exist in complex situations. It provides a simple way to break down improvement aims into well-defined drivers that can then form the focus of improvement efforts. A typical driver diagram includes:

- The aim or goal of the improvement effort
- The primary drivers—the direct influences (positive or negative) on the goal or aim

- Secondary drivers—the interventions or specific actions that will affect the drivers
- The relationship arrows show the connections between drivers and interventions. A single intervention may affect several drivers.

A driver diagram can identify factors that negatively affect an issue (a root cause) and provide solutions by presenting the positive factors (drivers) that influence the improvement aim.

Figure 12. Driver Diagram for Uganda Community-Based Family Planning



The driver diagram shown in **Figure 12** was developed by a team in Uganda to illustrate a shared theory of how to reach the aim of improving the quality of community-based family planning (CBFP) services provided by village health team workers and the continuation rates for FP use among reproductive-age women. The team identified four primary drivers that have direct influences on the improvement aim: 1) adequate counseling on FP; 2) women's return for FP resupply; 3) encouraging couple counseling ; and, 4) sensitizing more men on FP. Before using this tool, the team had a poor understanding of the connections among primary drivers, secondary drivers, and the aim and had limited ideas for interventions or changes. The driver diagram helped the team members see alternative ways to address recurrent issues and test them through PDSA.

Preventing errors in root-cause analysis

A team may feel discouraged and overwhelmed when conducting an RCA as they identify multiple causes of a problem. Coaches should guide their teams to focus on the root causes that can be addressed, as in the example of the Ukraine team. Remember that cause-and-effect diagrams represent hypotheses about causes, not facts. Failure to test these hypotheses (treating them as if they were facts) often leads to implementation of ineffective interventions and wasted time.

A team must collect data to test its hypotheses, determine the root cause(s), and find out whether proposed interventions have the intended effect. The problem, which is the "effect," should be clearly articulated to produce the most relevant hypotheses about the cause(s). If the problem is too general or ill defined, the team will have difficulty focusing on it, and the diagram will be large and complex. It is best to develop as many hypotheses as possible so that no potentially important root cause is overlooked. Be sure to develop each branch fully. If this is not possible, then the team may need more information or help from others to fully develop all the branches of the diagram.

CHANGE CONCEPTS

What are change concepts?

Using a list of **change concepts** that help stimulate new ideas has proved a major contribution to the science of improvement. A *concept* is an abstract notion (approach, thought, belief, or perception) carried out through a more specific idea. A *change concept* is a general notion or approach to change found to be useful in developing specific ideas for changes that lead to improvement. A *change idea* is the specific change that a QI team wants to test to determine whether it leads to improvement before adopting and sustaining it.

Table I shows the differences and some of the possible links between a change concept and a change idea through three examples. In these examples, the team began by suggesting the first three change ideas to solve the problems identified in the first column. Each one of these ideas relies on a change concept that, when made explicit, helped the teams generate additional ideas that might also be worth testing.

Table I. Change Ideas and Change Concepts

Problem	Change idea # 1	Change concept	Change idea # 2
Not enough doctors to deliver ART services	Have the nurses prescribe ART	Task-shifting	Test ART service delivery by home-based care providers
Variations in TB screening rates of HIV patients across wards	Have all wards use the same TB screening tool	Standardize processes	Have all wards perform rapid TB screening before sending patients for- x-ray exams
ART patients missing appointments	Contact patients by phone 3 days before their appointments	Use reminders	Ask a community health worker to remind patients the day before

How should change concepts be used?

The list of 72 change concepts below must be considered within the context of a specific situation, and then turned into a change idea. The idea needs to be specific enough to describe how the change can be tested and implemented in the specific situation.

Understanding and knowledge of the particular circumstances should always be the determining factors in assessing the appropriateness of a change concept. The following list can be used by coaches to help a team develop ideas and to stimulate creativity. A full explanation with examples for each change concept is provided in the Improvement Guide by Langley, et al.,[1] and some examples can also be accessed online at: http://www.ihi.org/knowledge/Pages/Changes/UsingChangeConceptsforImprovement.aspx

List of change concepts *(from Langley et al, The Improvement Guide)*[1]

1. Eliminate things that are not used
2. Eliminate multiple entries
3. Reduce or eliminate overkill
4. Reduce controls on the system
5. Recycle or reuse
6. Use substitution
7. Reduce classifications
8. Remove intermediaries
9. Match the amount to the need
10. Use sampling
11. Change targets or set points
12. Synchronize
13. Schedule into multiple processes
14. Minimize handoffs
15. Move steps in the process close together
16. Find and remove bottlenecks
17. Use automation
18. Smooth workflow
19. Do tasks in parallel
20. Consider people as elements in the same system
21. Use multiple processing units
22. Adjust to meet peak demand
23. Match inventory to predicted demand
24. Use pull systems
25. Reduce choice of features
26. Reduce multiple brands of the same item
27. Give people access to information
28. Use proper measurements
29. Take care of basics
30. Reduce demotivating aspects of the pay system
31. Conduct training
32. Implement cross training
33. Invest more resources in improvement
34. Focus on core process and purpose
35. Share risks
36. Emphasize natural and logical consequences
37. Develop alliances and cooperative relationships
38. Listen to customers
39. Coach the customer to use a product/service
40. Focus on the outcome to a customer
41. Use a coordinator
42. Reach agreement on expectations
43. Outsource for "free"
44. Optimize the level of inspection
45. Work with suppliers
46. Reduce setup or startup time
47. Set up timing to use discounts
48. Optimize maintenance
49. Extend specialist' s time
50. Reduce wait time
51. Standardization (create a formal process)
52. Stop tampering
53. Develop operation definitions
54. Improve predictions
55. Develop contingency plans
56. Sort product into grades
57. Desensitize
58. Exploit variation
59. Use reminders
60. Use differentiation
61. Use constraints
62. Use affordances
63. Mass customize
64. Offer product/service any time
65. Offer product/service any place
66. Emphasize intangibles
67. Influence or take advantage of fashion trends
68. Reduce the number of components
69. Disguise defects or problems
70. Differentiate product using quality dimensions
71. Change the order of process steps
72. Manage uncertainty, not tasks

In practice, teams (with the help of a coach) can review the checklist of change concepts to identify the ones that might be particularly useful for their improvement project. This is done at the stage prior to the use of the PDSA cycle in brainstorming sessions where the concepts can help generate change ideas. The list above is not exhaustive, and additional change concepts can always be identified.

Preventing errors when generating ideas

The most common "error" that teams make when generating ideas for changes is to identify interventions only. For example, teams might suggest training service providers in a new treatment guideline. Training is an intervention that will likely contribute to building the knowledge and skills of providers. However, the change is the new treatment itself, and implementing this change will require more than training, including interventions such as developing new job aids, adapting forms for supervisors, and adding indicators to the health information system. It is important to not confuse "change" with "interventions." For example, introducing weekly preventive maintenance of the CD4 machine is a change, while training lab technicians in preventive maintenance of the CD4 machine is an intervention. This distinction between change and intervention will be clearer to coaches and team members after they complete the planning of how to test a change using the PDSA tool (in the next **Chapter 10**, see **Supplement 10.2**).

Chapter 10

Testing and implementing changes

Once a change has been identified, it should be further explored and refined through testing on a small scale and observation of how the system reacts to the change over time. The PDSA cycle of improvement (see **Figure 13**) is based on trial and learning and is meant to guide a team in testing the effects of changes.

What is the PDSA cycle of learning and improvement?

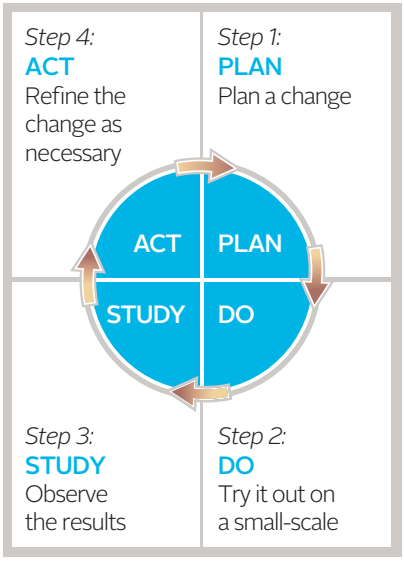
The model for improvement introduces us to the principle of testing our changes while monitoring outcome and process measures to determine whether the changes could lead to an improvement. Testing also allows us to make any necessary modifications to our original idea before adopting a change.

We test changes using the PDSA cycle, also known as Shewhart's Cycle for Learning and Improvement. The PDSA cycle (**Figure 13**) is a scientific approach that enables a team to try a potential solution on a small scale before a system-wide implementation.

When should a change be tested?[22]

- One has a change idea in mind, but it has not been tried by others.
- Others have achieved great results with the idea, but in a different context.
- The change involves people who are not open to doing something different. (They may be afraid of negative consequences.)

Figure 13. Anatomy of PDSA



Each step of the PDSA cycle consists of several activities, as shown in **Figure 14**.

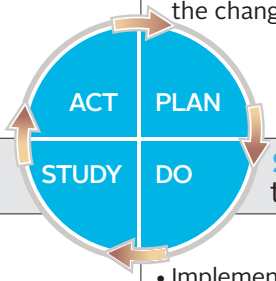
Figure 14. PDSA Activities by Step

STEP 4. ACTING is a decision-making process that depends on the results of the test:

- If the change leads to the desired results, then it is sustained at the test sites and the team plans to expand the change to other sites in the system
- If the change does not lead to the desired results (no improvement/not enough improvement/side effects/resistance), then the team needs to:
  - Verify that the change was carried out as planned
  - Identify potential factors that might have influenced the implementation
  - Consider redesigning the change or testing another change

STEP 1. PLANNING the test requires preparation for:

- Implementation of the change—who will do what, when, where, and how
- Communication of the change and its implementation plan, including its rationale
- Documentation of the implementation
- Measurement of the improvement indicators
- Evaluation of the effectiveness of the change



STEP 3. STUDYING the test involves answering four questions:

- Was the change tested/implemented as planned?
- Are the data reliable?
- Has an improvement occurred?
- Did the change achieve the predicted or desired results?

STEP 2. DOING the test means:

- Implementing the change on a small scale
- Recording information about the process of implementation as described in the plan
- Collecting data and beginning the analysis

We strongly recommend using IHI's PDSA worksheet to document PDSA steps (see **Supplement 10.1** at the end of the chapter). An example of a plan for one PDSA cycle is shown in **Supplement 10.2**.

Repeated use of the PDSA cycles

The following are some **principles of planning** small PDSA cycles:

- Plan multiple cycles to test a change.
- Think a couple of cycles ahead.
- Initially, scale down the size of the test (# of patients, clinicians, and locations).
- Do not try to achieve a consensus among a large group of stakeholders. Instead, test a change with a small group of health workers who volunteer to participate.
- Be innovative to help make the tests feasible.
- Collect useful data during each test.
- In latter cycles, test over a wide range of conditions.

