LeBoHA

QUALITY IMPROVEMENT MANUAL

A guide for Quality Improvement initiatives at health facilities in Lesotho

Kaitlyn Berry, MPH

2017

LeBoHA
Quality Improvement
Manual:

A guide for leading Quality Improvement
initiatives at health facilities in Lesotho

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Acknowledgements

Lesotho Contact Information:

Lesotho-Boston Health Alliance
Nala House
Bowker Road
P.O. Box 0813
Maseru West, 105
Lesotho
+266 2232 4262

US Contact Information:

Lesotho-Boston Health Alliance
Dept of Family Medicine
Dowling 5S Room 5505
1 Boston Medical Center Place
Boston, MA 02118
+1 (617) 414-6264

Manual Overview

> "Quality is everybody's responsibility."
>
> -W. Edwards Deming

The LeBoHA Quality Improvement manual was designed to support QI projects across Lesotho. The manual walks you through steps the Quality Improvement from forming a QI team and setting aims to testing and implementing changes so that you can start making lasting improvements at your health facility.

Target Audience

The target audience is health professionals, including nurses, nurse-midwives, medical officers, physicians, pharmacists, lab technicians, and others. However, patients, community leaders, and community members may also find this manual to be helpful. In fact, anyone who cares about quality health care and wants to improve the delivery of health care can use this manual!

All examples presented in the following chapters are from past QI projects in Lesotho. However, the content could be adjusted for other similar contexts.

How to Use This Manual

In facilities that already have QI teams, this manual can be used to support ongoing QI projects. The QI tools and methods described in this manual are similar to those you may have already learned from the Elizabeth Glaser Pediatric AIDS Foundation (EGPAF) and the University Research Council (URC). This manual aims to help you develop a deeper understanding of these concepts by detailing Lesotho-specific examples and providing specific instructions on how to use various QI tools.

However, this manual does not require prior knowledge of or experience with Quality Improvement. Those who are new to QI will also find this manual useful on their improvement journey. People are often hesitant to start improvement projects, because they don't know how to improve or where to begin. This manual can help with all of that and more!

Manual Overview

Chapter by Chapter

The chapters of this manual are organized around steps that are commonly used during improvement projects. After a brief introduction to QI, the manual will lead you from forming a QI team to sustaining your improvements. However, improvement is not always a linear journey, so feel free to rearrange the chapters as your feel necessary.

Chapter 1 introduces the concept of "quality improvement" and how it provides to health care. This chapter will help you understand the key principles of QI and how they can be applied to solve priority issues at health facilities.

Chapter 2 is all about forming a QI team. This chapter will provide useful information on how to select members for your QI team and how to navigate the stages of team development in order to get the most out of your work.

Chapter 3 introduces a QI methodology, called the Model for Improvement, that is frequently applied to health care improvements. The remaining chapters will discuss this the elements of this model in more detail.

Chapter 4 is about setting aims for improvement projects. This chapter will help you understand the importance of analyzing your system and setting aims that are specific, measurable, attainable, relevant, and time-based.

Chapter 5 explains establish measures for improvement projects. This chapter will help you learn the importance of measurement for improvement and provide guidelines on how to track your changes.

Chapter 6 is about identifying changes to test that are worth testing. This chapter will help you brainstorm change ideas that you think will result in improvement and decide which changes to test first.

Chapter 7 explains how to test changes using a Plan, Do, Study, Act (PDSA) cycle. This chapter will help you understand the benefit of making small scale tests and how to build use these tests into improvement.

Chapter 8 is about sustaining and spreading your improvements. This chapter provides helpful tips about maintaining your progress and sharing it with others.

Each chapter includes examples from past QI projects in Lesotho and explanations on how to use important QI tools like run charts and process maps. Each chapter also contains a summary of key points and a list of references.

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Manual Annexes

This QI manual also contains resources to support your QI projects. These resources can be found in the annexes at the back of the manual.

Annex A is a glossary of QI terms. This resource allows you to look up the meaning of key QI terms without reading through the main text of the chapters.

Annex B contains a "Quality Improvement Toolbox." This toolbox provides a short explanation for each of the QI tools presented in the manual. This section is useful to reference when trying to decide which tool to use and when to use it.

Annex C contains worksheet templates that will help you form a QI team and document meetings.

Annex D contains worksheet templates that will help you complete your improvement project. This includes a QI Project Charter that will be revisited at various stages of your project. This section also contains a worksheet that you can use to document PDSA cycles.

Don't forget to consult these resources as you start of on your journey for continuous improvement!

> "Continuous improvement is better than delayed perfection."
>
> -Mark Twain

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INTRODUCTION TO QUALITY IMPROVEMENT

> **Chapter 1 Objectives**
>
> - Understand the meaning of "quality" and how it pertains to health care delivery
> - Be able to define and differentiate between Quality Assurance and Quality improvement
> - Understand the key principles of Quality Improvement
> - Understand how Quality Improvement can be applied to solve priority health issues

Understanding Quality

Think about the last time you accessed a service. It could be related to health, education, food, transportation, etc. What expectations did you have for that service? What made it a high quality or low quality service? What factors make you want to return to that service?

For example, when you go to a restaurant with your family, you have certain expectations about the food, atmosphere, and service delivery that affect your opinion of the restaurant. If you get your food quickly, it is cooked appropriately and tastes good, the price is reasonable, and the staff is friendly, you would likely be satisfied with your experience and with the quality of the restaurant and the services they offer. On the other hand, if your food takes a long time or comes out cold, if the staff is rude to your family, or if you get sick from eating undercooked meat, you will probably be less satisfied and decide the restaurant has poor quality service.

Quality is an essential aspect of any service, including health care. If the restaurant wants to do well, it must serve food that is good enough to satisfy its customers. Similarly, **health centers and hospitals must deliver quality health care that meet the needs and expectations of patients.**

Understanding Quality in Health Care

When we talk about quality in health care, we are talking about the level of value provided to patients by health resources like health centers, hospitals, medicines, or medical technology. The United States Institute of Medicine defines health care quality as "the degree to which health care services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge."[1]

Chapter 1: Introduction to Quality Improvement

In understanding how the concept of "quality" applies to health care, it is helpful to think about the different properties or dimensions of quality. The Institute of Medicine further defines quality as having the following six properties:[1,2]

Safe: avoiding injuries to patients and potential bodily harm

Timely: delivering necessary care while minimizing delays for both those who give and receive care

Equitable: providing health care of equal quality to those who may differ in personal characteristics such as gender, ethnicity, geographic location, and socioeconomic status

Effective: providing care processes and achieving outcomes as supported by scientific evidence

Efficient: avoiding waste, including waste of equipment, supplies, and energy, and maximizing resources

Patient-centered: meeting patients' needs and preferences and providing care that is responsive and respectful to the individual

Figure 1: Dimensions of Quality

Other dimensions of quality could include health care that is: appropriate, accessible, affordable, technically sound, continuous, participatory, sustainable, and compassionate.

Simply put, health care quality is how well a product or service matches the expectations and needs of a patient.

> "Quality means doing the right thing right the first time."

Quality Assurance and Quality Improvement

One way to think about health care quality is to think about how well health services are conforming to **standards**, or statements of expected performance, set at the national level. Standards are often broken into measurable steps called **criteria** which allow us to evaluate whether the standards are met and enable achievement. When we are evaluating whether health care performance is conforming to standards and criteria, we use measurement tools called **indicators** that indicate the level at which standards are met.

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Chapter 1: Introduction to Quality Improvement

Quality Assurance (QA) refers to the set of activities we engage in to set standards and measure our performance against these standards. All our activities as health care providers must demonstrate that the required level of quality is present to assure patients that services are safe and effective.

Simply put, Quality Assurance is the oversight process for managing health care quality, including adherence to standards and guidelines.

The Ministry of Health of Lesotho has developed the *MOH Standards Quality Indicator Guide.* This guide lists all the national-level health care standards so that all health workers—from nurse assistants to district health managers—know what is expected of them. A copy of this guide should be available in all health centers and hospitals throughout Lesotho.

As health professionals, we should be constantly monitoring our performance against these standards and guidelines. Ideally, the health facility where you work is performing well and meeting national standards.

But what happens when we are not meeting these standards? What should we do when there is a gap between our performance goals and our actual performance? This is where **Quality Improvement** comes in.

Quality improvement (QI) can help us close this performance gap. QI is the application of systematic and continuous actions that lead to measurable improvements in the health care services or in the health status of a target population. The QI process helps us identify gaps in performance, brainstorm solutions, generate plans, test changes, and implement solutions.

Both QA and QI are essential. Quality Assurance (QA) helps us study and measure the performance of health systems and services, and Quality Improvement (QI) helps close gaps and improve performance.

QI provides the steps to help close the gap between performance goals and actual performance:

Figure 2: Closing Quality Gaps

Chapter 1: Introduction to Quality Improvement

Key Principles of Quality Improvement

It is helpful to think of Quality Improvement as both a philosophy for the pursuit of continuous performance improvement and a family of tools and methods for managing systems.[3]

QI is the science of process management. It works by improving systems and processes.

All health organizations have systems and processes for achieving desired objectives, whether it is promoting a new public health education campaign or directing a Lesotho health center. Quality Improvement (QI) is the science of process management. It works by improving the systems and processes where you work. Understanding current systems and processes is an important prerequisite for improvement.

QI is data driven. It collects and uses data to track improvements.

Collecting and understanding data is essential for understanding these current systems and processes. Before we even start improving, we need to establish baseline measurements. This will provide us a comparison that we can track progress against. And we need to continuously collect and interpret good data throughout the improvement process.

QI requires support, collaboration, and participation of multiple stakeholders.

Quality improvement is a team process where everyone shares responsibility for analyzing the system, testing changes, and monitoring progress. Preferably, QI teams should be multidisciplinary; they should consist of a variety of health workers and stakeholders. Data clerks, facility managers, community members, and frontline health workers like nurses and village health workers should all be involved in the QI process. The idea is to bring together people with different perspectives and experiences to work together on the improvement process. Often, the best ideas come from frontline health workers or even patients, but it is important to have the support of facility managers as well.

QI is patient-focused.

Above all else, Quality Improvement is patient-centered. Health services should be designed to meet the needs and the expectations of individual patients and the community. When there are gaps between these needs/expectations and performance, improvement efforts concentrate on meeting the needs of patients rather than the needs of the organization. Many QI projects involve a measurement of patient satisfaction, and patient representatives should be included on QI teams.

QI is a journey in learning rather than a method for quick fixes.

During Quality Improvement projects, QI teams take incremental steps that together result in improvement. Using basic QI methods can catalyze or speed up change, but the process requires time and continuous effort. Throughout this journey towards improvement, QI teams should be learning more about the system and readjusting their plans of action as needed.

Chapter 1: Introduction to Quality Improvement

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Why use Quality Improvement?

- To ensure provision of high quality services

- To close gaps between performance and goals/standards

- To optimize the use and reduce waste of limited resources

- To improve staff morale

- To increase efficiency

- To produce better health outcomes

- To increase patient satisfaction

- And more!

</div>

Quality Improvement in the Context of Lesotho

Most aspects of Quality Improvement methodology are borrowed from the manufacturing and business sectors. QI tools and principles were first applied to health care in the United States, and the majority of research on the success of QI comes from high-income countries. However, a growing body of evidence suggests that Quality Improvement also works in the developing world.[4]

In fact, the conditions for Quality Improvement may be better in low- and middle-income countries than in wealthy ones.[4,3] The gap between current care and the best possible care is often larger in these countries, suggesting a greater opportunity for potential quality improvements.[3] In countries like Lesotho, health care leaders are already accustomed to working with limited resources and health care workers might be more familiar with working in teams.[4]

Quality Improvement has the potential to further optimize the use of limited resources. If this results in improved health outcomes, the improvement could also increase the confidence of the Ministry of Health and donor organizations and lead to increased investment.[3] Furthermore, quality improvement helps support current capacity-building efforts in Lesotho and gives health professionals the knowledge and tools needed to create lasting change.

Lesotho is no stranger to Quality Improvement. A hospital wide QI program at Motebang Hospital in the Leribe District, led by the Lesotho-Boston Health Alliance (LeBoHA), has resulted in significant improvements in partogram documentation on the maternity ward, decreased wait times for critically ill patients, and a streamlined referral process.[5] Additionally, partner organizations like the University Research Council (URC) and the Elizabeth Glazer Pediatric AIDS Foundation (EGPAF) are bringing QI trainings and projects to district health centers.

Simply put, Quality Improvement works. It works in the health care sector. It works in low resource settings. And it works in Lesotho.

Chapter 1: Introduction to Quality Improvement

> ## Summary of Key Points
>
> - Health centers and hospitals must deliver quality health care that meet the needs and expectations of patients.
>
> - According to the Institute of Medicine, quality health care should be: safe, timely, equitable, effective, efficient, and patient-centered.
>
> - Both QA and QI are essential. Quality Assurance (QA) helps us study and measure the performance of health systems and services, and Quality Improvement (QI) helps close gaps and improve performance.
>
> - Quality Improvement works by improving systems and processes. It is data-driven, requires multidisciplinary participation and support, focuses on patients, and involves constant learning.
>
> - Quality Improvement has the potential to ensure provision of high quality services, close gaps between performance and goals/standards, optimize the use of limited resources, support capacity-building efforts, improve staff morale, increase efficiency, increase patient satisfaction, and produce better health outcomes.
>
> - Quality Improvement is well suited to low resource settings and has proven to be effective at creating change in Lesotho.

References

1. Institute of Medicine. Crossing the quality chasm: a new health system for the 21th century. *Iom*. 2001;(March):1-8. doi:10.17226/10027.

2. Understanding Quality Measurement. Agency for Healthcare Research and Quality. https://www.ahrq.gov/professionals/quality-patient-safety/quality-resources/tools/chtoolbx/understand/index.html. Published 2012.

3. Leatherman S, Ferris TG, Berwick D, Omaswa F, Crisp N. The role of quality improvement in strengthening health systems in developing countries. 2010;22(4):237-243.

4. Leatherman S. Quality improvement in the developing. 2002;14(6):439-440.

5. Berman J, Nkabane EL, Jack B, Bicknell W. Developing a hospital quality improvement initiative in Lesotho. 2012;27(1):15-24. doi:10.1108/IJHCQA-01-2012-0010.

FORMING A QUALITY IMPROVEMENT TEAM

Chapter 2 Objectives

- Understand the role of teams in delivering quality health care

- Be able to form a multi-disciplinary Quality Improvement Team

- Understand how to use a team contract and hold team meetings

- Understand how to deal with resistance to change

- Understand the importance of team reflection

Understanding Teams

A **team** can be defined as a small number of people with complimentary skills who are united by a commitment to a common purpose, approach, or performance goal.[1] Some teams work together over a long period of time, while other project-based teams have a specific task and work for a limited time to achieve a specific objective.

Delivering health care itself is a team process—it requires physicians, nurses, nursing assistants, pharmacists, village health workers, and others with different types of expertise to work together to care for patients.

In fact, as health professionals, you are probably already part of several health care related teams. You are working as a team with other health professionals at your hospital or health center daily to see patients and provide care. You may also be part of other project-specific teams coordinated by facility management or partner organizations to address certain health issues. For example, you might be part of a small team at your health center working to increase the rates of childhood immunizations in certain villages.

Simply put, working in teams is an essential part of delivering health care, and teams come in all shapes and sizes.

Teams are most effective when they practice a team learning approach. In team learning, teams work together to achieve goals but also to help their teammates learn and become more effective team members and leaders. Team learning can help develop individual skills and insights, develop collaborative skills, increase the collective intelligence of the team, and accelerate progress towards goals.

Chapter 2: Forming a Quality Improvement Team

Many skills are necessary to participate effectively in teams. Team members must demonstrate listening skills and an openness to the opinions and ideas of others. Team members must also have the skills to communicate effectively with other team members. The abilities to provide constructive feedback to other team members and receive feedback from others are also essential.

Simply put, teamwork requires listening, communication, and an openness to giving and receiving feedback.

TEAM

Together

Everyone

Achieves

More

Figure 3: TEAM Acronym

The Importance of Teamwork in Quality Improvement

Improvement is achieved through a team approach to problem solving.
Quality Improvement projects are difficult to implement on your own. However, when people join forces and work together, it becomes much easier to achieve improvements. Every Quality Improvement project needs a team of change champions that take a joint approach to solving problems and creating solutions.

Involving people with different roles and perspectives improves ideas.
Evidence suggests that diverse problem-solving teams outperform teams consisting of highly capable, but similar individuals.[2] Workers with different roles in the health system often have diverse perspectives that can improve collective understanding and problem solving.

Participation reduces resistance to change and increases buy in.
When people are involved in the process of Quality Improvement, they are more likely to embrace proposed changes and feel invested in the project. As a result, members of the QI team "buy in" to, or adopt, the team's ideas and strategies resulting in a greater support for the project and greater chances of success.

Accomplishing things together increases confidence and allows groups to build momentum for change.
When QI teams work together, they are more likely to be successful and accomplish their improvement aims. This success increases the confidence and enthusiasm of the group and motivates them to continue striving for improvement. Each successful QI project builds momentum for change and makes future QI projects easier.

> "Alone we can do so little, together we can do so much."
> -Helen Keller

Chapter 2: Forming a Quality Improvement Team

Forming a Quality Improvement Team

Before you get started on your Quality Improvement projects, you must form a QI team at your health facility. This QI team should be multi-disciplinary and consist of individual members that have different roles in the delivery of health care. Changing systems and improving quality requires different types of expertise that incorporate diverse perspectives and knowledge of different medical procedures, equipment, laboratory tests, information management.

In some cases, you might have an idea of the general topic for your improvement project before you get started. If so, you can try to invite people to join that make sense for the project at hand. Other times, you might form a QI team before you decide what sort of a project you want to conduct. Regardless of the topic, you should invite a variety of medical professionals and other workers to join the QI team. QI projects benefit from both clinical and non-clinical perspectives.

Potential team members include doctors, nursing sisters, nurse-midwives, nursing assistants, data managers, and pharmacists. While it is important to have the support of facility management/leadership, the best ideas for improvement usually come from the frontline health workers who have the most interaction with patients and with the systems we are trying to improve. Additionally, QI teams should include patients or other representatives of the community that will be impacted by the project.

Simply put, QI teams should be facility-based and include members with a variety of roles and perspectives.