Figure 15. A PDSA "Ramp"

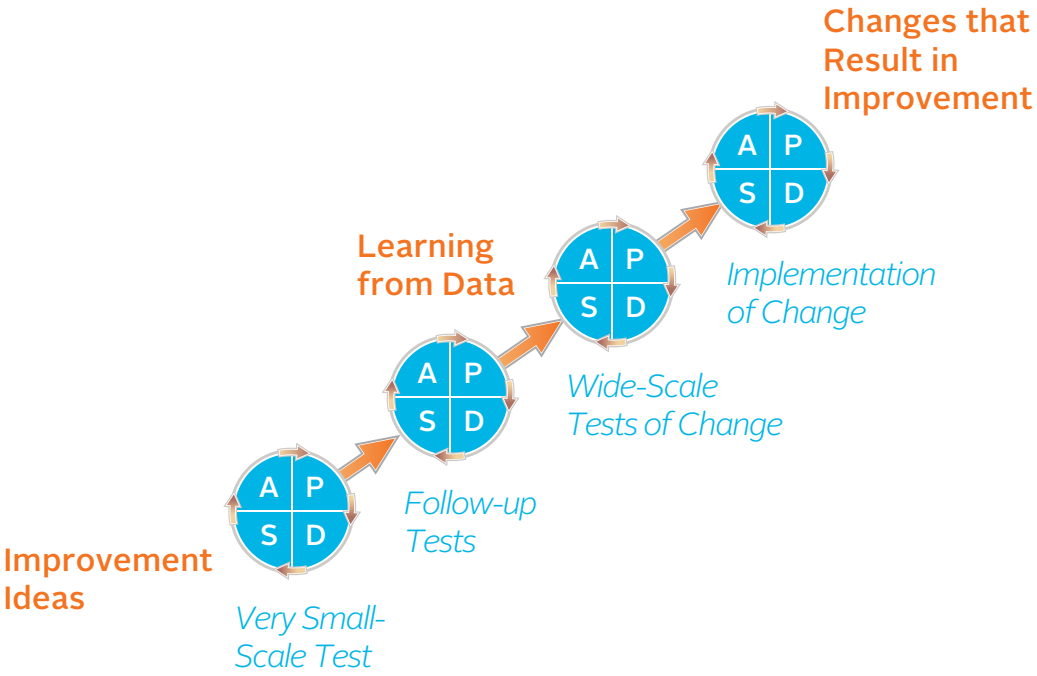


Figure 15 depicts a "PDSA ramp," showing repeated testing in different conditions and at different scales. Repeated use of PDSA cycles increases confidence that a change will result in improvement and reduces the risk that "failures" will affect performance. Multiple PDSA cycles also enable a team to document how much improvement can be expected from a change, adapt the change to local conditions, and build support for eventual implementation.

Learning about changes that do not work is as important as learning about changes that work. Teams must avoid the tendency to consider every change an improvement. For example, the team in Ukraine believed that conducting several trainings in HIV counseling and testing would help providers to start counseling patients. However, despite multiple trainings, providers were still hesitant to counsel patients until they developed a local protocol on HCT that enabled them to offer such counseling with confidence.

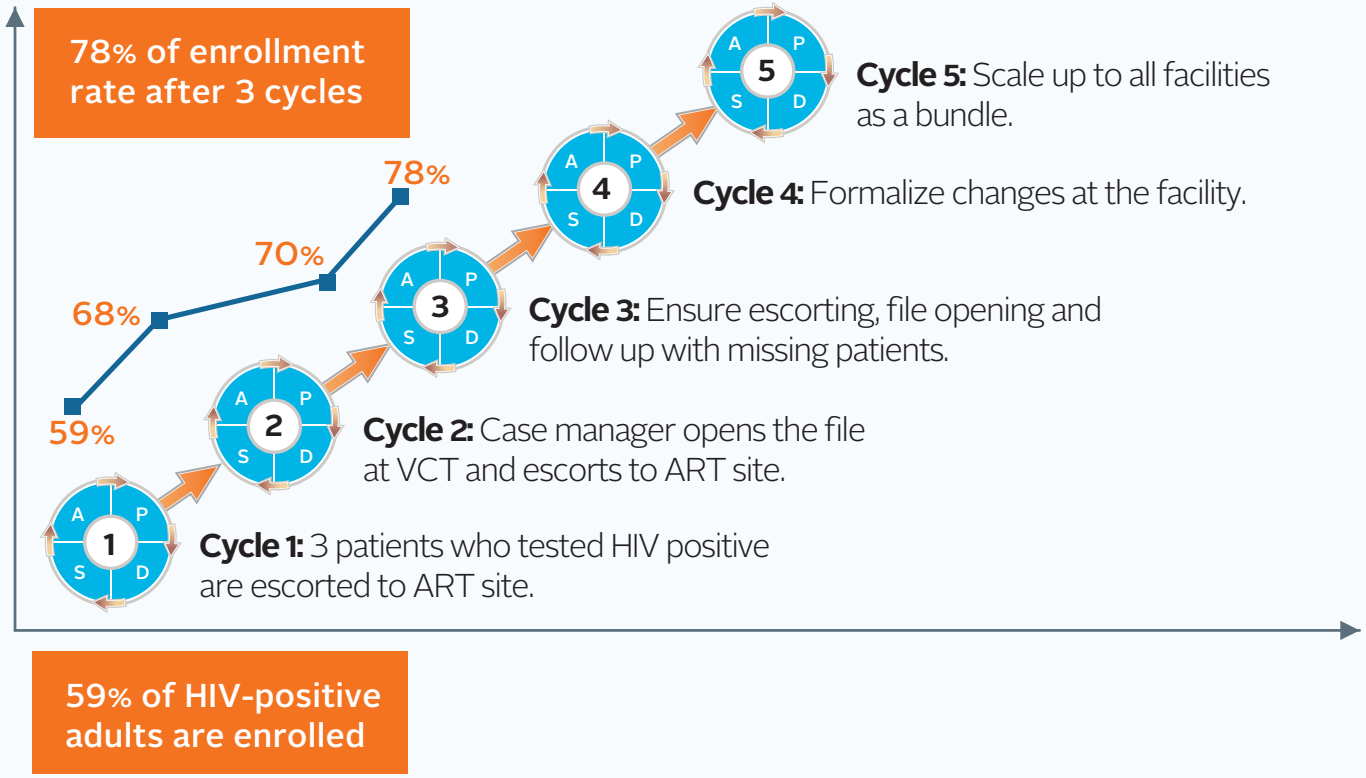
In the following case study from Mozambique, the team conducted multiple PDSA cycles, improving the enrollment rate of patients into HIV care from 59 percent to 78 percent. Additional cycles were conducted to formalize the changes at the facility where they were tested and to then scale them up to all health facilities in the province (see **Figure 16**).

Case study: Testing Changes through a Series of PDSA Cycles

Consider this **example** of an HIV project in Sofala province (Mozambique) that used a series of PDSA test cycles to address low levels of enrolment in care among HIV-positive patients. Only 59% of HIV-positive patients were enrolled in ART in a timely manner. The program's staff members said that many patients do not visit the ART site for a combination of reasons, including stigma, denial of the diagnosis, and unfriendly attitudes of the health staff. To address this issue, the project proposed to test whether escorting the patient would increase the percentage of patients who would enroll in care. The table below shows how the team tested three changes, each with a PDSA cycle, and learned about their effects on the enrollment process.

PDSA Cycle 1 objective:	PDSA Cycle 2 objective:	PDSA Cycle 3 objective:
Escort HIV patients to the ART care site.	Escort HIV patients and register them at the ART site.	Get HIV patient's consent for an active search if the patient does not enroll within 5 days.
Prediction: Escorting HIV patients from VCT to the ART site will increase the percentage of patients enrolled in ART care.	**Prediction:** Escorting HIV patients from VCT to the ART site, and then helping them register will increase the percentage of patients enrolled in ART care.	**Prediction:** Active searching for referred patients who do not visit the ART site will increase the percentage of patients enrolled in ART care.
PLAN 1: A case manager or a volunteer escorts willing HIV-positive patients from VCT to the art site.	**PLAN 2:** In addition to escorting patients, VCT unit case managers will help register them at the ART site.	**PLAN 3:** In VCT, the case manager asks for consent from the HIV-positive patient to allow an active search if the patient does not enroll within 5 days.
DO 1: Case managers escorted 7 willing newly identified HIV-positive clients from VCT to the ART receptionist.	**DO 2:** Four of 6 patients were escorted and registered in the pre-ART book.	**DO 3:** Contact information was recorded for all patients in the VCT registers. Case managers tracked enrollment and followed up by phone and through community volunteers with the 3 missing patients.
STUDY 1: All clients accepted the escort, so it is feasible. But the waiting time at the ART site is very long, and some clients left before registering for ART care.	**STUDY 2:** The average waiting time decreased from 2 hours to 30 minutes per patient. Two patients did not accept enrollment and escorting the same day, saying they needed to talk to their partners and family about the diagnosis and care.	**STUDY 3:** One patient was found and accompanied to ART by a community volunteer; one patient reached by phone promised to visit the ART site; and one patient was not found.
ACT 1: The team continues to escort newly identified HIV-positive patients, but addresses the inefficiency of the enrollment (the long waiting time).	**ACT 2:** Team sustains escorting and registration through case managers at the facility. Team addresses the issue of patients who did not want to be enrolled the same day.	**ACT 3:** Maintain the change. In addition, offer a motivational package for patients who do not want to be enrolled in care the same day they receive test results.

Figure 16. Multiple PDSA Cycles to Improve Enrollment in HIV Care



When can we move from the testing to implementation?

Implementing a change means making it a permanent part of day-to-day work. The current situation and the staff 's readiness to implement an effective change play key roles. In Mozambique, an analysis of a run chart (**Figure 16**) provided strong evidence that the combination of changes led to the expected improvements, were feasible, and should be implemented and maintained.

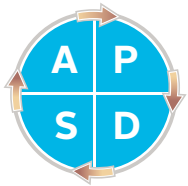
How to prevent making errors with the PDSA method

We often see that teams tend to rush from the Do to Act step without taking time to reflect and refine a change or to abandon the change if it is not effective. Thus, teams can mistakenly conclude that every change is an improvement. Coaches can help their teams go through the Study in a structured manner.

Supplement 10.1: PDSA Worksheet [adapted from IHI]

Model for Improvement CYCLE: _____ DATE: _____

Objective for this PDSA Cycle:



PLAN:
Questions:

Predictions

Plan for change or test: who, what, when, where

Plan for collection of data: who, what, when, where

DO: Carry out the change or test; collect data and begin analysis.

STUDY: Complete analysis of data; summarize what was learned.

ACT: Are we ready to make a change? Plan for the next cycle.

Supplement 10.2: Plan for Testing a Change

Issue: The CD4 machines are subject to frequent breakdowns. Change to be tested: Introduce weekly preventive maintenance.				
What	**Who**	**When**	**Where**	**How**
Implement the change: • Develop and communicate standard operating procedures (SOPs) to perform preventive maintenance measures.	Senior technicians from the national reference laboratory	The second week of March	At the national reference laboratory	Two-day training, including presentation and practice.
Communicate the change and the test: • Inform all laboratory personnel about the new maintenance measures. • Inform the service providers referring patients for CD4 tests.	Head of the facility and head of the laboratory	Next Thursday during the weekly staff meeting	In the three district hospitals where CD4 tests are performed	Prepare a presentation describing the preventive measures, the plan, and who is responsible for what.
Document the implementation of the change: • Monitor adherence to the preventive maintenance plan (PPM) and schedule. • Monitor adherence to standard operating procedures.	Laboratory personnel	Once a week	At each laboratory	Through direct observation, using a checklist developed according to the SOP.
Measure the improvement indicators: • Monitor, every month, the number of days when the CD4 machines are not working and/or the number of days between 2 breakdowns and plot on a run chart.	The service providers referring patients for CD4 tests	The first Monday of the month for data on the preceding month	At each laboratory	Collect the data from the lab register daily form and report.
Evaluate the effectiveness of the change	The QI team	Three months after the first occurrence of maintenance activities	At each laboratory	Interpret the run charts before and after the maintenance activities started.

Chapter 11

Assessing the effect of changes through run chart analysis

Tracking performance allows a team to determine whether a change has led to an improvement. The interpretation of run charts is a valid method for establishing cause-and-effect relationships between introduced changes and their effects on processes or outcomes.