Figure 4: Teamwork Speeds Up and Simplifies Improvement

Chapter 2: Forming a Quality Improvement Team

The Stages of Team Development

Understanding the typically stages of team development can help teams anticipate challenges and get started their Quality Improvement projects. Typically, teams go through the stages of forming, storming, norming, performing, and adjourning/transforming.
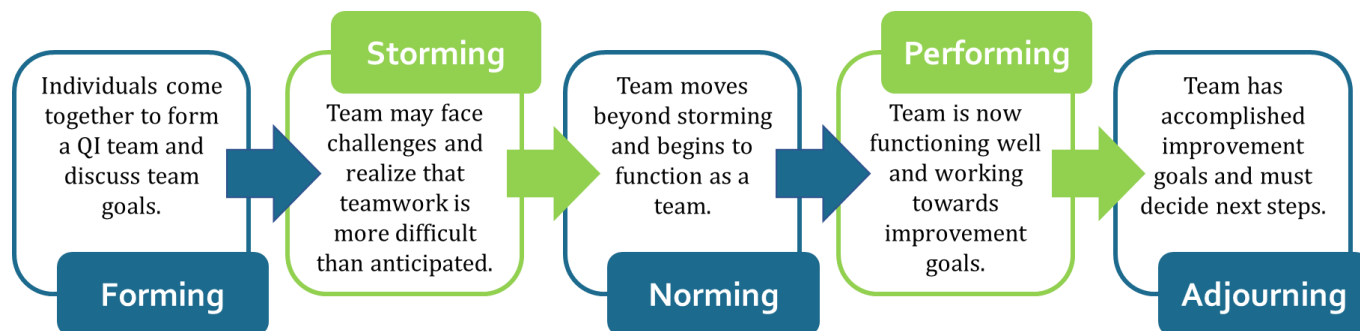

Figure 5: The Stages of Team Development

Stage 1: Forming

Forming is the introductory stage of team development. During this stage, teams meet each other and discover how to work together. At this stage, team dynamics are often characterized by agreement as individuals want to make good first impressions. While forming, teams should focus on managing team membership and creating a purpose. Depending on whether the team has worked together before, it might be helpful to take some time to get to know each other. Teams should discuss individual skills, areas of expertise, strengths, and weaknesses. It is also helpful to establish standard operating procedures and team rules before clarifying the team's purpose.

Stage 2: Storming

In the storming stage of team development differences of opinion are more obvious and the team may express conflicting views more openly. As people become more open with their expectations and options, teams may need to take time to clarify roles and resolve conflicts. Teams should focus on discussing the causes of tension and resolving disagreements. Everyone should be involved in the teamwork, and nobody should be left out.

> "Coming together is a beginning. Keeping together is progress. Working together is success."
> -Henry Ford

Stage 3: Norming

By the norming stage of team development, team members generally feel a sense of team identity and have a clearer understanding of team responsibilities. In this stage, teams begin to resolve conflicts and prepare to achieve their goals. Teams should focus on finalizing a team contract and establishing methods for solving problems and evaluating progress. This framework can be used in all team-based work, including projects outside of QI.

Stage 4: Performing

During the performing stage, team members are highly committed to accomplishing team goals and are completing project tasks. Team dynamics at this stage are characterized by teamwork and satisfaction regarding team progress. During this stage, teams should focus on evaluating results and learning from their experiences. Teams should strive for continuous improvement but take time to recognize and acknowledge team successes.

Stage 5: Transforming/Adjourning

As the team completes their QI project, the team moves into the final stage of team development which is referred to as adjourning or transforming. Teams should carefully manage the process of disbanding or moving on to other projects as individual members may deal with the end of the project differently. It is important to take time for group reflection as you wrap up the QI project.

Creating a Team Contract

Establishing a team contact can help teams navigate the stages of team development. A **team contract** is a document that establishes ground rules for the team. Typically, team contracts define meeting times and guidelines for communication and teamwork.

It is helpful for individuals to think about how they can contribute to the team and what they want to get out of the project before discussing these issues as a group. During the first meeting QI meeting, individuals can complete the **Team Contract: Part 1** worksheet found in Annex C.

After each team member completes Part 1, the team should discuss responses as a group and complete the **Team Contract: Part 2** worksheet. These team contract worksheets should be used to guide the team process throughout the QI project.

Holding Team Meetings

The team contract should establish meetings times and guidelines for the QI Team. The first meeting (or even two) should be dedicated to making introductions and developing a Team Contract. After that, teams should work through various stages of the QI process using the Model for Improvement as a framework. During each team meeting, team members should be required to sign in. Additionally, it is helpful to assign one team member to taking minutes during each meeting. Teams can use the **QI Meeting Sign-In Sheet** and **QI Meeting Minutes** in Annex C.

Chapter 2: Forming a Quality Improvement Team

Working with People's Responses to Change

You will likely encounter many barriers you continue on your improvement journey. One major barrier you may find is that people respond to change in different ways. Some people adapt quickly to new changes while others take longer to accept them.

As members of the Quality Improvement team, we should be committed to leading the change process and working to overcome these obstacles along the way. QI Teams must become champions of change and serve as an example for embracing new ideas for other health workers at the facility. It is important to note that QI projects are not an opportunity to blame a person, someone for the outcomes that we wish to impact, but to change the system in which we operate for the better.

Simply put, understanding responses to change can help QI team members and improvement leaders to encourage people to accept change.

Working with people's responses to change

It is important to understand the responses people have to change and provide support and encouragement that is appropriate to where people are in their own process

When people are in a place of…

Denial- provide them with additional information so that it becomes difficult to stay in denial.

Resistance- create opportunities for people to express their feelings. Explaining or defending change ideas can sometimes make things worse. Instead show understanding of conflicting opinions.

Exploration- make it easy for people to discover what is possible in the new situation. Encourage people to join together and support one another.

Commitment- try not to manage the change process at this point as people are ready to accept the change and make improvements!
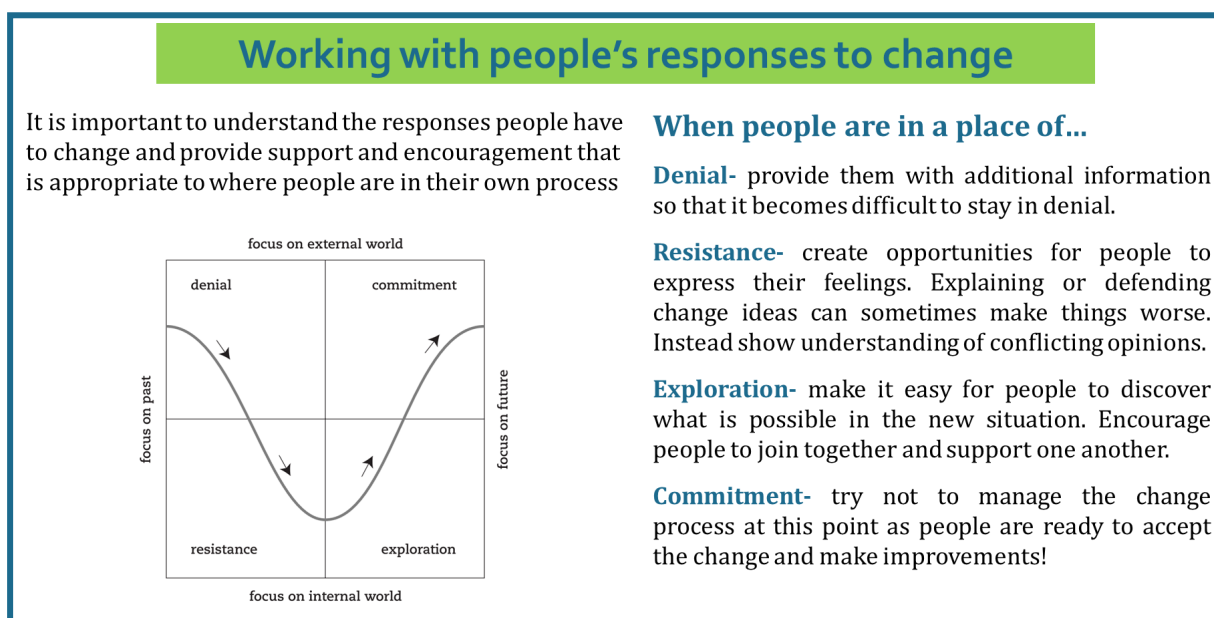
Figure 6: Responses to Change

Resistance is one of the most common and most challenging responses to change. People may resist change because they weren't in the decision-making process, because they view the change as conflicting with their opinions, or simply because they are accustomed to doing something in a particular way. Try using the following strategies to deal with resistance:[3]

- Make an effort to understand who is resisting and why

- Use reason to make the case for the proposed change

- Focus on the early adopters of change. These people can help you build momentum for new ideas and processes.

- Inspire others to adopt changes by appealing to a shared vision or personal values.

Chapter 2: Forming a Quality Improvement Team

> "If you want to go, fast go alone. If you want to go far, go together."
>
> -African Proverb

Reflecting on Team Performance

Team-based reflection can be a useful part of the Quality Improvement process. Building an environment of trust where team members can openly reflect on progress helps teams address some of the barriers to improvement.[4]

Teams should take time to reflect on their QI project at various stages throughout their improvement journey:[4]

Reflection-in-action: QI teams should observe their thoughts and actions as they are occurring in order to make adjustments as they go

Reflection-on-action: QI teams should study previous actions and apply knowledge gained to new actions

Reflection-for-action: QI teams should take time to pause and consider the effects and unanticipated consequences of changes

Simply put, QI teams will benefit from taking time for group reflection at various stages of the improvement process.

In addition to reflecting at different stages of the process, QI teams can reflect on different aspects of the improvement process. For example, teams can critically assess their mission and the roles and responsibilities of each member. They can also reflect on team dynamics, communication, and processes. The progress of the QI Project provides another opportunity for reflection.

Why use team-based reflection?

- Promotes buy-in, motivation and feelings of inspiration

- Enhances team problem solving

- Improves change management

- Strengthens discussion of the steps that need to be taken to implement desired QI changes

- And more!

Chapter 2: Forming a Quality Improvement Team

Summary of Key Points

- Teams are small groups of people working together to achieve shared goals.

- Teamwork requires listening, communication, and an openness to giving and receiving feedback.

- In Quality Improvement, working as a team increases problem solving skills, facilitates the sharing of different perspectives, reduces resistance to change, increases confidence, and helps build momentum for change.

- Quality Improvement teams should be facility-based and multi-disciplinary.

- Understanding the Stages of Team Development and creating a Team Contract can help teams navigate the process of working as a team.

- QI teams should document their meetings by taking attendance and recording minutes.

- Understanding how people respond to change will help QI teams overcome resistance and encourage participation in improvement initiatives.

- QI teams should build in time for team-based reflection throughout their

References

1. Katzenbach JR, Smith DK. *The Wisdom of Teams.* Harvard Business School Press; 1993.

2. Hong L, Page SE. Groups of diverse problem solvers can outperform groups of high-ability problem solvers. *Pnas.* 2004;101(46):16385-16389. doi:10.1073/pnas.0403723101.

3. Management Sciences for Health. *Managers Who Lead: A Handbook for Improving Health Services.*; 2005. doi:0-913723-95-9.

4. Crabtree BF. How team-based reflection affects quality improvement. *Qual Manag Healthc.* 2013;21(2):104-113. doi:10.1097/QMH.0b013e31824d4984.How.

THE MODEL FOR IMPROVEMENT

Chapter 3 Objectives

- Be able to describe multiple approaches to Quality Improvement
- Understand the stages of the Model for Improvement
- Understand the benefits of using the Model for Improvement for health care improvement projects

Different Approaches to Quality Improvement

Quality Improvement is based on making informed and intelligent change.

There are several different approaches to Quality Improvement that your team can take, but these approaches share more similarities than differences. The scientific method is at the core of each of these approaches. The **scientific method** is a process for experimentation consisting of systematic observation, measurement, and experiment, and the formulation, testing, and modification of hypotheses.

The following are three examples of common approaches to Quality Improvement:

Lean Management- aims to eliminate waste and improve flow by simplifying processes and making them error-proof

Six Sigma- minimizes variation, eliminated defects, and establishes robust controls

Model for Improvement- emphasizes teamwork and iterative learning to make incremental tests of change that build to create larger-scale improvement

Lean Management and Six Sigma are more commonly used in manufacturing and industry, but the Model for Improvement is frequently applied to health care.

Simply put, your team can take multiple approaches to Quality Improvement, but the process will always follow the basic scientific method.

This manual will focus on the Model for Improvement since this methodology is already being used in Lesotho by partner organizations like LeBoHA, EGPAF, and URC.

Chapter 3: The Model for Improvement

Understanding the Model for Improvement

The **Model for Improvement** is a powerful, yet simple framework for accelerating improvement. Although developed in the United States, the Model for Improvement has been used by hundreds of health care organizations in dozens of countries to improve a variety of health care processes and outcomes. This model can be used in combination with other change models, approaches, and programs already being used in health centers and hospitals.[1]

The Model For Improvement

What are we trying to accomplish?

How will we know that a change is an improvement?

What change can we make that will result in improvement?
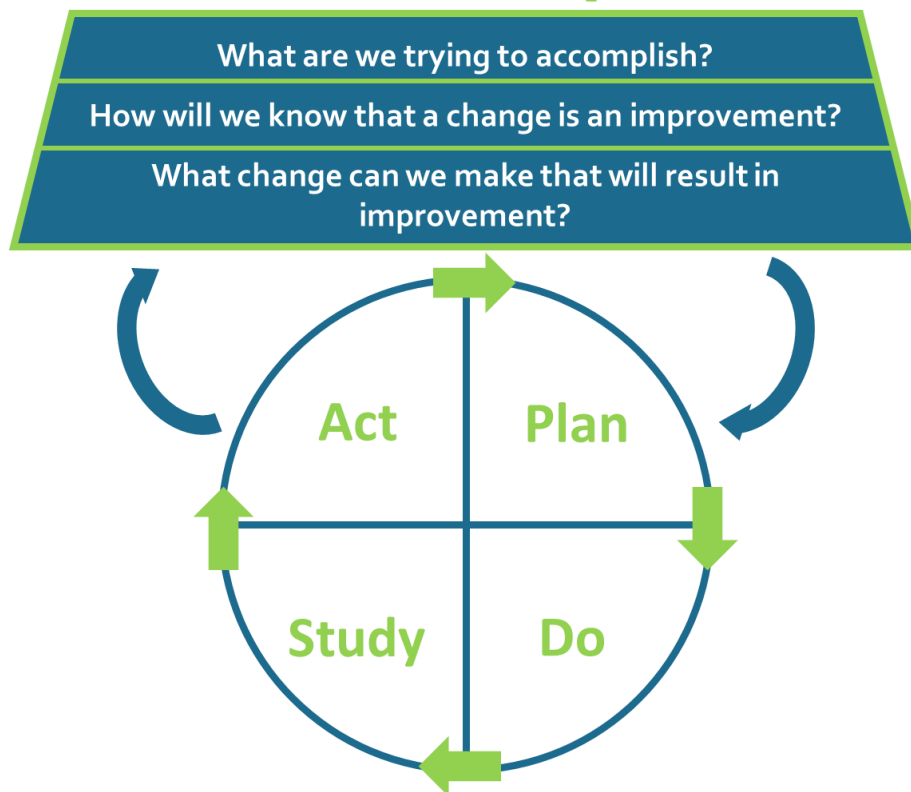
Act   Plan

Study   Do

Figure 7: The Model for Improvement

The Model for Improvement guides QI teams through the process of developing, testing, and implementing specific, identifiable changes.[2] This model consists of two main parts: 3 fundamental questions and a Plan-Study-Do-Act (PSDA) cycle to test changes in real work settings.

The Model for Improvement itself if a flexible method, but it is designed to promote a structured process for continuous learning through experience. The 3 fundamental questions and PDSA cycles guide help QI teams go through the steps needed to complete a QI project including: setting aims, establishing measures, selecting changes, testing changes, and implementing changes.

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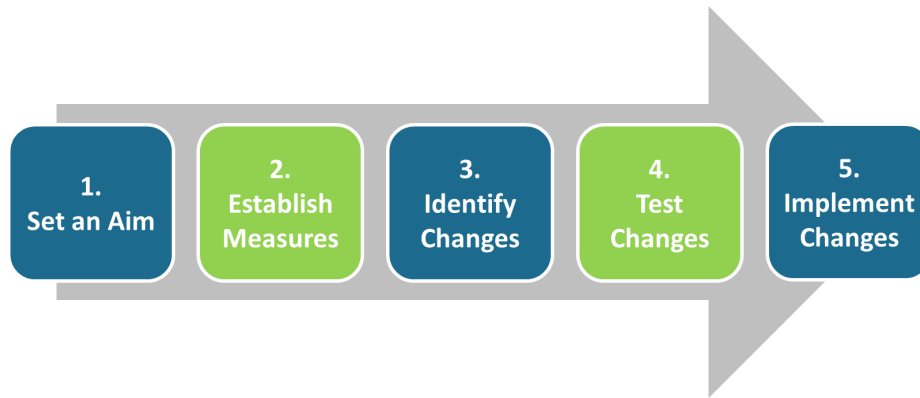
Chapter 3: The Model for Improvement

Figure 8: Steps of the Model for Improvement

Key Features of the Model for Improvement

The Model for Improvement requires QI teams to set clear aims for improvement.
The first step towards improvement is having the intention to learn and improve. You don't learn to ride a horse accidentally; you must first set a goal to learn how to ride. Before your QI team starts making any changes, you should develop a clear and specific goal for improvement. The first fundamental question of the Model for Improvement will help you set an aim for improvement.

The Model for Improvement relies on the use of data over time.
Collecting and understanding data is a huge part of the Quality Improvement process. Before we even start improving, we need to establish baseline measurements. This will provide us a comparison that we can track progress against. And we need to continuously collect and interpret good data throughout the improvement process so that we can understand the impact of any changes we make. The second fundamental question of the Model for Improvement will help you establish measures.

The Model for Improvement involves prediction-based tests of change.
As you continue on your improvement journey, your QI team will test changes that will help you achieve your aim and make improvements. Before you can test any changes, you should identify changes that you think will have a large impact on your aim and predict the outcome of these changes.[3] The third fundamental question of the Model for Improvement will help you select changes to test and make predictions for testing them.

The Model for Improvement uses PDSA cycles for small-scale, iterative testing.
Once you are ready to test changes, your QI team will conduct multiple Plan-Study-Do-Act (PDSA) cycles. These PDSA cycles will start small and build in scale as confidence grows. This facilitates rapid testing and allows changes to be adapted between cycles. Lessons from each PDSA cycle should inform the cycles that follow, creating an iterative approach.[3]

The Model for Improvement requires thorough documentation.
Documentation of QI initiatives helps teams learn from the process and understand their improvements. Documentation also makes it easier to transfer this learning to other settings.[3]

Chapter 3: The Model for Improvement

Three Fundamental Questions

The first part of the Model for Improvement consists of three fundamental questions that will help you plan your improvement project and prepare to test changes. These questions can be answered in any order, but are most commonly used in the order listed below.