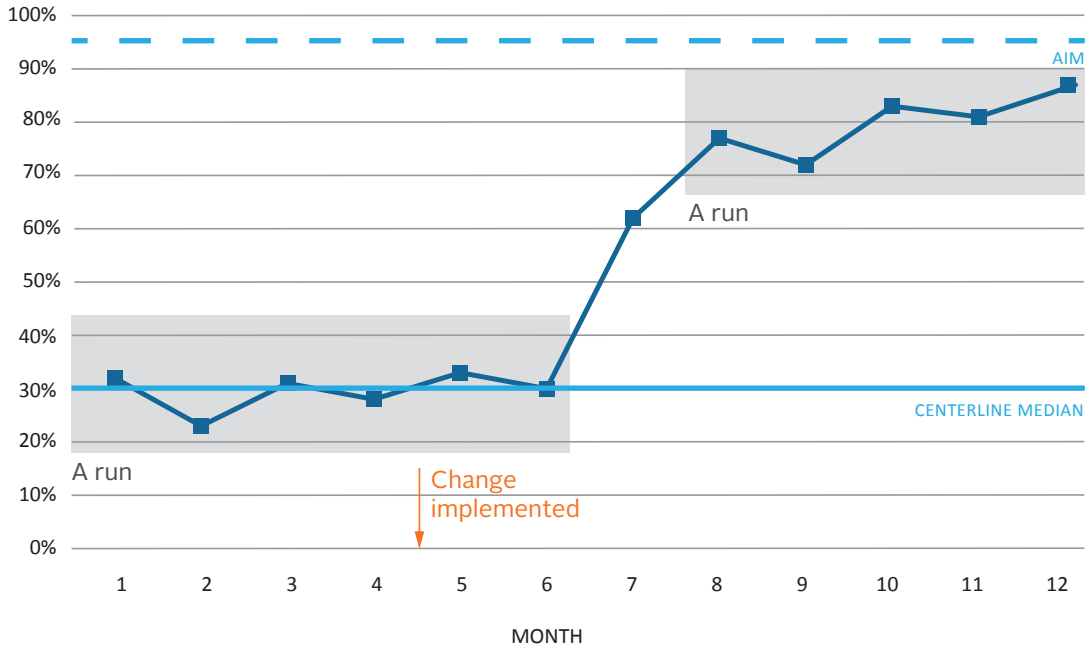
What is a run chart and when should it be used?

A run chart is an essential tool that QI teams can use to track their progress toward their improvement aim and objectives.[12,17] Run charts provide a visual representation of the variations in performance over time and offer insights on the factors that might influence that performance. They add value to the traditional descriptive summary statistics (such as average, median, and range) by revealing trends. Run charts graphically display non-random patterns (variations in performance caused by external factors)—such as shifts and trends—that can be used to identify progress and problems.

What does a run chart look like?

The x-axis of a run chart represents equal time intervals, reflecting the frequency of data collection. The y-axis is the value of the performance indicators, usually expressed as a percentage. The centerline is the median of the dataset before any change has been introduced. A run (the shaded areas in **Figure 18**) consists of consecutive points running either above or below the center line. Each point is the value of the indicator. A run is broken once a point crosses the center line. Values on the center line are ignored: they do not break the run, nor are they counted as points in the run. Arrows indicate when a change or intervention was introduced to the process or system. A horizontal line can be added to indicate the value of the improvement aim.

Figure 18. Elements of a Run Chart



How is a run chart interpreted?

A run chart can be interpreted from two perspectives: non-statistical and statistical. The non-statistical interpretation looks only at whether the process achieves the desired performance (improvement aim or objectives) over time. In this case, the center line is not necessary, but indications of changes or interventions are useful for interpreting effects.

A statistical interpretation requires the identification of visual patterns, but usually does not impose any statistical tests that are beyond the capacity of local QI teams. Shifts and trends are the most important patterns. The "Rule of 6" is used to identify patterns that suggest a statistically significant difference in quality or performance (if a statistical test were conducted), and it requires the center line.[12] For example, six ascending or descending points indicate a trend, whereas six consecutive points above or below the centerline represent a shift (see **figures 19** and **20**). The Rule of 6 is appropriate only when the total number of points is from 20 to 30.

Figure 19. Rule 1: Shift

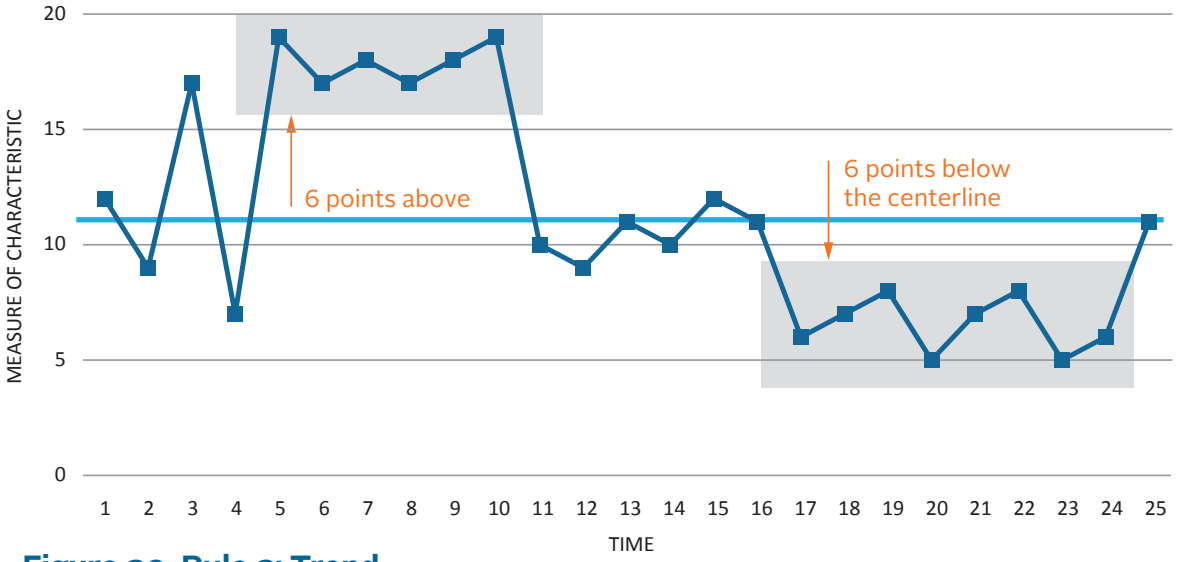
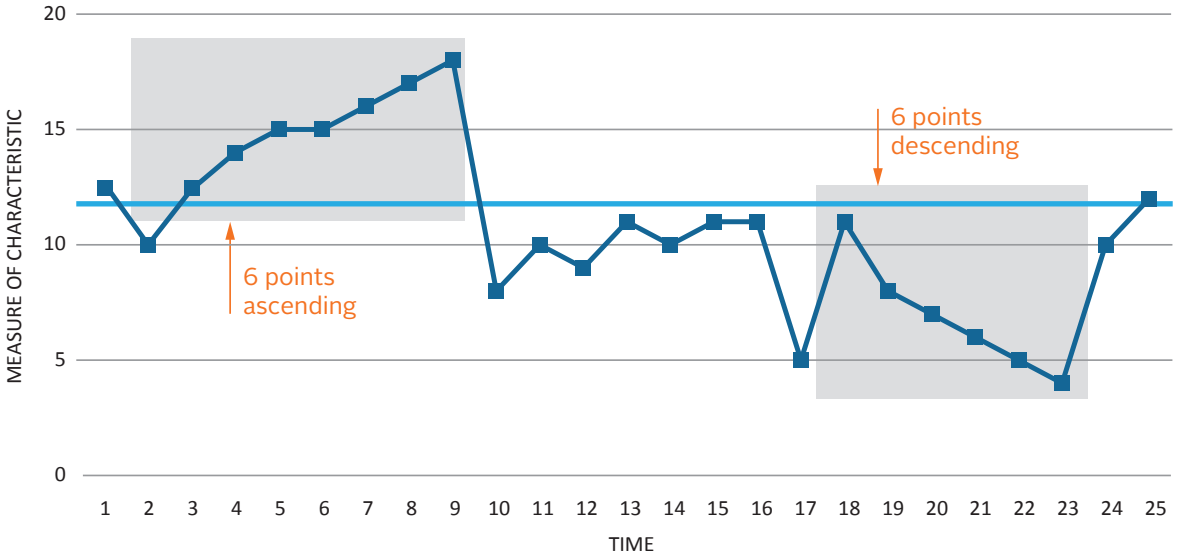


Figure 20. Rule 2: Trend



Trends and shifts indicate statistically significant differences in the performance of a process. Whether this difference represents an improvement or not depends on the direction of the trend or shift. Significant variations in performance rarely take place without a change in the process, so the existence of a pattern requires the identification of the change(s) that must have occurred. Such changes may have been implemented by the team or may have been unexpected and unplanned. Changes made to a process are often marked on the graph to help teams understand their impact on the process. (See an example of an annotated run chart in the case study on the next page.)

Case study: Examples of Run Charts

The following real-world examples show how to interpret run charts and how to decide whether a change should be abandoned, adapted, or adopted.

EXAMPLE 1: This example involves village health teams (VHTs) as the core providers of family planning methods to women of reproductive age in Uganda. FHI 360 applied the collaborative model to encourage uptake and sustained use of family planning. The model was piloted at three health centers in one district and is now being scaled up to more than 10 facilities in two districts. On average, 15 VHTs are attached to a single health facility and each VHT serves 20 women of reproductive age per month, so many women will benefit from any improvements.[27]

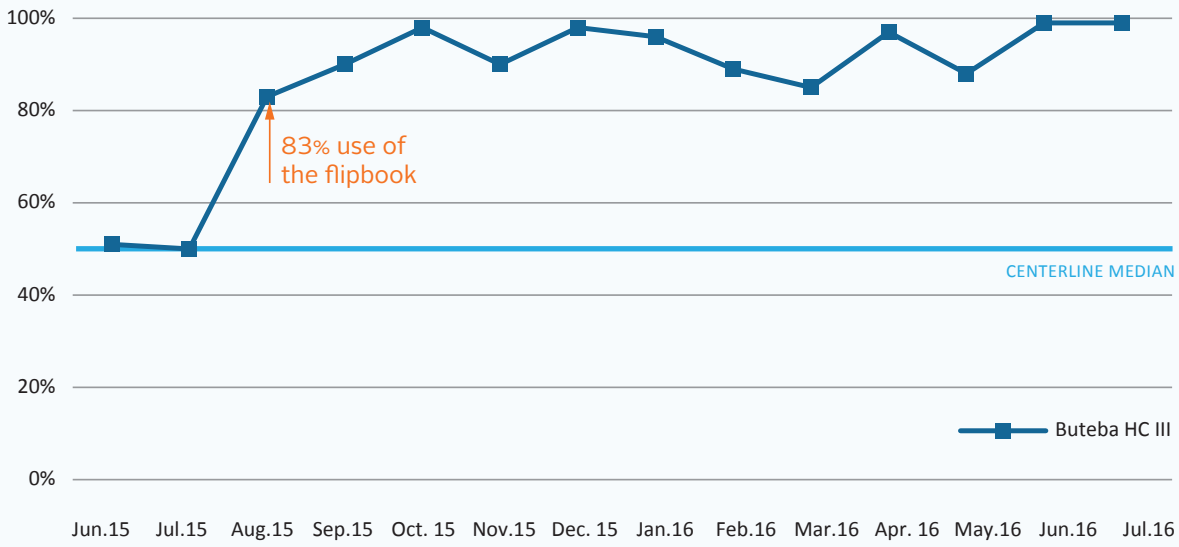
OBJECTIVE 1: All female clients (new and returning, 15-49 years old) receive adequate family planning counseling services from the VHTs on the side effects of family planning methods, including long-acting reversible contraceptives (LARCs).

Findings: The proportion of clients adequately counseled by the VHTs shows an increasing trend for VHTs from Buteba health center (**Figure 21**).

Issues reported by the teams: In general, the VHTs provided counseling only on the side effects of the short-term contraceptive methods that they provided (e.g., pills and injectables), but referred the clients to a midwife for counseling on LARCs. Also, some VHTs did not document the nature of the family planning counseling they provided to clients.

Certain changes may have led to an improvement: In February 2016, VHTs started using a flipchart as a job aid and began to record the provision of adequate counseling.