Question 1: What are we trying to accomplish?
- Answering this question helps QI teams set aims for improvement

- The aim should be specific and measurable

- The aim should also define the specific population of patients being affected

- You will learn more about this step in Chapter 4 of this manual

Question 2: How will we know that a change is an improvement?
- Answering this question helps QI teams establish measures for their improvement projects

- Teams can use quantitative measures to track progress and determine if changes result in improvement

- You will learn more about this step in Chapter 5 of this manual

Question 3: What change can we make that will result in an improvement?
- Answering this question helps teams to select changes to test

- Ideas for change can come from a variety of sources including those who work in the system, experts in the area you are trying to improve, or other health facilities/ organizations who have made similar improvements

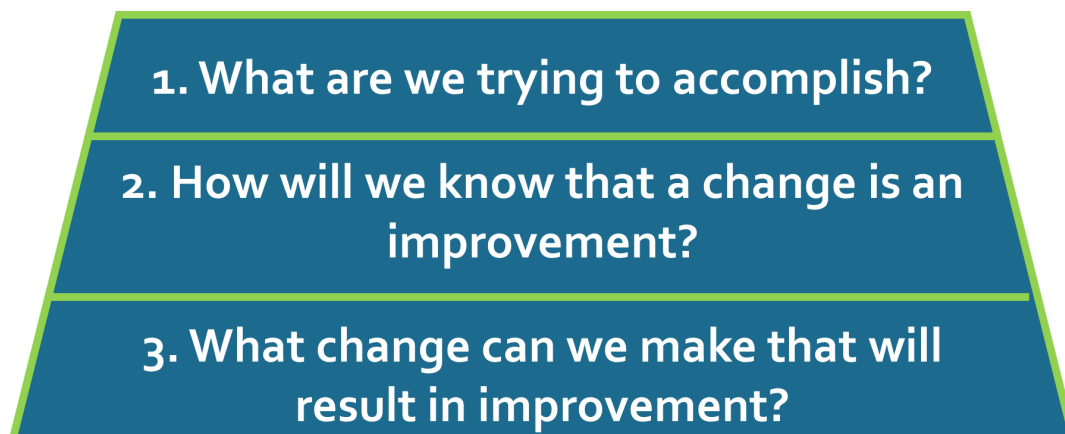- You will learn more about this step in Chapter 6 of this manual

1. What are we trying to accomplish?

2. How will we know that a change is an improvement?

3. What change can we make that will result in improvement?

Figure 9: Three Fundamental Questions

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Plan-Study-Do-Act (PDSA) Cycles

The second part of the Model for Improvement involves running multiple Plan-Study-Do-Act cycles to actually test changes that might lead to improvement in your workplace. These cycles are essentially the scientific method adapted for action-oriented learning.

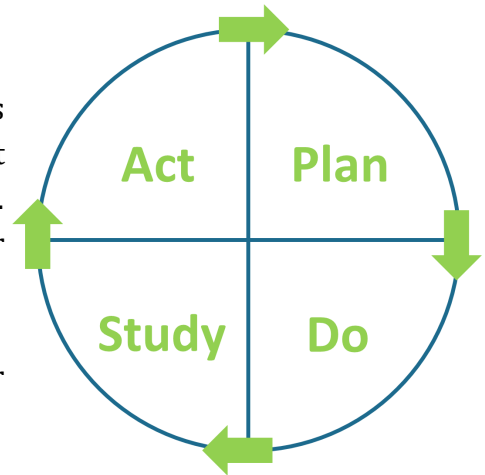After selecting a change to test, your QI team can start your first PDSA cycle.

Figure 10: PDSA Cycle

Elements of the PDSA Cyle

Part 1- Plan:
- State the objective of your test of change
- Make predictions about the outcome of this test and why you expect this outcome
- Develop a plan to test the change in your workplace at some small scale

Part 2- Do:
- Carry out your planned test of change
- Document results including problems and unexpected observations

Part 3- Study:
- Analyze the data gathered during the test
- Compare data to your predictions
- Summarize results and reflect on what you have learned

Part 4- Act:
- Use the results of the test to determine what to do next
- Adopt, adapt, or abandon the change so that you can start a new

---

Generally, you should start with testing small changes and conduct multiple PDSA cycles. Prior PDSA cycles should inform future cycles. This allows you to rapidly assess interventions without wasting resources. Over time, these small changes will build to create larger-scale improvement. You will learn more about PDSA cycles in Chapter 7 of this manual.
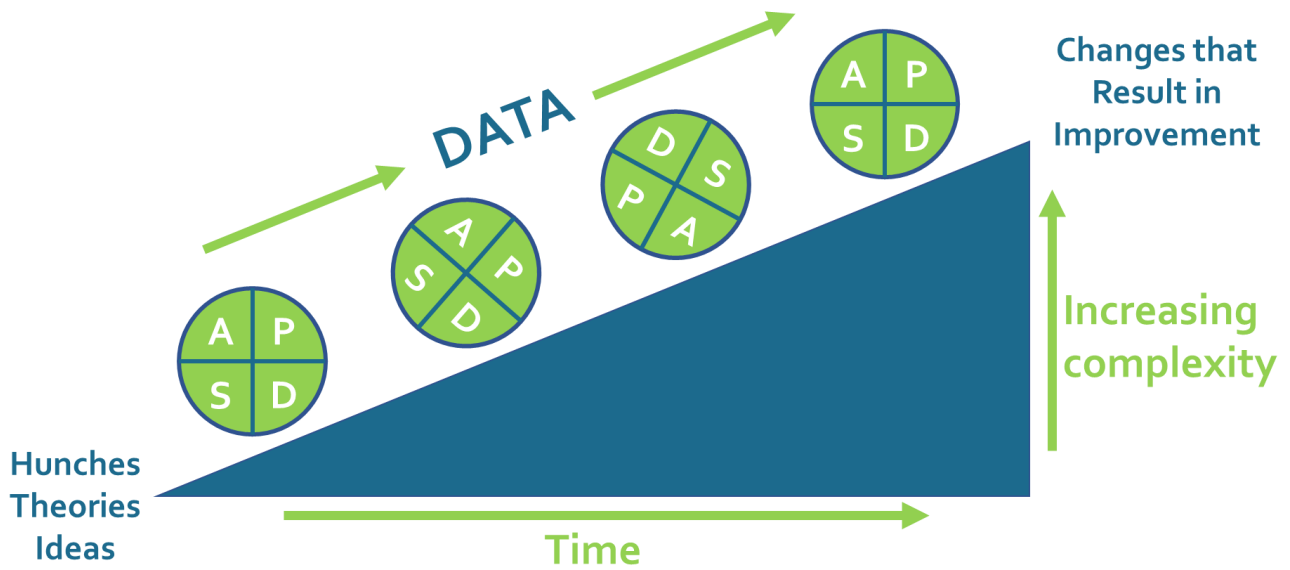
Chapter 3: The Model for Improvement

Figure 11: The PDSA Ramp to Improvement

Implementing and Spreading Changes

Testing change on a small scale allows you to learn from each test and refine the intervention through multiple PDSA cycles. Once your QI team has successfully achieved their improvement aims, you can implement the change, or package of changes, on a larger scale. For example, you could implement the full intervention for an entire pilot population or a specific area of your health facility.[1]

If you continue to have success in implementing your package of changes for this population or unit, the team can move on to scaling up and spreading the change to the whole organization or to other organizations interested in similar improvements.

You will learn more about implementing, sustaining, and spreading improvement in Chapter 8 of this manual.

> "Quality is never an accident, it is always the result of high intention, sincere effort, intelligent direction and skillful execution; it represents the wise choice of many alternatives."
>
> -William A. Foster

Summary of Key Points

- There are multiple approaches to Quality Improvement including lean management, six sigma, and the Model for Improvement, but they all contain elements of the scientific method.

- The Model for Improvement is a powerful, yet simple framework for accelerating improvement by guiding QI teams through the steps of developing, testing, and implementing specific, identifiable changes.

- The Model for Improvement consists of three fundamental questions followed by a series of Plan-Study-Do-Act (PDSA) cycles.

- The steps needed to complete a QI project include setting aims, establishing measures, selecting changes, testing changes, and implementing changes.

References

1. Science of Improvement: How to Improve. Institute for Healthcare Improvement. http://www.ihi.org/resources/Pages/HowtoImprove/ScienceofImprovementHowtoImprove.aspx.

2. Berman S. Accelerating the Pace of Improvement : An Interview with Thomas Nolan. *J Qual Improv*. 1997;23(4).

3. Taylor MJ, McNicholas C, Nicolay C, Darzi a., Bell D, Reed JE. Systematic review of the application of the plan-do-study-act method to improve quality in healthcare. *BMJ Qual Saf*. 2013;(September):bmjqs-2013-001862-. doi:10.1136/bmjqs-2013-001862.

SETTING AIMS FOR IMPROVEMENT

> ### Chapter 4 Objectives
>
> - Know the first fundamental question of the Model for Improvement
> - Understand the importance of analyzing the current system through process mapping and other QI tools
> - Understand how to identify priority problems to address
> - Be able to create a S.M.A.R.T aim for an improvement project

The First Fundamental Question

The first step towards improvement is having the intention to learn and improve. You don't learn to ride a horse accidentally; you must first set a goal to learn how to ride. Before your QI team starts making any changes, you should develop a clear and specific goal for improvement.

The first fundamental question of the Model for Improvement asks, "What are we trying to accomplish?" Answering this question will help you set an aim for improvement.
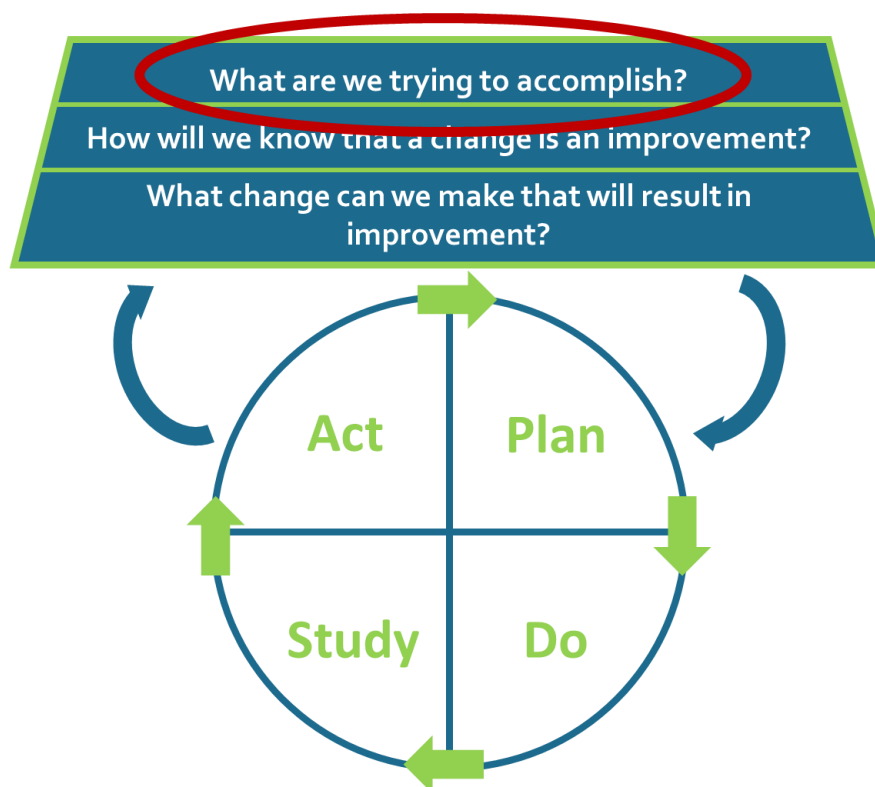

Figure 12: The First Fundamental Question

Chapter 4: Setting Aims for Improvement

An **aim statement** is a clear description of the team's goals and desired outcomes expressed in a measurable and time-specific way. Aims provide a structured approach to developing work plans and set the stage for improvement projects.

Simply put, aims are statements of intention that guide improvement projects.

Understanding the Current System

Sometimes, QI teams are formed with a project topic or goal already in mind. Your health center could have decided to start a QI project specifically to address childhood immunization rates.

However, most of the time, QI teams should spend time thinking about the different problems or processes in their health facility that they could try to improve before choosing one to focus on and setting an aim.

Many people can't accurately describe the systems in which they work. Studying, analyzing, and understanding these systems is an essential precursor to improvement. Gathering and identifying data on the way your health facility currently works can help you identify parts of the system that need improvement.

Simply put, improvement starts with knowledge of a system.

Process maps, root cause analyses, Pareto charts, and Fishbone diagrams are all Quality Improvement tools that can help us understand the systems we are trying to improve.

Process Mapping

Process mapping is a method of visually displaying a series of steps in a complex system or process. As the name suggests, it is used to develop a "map" of the processes within a system.

Process mapping:[1]
- Provides a starting point for improvement projects specific to your context
- Helps teams quickly understand the system in which they are working
- Helps teams quickly identify opportunities for improvement
- Encourages ideas from staff who understand the system and engages them
- Creates a culture of ownership, responsibility, and accountability for QI teams
- Produces an end product that is visual and easy to understand

Simply put, process mapping is a powerful tool that helps QI teams visualize and understand systems at their health facilities.

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Process maps can be created at any level. For example, you could create a high-level process map that depicts the key steps that a patient goes through when visiting a health center from registration to discharge. This can be a useful first step in understanding your system. However, you can also create more detailed process maps that examine a portion of the entire process. For example, you could then create a detailed process map of registration procedures to develop a more thorough understanding of this part of the patient care system.

Simply put, process maps are can be created at multiple levels. Start with a high-level process map of the whole system then create additional detailed process maps if necessary.

Creating a process map is fairly simple. First, determine the boundaries of your system (where the process begins and ends). Then, list the steps in the process. After listing the steps, make sure that they are in the correct order. It is helpful to use sticky notes to do this so that you can move the steps around until your QI team is confident about the sequence. Next, draw the process using appropriate symbols for various steps and connect these steps with arrows. Finally, check the process map for completeness and add a title and a date for easy reference.
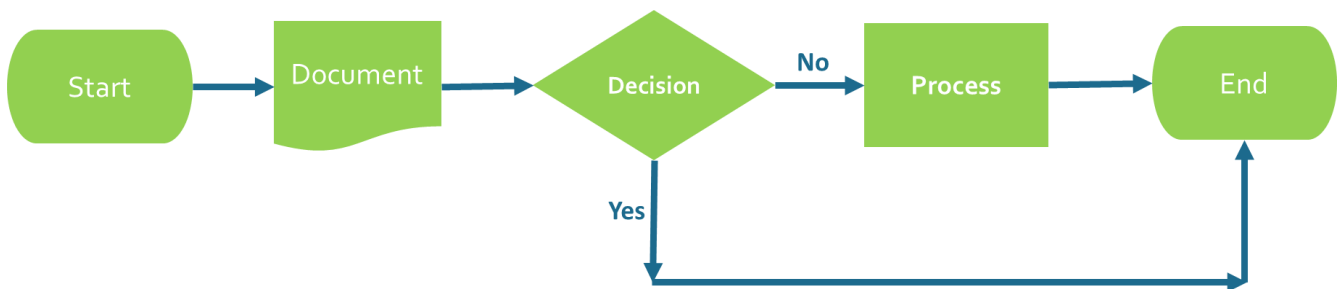

Figure 13: Basic Structure of a Process Map

The QI Case Study on the following page shows an example of a process map from a past QI project at Motebang Hospital in Leribe.

You can use your process map to make note of any activities that are wasteful, redundant, impede flow, or do not add value to the process. This approach borrows techniques from Lean Management which aims to eliminate waste, improve flow, and make processes simple and mistake-proof.[2]

Look for delays like patients waiting to be discharged, examples of over processing like excessive paperwork, inventory issues, unnecessary motion like searching for charts and supplies, examples of over producing, defects like medication errors, and issues related to skill like under-utilizing the capabilities of trained health professionals to do simple tasks. Identifying these steps can help you determine which areas need improvement.

Simply put, analyzing your process map for waste and delays can help identify targets for improvement.

Chapter 4: Setting Aims for Improvement

QI Case Study: Process Mapping at Motebang

In 2010, the Referral QI Team at Motebang Hospital decided to create a more efficient and well-coordinated referral process between Motebang Hospital and Queen Mamohato Memorial Hospital (QEII). The QI Team made a process map of the existing referral system. They then used this process map to assess current performance and identify 31 problems in the existing referral system.