Figure 21. Percentage of FP Clients Receiving Adequate Counseling



Next change to test: The team would like to test "differentiated counseling" based on the nature of the client's visit. For example, during a client's first visit, the VHT should provide in-depth counseling on all family planning methods, including their side effects. During returning visits, the VHT should proactively ask the client whether she is experiencing any side effects and, if so, the VHT should provide management or referrals. Return visits also provide an opportunity to ask the client about side effects.

OBJECTIVE 2: Increase the number of female clients who return to the VHTs on the appointed date to continue the use of a family planning method.

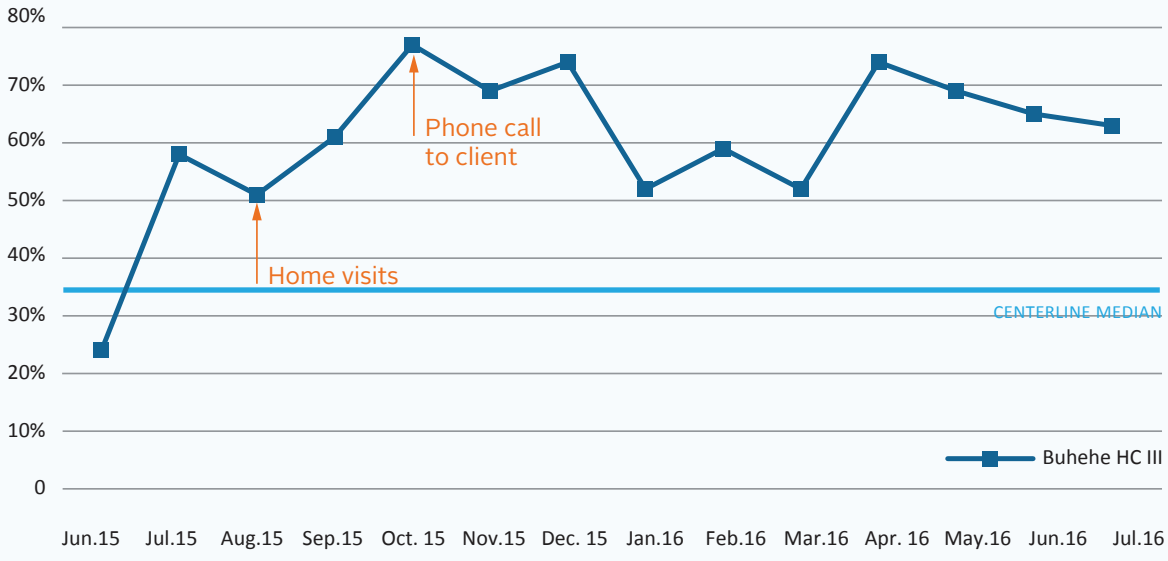
Findings: Since August 2015, the rate of clients returning for FP appointments has been at least 60%, up from 23% (**Figure 22**).

Issues reported by teams: The VHTs do not proactively check whether women return in time to replenish their chosen methods. A root-cause analysis found that about 30% of the women discontinued the method they were using because of side effects. Also, some women do not return because they did not disclose the use of a contraceptive to their partner or because they continued to have misconceptions about family planning.

Certain changes may have led to an improvement: The VHTs proactively reminded women about their next appointment through phone calls, appointment cards, and home visits. The VHTs used the home visits as an opportunity to counsel the women and their husbands about the importance of family planning.

Next change to test: The VHTs would like to test the use of a checklist to identify and manage side effects.

Figure 22. Percentage of Clients Returning at Appointed Time to Continue Method Use



Preventing errors in run chart analysis

Teams should be careful not to overinterpret a run chart or overreact to the data. Overinterpretation can happen when the team makes assumptions about the stability of a system or process and concludes without further analysis that the observed improvement is sustainable in the future. An over-reaction can happen when a team starts an investigation each time an indicator shows a slight change from the previous result. Random variation is expected in every system, so every change is not necessarily significant.

A midwife explains the data on a run chart to village health team members in Uganda, 2015. Photo credit: APC CBFP project.

Displaying progress on key indicators

Teams should keep up-to-date charts or graphs of their key indicators. The graphs do not require special graph paper or software, and they can be displayed on a wall. The visibility of the graphs can be a motivating factor. If the work is going well, the staff can take pride in their accomplishments. If the desired improvement is not taking place, the team develops a heightened sense of commitment to test new ideas. Such displays are a great way to raise the interest and commitment of the entire staff.

Part 4

SUSTAINING AND SCALING UP IMPROVEMENT IN THE HEALTH SYSTEM

Organizations and health leaders should understand the importance of making continual improvements to a health system. What is required is the development of a culture and a system that can sustain improvement efforts indefinitely.

The most successful health systems and organizations are those that can implement, scale up, and sustain improvement initiatives that increase the quality of services and a patient's experience at lower cost. According to the National Health System's Institute for Innovation and Improvement in the United Kingdom, when improvements are sustainable and widely scaled, the thinking and attitudes behind them are fundamentally altered and the systems surrounding them are transformed.[24]

The thinking behind the improvement model assumes that effective changes to the system will be maintained—but this is not always the case. Most QI projects in LMICs are introduced by international NGOs or other external groups that must eventually depart, leaving systems to evolve on their own. That is why building sustainability throughout the improvement process is so important.

Sustainability and scale-up processes are interrelated and mutually enhancing. But scaling up complex health interventions to large populations and sustaining those interventions are not straightforward tasks. Without purposeful, guided efforts to expand and sustain effective change(s), an improvement effort may stop at the pilot phase or may take many years to be broadly implemented. Based on our experience of implementing improvement efforts, we have developed a "formula" for sustainable change:

Sustainable change = Scale up + Effective change(s) + Leadership will + Time

Improvement processes and effective changes are more likely to be sustained if they are **scaled up** from the pilot units/sites to the remaining units/sites within the broader system (for example, from a few to all of the health facilities in a district or provincial health system). The **nature of the effective change** is important because certain qualities—such as evident superiority, simplicity, and alignment with the culture of the scale-up sites—can determine the scalability of the intervention and the rate at which it is adopted by the larger community.[23] **Leaders** of health care delivery systems are under pressure to achieve better performance. Supporting and encouraging leaders to be informed and engaged in the improvement effort is key to achieving large-system change in health care. Finally, the improvement process must have **adequate time to succeed**. The dimension of time is critical because acquiring the habit of continually improving processes and making them a part of the daily routine cannot be done instantaneously. Therefore, the improvement process must be started as soon as possible in a project cycle. An early start provides more time for QI habits to develop and increases the chances that improvements will be sustained when external support is removed.

In Part 4 of this handbook, we will describe the properties of organizations and systems that have successfully sustained improvements. We will explain how to plan and carry out expansion of a QI effort, using tools such as a spread planner and a change package. In addition, we will focus on ways to sustain and expand change dynamics through the organization of regular coaching sessions, visits, and learning sessions.

Chapter 12

Sustainability

The IHI defines sustainability as making a change permanent or when new ways of working and improved outcomes become the norm. According to the IHI's guide on sustainability and spread,[24] organizations and systems that sustain improvements have the following properties:

- Supportive management structure
- Structures to "foolproof" change
- Robust, transparent feedback systems
- Shared sense of the systems to be improved
- Culture of improvement and a deeply engaged staff
- Formal capacity-building programs

Successful examples for each of these properties are described below.

1. Supportive Management Structure
The leaders treat quality (of care) as a high priority—devoting regular attention to it, addressing issues beyond the improvement team's control, and enabling scale-up—to sustain effective changes.

Example: To improve the system of care and services for patients with pulmonary tuberculosis in the Mbao District of Senegal, the Mbao[25] Collaborative was established with a solid management structure. Quality improvement teams at the hospital level were supported by a two-layer management structure. The first layer involved a collaborative management team that consisted of the district medical officer, deputy district medical officer, chief nurse, chief of the laboratory, and chief of the TB treatment center. This team provided daily management and support to the improvement teams through coaching visits. The second layer of management consisted of a strategic leadership team, which included representatives of the national TB program, the supervisor of primary health care services from the Dakar medical region, and the district medical officer. This team

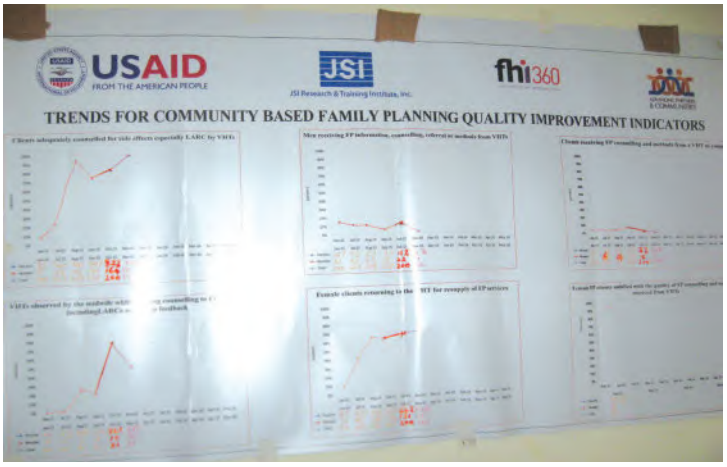
supported changes, addressed issues that were beyond the control of the QI teams, and identified best practices to sustain the improvement effort and replicate it nationwide.

2. Structures to "Foolproof" Change
The organizations have built structures—such as IT systems or packaged materials that support an intervention—that make it difficult, if not impossible, for providers of care to revert to the old ways.

Example: A TB health facility in Ukraine developed a local HIV counseling and testing protocol.[26] This protocol was then institutionalized through a local order and further adopted and adapted by multiple health facilities. The local protocol includes quality improvement measures to support sustained implementation of the intervention. To further enforce implementation of the protocol with new providers, coaches worked with each team to adapt it to their specific facility and context.

3. Robust, Transparent Feedback Systems
The organizations in the system maintain a high level of awareness of key indicators by reviewing information generated by a measurement system that provides data to stakeholders at every level of the organization and comparing it to clear standards set by the management. The organizations also take part in designing and implementing improvements based on the data.

Example: In the Uganda APC community-based family planning project, the improvement teams post run charts that contain data on all the improvement interventions and note their performance relative to the aims articulated by the leadership. The data are updated monthly basis. The team publicly displays the data on a wall for any visitor or staff member of the health facility to review.[27]



Run charts displayed on wall of a health facility. Uganda, 2015. Photo credit: APC CBFP project.

4. A Shared Sense of the Systems that Need Improvement
All stakeholders—managers and frontline providers of care—share an understanding of the processes and systems that they wish to improve. They also have a clear understanding of their contributions to the desired improvement.

Example: By signing the charter, managers, frontline workers, and other stakeholders agree on the improvement goal and their commitment to the improvement process. Almost all FHI 360 improvement projects develop charters, and many are formally signed.

5. A Culture of Improvement and a Deeply Engaged Staff
The organizations/systems share a sense of pride in their performance and improvement skills, and many enjoy their work in this area. Staff members are aware of the quality improvement initiatives and feel invested in the outcomes. Their job descriptions and performance evaluations include the staff member 's attention to QI activities.

Examples:

- To improve community-based family planning in Uganda, village health team members clearly understood the major improvement activities and could explain their role. Their understanding was enhanced by monthly QI meetings with a midwife, regular learning sessions, and bimonthly coaching visits.[27]
- In Ukraine, physicians who provided ART were nurtured as local coaches and viewed quality improvement work as part of their job. They believed they had a stake in continually enhancing their performance in all areas of the intervention. In addition to their roles as physicians, they agreed to take on the role of an improvement coach to support the QI effort.

6. Formal Capacity-Building Programs
The organization or system ensures that the training of executives and staff members in QI is a high priority. The programs build skills in appropriate clinical disciplines and develop organization-wide skills in the application of modern QI methods. They also create a culture in which improvement work is seamlessly integrated into day-to-day activities.

Example: In Uzbekistan, QI training is integrated into the Master of Public Health curriculum and is part of continuing education for family physicians. Although the original improvement project supported by USAID may be finished, the QI training institutionalized at postgraduate universities enables the development of new cadres of health professionals that know about improvement science.

Chapter 13

Planning scale-up

Scale-up—or spread—takes effective changes beyond the pilot unit or population and expands them into the infrastructure of other units and populations.[23] The expansion may involve new facilities within the same region or facilities in other regions. Although expansion is inherent in the collaborative model (because multiple sites are involved), scale-up will not happen without proper planning and execution.

Scaling up an improvement is often a peer-driven process: coaches and champions from the pilot sites will play key roles in spreading the process. Small pilot efforts require little support from leaders, but their active engagement is essential for large expansion efforts.

The spread of an improvement is a complex intervention. Scaling up in the improvement context often means expanding not only the specific activity that led to improvement, but also the improvement processes. For example, the scale-up of shifting the task of HIV counseling to nurses requires not only training in HIV care, but also the measurement of improvement indicators, teamwork, the engagement of patients, and regular learning sessions and coaching visits.

Coaches and teams can use a number of approaches to spread complex interventions. We recommend IHI's framework for expansion based on Everett Roger's diffusion of innovation theory.

Box 4. Scale-up Terms

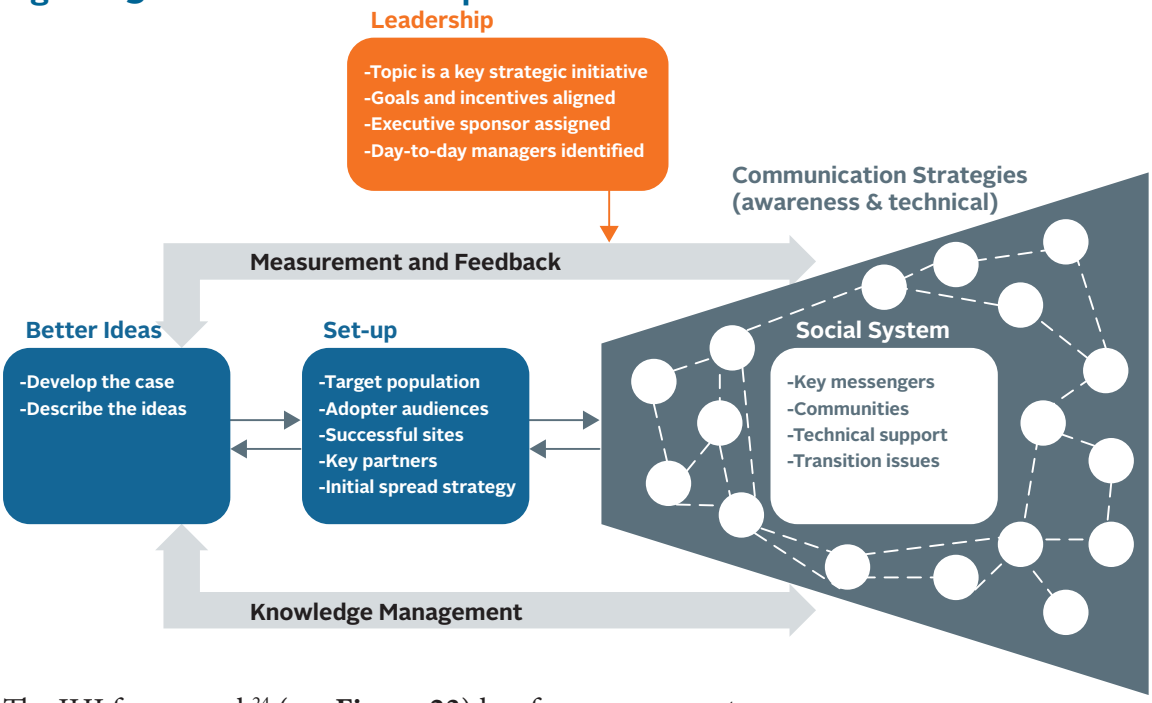
Scale-up, or spread: *the process by which an innovation (intervention) is communicated to the members of a social system*

New teams: *service providers who intend to adopt an innovation or intervention*

Pilot teams and coaches: *service providers who have developed effective innovations or intervention*

Change package: *a list of effective interventions that lead to the improvement of services and clinical outcomes*

Figure 23. IHI Framework for Spread [28]



The IHI framework[24] (see **Figure 23**) has four components:

1. Plan and set up the scale-up (involves leadership).
2. Design communication (requires an examination of the social system).
3. Ensure continuous monitoring and feedback.
4. Develop better ideas (listed in the change package).

When should you scale-up?

According to the IHI sustainability and spread kit,[28] expansion of improvements is best accomplished when three conditions are in place:

1. The topic is of strategic importance to senior leadership, who must communicate to others that (1) this issue is a top priority for new units; (2) the status quo is no longer acceptable; and (3) they expect the new units to adopt and adapt the change. As a strategic initiative, the topic is always present, not merely when a periodic report is due at a committee meeting.
2. The success of the pilot sites is an essential component of expansion because they provide the evidence that the changes can be made and the methods to do so. This is why the senior leaders' first responsibility during the collaborative is to support the teams and ensure that they achieve success. The list of successful interventions for the improvement objective are often compiled in the "change package" (see the next page).

3. An executive is designated by senior leadership to be responsible for the expansion. The executive will participate in the development of a plan for the expansion while monitoring its progress in the target population.

What is a change package and why is it so important?

A change package is the list of change ideas or interventions that lead to the improvement of services and clinical outcomes. Change ideas are actionable, specific ideas for changing a process—IHI calls them "ideas with a pedigree"—that are supported by evidence in the literature or by expert opinion. Change ideas can be rapidly tested on a small scale to determine whether they result in improvements in the local environment.

A change package is often developed during the pilot improvement effort and continually updated because new ideas are generated, tested, and refined. Coaches play a critical role in assisting teams to develop and update a change package. An analysis of the run charts helps to establish potential cause-and-effect relationships between a change and an effect if the coaches and teams are diligent in the documentation and implementation of the change. The change package is critical to the improvement of an identified care process. But it is especially important for spreading and sustaining the improvement, because a change package makes it very easy to share and explain interventions to new teams.

The hard work of first introducing an intervention into the setting—characterized by experimentation and adaptation—must be completed with confidence. In other words, high levels of performance should have been achieved across a unit or facility for several months before initiating the expansion.[29]

Learning sessions provide the best opportunities to share a change package with new teams and to update a change package based on the teams' presentations and storyboards. The National Health Service (UK) Improvement Leaders' Guide to Sustainability and Spread identifies four sets of questions that coaches and teams should ask themselves when they embark on the expansion phase:

1. Is the (intervention) near the final stage of development? If there were room for further changes, would these completely alter the way the solution has been introduced?
2. Are the measurements demonstrating real improvement?
3. Who cares about this improvement? Is the solution representative of the wider views of those involved?
4. What policy or technological changes may render this solution redundant? When might this happen?

Supplement 13.1 describes an example of a comprehensive change package that contains information about the interventions that were necessary to secure improvement and the change ideas that made it possible to reliably perform those interventions. Although spreading a complete package of changes offers the greatest potential for achieving overall success, change ideas can be spread one at a time and still have a demonstrable effect.

Where to start? How should the expansion be organized?

Start with an aim. As with the improvement effort, one needs to formulate an aim for the expansion. According to IHI, an expansion aim should address the "who, what, and where?" questions and should include the following components:

- The recipient sites (e.g., 15 ART facilities and surrounding communities) that are the target of the spread activities
- An indication of the purpose (for example, to improve the retention of patients on HIV treatment)
- The specific goals that are to be achieved (e.g., access to primary care within 24 hours)
- An indication of the best practices/changes (e.g., using support groups, default prevention activities, continuous measurement)
- The timeframe for the effort (for example, 6 months, 12 months, 2 years)

Once the aim is clear, it is time to develop an expansion plan, which addresses "how" the spread takes place. The plan should include (1) communication methods and channels to reach and engage the target population; (2) a measurement system to assess the progress of the expansion aims; (3) anticipation of the actions needed to embed the changes into the organization's operational systems; and (4) the coaches' support for implementation of the plan.

Using IHI's framework for the expansion, FHI 360 developed a checklist that can be easily adapted. The checklist is included, along with our adaptation of the IHI Spread Planner tool, in **Supplement 13.2**. The checklist in **Table J** was developed by the Ukraine HIV program team for its expansion plan. The pilot team had tested and implemented best practices and could demonstrate evidence of their effectiveness with run charts. Coaches and teams said that their colleagues from other districts had expressed an interest in learning about and adopting the new practices, and the district and provincial leaders had agreed to support the expansion. The expansion unit was a district that included part of the HIV care system—namely, the district primary health care center with an infectious diseases unit and a TB dispensary.

Table J. Checklist for Planning Expansion of Improvements, Ukraine

Questions	Answers and explanations
What to spread?	Identify preliminary best-practice ideas that were effective with the original teams and coaches (the change package).
Are the new sites ready?	Conduct sensitization for the future coaches from the new sites and assess their interest and readiness.
What will be the spread unit?	Identify (with the involvement of local stakeholders) the part of the system that will be adopting an improvement.
Who will be part of the spread team?	Identify the spread team members from the original and new sites (a mix of leaders, coaches, and champions) and define their roles and responsibilities.
What support is needed for launching the spread?	The expansion should be approved by the province or district leadership. You will need a draft of the spread planner (see below) and a timeline.
When to start the spread process?	Organize a 2-day learning session and bring together new sites and pilot teams to discuss the current state of the pilot project and finalize the spread plan.
What will be the rate of spread?	Discuss and agree with leaders on the rate of spread (for example, add 3 new districts every 6 months and cover the whole province in 48 months).
What data will you collect and how will it be collected at the new sites?	New sites will collect the same improvement measures as the original sites after on-the-job training by coaches from the original sites.
What methods of communication should be used?	Regular communication will be established between coaches from the original sites and the coaches at the new sites. They will communicate via meetings, calls, and emails.
How should you build the capacity of new sites for improvement and new interventions?	Develop a short, user-friendly training on the improvement process that includes content on the services to be improved. Conduct the training during coaching visits as on-the-job training and during regular learning sessions.
What tool should be used to plan the spread?	The adapted IHI Spread Planner* (**Supplement 13.2**) has seven sections, corresponding to each of the components of the Framework for Spread.[28] Each section contains specific questions that prompt those responsible for the spread to consider the actions needed to effectively guide the expansion process. The tool can be used during the learning session to facilitate the planning between original and new sites.

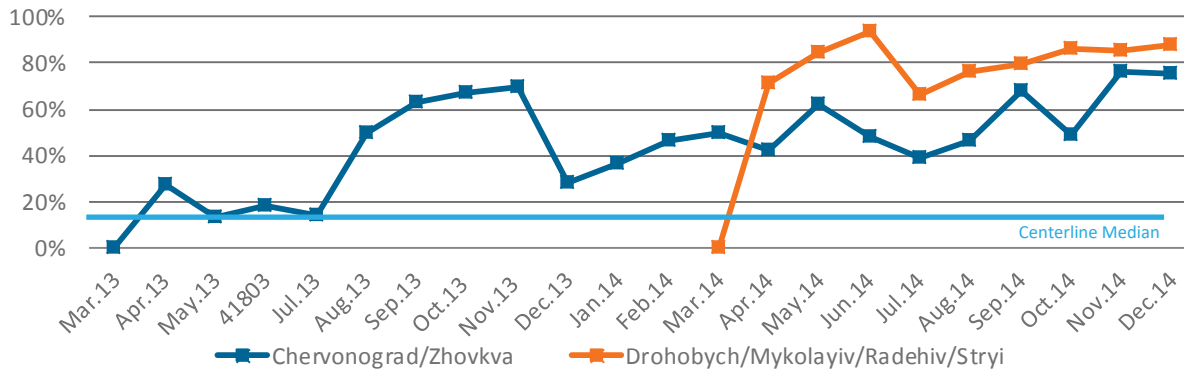
* IHI's Spread Planner. 2004. http://www.ihi.org/resources/Pages/Tools/SpreadPlanner.aspx

What results should be expected from the expansion sites?