The high level process map below shows the main steps in the referral process between health centers and Motebang and Motebang and QEII. Note the use of different shapes to represent different aspects of the process.
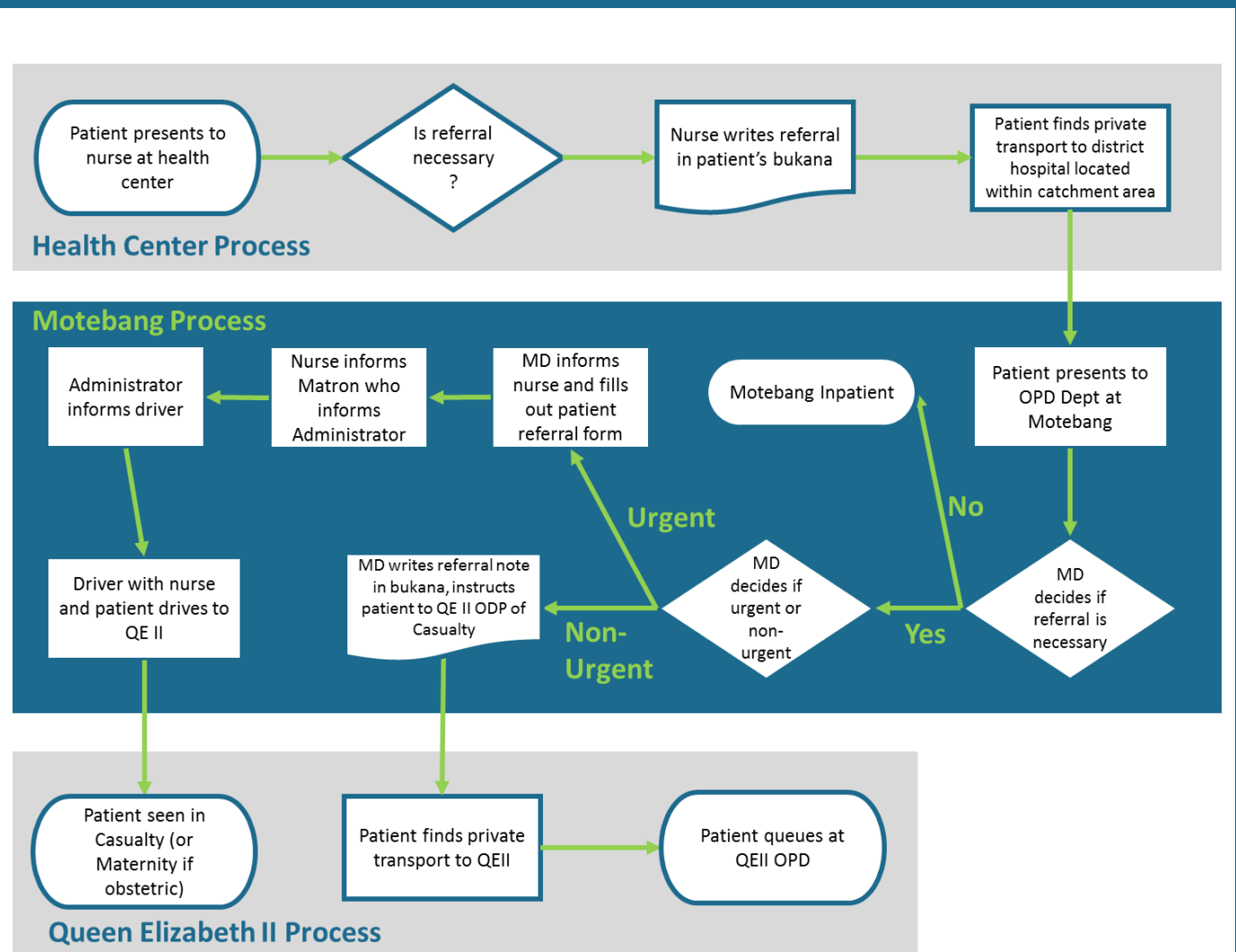

Figure 14: Process Map of the Referral System at Motebang Hospital

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> "If you can't describe what you are doing as a process, you don't know what you are doing."
> -W. Edwards Demming

Brainstorming

Brainstorming refers to when a group of people meet to generate new ideas around a specific area of interest. The purpose of brainstorming is to produce as many ideas as possible in a fast-paced, positive setting. Group brainstorming is effective because it encourages people to share their ideas and build off of the ideas of other team members.

Brainstorming is often the first step in a focused, productive Quality Improvement meeting and can be useful during all stages of the improvement process. During the aim setting stage, teams should brainstorm potential problems to address through QI. Later on, you will see how brainstorming is used to identify potential changes to test with PDSA cycles.

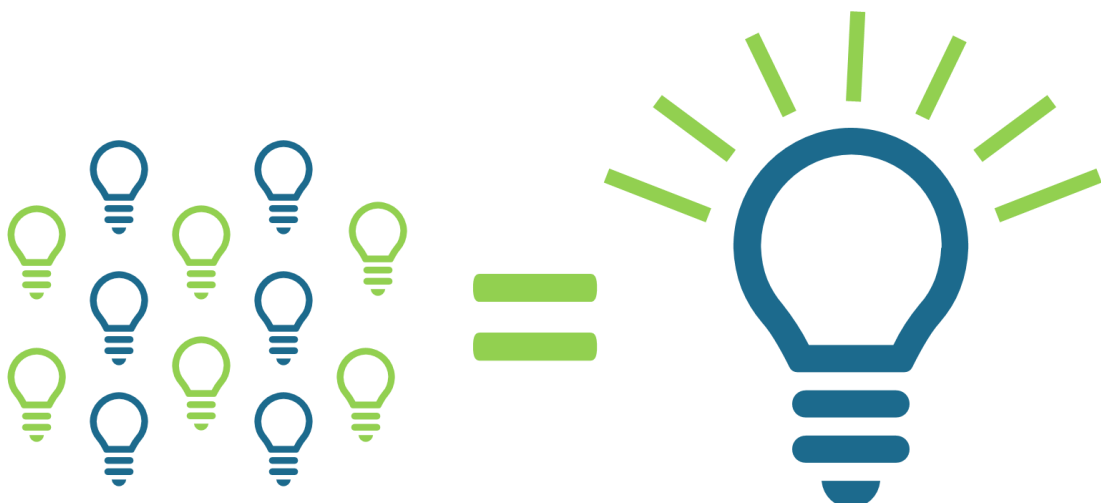**Simply put, brainstorming is useful when you want to generate a list of ideas quickly in a group.**

Figure 15: The Power of Brainstorming

Chapter 4: Setting Aims for Improvement

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Rules for Effective Brainstorming

- Postpone and withhold your judgement of ideas

- Encourage wild and exaggerated ideas

- Quantity counts at this stage, not quality

- Build on ideas put forward by others

- Every person and idea has equal worth

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There are many, many tools that can help your group facilitate the brainstorming process.

For example, the **diads/triads** technique requires groups to separate into pairs or threes. Each small group tries to come up with three ideas within five minutes. Afterwards, each diad/triad reports their best idea to the larger group.

Before you develop your aim statement, your QI team should take some time to brainstorm potential problems to address. Some of your ideas for problems to address will come from the process map you created to visualize your system. However, other ideas can come from the experiences and observations of team members.

> "The best way to have a good idea is to have lots of ideas."
> -Linus Pauling

Prioritizing Problems

Now that your team has generated a list of potential problems to address through a Quality Improvement project, the next step is determining which single problem to focus on.
A **matrix diagram** or a **priority matrix** is a diagram that helps you rank ideas and prioritize problems to address.

To create a priority matrix, list the top 5 problems your team is considering addressing in a column on the left of the chart. Then choose 3-5 simple indicators that will help us determine which problem to choose. List these indicators on the top row of the matrix. For example, you could choose to rate each potential problem in terms of impact on health or health systems, feasibility, support, and urgency. You then rate the problems on a scale of 1-10 for the indicators you have chosen. After filling out the chart, add the score of each category. The 1-2 problems with the highest scores are priorities for your QI project.

Matrix Diagram for Prioritizing Problems

	Impact	Feasibility	Support	Urgency	Total
Problem #1					
Problem #2					
Problem #3					
Problem #4					
Problem #5					

Assign problems scores of 1-10 for each indicator. Total the scores.
Highest Scoring Problem = _____

Figure 16: Matrix Diagram for Prioritizing Problems

The following explanations will help you complete the process:

Impact on health or health system- think about important the problem is to the process we are trying to improve

Feasibility- ask yourselves how likely your group is to make any changes to this problem happen

Support- ask yourselves if there is enough support and resources to make a solution possible. What will staff and other stakeholders think about improving this problem?

Urgency- think about how immediate is the need to fix the problem. What depends on finding a solution?

Explanation of problem ratings:
A ranking of 1-3 means that the problem **does not** fit the criteria
A ranking of 4-7 means that the problem **sometimes or partially** fits the criteria
A ranking of 8-10 means that the problem **completely or nearly completely** fits the criteria

Simply put, a matrix diagram helps QI teams identify which problems are priorities and informs the development of the aim statement.

Chapter 4: Setting Aims for Improvement

QI Case Study: Prioritizing Problems at Motebang

After creating a process map of their system, the QI Referral Team at Motebang Hospital in Leribe identified 31 problems with the referral system which they grouped into 4 categories: lack of staff; the referral system takes too long; ineffective/insufficient communication; disproportionate distribution of work among/between employees. Then, they used a priority matrix chart to determine what to focus on for their project. After a thorough discussion and debate, the team created the following table and decided to focus on communication issues.

Matrix Diagram for Prioritizing Problems

	Impact	Feasibility	Support	Urgency	Total
Lack of Staff	9	1	4	7	**21**
Length of Referral System	10	8	9	5	**35**
Communication	10	9	8	10	**37**
Distribution of Work	10	5	4	9	**28**

Highest Scoring Problem = Communication

Figure 17: Priority Matrix for the Referral System at Motebang Hospital

Writing Aim Statements

By this point in the improvement journey, your team has developed a thorough understanding of the system or process that you are trying to improve. You have analyzed your process map and brainstormed potential problem areas to address. And you have prioritized one problem to start with. Now it is finally time to set an aim for your improvement project.

Aim statements clearly articulate the purpose of the project and help others understand why the project is being initiated and what it is trying to achieve.[3]

Chapter 4: Setting Aims for Improvement

Aims are also called **project objectives**. They answer the question "What will we accomplish by when?" Aims/objectives are slightly different than a **project goal** which is a broad, brief statement of intent that provides focus and vision for a project. While goals can be vague and idealistic, aims should be specific and measurable.

When setting improvement aims, make sure the aim feels important and meaningful to the team. An aim should articulate an improvement that team truly wants to achieve.

Simply put, to set an aim, your team should pick something you want to accomplish and write it down in a clear way that feels potentially measurable.

S.M.A.R.T Criteria

In developing your aim statement, your QI team should try to make the aim S.M.A.R.T (Specific, Measurable, Achievable, Relevant, and Time-based).

Figure 18: S.M.A.R.T. Criteria for Aims/Objectives

Specific- What exactly are we going to do?
The aim/objective should be well-defined and state a specific desired outcome. The more specific the aim, the more likely the improvement. Try to answer these questions: What is the action? What is the intended impact? Who is the target population? Who is responsible for carrying out actions?[4]

Measurable- Is the aim measurable and do we have the resources to measure it?
Writing a measurable aim involves determining what will be measured to show improvement, impact, or success. We will discuss establishing project measures further in the next chapter, but for now, try to make sure your desired outcome is stated in numbers (or percentages, frequencies, etc.) and feels like something your team could measure. Try to answer these questions: How much and in what direction will the change occur? What data will prove useful? Are we capable of collecting this data?[4]

Chapter 4: Setting Aims for Improvement

Achievable- Do we believe that we can accomplish our objectives?

Improvement aims should be within the reach of your improvement team and feel attainable. Be realistic about what you can accomplish given your team's resources, knowledge, and experience. However, don't be afraid to set bold aims that feel ambitious; give your QI team the opportunity to rise to the challenge without being totally unrealistic. Try to answer these questions: How can this aim be accomplished? What resources will help us achieve this aim? What limitations might we face in trying to achieve this aim?[4]

Relevant- Will reaching this aim lead to reaching overall goals?

Aims should relate to larger goals of the QI team and the entire health facility. The most successful project aims relate to the organization/facility's overall mission and guiding principles. Try to answer these questions: Will this aim lead to achieving this groups larger goals? Does this aim seem worthwhile to our health facility?[4]

Time-based- When will we accomplish this goal?

Aim statements should clearly define a specific time frame for achievement. This time frame needs to be long enough to provide time for improvement but short enough to feel urgent. Try to answer these questions: When will this aim be achieved? Is the time frame realistic?[4]

Simply put, using S.M.A.R.T. criteria can help you set improvement aims that are clear and effective.

QI Case Study: SMART Aims in the Casualty Department

Overall Goal: To make the Casualty Department the most reliable in the provision of quality services in order to decrease the mortality rate and improve patient satisfaction.

A**im/Objective #1:** To reduce waiting time by 10% within 4 weeks

Aim/Objective #2: 70% of the total number of patients that come to Casualty go through a triage system and are screened by a nurse prior to being seen by a physician

Aim/Objective #3: Vital drugs available 80% of the time in Casualty within 2 months

Aim/Objective #4: To have 100% of needed resuscitation equipment available in Casualty within 2 months

Developing a Project Charter

Getting started on your improvement project is often the most challenging part of the improvement process. Developing a project charter can help QI teams navigate through some of this complexity.

A **project charter** is a tool for developing and recording an improvement plan that the team agrees upon. Project charters usually include a statement of rationale, aims, measures, and possible tests of change.

Project charters help guide the improvement process and help us document our progress. They also help communicate goals and plans with people who may not be involved in the project. Charters effectively unite QI teams under a common framework of aims and conditions.

Your team can start writing the charter at this stage and continue developing it as you take the next steps in the improvement process: establishing measures and identifying changes. To facilitate this process, teams can use the **QI Project Charter** worksheet found in Annex D.

> "A goal properly set is halfway reached."
> -Zig Ziglar

Chapter 4: Setting Aims for Improvement

> **Summary of Key Points**
>
> - The first fundamental question of the Model for Improvement asks "What are we trying to accomplish?"
>
> - Aims are statements of intention that guide improvement projects.
>
> - Understanding the system you are trying to improve is essential. Process mapping is a simple tool to help you map and analyze the system.
>
> - Brainstorming can help you generate ideas for improvement projects and creating a priority matrix can help you prioritize which problems to focus on.
>
> - Using S.M.A.R.T. (Specific, measurable, attainable, realistic, time-based) can help you set aims that are clear and effective.
>
> - Improvement charters are useful tools for documenting aims and navigating the improvement process.

References

1. Trebble TM, Hansi N, Hydes T, Smith MA, Baker M. Process mapping the patient journey: an introduction. *BMJ*. 2010;341.

2. Zidel TG. A Lean Toolbox- Using Lean Principles and Techniques in Healthcare. *J Healthc Qual*. 2006;28(1).

3. Science of Improvement: How to Improve. Institute for Healthcare Improvement. http://www.ihi.org/resources/Pages/HowtoImprove/ScienceofImprovementHowtoImprove.aspx.

4. SMART Objectives. Minnesota Department of Health. http://www.health.state.mn.us/divs/opi/qi/toolbox/objectives.html. Accessed April 4, 2017.

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ESTABLISHING MEASURES

Chapter 5 Objectives

- Know the second fundamental question of the Model for Improvement

- Understand the need for measuring progress during a QI project

- Understand how measurement for improvement differs from measurement for accountability and measurement for research

- Know how to establish outcome measures, process measures, and balancing measures for an improvement project

- Understand how to use a run chart

The Second Fundamental Question

Collecting and understanding data is a huge part of the Quality Improvement process. Before we even start improving, we need to establish baseline measurements. This will provide us a comparison that we can track progress against. And we need to continuously collect and interpret good data throughout the improvement process so that we can understand the impact of any changes we make.

The second fundamental question of the Model for Improvement asks, "How will we know that change is an improvement?" Answering this question will help you establish measures for your QI project.
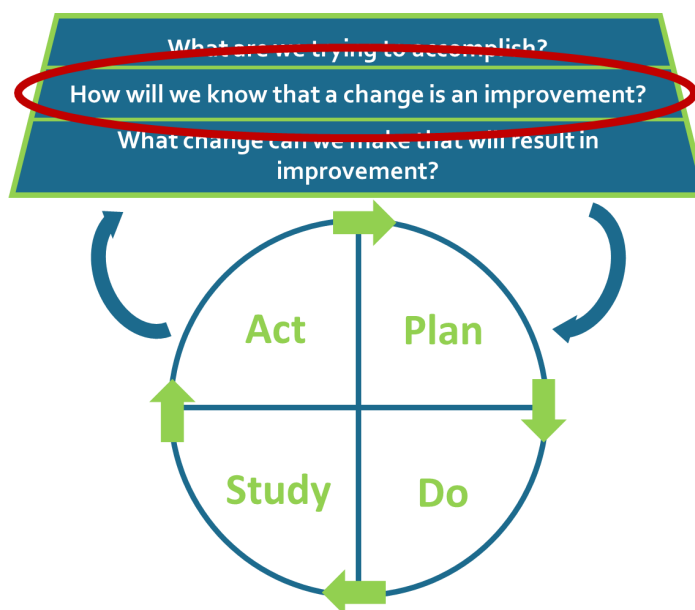

Figure 19: The Second Fundamental Question

Chapter 5: Establishing Measures

Data is information in the form of quantitative (numerical) and qualitative (descriptive) variables. Collecting data offers us opportunities to obtain knowledge through inquiry, analysis, and summary.

 Simply put, collecting data over time is essential for successful Quality Improvement projects.

Measurement for Accountability, Research & Improvement

You are likely familiar with data and measurement already. Collecting and analyzing data is probably part of your work as a health professional here in Lesotho. However, the motivation behind measurement done during the improvement process may be less familiar to you. We often confuse measurement for accountability and measurement for research with measurement for improvement.[1]

Measurement for accountability uses data to determine whether performance was achieved at a defined level or in comparison to the performance of another. This sort of data is collected principally for a person/organization outside the health facility who uses the information to assess performance and provide judgements. Data for accountability is primarily on outcomes and offer little insight to how processes might be changed to achieve outcomes. Few measures are collected through a complex process that emphasizes precision and validity.[1] You are probably familiar with measurement for accountability through quality assurance performance-based financing assessments.

Measurement for research uses data to generate new knowledge for the scientific community and the general public. Research relies on the collection of multiple measures through an extremely complex system that also emphasizes precision and validity. Often, aspects of the environment and processes where the data comes from are strictly controlled to reduce the impact of confounders.[1] As health professionals, you have probably read health research articles on various clinical practices.

Measurement for improvement is different than both measurement for accountability and measurement for improvement.

> "The goal is to turn data into information and information into insight."
> -Carly Fiorina

Chapter 5: Establishing Measures

Data helps you measure improvement.

Figure 20: Measurement for Improvement

Measurement for improvement is less complex and precise that either measurement for accountability and measurement for research. In Quality Improvement, we try to limit our measures to a few and collect only the data that we need to understand processes and evaluate changes. Furthermore, the sample size for collection is typically very small and data collected is more approximate than precise. This makes measurement for improvement simpler and less daunting than other types of measurement.

Another key difference is that measurement for improvement allows us to collect and analyze data quickly and in real time. Measurement for accountability and measurement for research, on the other hand, have long data collection periods and usually make conclusions about past events and performances. The ability to collect and analyze data throughout different stages of a project is a key feature of Quality Improvement.

Unlike measurement for accountability and research, measurement for improvement focuses on collecting data on health outcomes and the processes that produce them. This makes measurement for improvement more useful in evaluating the results of changes.

Simply put, measurement for improvement is simpler, faster, and often easier to conduct than measurement for accountability and measurement for research and it provides valuable information about the performance of a system in real time.

This distinction is important, because many people are resistant to measurement and data collection. They might associate measurement with performance assessment, identification of errors, and judgement. Or they might think that complex data collection procedures interfere with their daily work. It is important to emphasize that measurement for improvement is about collecting data for learning not judgement and that it is a relatively simple process.

To avoid confusion and encourage participation in data collection, try not to have measures that serve accountability and research purposes at the same time as improvement.[1]

Chapter 5: Establishing Measures

Understanding the Need for Measurement

At this point, you have probably set an aim for your improvement project and are eager to get started making changes. However, it is crucial to establish a set of measures and develop a data collection plan before jumping into any potential improvements.