We frequently observe that expansion sites achieve improvement faster than the pilot ones and often achieve better results. The data from the HIV improvement project implemented in Ukraine[30] demonstrates this phenomenon. **Figure 23** presents data on HIV testing among TB patients for the original sites (in **blue**) and four expansion sites (in **orange**). The expansion sites are performing better than their predecessors in reaching the objective of increasing HIV testing among TB patients, with performance levels ranging from 60 percent to 80 percent, whereas the pilot sites' levels are 20 percent to 50 percent.

A likely explanation for this common phenomenon is that new sites direct much of their effort toward refining changes, whereas the original sites spend months testing the changes. For example, in this case, pilot teams in Chervonograd and Zhovkva improved the rate of HIV testing through trial and error over nine to 12 months, including strengthened collaboration with the infectious diseases center where patients were referred for HIV testing. The new sites decided to purchase rapid test kits with their own funds, and thus were able to drastically increase the percentage of patients who were tested in a much shorter time. Now all the teams use HIV rapid test kits.

Figure 24. Percentage of TB Patients Tested for HIV



Case study: Expanding a Community-Based Family Planning Improvement Effort in Uganda

A health-management team in Uganda proposed a district-wide expansion of a community-based family planning (CBFP) improvement effort after the improvement was implemented by village health team members (VHTs), in collaboration with a midwife, at three pilot health facilities in Busia District. On average, 15 to 20 VHTs report to each health facility. Nine months after the pilot project began, the district health management team decided to spread the project from the three original facilities to four more health facilities.

Coaches from the three pilot QI teams met with the district management team, including representatives from the new sites, and developed a spread plan. The plan involved visits by a midwife, a VHT, and a district manager who had been trained as coaches to four potential sites to conduct sensitization on the CBFP improvement effort and a baseline assessment of potential gaps in CBFP services. The district management team proposed a presentation of the baseline assessment and use of the data to modify and adopt the charter from the pilot sites. This charter meeting also helped increase the commitment of the new sites and introduced selected coaches and team members from the pilot sites to the new teams.

The second learning session—where initial pilot teams presented their storyboards with the change package (see **Supplement 13.1**)—was used to develop a plan using the spread planner tool (see **Supplement 13.2**). This planning exercise provided an opportunity to review important elements of the transfer of the change ideas and created a bond between VHTs and midwives at the old and new sites. It also enabled teams to agree on the transfer of the QI indicators, identify coaches from the pilot teams for each new team, and schedule the coaching visits. **Figure 25** and **26** shows the results for the pilot and scale-up sites for one of the improvement objectives.

OBJECTIVE: More male clients receive FP information and counseling during interactions with VHTs.

FINDINGS: The results suggest that the number of men reached increased at a faster rate at the new sites (**Figure 26**) compared to the pilot sites (**Figure 25**). The new sites targeted all men for sensitization on the importance of family planning using an "elevator speech," a change that was initially developed by the pilot sites. However, the new sites also focused more on young men because the pilot sites had found they were more likely to support their wives use of a FP method.

Figure 25. Number of Men Reached with FP Information, Counseling, Methods, or Referrals at Pilot Sites

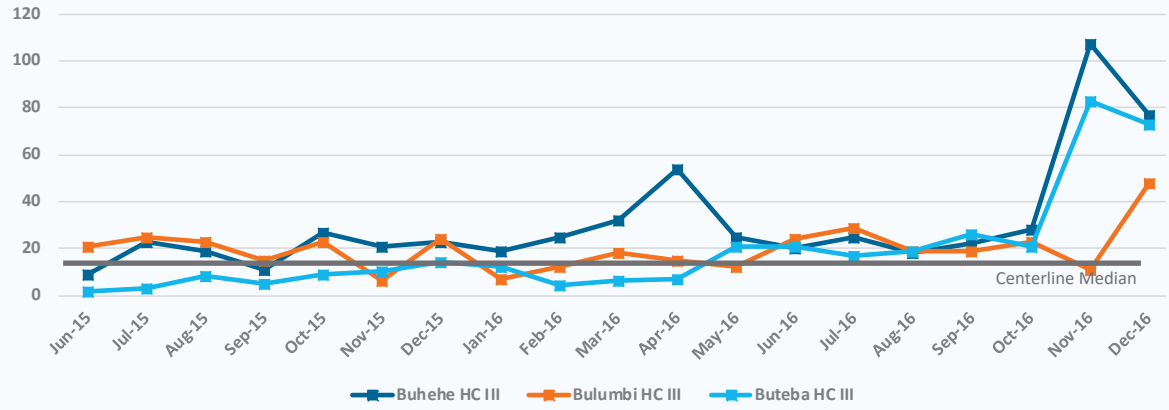
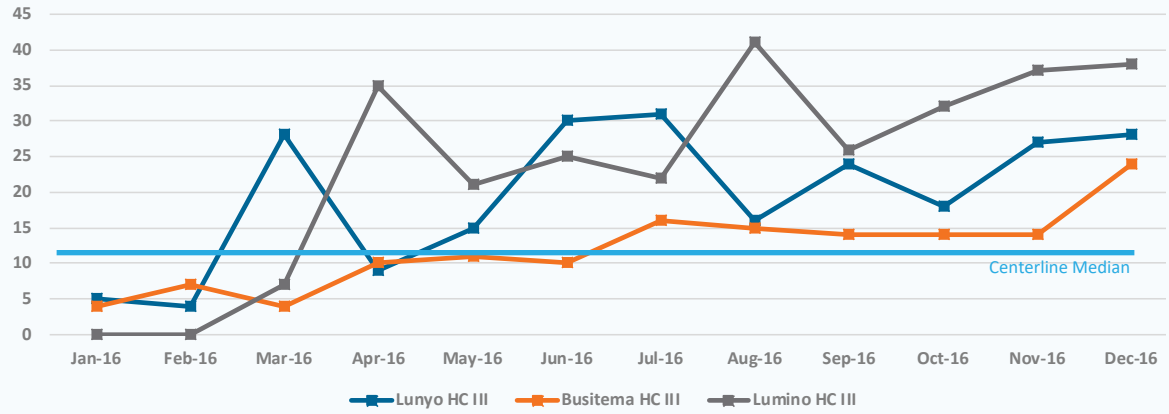


Figure 26. Number of Men Reached with FP Information, Counseling, Methods, or Referrals at Scale-up Sites



Supplement 13.1: Change Package for Improving the Quality of CBFP Services

Objective 1: Ensure all female clients (new and returning, 15-49 years old) receive adequate counseling from VHTs on the side effects of FP methods, including LARCs.	
Change idea	**Implementation details**
Describing the side effects of various contraceptive methods with clients using a job aid helps clients make informed decisions and prepares them to manage side effects.	• VHTs use the flipbook on informed choice counseling for family planning to introduce all the methods and review the side effects for the method(s) the client considers or selects. • If a returning client is experiencing side effects, the VHT refers to the checklist to provide counseling on managing the side effects. • Expert clients talk to women about side effects. • VHTs conduct home visits to talk to husbands. • VHTs use the family planning flipbook routinely during counseling for new and returning clients.
Objective 2: More female clients (new and returning, ages 15 to 49) are counseled on FP with their partners by the VHTs.	
Change idea	**Implementation details**
Couples counseling allows women to feel safe using a FP method and can be conducted whenever the VHT has a chance to meet a woman and her partner (during a home visit, immunization day, etc.)	• During home visits, VHTs counsel couples on FP and record the event in the VHT register. • VHTs provide counseling on FP when couples receive immunizations and during antenatal visits. • VHTs encourage women to come with their husbands to the next appointment for FP counseling, if possible. • VHTs encourage men who support FP use by their wives to serve as champions. • VHTs encourage couple-to-couple visits in the community.

Objective 3: More male clients receive FP information and counseling during interactions with VHTs.	
Change idea	**Implementation details**
Involving males provides an opportunity to address myths and misconceptions in the community. Use an engaging "elevator speech" to encourage the man's interest in FP.	• When a man comes for a condom, VHTs use the appropriate one-minute elevator speech (e.g., for husbands or adolescents) to capture his interest in the importance of using an FP method and record this activity in the VHT register. • Male expert clients are identified and encouraged to give testimonies at meetings of various community groups, including village savings and loan association (VSLA) and mining groups. • FP information is integrated in the messages conveyed in churches and the mosques. • Other satisfied male users of FP are encouraged to talk to other men who are against FP. • Male VHTs should be FP role models in the community. • Male gathering places are used for sensitizing men on FP (e.g., church, mosque, sporting events). • VHTs identify the "best friends" of the men who are opposed to FP and encourage them to talk about FP. • VHTs identify couples that are happily using FP methods and determine whether they can conduct a couple visit to their family and friends who are not using FP.
Objective 4: More female clients return on time to the VHT to continue use of an FP method.	
Change idea	**Implementation details**
Reminding women about their next visit and having peers (expert clients) encourage women to continuously use an FP method increases the chance that women will return on time to get their FP methods.	• VHTs look at the registry, check the return date, generate a list of all clients expected to return, and remind women about follow-up dates through home visits and informal meetings in the community. • VHTs give clients appointment cards as reminders. • VHTs visit the homes of the women whose husbands are aware they are on FP. • VHTs identify and recruit FP expert clients. No formal agreement is needed. These expert clients are women and men who have been satisfied with the use of an FP method for more than 6 months and are also willing to share their experience with others. • Each VHT and expert client agree on a convenient date, time, location, the nature of the testimony, and a way to document the event. (The VHT should not pressure an expert client if the client changes his or her mind.) • VHTs empower women to talk to their husbands. • VHTs follow up with phone calls to clients to remind them of their return dates. • VHTs conduct exchange visits across villages and to raise clients' confidence in the VHTs' statements.

Supplement 13.2: Spread Planner

Adapted from a planner created by IHI, this Spread Planner was created for an initiative to expand the improvement of community-based family planning services in Uganda. The planner is designed to help adopters (the new teams) and coaches (from the experienced pilot teams) to jointly develop a plan to spread both the improvement process and the interventions that have proved effective. The goal is to accelerate the expansion of these interventions so that more clients can receive the benefits and to institutionalize the improvement process. The tool has a questionnaire that should be completed by the adopters with the help of their QI coaches and experienced representatives of the existing QI teams. New team representatives, project QI experts, and coaches should each have a copy of the spread planner and the change package.

Date_____

Coach(es) from pilot site (names): _____

VHT members from pilot site (names): _____

Pilot health facility midwife (names):_____

Adopter health facility midwife (names): _____

Adopter: Leadership for Spread [may be completed without coaches from pilot sites]

Question	Answer
1a. Can the quality of community-based family planning (CBFP) services be improved in your community, health center, or district?	❑ Yes ❑ No ❑ Unsure
1b. Is there an executive who is responsible for family planning in your district?	❑ Yes [Who?] ❑ No ❑ Unsure
1c. Is the executive passionate about the family planning?	❑ Yes ❑ No ❑ Unsure
1d. If "no" or "unsure," what actions will you take?	
1e. Is there a person or a team who will manage daily activities dedicated to the improvement of CBFP in the district?	❑ Yes ❑ No ❑ Unsure

Adopter: Set-up for Spread [to be completed with the aid of the coaches]

Question	Answer
2a. Who are the most responsible people in your organizations and communities who would be enthusiastic about making improvements?	
2b. How will you involve these enthusiastic people?	
2c. Using the change package, list the changes that should be prioritized for expansion.	
2d. Who will be responsible for monitoring the indicators every month?	
2e. When will you start monitoring the indicators?	
2f. What support is needed to spread the changes (training, printing forms, staff time, materials)?	
2g. What possible issues or problems may arise during the expansion?	
2h. What will be your initial response to overcome these issues?	

Adopter: Strengthening the Social System [to be completed with the aid of the coaches]

Question	Answer	
3a. Who are the key messengers who will explain the new CBFP system to target audience?	Who	Target audience
3b. Who (subject experts) can help them?		
3c. What materials do you think will be needed to explain the new system (charter, presentation, indicators)?		