Measurement helps us identify and prioritize where QI is needed.
As your QI team begins the improvement journey, you can use data that has already been collected to develop a more thorough understanding of the system you want to improve. Your health facility likely already collects data on a variety of indicators—from immunization rates to patient visits to HIV tests to maternal mortality—use this information (and what you learn from process mapping) to help you identify areas that need improvement.

All improvement projects need baseline measurements against which to compare results.
Measurement can also be used to establish a baseline against which to track subsequent improvement.[2] In order to determine if progress has been made, your QI team needs to establish a starting point. This helps us determine the extent of progress and assess whether such progress can be attributed to our change or other factors.

Capturing data helps us understand the patient experience.
Quality Improvement is a patient-centered process. Collecting and analyzing data throughout the improvement process helps us asses how our changes are impacting patients. Your QI team can collect both quantitative and qualitative data on the patient experience.

Measurement is essential for tracking changes and assessing improvements.
Throughout the improvement process, you will be continually collecting, interpreting, and analyzing data. This data will help you assess the impact of your changes in real time. Any improvements should be compared against the baseline data you collected at the beginning. This will help you draw conclusions for your improvement project about the impact of changes and interventions.

Data informs decision making.
Analyzing data helps QI teams determine whether innovations should be kept, changed, or rejected. This data informs the next steps after changes are tested and helps teams decide how to proceed with sustaining and spreading improvements.

> "Without data, you are just another person with an opinion."
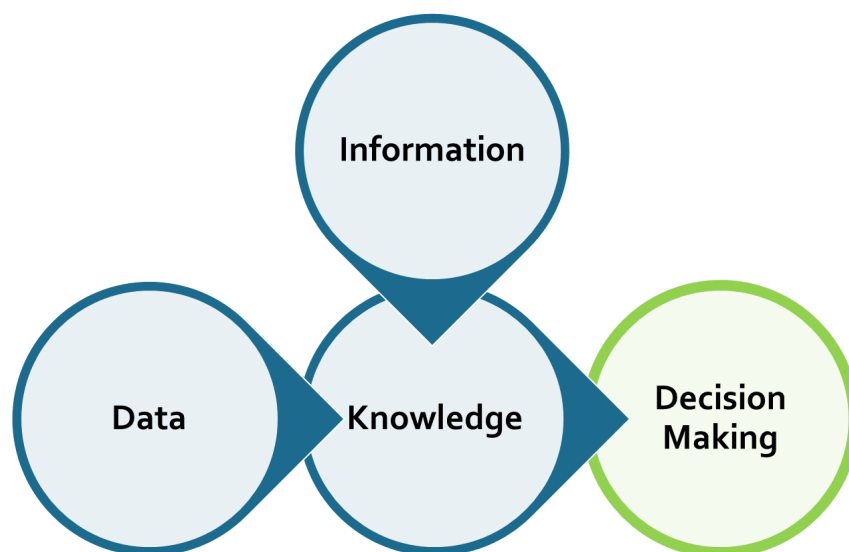> -W. Edwards Demming

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Figure 21: Data Informs Decisions

Establishing a Family of Measures

Before you start making changes, we need to think about the key, vital few measures that will help you realize whether you are making improvements. No single measure will give you all the information you need in order to assess changes and make a difference. Your team should plan to capture different types of measures that provide different insights. Different types of measures include outcome measures, process measures, and balancing measures.

Outcome measures evaluate the effect of the health system on patients or the impact on the community.[3] They answer the question "What is our ultimate result?" and if the system is meeting established standards of goals. For example, the average blood pressure level for a population of patients with hypertension and the maternal mortality rate are outcome measures.

Process measures evaluate system performance and potential changes.[3] They answer the question of whether steps in the system are performing as planned to achieve the desired outcome and help us assess if we are on track in our improvement efforts. The percentage of patients whose blood pressure was measured during their last visit to a health facility is a process measure. Another example of a process measure is the partograph completion rate for deliveries.

Balancing measures monitor unintended consequences of changes to a system.[3] Balancing measures are also known as side effect measures or collateral damage measures. The answer the question "Did changes designed to improve one part of the system, negatively impact something else?" For example, if we were trying to reduce patient's length of stay in the hospital, we might want to monitor readmission rates and make sure they aren't increasing. Time and patient satisfaction are commonly used as balancing measures.

Chapter 5: Establishing Measures

Simply put, Quality Improvement teams should collect a family of measures (including outcome, process, and balancing measures) that enable them to look at a problem or process from a number of different perspectives.

Creating a Data Collection Plan

Choosing a family of measures that includes outcome measures, process measures, and balancing measures is not enough. You QI team must plan how they want to gather the appropriate data for these measures. You must also start to think about how to use the data in a way that is beneficial and informative. Your team should anticipate how the data you are collecting will help inform decisions.

Data can be collected from almost everywhere and by almost anyone. Data for improvement is typically collected by those within the system and all players should be involved in the process.

You must be thoughtful and intentional about your data collection plan. As a team, you should plan all the technical details related to data collection. Ask yourselves: What information are we trying to collect? Who will collect this data? Where and when will they collect it? What process will they follow? How will they record the data?

Your team should plan to incorporate data collection into your daily activities and current processes. Furthermore, your data collection plan should be as simple as possible, and you should only collect data that you plan to use. This will reduce the additional burden on staff involved and make the data collection feel important.

Simply put, you need to know what you are going to track, how to track it, and why you are tracking it.

Your QI team can use the **Project Charter** you started in Chapter 4 to develop your data collection plan. As you establish your project measures and develop you plan, it is smart to revisit your aim statement and make any adjustments as necessary. Quality Improvement is a non-linear, iterative process, and you should be continually applying knowledge to previous steps and updating your Project Charter.

> "The ultimate purpose of collecting the data is to provide a basis for action of recommendation."
> -W. Edwards Demming

Tips for Effective Quality Measurement

- Limit the number of measures to 3-8

- Establish a family of measures that includes process measures, outcome measures, and balancing measures

- Pick measures that feel important to staff and patients

- Collect baseline measures before implementing any changes

- Provide training, tools, and examples for those who will be responsible for data collection

Tracking Data with Run Charts

Run charts are simple analytical tools that allow us to learn from variation in healthcare processes. They are one of the most important tools in our Improvement Toolbox because they provide valuable information with minimal effort and complexity. Run charts show if a process if demonstrating non-random patterns which helps QI teams determine if the changes they are seeing in the system are due to changes and improvement or simply the product of chance.[4]

The key feature of run charts is that they provide a temporal view of data rather than a static view. This means that run charts show the behavior of something over time and can be used in real time to study ongoing projects. Viewing data over time provides more information than looking at summary statistics at the completion of a project and leads to more accurate conclusions.[4]

Run charts are graphical displays of data. The horizontal x-axis shows time often in terms of days, weeks, months, quarters. However, sequential patients, visits, or procedures could also be used. The vertical y-axis represents the measure that is being studied.

Since your QI project involves multiple measures, your team can create simple run charts to track the behavior of each one. Using multiple charts will provide richer information and allow your team to develop a more thorough understanding about the impact of your changes and improvements.

To further increase the value of your run charts, your team should annotate the chart with notes about the changes you are making and when. You can simply add an arrow and a short note about a test of change to the time portion of the chart where the change was made. This makes it easier to visualize the impact of this change. We will learn more about analyzing run charts and applying run chart rules in Chapter 7 on PDSA cycles.

Simply put, run charts are easy to construct, simple to interpret, and provide valuable information about performance/behavior over time that helps evaluate the success of improvement projects.

Chapter 5: Establishing Measures

> ## Summary of Key Points
>
> - The second fundamental question of the Model for Improvement asks "How will we know that change is an improvement?"
>
> - Measurement for improvement differs from measurement for accountability and measurement for research that health care staff may be more accustomed to.
>
> - It is crucial to establish a set of measures and develop a data collection plan before jumping into any potential improvements.
>
> - Measurement for improvement helps us identify problems, track progress, understand the patient experience, assess improvements, and make more informed decisions.
>
> - Quality Improvement teams should collect a family of measures (including outcome, process, and balancing measures) that enable them to look at a problem or process from a number of different perspectives.
>
> - Run charts are simple to use and are useful tools for measuring data over time during improvement projects.

References

1.   Solberg LI, Mosser G, Mcdonald S. The Three Faces of Perform ance Measurement: Improve ment, Accountability, and Research. 1997;23(3):135-147. http://www.ingentaconnect.com/content/jcaho/jcjqs.

2.   Russell NCC, Wallace LM, Ketley D. Evaluation and measurement for improvement in service-level quality improvement initiatives. Heal Serv Manag Res. 2011;24(4):182-189. doi:10.1258/hsmr.2011.011010.

3.   Braithwaite J, Matsuyama Y, Mannion R, Johnson J, Bates DW, Hughes C. Perspectives on Quality How to do better health reform: a snapshot of change and improvement initiatives in the health systems of 30 countries. Int J Qual Heal Care. 2016:1-4. doi:10.1093/intqhc/mzw113.

4.   Perla RJ, Provost LP, Murray SK. The run chart: a simple analytical tool for learning from variation in healthcare processes. BMJ Qual Saf. 2011;20(1):46-51. doi:10.1136/bmjqs.2009.037895.

IDENTIFYING CHANGES

Chapter 6 Objectives

- Know the third fundamental question of the Model for Improvement

- Understand the possible sources of ideas for change

- Understand the key principles of a Root Cause Analysis

- Know how to use fishbone diagrams and the five whys technique to identify root causes

- Understand how to prioritize changes

> "Every system is perfectly designed to achieve exactly the results that it gets."
> -Paul Batalden

The Third Fundamental Question

There is a saying in improvement science that every system is perfectly designed to achieve exactly the results that it gets. This simply means that the results you are seeing in your health system are not arbitrary; they are a product of the system. If you change elements of the system, you will change the results. The challenge here is identifying the changes you can make to your system that will result in positive changes in the results or outcomes. Not every change will lead to improvement, so your improvement team should carefully consider the potential impact of changes before making them.

Simply put, not all change is an improvement, but all improvement is change.

The third fundamental question of the Model for Improvement asks, "What change can we make that will result in an improvement?" Answering this question helps teams decide which changes to test.
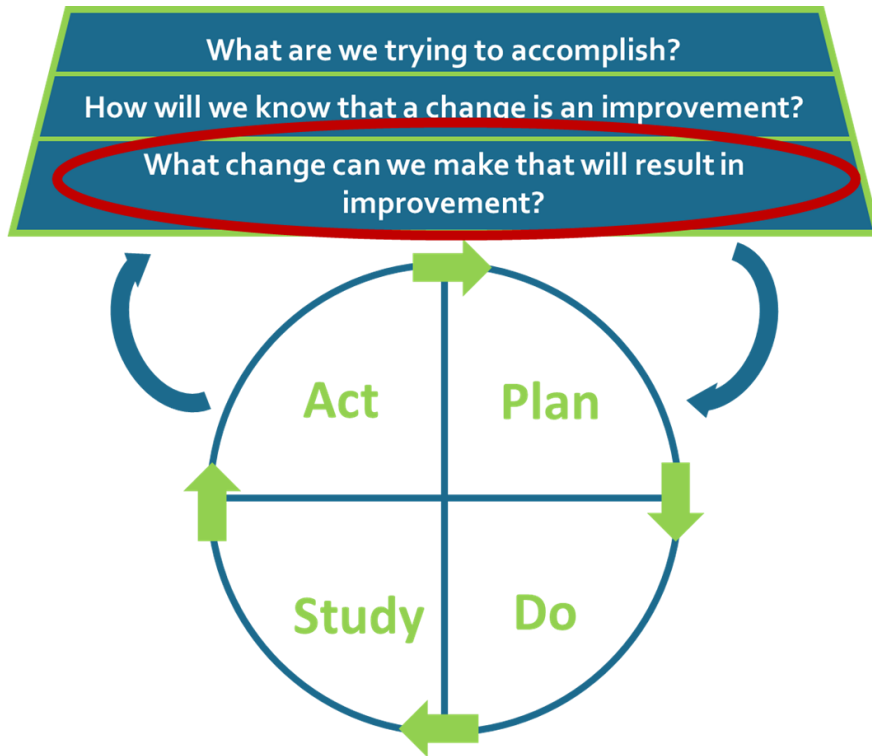
Chapter 6: Identifying Changes

Figure 22: The Third Fundamental Question

Finding Changes that are Worth Testing

Before you start running your first PDSA test and making changes, your QI team should identify a portfolio of changes that are worth testing. Identifying potential changes to test is another instance where brainstorming comes in handy. While internal team discussions are an important source, ideas for potential changes can come from a variety of other sources:

Change ideas can come from available research.
More likely than not, another health facility has faced a similar issue to the one you are trying to improve. Search available literature for examples of interventions and projects that other facilities have tried. There is no need to reinvent the wheel—your team can learn a lot from looking at prior case studies and projects. Additionally, you could consult someone who is considered an expert on the specific problem you are addressing or your field.

Change ideas can come from those who work in your health facility.
Your team should try to involve other health care workers in the improvement process by inviting them to contribute ideas to the brainstorming process. Those who haven't been involved with the QI team may have different perspectives that your team hasn't considered yet. It is especially important to seek ideas from frontline health workers who have the most interaction with patients and with the process you are trying to improve.

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Change ideas can come from patients, families, and communities.
Health care workers are not the only people that your team can consult for change. Share your project aims with your patients and their families and invite them to share ideas about how to achieve them. You can even get the entire community involved by holding a community meeting to brainstorm potential changes.

Change ideas can be borrowed from other industries.
The process of Quality Improvement originated in the manufacturing industry and most aspects of QI methodology are borrowed from the manufacturing and business sectors. Ideas for changes and improvements can also be borrowed from these industries so be sure to include them in your research. For example, you can learn a lot about decreasing wait time by looking at improvements made in the automobile industry.

Change ideas can come from further analyzing the process or system you are trying to improve.
We have already discussed the importance of understanding the process or system you are trying to improve. Process mapping can help us identify problems on which to focus our improvement efforts. However, we need to develop a more thorough understanding of these problems if we hope to meet our improvement goals. One method for further analysis is called root cause analysis.

Root Cause Analysis

A **Root Cause Analysis** is a method of problem solving used for identifying root causes of problems. The goal of root cause analysis is to identify and remove the causes of problems or obstacles by asking why they are occurring.[1] This method helps us distinguish symptoms of problems in your health system with true underlying causes.

A **root cause** is the most fundamental reason (or reasons) why improvement is necessary or how the imperfect situation occurs.[2]

However, studying the relationship between this "cause" and the outcome is more important that assigning blame. QI teams should take steps to reduce assigning blame for the problems they are trying to solve as this decreases team motivation and discourages reporting of future problems and challenges.

There are many tools that can be used to conduct a Root Cause Analysis. Most of them involve similar steps including identifying a problem, breaking down the problem into multiple components, identifying causes of these components, analyzes root causes using a systematic approach, and identifying causes to target for action.

The two tools for conducting a Root Cause Analysis in our QI toolbox are Cause and Effect Diagrams (Fishbone Diagrams) and the Five Whys technique.

Chapter 6: Identifying Changes

Symptoms of the Problem
The visible part of the tree represents symptoms are easy to see. They are obvious consequences of underlying problems and causes. If we cut a tree at the surface, the roots will continue to grow. Similarly, if we address only surface-level symptoms, the problem and its causes will continue to grow.

The Underlying Causes
The roots of the tree represent the underlying causes that exist below the surface and aren't as easy to see. Conducting a Root Cause Analysis helps us identify these causes so that we can target them in our improvement projects.
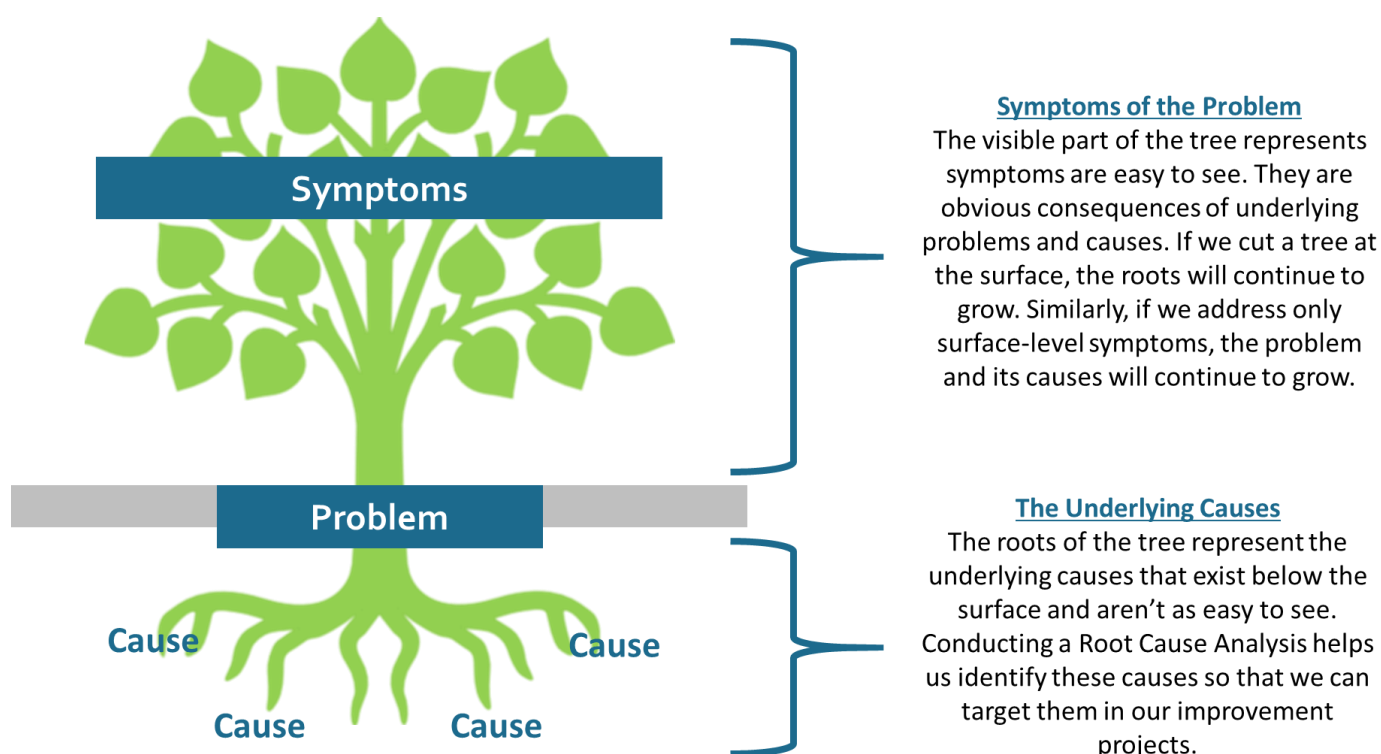
Figure 23: Root Cause Analysis

You can also use qualitative data gathered through focus group discussions and in-depth interviews to identify what key stakeholders perceive as underlying causes for identified health problems. **Focus group discussions** are group discussions held with a small group of respondents to explore their perspectives on a particular problem, idea, program, or situation. **In-depth interviews** are intensive one-on-one interviews also used to explore perspectives.

Simply put, conducting a root cause analysis helps your deep develop a more thorough understanding of the problem and its underlying causes which can you generate areas to target for improvement.

QI Case Study: Root Cause Analysis in Leribe

For example, in 2016, LeBoHA conducted a Root Cause Analysis of Home Deliveries in the Leribe District. LeBoHA used in-depth interviews and focus group discussions with health center staff, village health workers, women who delivered at home, women who delivered in the health centers, and family members determine the underlying factors that motivate women to deliver at home instead of in health facilities. Through this Root Cause Analysis, financial barriers, poor preparation for the onset of labor, distance to health centers, and the treatment provided by nurse-midwives were identified as potential root causes. These findings can serve as a starting point for future QI initiatives in Leribe.

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Fishbone Diagrams

A **Fishbone Diagram** is a graphic tool used to explore and display the possible causes of a certain effect. Fishbone diagrams get their name because their design looks like the skeleton of a fish. These diagrams are also called **Cause and Effect Diagrams** and **Ishikawa Diagrams.**[1]

Fishbone Diagrams help QI teams identify potential causes and organize them in a way that helps inform action. They are especially helpful when problems are complex and likely have multiple causes.[3] They also help QI teams think through causes that they might have otherwise missed.
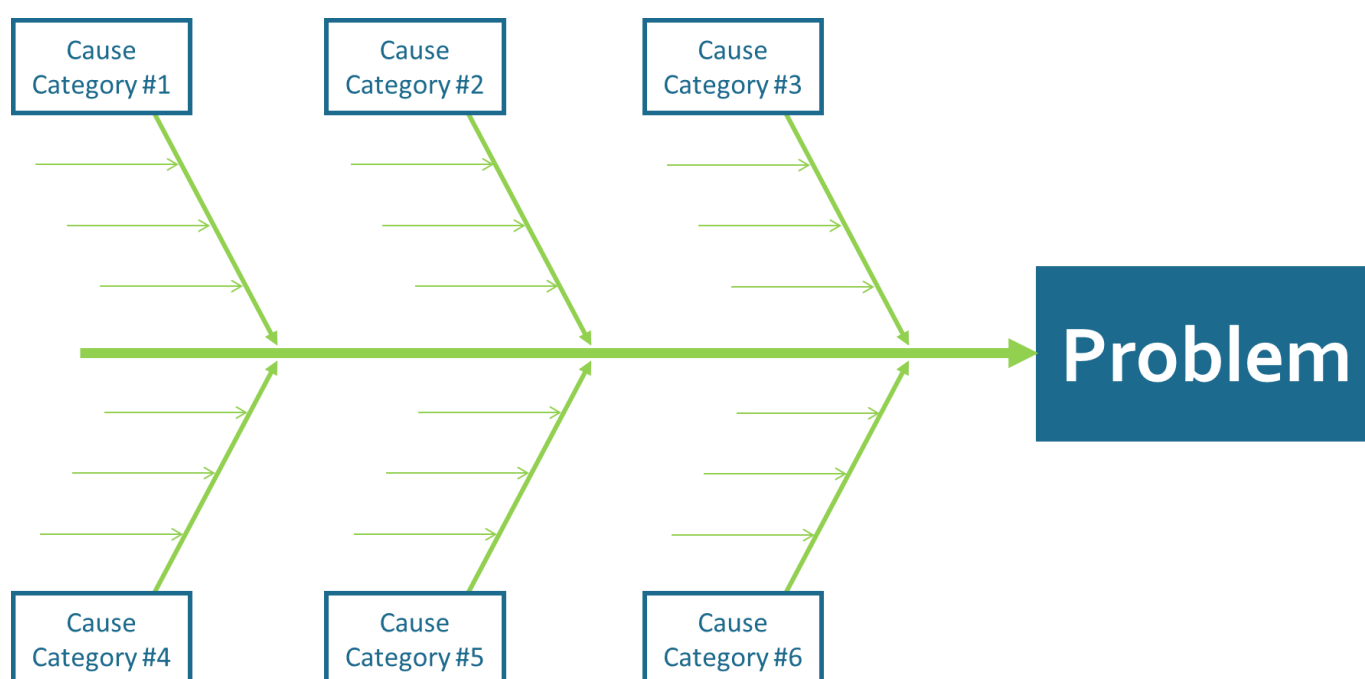

Figure 24: Cause & Effect "Fishbone" Diagram

The first step in creating a fishbone diagram is to identify the problem you are analyzing. This problem becomes the head of the fish.

Next, brainstorm the major categories that you will use to group potential causes. These categories are designed to help you organize your ideas. Commonly used categories include people (knowledge, skills, feedback, motivation, support), policies (rules and regulations that you can affect), processes/ procedures (standards, equipment), and environment (Ministry of Health, community, other stakeholders), but you may also choose your own categories to fit your project aims.[4] These categories of causes branch off the spine of the fish.

After establishing your categories, brainstorm the possible causes of the problem or performance gap that fit in each category. Add your ideas to the diagram as sub-branches. You may also break each sub -branch into contributing factors if you choose.

Chapter 6: Identifying Changes

Finally, use your fishbone diagram to start a discussion on the causes that are most responsible for the problem. You can use the Five Whys technique to probe deeper and identify causes that, if successfully addressed, with allow you to make improvements and meet your aims.[4]

Simply put, fishbone diagrams, also called cause and effect diagrams are a useful technique for identifying the root causes of problems that warrant the most attention.

The Five Whys Technique

The Five Whys Technique is a questioning exercise for moving past obvious symptoms and identifying the root causes of a problem. This technique allows you to probe for deeper understanding of true causes rather than mistaking symptoms of problems for causes.

The Five Whys technique is extremely effective when paired with fishbone diagrams (also called Cause and Effect diagrams).

To use this technique, choose a probable cause from your fishbone diagram and ask, "why is this happening?" Once you have an answer, ask "why?" again. Continue to ask "why" until you can no longer answer the question or at least five times.

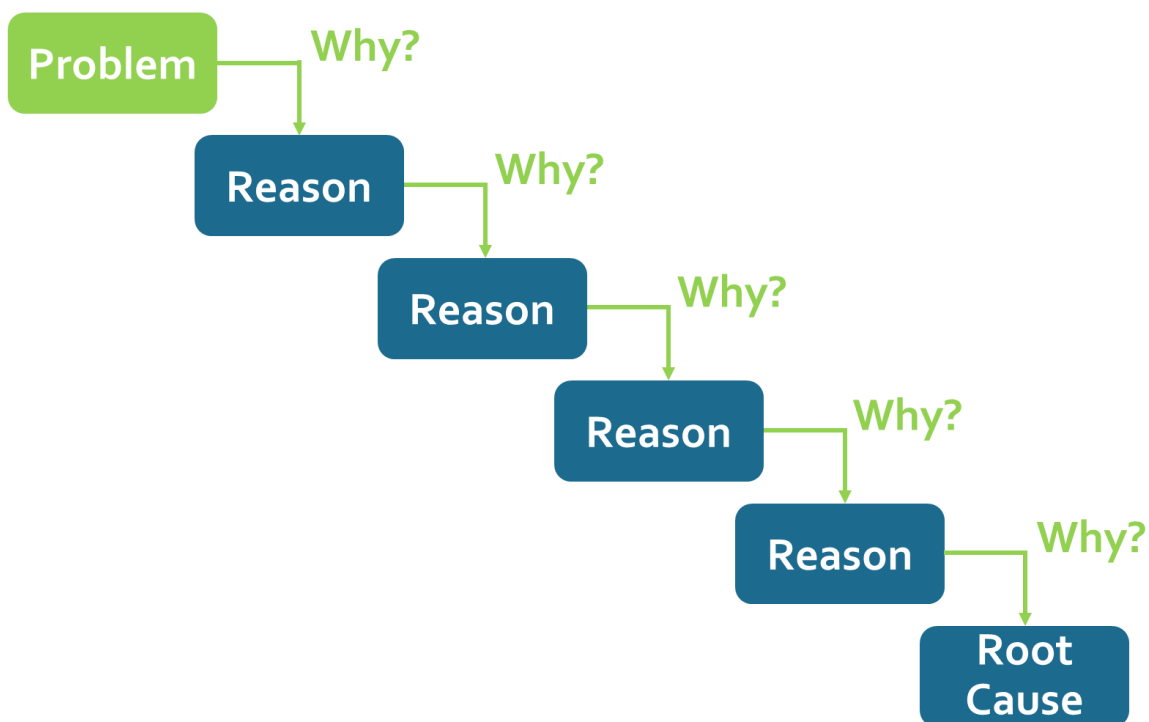Use this technique to help identify causes to target with changes.

Figure 25: The Five Whys Technique

"Without change there is no innovation, creativity, or incentive for improvement."
-William Pollard

QI Case Study: Fishbone Diagrams at Motebang

In 2010, the OPD QI Team at Motebang Hospital decided to address the problem that critical patients were not being seen fast enough in the OPD. They set an aim to decrease waiting time, on average, for high acuity patients seen in the OPD from 179 minutes to 30 minutes. Before implementing any changes, they constructed a fishbone diagram to investigate the underlying causes of this problem.
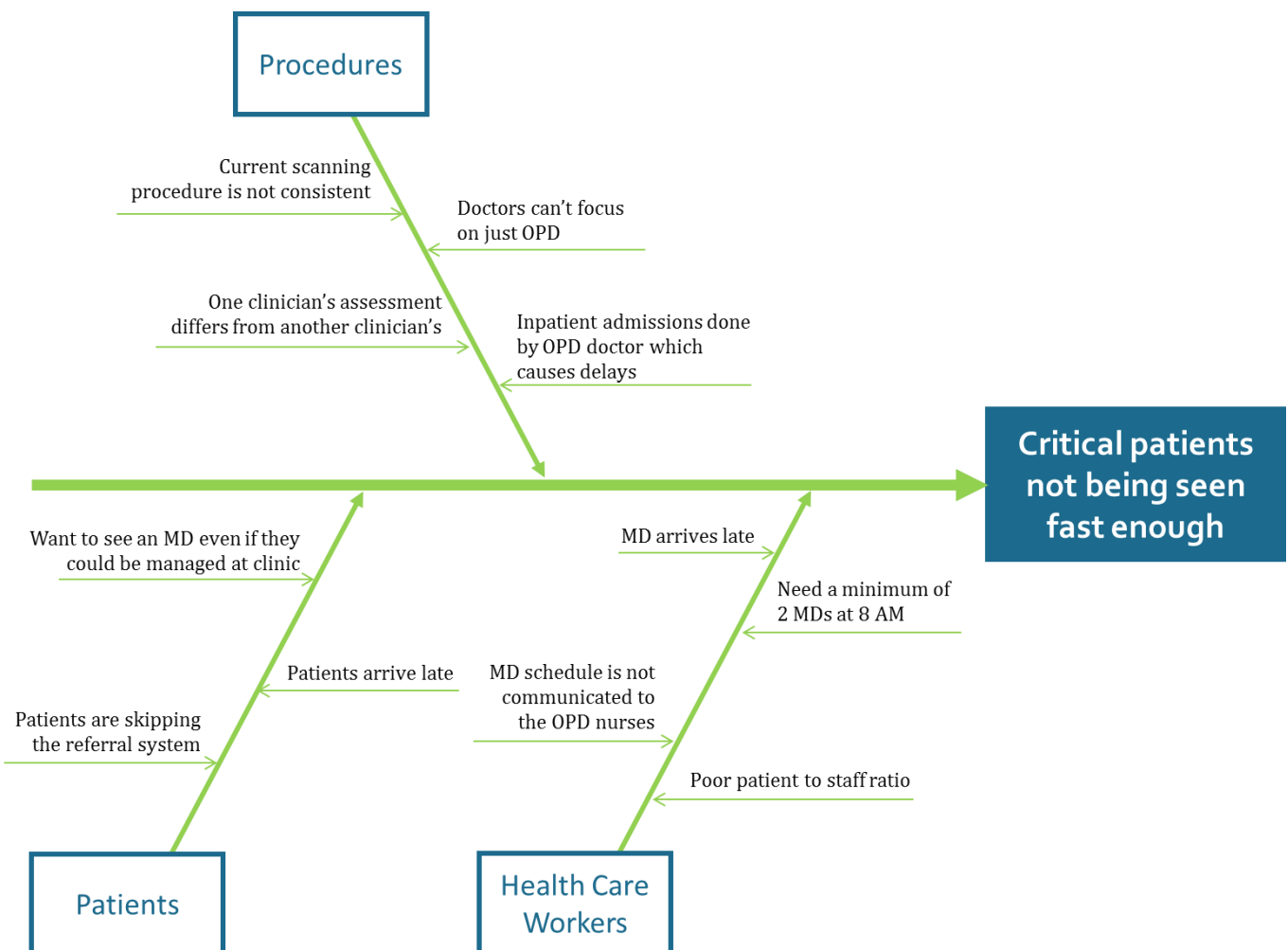
Procedures

Current scanning procedure is not consistent

Doctors can't focus on just OPD

One clinician's assessment differs from another clinician's

Inpatient admissions done by OPD doctor which causes delays

Critical patients not being seen fast enough

Want to see an MD even if they could be managed at clinic

MD arrives late

Need a minimum of 2 MDs at 8 AM

Patients arrive late

MD schedule is not communicated to the OPD nurses

Patients are skipping the referral system

Poor patient to staff ratio

Patients

Health Care Workers

Figure 26: Fishbone Diagram for OPD at Motebang Hospital

Chapter 6: Identifying Changes

> "Progress is impossible without change; and those who cannot change their minds cannot change anything."
> -George Bernard Shaw

Prioritizing Changes

Now that your team has generated a list of potential changes to test by consulting relevant research, involving others in the brainstorming process, and identifying the root causes of the identified problem, the next step is determining which test of change to start with.

We learned about **matrix diagrams** (or priority matrices) in Chapter 4 of this manual when we were discussing project aims. A matrix diagram can also help you rank your change ideas and decide where to start.

To create a priority matrix, list the top 5 change ideas your team thinks would lead to improvement in a column on the left of the chart. Then choose 3-5 simple indicators that will help us determine which problem to choose. List these indicators on the top row of the matrix. For example, you could choose to rate each potential change idea in terms of impact/importance, control, ease to implement, and cost. You then rate the change ideas on a scale of 1-10 for the indicators you have chosen. After filling out the chart, add the score of each category. The 1-2 changes with the highest scores are priorities for your QI project and show you where to start for your first Plan-Do-Study-Act (PDSA) Cycle.

Matrix Diagram for Prioritizing Change Ideas

	Potential Impact	Within Control	Ease to Implement	Cost	Total
Change Idea #1					
Change Idea #2					
Change Idea #3					
Change Idea #4					
Change Idea #5					

Assign change ideas scores of 1-10 for each indicator. Total the scores.
Highest Scoring Change = _____

Figure 27: Matrix Diagram for Prioritizing Changes

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Summary of Key Points

- The third fundamental question of the Model for Improvement asks, "What change can we make that will result in an improvement?"

- All improvement requires making some sort of change to the system but changes should be well thought out because not every change will result in improvement.

- Ideas for changes to test can come from a variety of sources including your QI team, other health care workers, patients and members of your community, outside research, and projects from other industries.

- A Root Cause Analysis is a method of problem solving used for distinguishing symptoms of problems in your health system with true underlying causes.

- Fishbone diagrams and the five whys technique can help you identify and understand root causes.

- Creating a priority matrix can help you choose a change idea to test during your first PDSA cycle.

References

1.   Management Sciences for Health. Managers Who Lead: A Handbook for Improving Health Services.; 2005. doi:0-913723-95-9.

2.   Buczkowski L, Carr M, Castro G, Wyatt R. Root Cause Analysis in Health Care : Tools and Techniques.

3.   Quality improvement for General Practice. 2015;(september).

4.   MSH (Management Sciences for Health). Health Systems in Action: An Ehandbook for Leaders and Managers.; 2010. http://www.msh.org/sites/msh.org/files/ msh_ehandbook_complete.pdf.

Testing Changes with PDSA Cycles

Chapter 7 Objectives

- Understand the Plan, Do, Study, and Act stages of the PDSA cycle

- Understand the key principles of PDSA cycles

- Know how to use driver diagrams

- Know how to interpret run chart rules

- Understand how to learn from one PDSA cycle and start additional cycles

PDSA Cycle Overview

After your team has answered the three fundamental questions of the Model for Improvement, you should focus on running multiple Plan-Study-Do-Act cycles to test changes that might lead to improvement in your workplace. These cycles are essentially the scientific method adapted for action-oriented learning and mirror the steps of formulating a hypothesis, collecting data to test this hypothesis, analyzing and interpreting the results, and making inferences to adjust the hypothesis.[1]
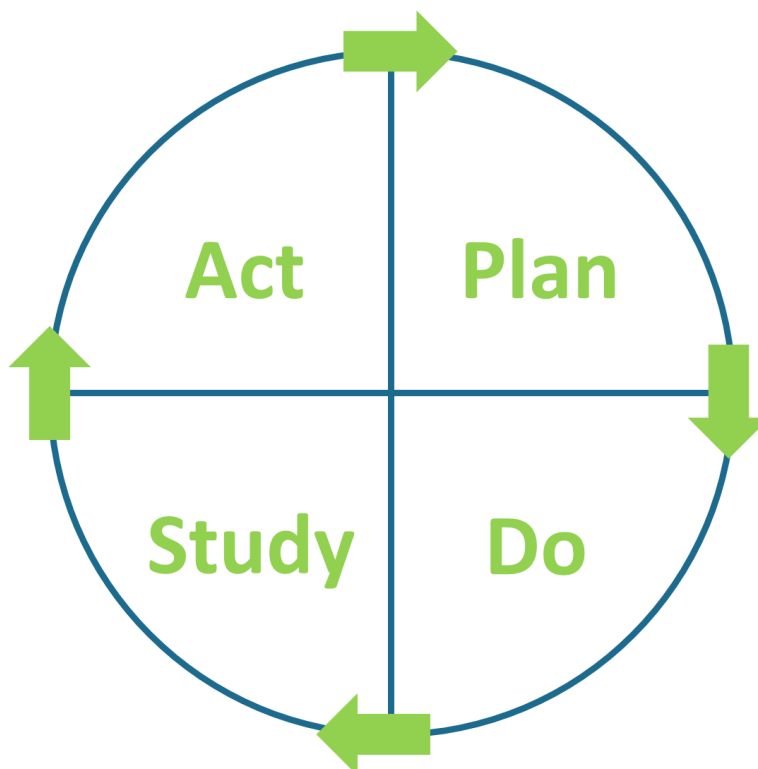
Act   Plan

Study   Do

Figure 28: Plan-Do-Study-Act Cycle

Chapter 7: Testing Changes with PDSA Cycles

PDSA cycles include the following basic steps:

Plan:

- State the objective of your test of change
- Make predictions about the outcome of this test and why you expect this outcome
- Develop a plan to test the change in your workplace at some small scale

Do:

- Carry out your planned test of change
- Document results including problems and unexpected observations

Study:

- Analyze the date gathered during the test
- Compare data to your predictions
- Summarize results and reflect on what you have learned

Act:

- Use the results of the test to determine what to do next
- Adopt, adapt, or abandon the change so that you can start a new PDSA cycle

Simply put, Plan-Study-Do-Act four-stage cyclic learning approach to testing changes that lead to improvement.