Adopter: Strengthening a Team [to be completed without coaches]

Question	Answer
4a. Who will be part of the improvement team in your VHT or health facility? (List names and positions.) Who will be the leader of your team?	
4b. Who will be involved outside of your VHT or health center? (This may be another health center, VHT, or community-based organization.)	
4c. Will you involve a patient representative?	❑ Yes ❑ No ❑ Unsure
4d How will you involve a patient representative?	
4e. How will you provide a time and place for people to interact as a team?	
4f. How will you encourage communication and feedback among team members?	

Adopter: Coach and Team Interaction [to be completed with aid from the coaches]

Question	Answer
5a. Do you need a coach to help you spread the new family planning improvement system?	❑ Yes ❑ No ❑ Unsure
5b. What is the name and title of your coach?	
5c. How will your coach interact with the VHT or health facility?	❑ Phone ❑ Email ❑ Visit
5d. How frequently will the coach visit the new facility or team?	❑ Biweekly ❑ Monthly ❑ Quarterly
5e. What exactly will the coach be doing during the visit?	
5f. When is the coach's first visit?	
5g. Should the coach be accompanied by any other authority? (For example, a chief district educator or other district representative)?	❑ Yes ❑ No ❑ Unsure

Chapter 14

Supporting regular coaching sessions

Coaching sessions or visits are a great way to maintain rapport and help providers function as a team. Facility staff members are usually too busy to have regular meetings on their own, so a coach's visit provides an opportunity to facilitate a team meeting.

Coaching sessions also play a critical role in the sustainability and scale-up process. During scale-up, coaches are the main communicators of the change package to the new teams. If the coaches are part of the health system (rather than an external project), they will also play a significant role in sustaining the improvement process and the changes.

How to Organize a Coaching Session

Coaches support the process and the teams through all phases of the improvement effort through regular phone calls, emails, and face-to-face interactions during frequent (at least monthly) visits. A **coaching session** is a planned interaction between a designated coach and a team or site or facility staff. The goal of a coaching session is to provide technical and moral support to the team members in their journey for improvement. Interactions between coaches and the staff help build relationships, strengthen teamwork, generate improvement ideas, and encourage analysis and use of improvement data.

FHI 360 has developed coaching guidance to help coaches prepare, conduct, and follow up on a coaching session.

Preparation for a Coaching Session

Preparation for a coaching visit includes organizing the necessary logistics and developing an agenda. Coaches might need to consider the following activities:

- Inform the team (clinical facility or NGO members) of the date of the visit in advance and confirm the availability of the leader and as many team members as possible. Decide on a time (usually the afternoon) when the visit would least disrupt service delivery activities.
- For the first coaching visit, be prepared to introduce the QI model and help teams review data and identify an improvement topic.
- For follow-up visits, plan to use the meeting to generate change and/or develop tests of the changes using the PDSA form.
- Identify the stage of the QI process and set specific goals for the visit, including a list of topics to be covered. Develop an agenda appropriate to the objectives and the availability of the team. Try to share the agenda with the team in advance.
- If it is available, review the performance data of the improvement team you are planning to visit (see the Team Performance Tracking Form, **Supplement 14.3**).
- Prepare questions for the team based on the Improvement Project Monitoring Form (**Supplement 14.2**) and make copies of the tools that are relevant to the current stage of the QI process for distribution to the team. If you have access to the team run charts, analyze the trends.
- Print the run charts in advance so you can present them to the team and discuss the trends.
- Identify and bring materials associated with the content of the improvement topic (e.g., policies, protocols, guidelines, training materials, job aids), as well as supplies such as flipcharts and markers.
- For the first coaching visit, consider inviting a content expert, a representative of the district health management team, or another relevant specialist to accompany you. Discuss your respective roles and responsibilities with this partner before the visit.

The preparatory checklist in **Table K** can be used by a coach as a job aid or reminder. The checklist should be completed, if possible, before the meeting.

Table K. Preparatory Checklist for a Coaching Session

Activities	Completed
Review and analyze the QI measures for that health facility or team. Write down your conclusions and questions for the team.	
Contact a health facility or team and agree on a date to meet at the site. Remind all participants about the time and venue for the meeting.	
Adapt the agenda (below).	
Print at least one copy of the QI charter and the QI measures.	
Prepare a presentation about the improvement effort.	
Use the most relevant tool from this handbook to engage the team in a discussion.	
Bring the relevant guidelines, flipchart, markers, pen, paper, and other supplies.	
Arrange a venue for the meeting.	
Consider a short coffee break during the meeting.	

Conducting a Coaching Session

Coaching sessions differ from supervisory visits. Coaches want to interact with, learn from, and support the team in its QI effort. If a coach is working with multiple teams, these sessions offer opportunities to identify champions and link them with teams that lag in performance.

Coaches should always listen for change ideas that may lead to improvements. Consider these tips for the successful facilitation of a coaching session:

- Encourage everyone to contribute.
- Give plenty of encouragement and praise.
- When it is time to start work on a new improvement topic or to generate new change ideas, use improvement tools, such as a flowchart or a fishbone, to spark interest and make the meetings more interactive. If you are coaching multiple teams, share successful ideas from other places if a team has difficulty generating ideas for changes.
- When starting a new PDSA cycle, encourage teams to use the PDSA template and record their plans. Revisit the plan during the next meeting and have team members' complete other sections of the template. Encourage the team to display PDSA cycles in a storyboard (next chapter).

- Bring energy and optimism to the meeting. As you facilitate, you are teaching others how to apply improvement methods and engage a team in QI. Remember that you are modeling behavior; the team will watch and learn from you.
    - As time permits, take the opportunity to teach improvement methodology. This will allow the team to develop its own expertise and will enable team members to work independently on improving their performance.

In Uganda, midwives coach VHTs during monthly meetings by helping them interpret the run charts, providing tips in FP counseling, and encouraging them to test ideas using the PDSA. The data from this improvement effort shows positive trends in all the improvement indicators. This success may be the result of strong support from the coaches, which increased the capacity of the VHTs to apply QI processes and to collect, analyze, and use data.

A generic agenda for a coaching visit (**Supplement 14.1**) can be customized to a program's needs.

A coach-midwife discusses data with VHTs at a monthly coaching session in Uganda, 2016. Photo credit: CBFP project.

Follow-up after the Coaching Visit

Coaches should maintain communication with the teams between coaching visits to discuss how recommendations are being implemented. This can be done through a follow-up conference call within 10 days of the visit or the use of available information technology. Between meetings, coaches should also:

- Draft a report using the Improvement Project Monitoring Form (**Supplement 14.2**).
- Update the site data, including changes and indicator results, in the improvement-monitoring database.
- Share the report with the facility and district team management,
- Advocate for and implement follow-up actions.
- Do what you said you would do to facilitate the work of the QI team. For example, in Ukraine, a coach had been asked to resolve a conflict between a TB doctor and an infectious-disease specialist. The coach approached the AIDS Center director, and together they met with the TB doctor and the infectious-disease specialist to mediate the conflict. This action helped the coach gain the trust of the team; future interactions with the team became easier and more fruitful.

How do Coaches Assess the Progress of QI Teams?

Coaching reports are a valuable source of information, particularly for documentation and learning. The forms in **Supplement 14.2** and **Supplement 14.3** were adapted from the collaborative team assessment form developed by IHI. Coaches should use these forms during site visits to assess the progress of the QI teams relative to the QI process and results—ideally every quarter. The data can be collected by holding discussions with the QI teams, observing their interactions, validating facts by reviewing documentation, and conducting occasional client interviews. The template of the Improvement Project Monitoring Form follows the MFI logic.

Supplement 14.1: Sample Agenda for a Three-Hour Coaching Visit

Objective of the visit *[please indicate appropriate item]*:

- ❑ Help the team interpret run charts to understand the current status of the effort.
- ❑ Engage the team in a discussion about potential issues and challenges.
- ❑ Develop ideas for improvement through brainstorming.
- ❑ Conduct quality assurance of the improvement data.

Main Activities	Specific tasks	Duration
Introduce the session.	• Introduce participants. • Present the agenda of the session. • Identify a timekeeper and a note taker from the QI team. • Describe the objectives of the session and revise them as necessary.	10 min
Review updates on the QI work and progress.	• If the team has developed an improvement charter, ask someone to summarize the charter and review the progress toward its implementation. • If the team does not have an improvement charter, ask them to describe their progress with the improvement aims/objectives, the indicators, and the changes (planned or introduced). • Use the rest of the session to review performance data and identifying improvement opportunities.	15 min
Identify issues to address during the coaching visit.	• If possible, ask the team to display measures on run charts and use them to interpret any trends. Ask the team leader to list their priority issues—with the QI process and with the health system. • Assess the performance of the team, using the Team Performance Tracking Form (**Supplement 14.3**).	15 min
Conduct a quality assessment of the data.	• Validate the reliability of the QI measures by observing the team's data-collection and data-verification processes for the past month.	45 min
Provide technical assistance to build the capacity of the team	• Provide feedback to the team based on the Team Performance Tracking Form (**Supplement 14.3**). Identify and use the relevant coaching tool(s) to help the team address its challenges and move to the next step. This could be the analysis of a system or process of care through system modeling, use of a flowchart, root-cause analysis, review of the data and construction of a run chart, or planning the test of a change. For more advanced QI efforts, the focus will be on documenting lessons learned and planning the scale-up.	45 min
Plan the next steps.	• Summarize what has been done and learned during the session. • List and prioritize the issues to be addressed. • Brainstorm possible solutions and next steps. • Plan the implementation of the next steps, including the role of the coach in addressing the priority issues.	40 min
Plan follow-up.	• Identify the next communication (email, telephone, etc.). • Set a date for the next coaching session.	10 min

Supplement 14.2: Improvement Project Monitoring Form

Name of the team leader	
Date	
Title of the project	
Participating organizations and sites	
Improvement aims and objectives	
Quality improvement indicators	
Results in numbers or percentages	
Change(s) tested by the team	
Barriers to improvement	
Lessons learned by the team	
Next steps identified by the team	

Supplement 14.3: Team Performance Tracking Form

This scoring sheet is adapted from IHI Collaborative tools. Coaches should score the performance of the team at each visit and should provide recommendations based on the results of the Improvement Project Monitoring Form and the coaching session. The expectation is that a team gains higher scores over time, documented by a coach's assessment of the progress.

NAME OF THE COACH_____
DATE OF THE ASSESSMENT _____
TITLE OF THE PROJECT_____
DATA ARE VALIDATED _____

Situation	Definition	Scale
Intent to participate	The quality improvement charter has been signed. The QI team has been formed.	0.5-1
Organization of the project	The organization of the project has begun: the resources needed have been identified; tools and materials have been gathered; meetings have been scheduled, and leaders have been identified).	1.1-1.5
Activity, but no changes	Team has started measurement, data collection, and analysis of system/ processes, and data are collected consistently (with no errors). The team has started documentation using the Improvement Project Monitoring Form.	1.6-2.0
Changes tested, but no improvement	The first PDSA has begun. Measures are graphically displayed and the Improvement Project Monitoring Form has been updated	2.1-2.5
Modest improvement	The PDSA cycle has been completed according to plan. There is anecdotal evidence of , and 20% of the aim and objectives have been achieved or each measure shows at least an improvement of 20%.	2.6-3.0
Improvement	Testing and implementation continues. Improvement results are close to the target.	3.1-3.5
Significant improvement	The project has met the QI targets.	3.6-4.0
Sustained improvement	Monitoring data show that the improvement has been sustained since the last coaching visit.	4.1-4.5
Institutionalization and spread	The PDSA cycle has been completed, and the project aim has been achieved. Organizational changes have been made to accommodate improvements and to make the changes permanent. The scale-up has been planned, and the project has been documented using the QI storyboard Template (see **Supplement 15**).	4.6-5.0

Chapter 15

Facilitating learning sessions

What is a Learning Session?