This chapter will review the key principles of PDSA cycles, break down each step of the cycle, and provide you with the knowledge and tools you need to start testing changes and making improvements.

Key Principles of PDSA Cycles

PDSA cycles are often a key component of Quality Improvement initiatives. Understanding the key principles of running PDSA cycles will help your QI team get the most out of this four-stage cyclic learning approach to testing and adapting changes.

Using PDSA Cycles is an iterative approach.
According to the Model for Improvement, a series of PDSA cycles should be used in a process called **rapid cycle change**.[2] Generally, you want to start with testing small changes and conduct multiple PDSA cycles. The process is **iterative**, which means that prior PDSA cycles should inform future cycles and that future cycles may seek to modify, expand, adopt, or abandon a change idea that was tested.[1]

Rapid cycle change can be thought of as building a wall out of bricks. When you are building a wall, each brick's placement can be used to decide where the next brick should go. Each individual brick may be small, but when put together, they build off of each other and form a whole wall.[2]

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Chapter 7: Testing Changes with PDSA Cycles

PDSA cycles are built around prediction-based tests of change.

Generating a hypothesis is an important component of the scientific method. In the same way, making predictions is essential for effective PDSA cycles. During the "plan" stage of the cycle, your team will make predictions about the outcome of your change. After you test the change during the "do" stage, you will compare the results to this prediction during the "study" stage.[1] Each subsequent cycle will help you revise your theory-based predictions and help you understand what changes will lead to real improvement.

PDSA cycles rely on small-scale testing.

PDSA cycles start small and build in scale as confidence grows.[1] Starting with small tests of change allows you to rapidly assess interventions without wasting resources. Additionally, small changes are less likely to be met with resistance. Each PDSA cycle provides valuable information about ideas and processes that work and allows you to learn from those that do not. This facilitates rapid change and learning.[1] Over time, these small changes will build to create larger-scale improvement.
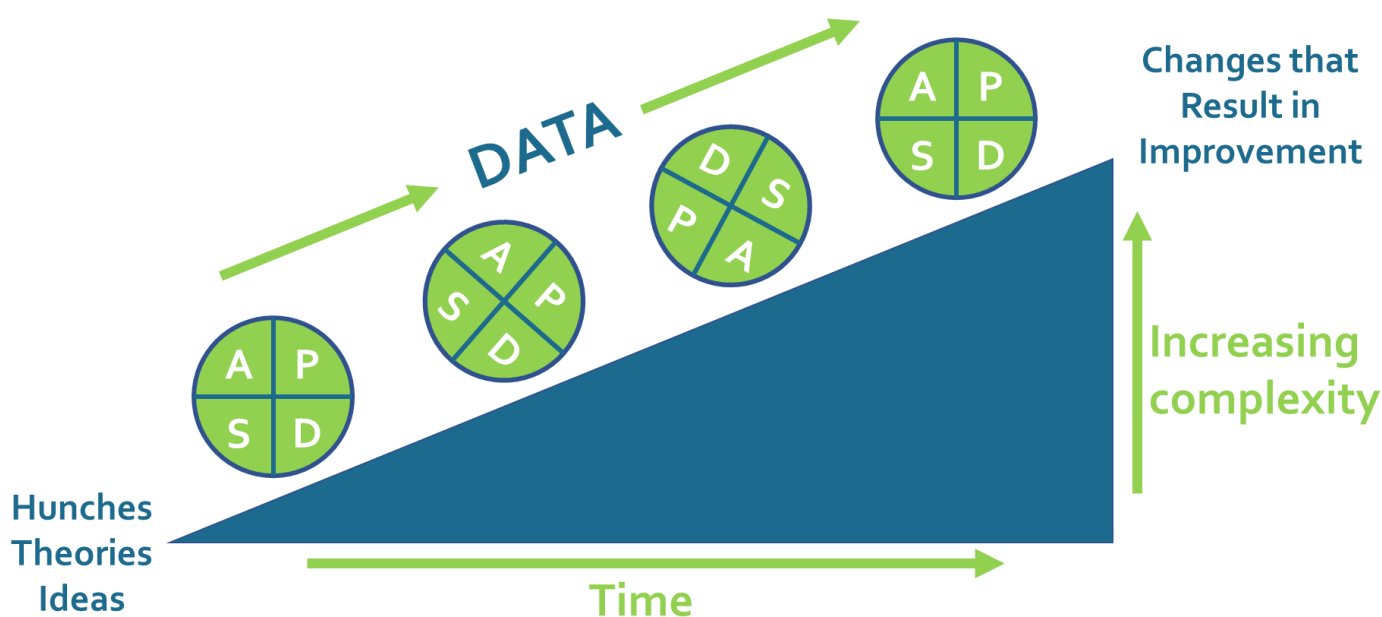

Figure 29: The PDSA Ramp to Improvement

The use of data over time is a key component of PDSA cycles.

Collecting and analyzing data over time is essential to understanding your complex health system. The use of data also helps you understand the impact of the changes that you are testing so that you can assess progress and address your change accordingly. Data is a key feature of all stages of the PDSA cycle. In the "Plan" stage, you will consult your project charter and finalize your data collection plan. In the "Do" stage, you will collect quantitative and qualitative data. During the "Do" stage, you will interpret this data and draw conclusions about the test. And finally, during the "Act" stage, you will decide what to do based on the data you collected and analyzed.

Chapter 7: Testing Changes with PDSA Cycles

Proper documentation increases the success of PDSA cycles.
Documentation throughout each stage of the PDSA cycle is extremely important. Documenting your plan helps you ensure scientific rigor and standardization. Additionally, documenting your data helps you understand the impact of the changes you are making. Furthermore, documentation promotes reflection, supports local learning, and helps you spread successes to other settings. As you go through each stage of your PDSA cycles, you can document your progress using the PDSA Cycle Worksheet found in the annex.

PDSA Cycle Step 1: Plan

Although the eventual goal is to create larger scale improvements, you should start small with your first PDSA cycle. In Chapter 6, you learned how to identify possible changes to test. You also learned how to prioritize your change ideas using a priority matrix.

For your first PDSA cycle, you should start with the change idea that your team feels will make the biggest difference in the shortest amount of time.

Don't worry too much about trying to test a complete intervention at this point. You can start with testing a portion of one of your ideas that you feel confident about. You can try this ideas on fewer people than your target audience or on only a part of the system. Remember, the point is to rapidly perform tests that will teach you something about the effectiveness of your ideas but that true improvement must build over time.

Some people in the improvement world like to ask themselves "What is the largest informative test of change that I could run by next Tuesday?" This helps them focus on starting with small changes that can be tested rapidly.

Once you have decided where to start, your QI should focus on planning the test of change. An important aspect of planning is to make a prediction about the effect that you think your change will have. You want to make sure that you think your change will lead to an improvement and understand why you believe that. Creating a Driver Diagram (discussed in the next section).

> "Our goals can only be reached through a vehicle of a plan, in which we must fervently believe, and upon which we must vigorously act. There is no other route to success."
> -Pablo Picasso

When planning your test of change you also need to consider the following questions:

- How are you going to test it?
- Where?
- On whom?
- At what scale?
- What steps will be involved?
- Who will be responsible for these steps?
- How long will the test run?
- How to do you plan to review the findings?

Outlining all the details of your planned test of change in advance helps standardize the implementation and the data collection process. Use the PDSA Cycle worksheet to document this process.
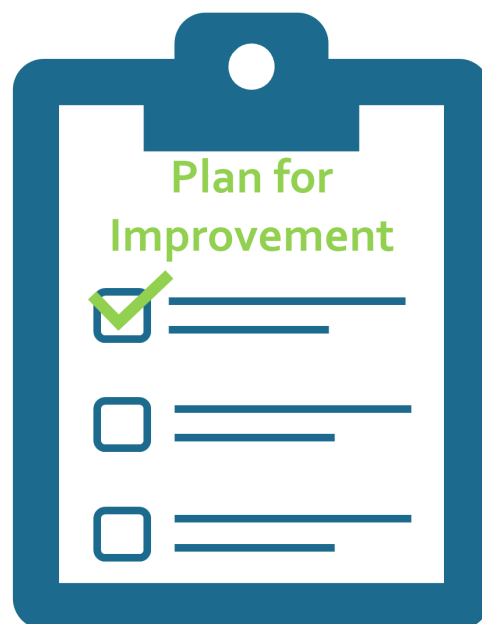
Plan for Improvement

Figure 30: The Planning Stage

Simply put, during the planning stage, your team will identify a change aimed at improvement and decide how to rapidly test that change on a small scale.

Using Driver Diagrams

Before testing your change idea in the "Do" phase of the PDSA cycle, stop to consider how confident you are that your change idea is going to lead to improved outcomes. Understanding how a change will impact your system is essential to predicting improvements.

A driver diagram can serve as a tool for building and testing theories for improvement. **Driver Diagrams** are visual displays of the system you are trying to improve that illustrate what structures, processes, and norms require change and how they can be changed through the application of specific ideas.[3]

The driver diagram starts with a clearly defined and measurable goal. You can use the aim statement that your QI team already created as this goal. Remember that you should be continually revisiting your **QI Project Charter** and making changes to this aim as you go through the improvement process. This aim goes in the box on the left of the driver diagram.

Everything to the right of the aim statement will identify a theory about what must change and how it must change to achieve this aim. Focus on the key leverage points of the your system including structures, processes, and operating norms.[3]
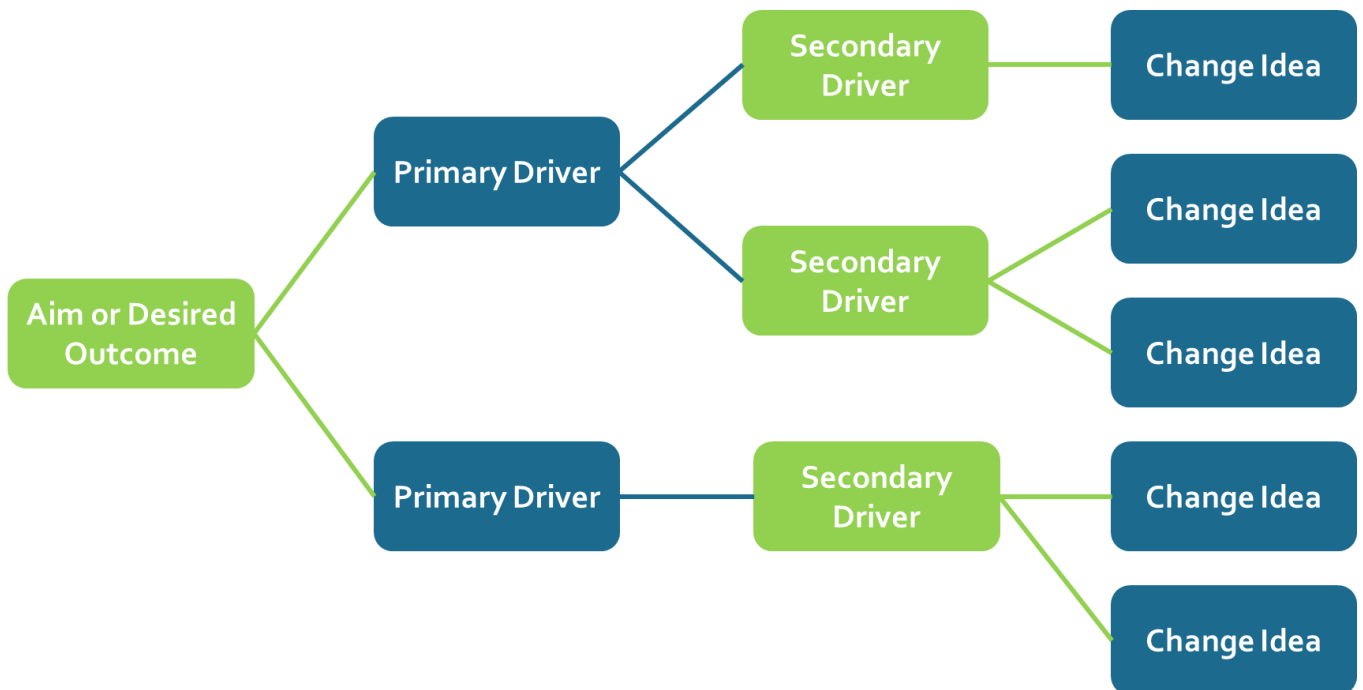
Chapter 7: Testing Changes with PDSA Cycles

Figure 31: Driver Diagram Template

Primary drivers are the high-level factors that have a direct impact on your chosen outcome and that must change to accomplish your aim. Looking back at your fishbone diagram can help you come up with these primary drivers. These primary drivers should be placed to the right of the aim to demonstrate their direct impact.

Secondary drivers are more actionable approaches or opportunities within the system where change can occur.[3] Place these secondary drivers to the right of the primary drivers on your diagram and connect related drivers with lines.

Next, add your change ideas to the right of the secondary drivers. Change ideas articulate how a specific change will take plan in a system.[3] Think about which secondary and primary drivers will be impacted by your change ideas. There should be a clear causal pathway between these ideas and the intended outcome.

As with the other improvement tools in this manual, driver diagrams are most useful if your team continues to revisit them and make modifications as you learn and improve.

Simply put, driver diagrams are a useful tool because they help breakdown your aim into smaller goals (ie "drivers") and make it easier to define the actions you need to make. Furthermore, they help illustrate the causal pathway between your change ideas and improvement (ie why you think your ideas will work).

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PDSA Cycle Step 2: Do

During the "Do" phase of the PDSA cycle, your QI team will test your change idea. You will implement your idea using the details outlined during the planning phase.[2]

Use the PDSA Cycle Worksheet to hold your team accountable to the plan. Each member of your team should be responsible for completing their designated roles.

Running tests is an exciting part of the improvement cycle, but remember that you need to carefully document the process in order to learn from the test. Data collection is an essential component of the "Do" phase. Follow the guidelines created by your QI Team on your team charter and your PDSA Cycle Worksheet.

In addition to collecting quantitative data, you should also be documenting your observations about the test. Try asking each member of the team to take notes during the test period on their observations and the challenges they face.

Simply put, during the "Do" stage, your team will run a small test to assess your change idea.

Figure 32: The Do Stage

PDSA Cycle Step 3: Study

The next step of the PDSA cycle is the "Study" phase. However, in reality, this phase should start at the same time as the "do" phase. Your QI team should start analyzing your results and interpreting progress in real time as you make changes and test your ideas.

As you run your test of change, remember to add data to the run charts you learned about in Chapter 5. Run charts help you view and interpret data in real time. The following section will discuss rules that you can use to interpret your run charts.

Chapter 7: Testing Changes with PDSA Cycles

In addition to your run charts, your team will also be collecting qualitative data about their observations and feelings surrounding the change you are testing. At the conclusion of the test, your team should take some time to discuss these observations and opinions as a group.

The primary goal of the "Study" stage is to determine the impact of your change on the outcome you are trying to improve. Remember that the impact you observe can be positive or negative.

Ineffective changes can tell you as much as effective changes because PDSA cycles always result in learning. Describe and analyze any changes that you deem to be failures as well as those you deem to be successes. Use this information to decide your next steps during the "Act" stage.

Simply put, during the "Study" stage, your team will analyze results of the test of change and compare them to your predictions.

Run Chart Rules

In Chapter 5, you learned how to construct a run chart that allow you to learn from the variation in health care processes that you are observing. Run charts show if a process if demonstrating non-random patterns which helps QI teams determine if the changes they are seeing in the system are due to changes and improvement or simply the product of chance.[4]

Remember that run charts are graphical displays of data. The horizontal x-axis shows time often in terms of days, weeks, months, quarters. However, sequential patients, visits, or procedures could also be used. The vertical y-axis represents the measure that is being studied.

Knowing a few simple rules for analyzing your run charts can help your QI team get the most out of the data you are collecting. After you have 12 data points on your run chart, you can apply a set of rules that will help you differentiate between common cause variation and special cause variation.

Common cause variation is natural variation that affects everything and is built into every system. For example, the routine variation in traffic between Leribe and Maseru is common cause variation. **Special cause variation** is caused by controllable factors and should be the target of our improvement projects. An accident that blocks several lanes and prevents passing would be an example of special cause variation.

The first step in applying the **run chart rules** is to add a line representing the median. The **median** is the midpoint of all observed data points.

For example, let's say your team is looking at average wait times over the course of several weeks and collect the following data: 40 minutes, 35 minutes, 28 minutes, 32 minutes, and 26 minutes.

To find the median, first arrange the numbers in order: 26, 28, 32, 35, 40. The middle number, 32 minutes, is your median. If you collected data for an additional week and found an average wait time of 25 minutes, your data would be: 25, 26, 28, 32, 35, 40. Since there is no clear "middle number," you would average 28 and 32 minutes to determine a median of 30 minutes.