A learning session is the major event of an improvement collaborative. Multiple teams share their experiences with their peers, discuss opportunities and challenges, and plan the next changes. Teams connect with coaches, experts, and leaders, and collaborate through small group sessions, storyboards, and social interactions.

A learning session is typically a two-day meeting organized every three to six months with the participation of all the QI teams (often represented by their team leaders). The teams work on the same improvement aim and objectives, measure the same indicators, and test different changes at the same time in their respective work environments. The attendance of the coaches and the managers of the health system provides an opportunity to discuss the progress of the QI effort, reach a consensus on each step of the QI model, and share results and lessons learned. The QI coaches are responsible for planning and organizing learning sessions according to an agenda that will evolve along with the progress of the QI teams.

Gathering participants from various sites empowers the group and introduces a healthy competition among peers. Team members develop collegial relationships and have an opportunity to question, compare, and learn from each other. New ideas generated by the teams can be planned during the learning session using the PDSA template.

Learning sessions can be used in any of the three phases of the improvement effort. They offer the opportunity for new teams to join the improvement effort, learn from their pioneering peers, and develop a joint plan using the Spread Planner Tool.

What are the Essentials of a Learning Session?

A major difference between a learning session and a conference or a training session is the spirit: everyone teaches, and everyone learns. These sessions provide an opportunity for

multiple teams to openly share proposed changes, progress, obstacles, and ideas about the way forward. The IHI calls for three "have to haves" for a successful learning session:

- **Will** – Motivation comes from learning that the goal is possible, and from bonding with colleagues who are working on the same problem. It is sustained by leaders' explicit support for improvements and changes.
- **Ideas** – Participants should have an opportunity to acquire great ideas for change using the change package, experts, and colleagues.
- **Execution** – Participants should learn to apply improvement tools to make lasting changes and to identify changes for the PDSA cycle planning.

During a typical learning session, the improvement teams, their coaches, and the other participants will:

1. Share their early experiences and use run charts to display data.
2. Identify positive and negative factors associated with an improvement idea/change, and consider modifications if necessary.
3. Plan the next changes to be tested.
4. Discuss the scale-up of successful changes that could be used in other organizations.

Teams from five health facilities in Vietnam generate ideas for improvements to test using PDSA. Photo credit: Abundant Health, 2016.

Preparing for a learning session requires significant effort. We have developed a checklist (**Table L**) to track the preparation for the learning session.

Table L. Checklist: Preparing for a Learning Session

Action items	Status
Develop and share a storyboard or presentation template with the teams.	
Coaches meet with teams to prepare and rehearse their presentations and storyboards.	
Plan a session to introduce the patient's "voice" (videos, patient's speech, focus group discussion).	
Finalize the agenda for the learning session; identify and send invitations to the participants.	
Develop facilitator instructions.	
Distribute roles and responsibilities for the group facilitation.	
Identify a venue for the learning session.	

A short collaborative usually consists of no more than three learning sessions. During the first learning session, the participants learn about the collaborative structure, the improvement model, and the evidence-based interventions to be implemented. Using the PDSA cycle, each team plans the initial changes that will be tested. After the first action period, the teams share their experiences of implementing changes and plan the next cycle of changes. This second learning session is also when QI experts and coaches answer participants' questions on the implementation, measurement, reporting, and interpretation of results. At the third learning session, the coaches facilitate and prepare new teams and pilot teams to work together to scale up the successful changes within their organizations.

In some instance, a greater number of learning sessions can be introduced, but they must be structured to provide further learning about improvement science and to share the experiences of each team. In this chapter, we provide an agenda (**Supplement 15.1**) for a learning session that can be adapted by coaches.

What are Storyboards and When Should They Be Used?

Teams and coaches from various sites share their experiences using storyboards during the learning sessions.

A storyboard is a tool used to display the work of participating teams that can also be used during small group discussions. Storyboards displayed in the meeting room help participants to learn from each other. Storyboards should focus on PDSAs that are displayed with run charts (see the photo below and on the next page).

The QI storyboard serves as an ongoing visual record of a team's progress, helping keep team members focused on the task while sharing their progress with others. Storyboards use simple, clear statements, as well as pictures and graphs to describe a problem, summarize the analysis, describe the changes and their implementation, and display the results.

A VHT presents a storyboard and run charts to his team. Uganda, 2017. Photo credit: CBFP project.

Clients share their stories with VHTs and health workers in a "voice of a client" session. Uganda, 2016. Photo credit: CBFP project

We often encourage teams to display storyboards in the health facilities to demonstrate their improvement initiative to patients and other visitors.

How can Patients be Engaged in the Learning Session?

A learning session is also a good opportunity to engage patients in a meaningful way. We should remember that there are always enthusiastic, patients who would like to share their stories and contribute ideas to the improvement effort. Providers also appreciate having patients at the learning sessions. As one of the providers said, "Listening to patient's stories gave us a meaning in our improvement work. We are not doing it for the sake of formality, we are making these efforts for real patients."

For example, in Uganda FHI 360 organized a special session with patient representatives called "voice of a client," where we heard the stories of women who had been using contraceptives with their husbands' support. At the end of the sessions, clients expressed the desire to cooperate with the QI teams, participate in health talks, share their testimonials, and empower other women to talk to their husbands about the possibility of using a contraceptive method. This experience shows how engaging clients can help transform them from passive recipients of services to proactive collaborative partners in an improvement effort.

Supplement 15.1: Quality Improvement Learning Session: Illustrative Agenda from a Hypertension and Diabetes Care Improvement Effort

ALL TEACH – ALL LEARN

Objectives:

- Identify accomplishments and areas for improvement since the start of the improvement effort.
- Understand the barriers to change and strategies to overcome them.
- Generate new change ideas and develop plans for new cycles of PDSA.
- Identify strategies to obtain regular feedback from community members about their experiences at the health facility and ways to use the information for quality improvement.

Participants: coaches and health-facility team members (including, physicians, assistant physicians, nurses, community collaborators, pharmacists, and patient representatives)

Day 1			
Time	**Agenda Item**	**Facilitator**	**Materials**
8:30 AM	Welcome and introductions • Review agenda and objectives • Introduction and welcome to new participants	District leaders	
8:45 AM	Program progress check-in: What we have accomplished and where we are headed next? • Review model for improvement • Presentations by two champion teams	Two champion teams	❑Handout of team presentation
9:15 AM	Storyboard walk-around • Review PDSA (briefly). • Learn about the testing at other facilities, including what worked and the challenge\ • Draft the next cycle of the test for your facility	All teams	❑Completed Storyboards posted around room
10:00 AM	Measurement review: learning from our data • Review the data and discuss what we can learn from it	Coach	
10:30 AM	Tea break		
10:45 AM	Strategies for increasing patient retention • Brainstorm session: Review the data and use a 2 X 2 table to prioritize test ideas • Draft a PDSA plan to test or learn more		Patient representatives are invited for a little talk
11:45 AM	Lunch		
1:00 PM	Team-building exercise	Coach	❑Slides
2:00 PM	Treatment of hypertension and diabetes: a review followed by a question and answer session	Expert	❑Slides ❑Ask participants to bring real cases of challenging patients
2:30 PM	Tea break		
2:45 PM	Promoting patient behavior change and coaching: role play and discussion	Coach	❑Slides
3:30 PM	Review Day 1 and plan for Day 2		

Day 2			
Time	**Agenda Item**	**Facilitator**	**Materials**
8:00 AM	Welcome back: Day 1 debrief		
8:30 AM	Leading change: challenges and choices	Coach	❑Slides
9:15 AM	Community/family engagement: strategies for a deeper understanding of the patient's perspective • Interview with two or three patient representatives • Discuss patient retention	Patient panel and discussion	Patient discussion in a circle
10:15 AM	Tea break		
10:30 AM	PDSA planning and next steps	Teams and coaches	❑PDSA and action-planning handout
11:15 AM	Report and close • Each team shares its action plan	District leader	
12:00 PM	End		

Supplement 15.2: Community-Based Family Planning Storyboard*

Health facility name: VHTs (Village Health Team) reporting to Buhehe Health Center (Busia, Uganda)
Team leader: _____
Team Members: _____
Date: October 2016
Population served: Buhehe VHTs have served 3314 women
Process that is being improved: Rate of clients returning to continue FP method.

Place logo here if desired. You can also insert a photo of the team.

PLAN: Identify an Opportunity and Plan for Improvement

1. Prediction
Reminding FP clients during a home visit about the next visit to the VHT and encouraging the women to come to the next visit with their husbands increases the likelihood that each woman will continue using a chosen method.

2. Plan (who, what, when, where, how)
Starting in November 2016 (after the learning session), 15 VHTs in the district will extract the names of women who are expected to come for the next FP visit. They will go to the houses of the women who have given advance permission for home visits and remind them about the date of the next FP visit. They will encourage women to come to the VHT's home with their husbands, if possible.

3. Data collected
Percentage of women who return to a VHT for their FP methods on time.

DO: Test the Theory for Improvement

4. What happened
All 15 VHTs tried to implement the change, including reminding and encouraging women to come with their husbands, with varied success.

STUDY: Use Data to Study Results of the Test

5. Lessons learned
The percentage of women who returned to pick up their FP methods in time increased up to 70%, with variations in time by facility or VHT. The main lesson learned is that VHTs should encourage disclosure to husbands only if they have positive signs that disclosure is what women want and if there are examples of other men in the village who support their wives' FP use.

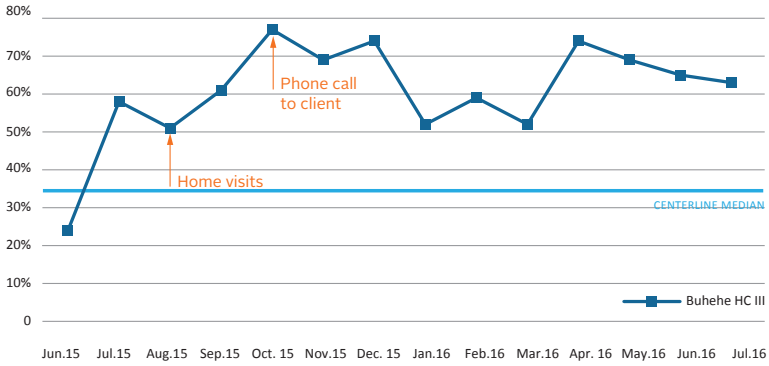
ACT: Standardize the Improvement and Establish Future Plans

6. Modify the improvement or develop new change ideas
VHTs plan to integrate couple disclosure in counseling and target women during the first 30-60 days of FP use with messages about side effects. VHTs will proactively ask these women during their visits if they are experiencing side effects. VHTs will engage client experts to help engage new couples.

7. Establish future plans
New ideas will be tested by a few VHTs with the help of midwives. During the monthly meetings, each VHT will report on the effectiveness of the changes tested.

*Adapted from Minnesota Department of Health. Available at: http://www.health.state.mn.us/divs/opi/qi/toolbox/storyboard.html

Figure 27. Percentage of Women Who Return to a VHT for Their FP Methods On Time



Chapter 16

Conclusion

In this handbook, we describe the Model for Improvement and the collaborative improvement model that are fundamental to FHI 360's approach to QI. We have highlighted the role of an improvement coach—a local health system leader trained in improvement and capable of guiding the team in the improvement journey. We have also presented the most essential tools for the three phases of improvement: design, implementation, and spread/sustainability.

In conclusion, we would like to provide a summary of the three most important messages for public health specialists engaging in an improvement effort:

- Every system is designed to achieve the results it produces. Thus, only through continuous improvement of systems and processes will we make a difference in the quality of health and health care.
- The science of improvement is evolving, but the coaching of QI teams will remain an essential feature of successful improvement efforts.
- This QI handbook is part of FHI 360's contribution to the design and implementation of improvement efforts in public health projects to produce lasting results. The pace of change in health care is accelerating, and the use of the handbook can help us anticipate changes and proactively support better health care for our patients and populations.

We encourage diverse FHI 360 programs and local health system leaders and stakeholders to use this handbook to start their own improvement journeys.

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