Rule 1: Shifts

On your run chart, 6 or more data points in a row that are all above or below the median are called a **shift**. Note that if one point falls directly on the median. A shift signals that something nonrandom has happened in the process. If a favorable shift happens after you test one of your change ideas, you can possibly attribute the improvement to that change.
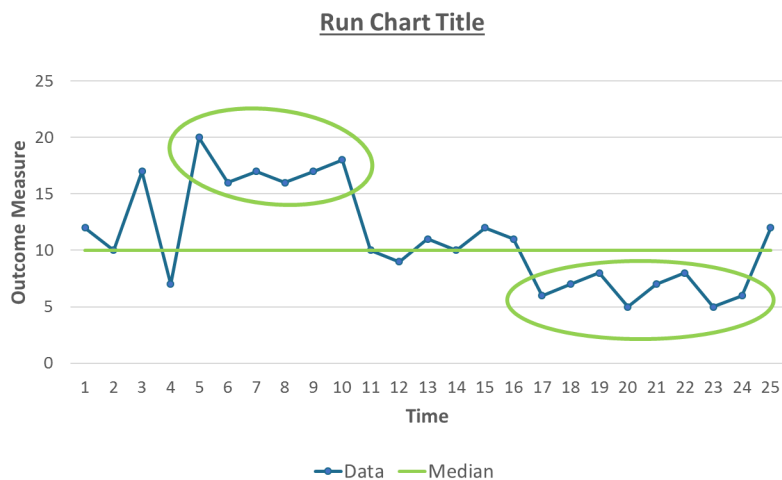
Figure 33: Run Chart Rules– Shifts

Rule 2: Trends

A **trend** is 5 or more points in a row that are either going up or down. If two points have the same value, count them as a single unit in your trend.
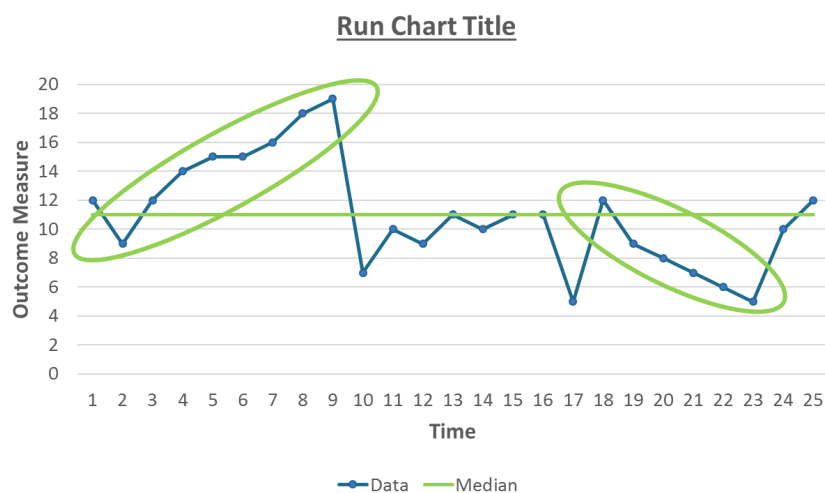
Figure 34: Run Chart Rules– Trends

Chapter 7: Testing Changes with PDSA Cycles

Rule 3: Runs

A **run** is a series of points in a row on one side of the median. A non-random pattern is indicated by too few or too many runs. You can determine the number of runs by counting the number of times the data crosses the median and adding one. This rule must be used in conjunction with a table that sets lower and upper limits for the number of runs based on the number of data points you collect.
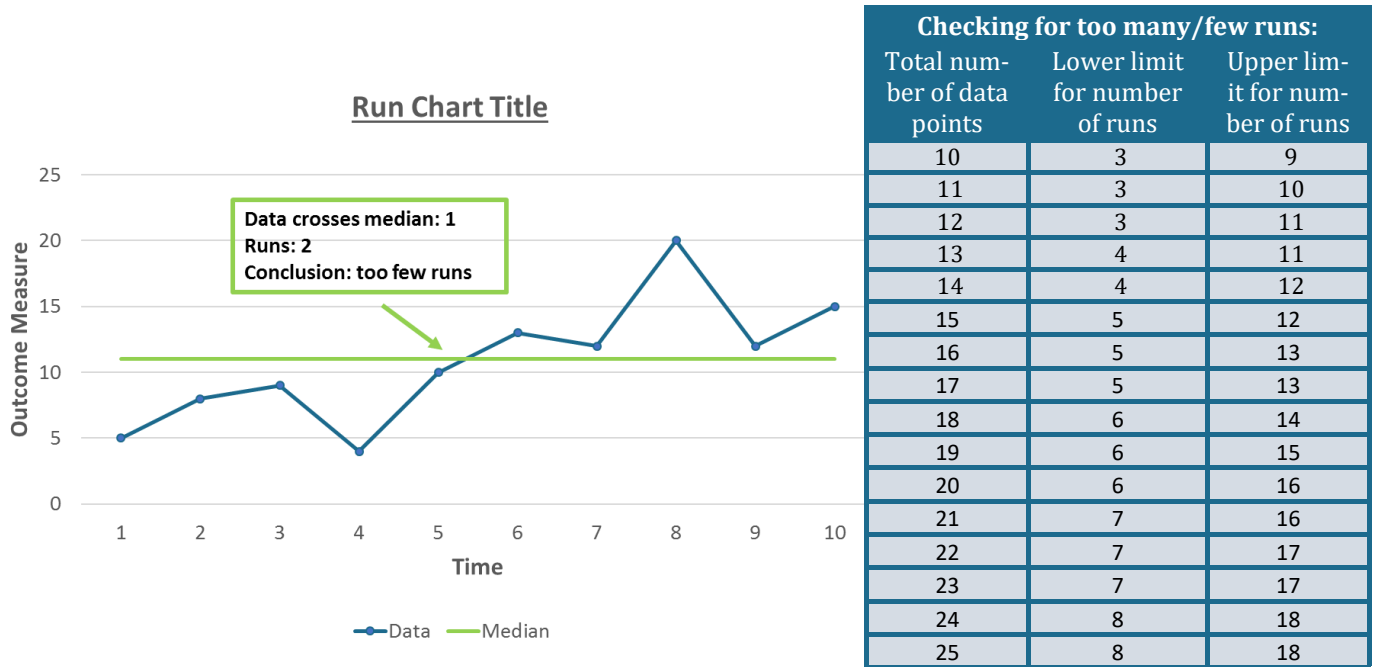
Run Chart Title

Data crosses median: 1
Runs: 2
Conclusion: too few runs

Checking for too many/few runs:		
Total number of data points	Lower limit for number of runs	Upper limit for number of runs
10	3	9
11	3	10
12	3	11
13	4	11
14	4	12
15	5	12
16	5	13
17	5	13
18	6	14
19	6	15
20	6	16
21	7	16
22	7	17
23	7	17
24	8	18
25	8	18

Figure 35: Run Chart Rules– Runs

Rule 4: Astronomical Points

An **astronomical point** is a data point that is obviously different from other values and is either unusually large or unusually small. This point is outside of the normal process and could indicate a problem in the data collection.
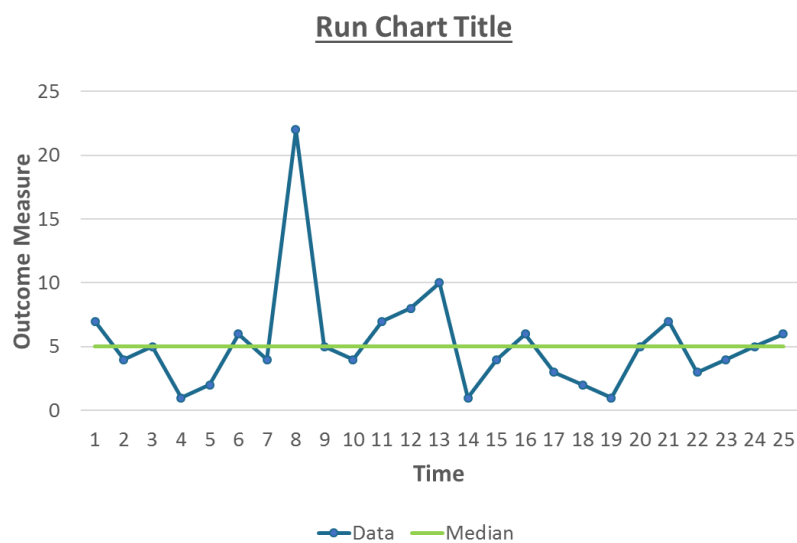
Run Chart Title

Figure 36: Run Chart Rules– Astronomical Points

Simply put, if your run chart shows any of the run chart rules, there is an attributable cause that you should try to understand. This could indicate that your changes are resulting in improvements or it could indicate something you want to figure out how to avoid.

PDSA Cycle Step 4: Act

The fourth stage of the PDSA cycle is the "Act" stage and is all about deciding what to do next. Based on the results of your test and the data your analyzed, your team will decide whether to keep the change, modify the change, or discard the change all together. Your team will also decide what to do for your next PDSA cycle.

If your test was successful, you may decide to adopt the change completely. In this case, your next PDSA cycle could involve testing your change at a larger scale or under different conditions. You could also decide to build on the change and test a related component of your intervention plan. Improvement often requires a package of interventions rather than a single change.

If you observe moderate success during the first PDSA cycle, you may decide to adapt your change. You could make adjustments based on your team's observations and then design a new test of your adapted change.

If your test of change was a failure, you might decide to completely abandon the change. In this case, your team should pick a new idea from their list of potential changes and start a new PDSA cycle. Remember, that PDSA cycles that do not result in improvement can be still beneficial in the learning process.

> "Failure is only the
> opportunity to begin
> again more intelligently."
> -Henry Ford

Simply put, during the "Act" stage of the PDSA cycle, you should adapt, adopt, or abandon your change idea and start planning your next cycle.

Remember that PDSA cycles are an iterative process that involves multiple cycles. Keep testing changes until you find what works and reach your team's improvement goals!

Throughout each cycle, use the **PDSA Cycle Worksheet** found in Annex D to document your progress.

Chapter 7: Testing Changes with PDSA Cycles

> ## Summary of Key Points
>
> - After answering the three fundamental questions of the Model for Improvement, your QI team should start testing changes using PDSA cycles.
>
> - PDSA cycles are an iterative process that involves small-scale, prediction based tests of change and rely on tracking data over time and proper documentation.
>
> - During the "plan" stage, your team will determine what change to test and how you plan to test it.
>
> - During the "do" stage, your team will carry out the test of change, collecting data and documenting the process as you go.
>
> - During the "study" stage, you will analyze the data and draw conclusions about the success of your test.
>
> - During the "act" stage, you will decide whether to adopt, abandon, or adapt your change and start planning your next PDSA cycle.
>
> - Creating a driver diagram can help you decide what change to start with and understand the causal pathway between that change and your improvement goals.
>
> - Using simple run chart rules can help you get the most out of your data and understand if the changes you are making are resulting in improvement.

References

1. Taylor MJ, McNicholas C, Nicolay C, Darzi a., Bell D, Reed JE. Systematic review of the application of the plan-do-study-act method to improve quality in healthcare. BMJ Qual Saf. 2013;(September):bmjqs-2013-001862-. doi:10.1136/bmjqs-2013-001862.

2. McQuillan RF, Silver SA, Harel Z, et al. How to Measure and Interpret Quality Improvement Data. Clin J Am Soc Nephrol. 2016;11(5):908-914. doi:10.2215/CJN.11511015.

3. Bennett B, Provost L. What's Your Theory? Driver diagram serves as tool for building and testing theories for improvement. Qual Prog. 2015:36-43. doi:10.1093/intqhc/mzp057.

4. Perla RJ, Provost LP, Murray SK. The run chart: a simple analytical tool for learning from variation in healthcare processes. BMJ Qual Saf. 2011;20(1):46-51. doi:10.1136/bmjqs.2009.037895.

Sustaining & Spreading Improvement

Chapter 8 Objectives

- Understand the importance of sustainability for QI projects

- Understand the benefit of incorporating changes into standard work

- Know how to use performance boards

- Know how to use improvement huddles

- Understand how to spread improvement within your organization and beyond

---

Meeting Your Improvement Goals

Each successful PDSA cycle brings you closer to achieving your improvement goals and reaching the aims that you set in Chapter 4. Once you reach and exceed these aims, make sure that your QI team takes time to celebrate your accomplishments and to reflect on the improvement process. Your team, and your entire health facility, should be proud of the improvements you have made!

However, your improvement journey is far from over. Improving a system is meaningless if the changes are only short-lived. You will need to work hard to ensure that your improvements last and that your system does not revert to its prior poor performance.

Sustainability refers to holding the gains of an improvement project, even in the face of staff and organizational turnover.[1]

In addition to meeting your improvement aims, the following signs can help you determine if a QI project is ready to be fully implemented and sustained:[1]

- The changes have been tested in different conditions with different staff who were all given the opportunity to provide feedback.

- Your facility has the necessary infrastructure, including personnel, supplies, and equipment, to support the project long-term.

- You have observed high performance for the project over the course of several weeks or months.

- Your team has identified measures to monitor performance in the long-term and assigned responsibility for measuring and reporting this performance.

Simply put, sustainability is an important aspect of Quality Improvement.

Chapter 8: Sustaining & Spreading Improvement

> "Quality is not an
> act. It is a habit."
> -Aristotle

Tips for Sustaining Your Gains

If you drastically reduce patient wait times over the course of six months, you want to maintain this improvement. You don't want patients to go back to the same long wait times as before when you reach month 9 or 10. Instead, you need to focus on sustaining your gains.

Think about sustainability from the beginning of your QI project.
When you improve quality at your health facility, you want to make sure that the improvements last. Considering the sustainability of your project during the planning stages can help you anticipate and navigate challenges. Try not to make any changes that will feel burdensome to the staff when the excitement for the improvement project wears off. Instead, ask yourself if your proposed changes are feasible in the long-run.

Use momentum from successful QI projects to motivate your staff.
Many improvement experts believe that continuing the work is more challenging than starting an improvement project, because the initial excitement eventually dissipates.[1] You should try to capitalize on the enthusiasm generated by early successes as quickly as possible. Try to make your changes into routine work while the staff are still excited. Additionally, project successes can motivate people to pursue additional projects.[2] Use this momentum to hold your gains and launch new projects.

Incorporate changes into standard work at your clinic or hospital to make the improvements expected and routine.
To achieve sustainability, QI initiatives must become the new, accepted way of working. The changes that you make should be incorporated into daily work and not feel like additional tasks. **Standard work** is a simple written or visual description of current best practices to complete a specific process. Incorporating changes made during your QI project into standard work helps them become legitimate and routine. This prevents backsliding in your improvement aims.

Additionally, you can use techniques like performance boards and improvement huddles to maintain focus on QI projects and motivate your team.
The following sections explain the benefits of performance boards and improvement huddles and provide details on how to use them.
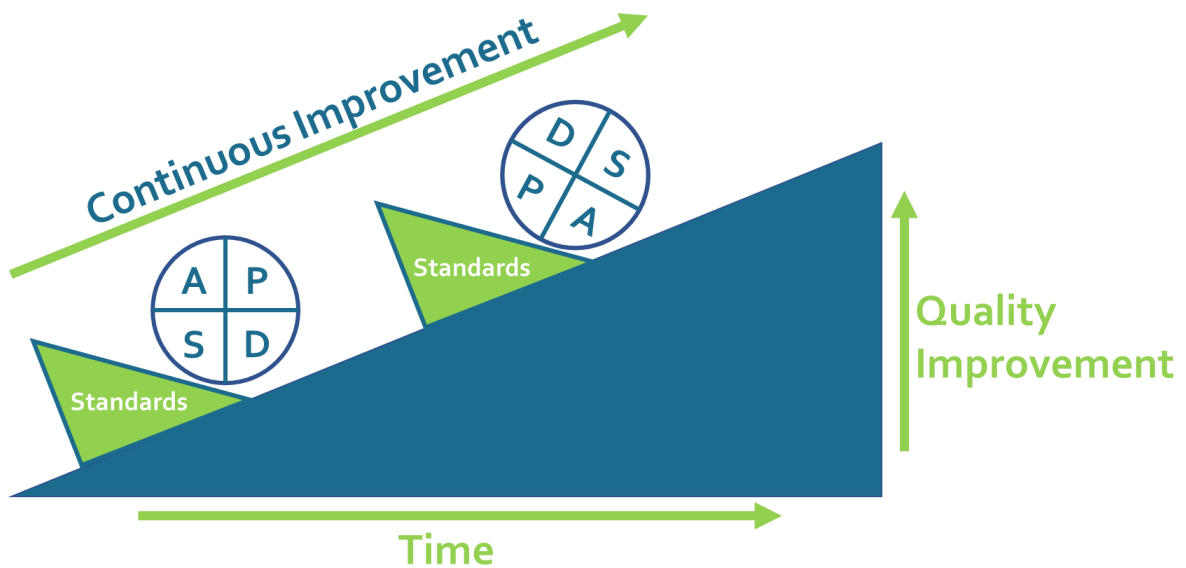
Figure 37: Standards Prevent Decreases in Progress

Using Performance Boards

A **performance board** is a visual display that communicates the outcome of QI projects to staff and patients. These boards are usually put up in a high traffic area and display improvement aims along with long-term (monthly/quarterly) and short-term (daily/weekly) results. Results are often displayed in run charts because they are simple and easy to understand. Performance boards should also include a description of current improvement activities.[1]

Performance boards can be used to rapidly disseminate information to members of the QI team, other health care workers, patients, and their families. It also can be used to recognize achievement and motivate improvement. Additionally, performance boards represent an organization's commitment to continued improvement.

Don't forget to designate someone to update the performance board over the course of your improvement project and beyond!

Holding Improvement Huddles

Improvement Huddles are regular 10-15 minute meetings among facility staff to discuss current projects and review performance. Improvement huddles should be held frequently— weekly or even daily— to establish a routine and maintain momentum for continuous improvement.[1]

You can hold your improvement huddles in front of your performance board and use the board to guide your discussion. One staff member should be designated as the facilitator for the brief meeting while another should document ideas generated. You may want to rotate these roles to encourage participation.

Chapter 8: Sustaining & Spreading Improvement

> ### Agenda for Improvement Huddles[1]
>
> - Review long-term (monthly/quarterly) performance (1-2 min)
> - Review short-term (daily/weekly) performance (1-2 min)
> - Review current QI projects and PDSA cycles (1-2 min)
> - Discuss reasons for high or low performance (2 min)
> - Brainstorm change ideas to sustain or adjust performance (2 min)
> - Assign responsibility for new changes (1-2 min)

Simply put, improvement huddles allow frontline staff to solve problems and sustain improvement while creating engaged staff members and a culture of improvement.

Spreading Improvement within Your Facility

In addition to sustaining your gains, you also want to spread your improvements in quality. **Spread** is the extent to which the knowledge, skills, and materials for changed work are available and used and the extent to which results are obtained beyond the pilot site.

In some cases, you might want to spread your improvement within your facility. For example, positive changes made in one ward of a hospital are often beneficial in other wards as well. Talk to supervisors and frontline workers from other areas to discuss how achievements in one area can be shared with other areas.
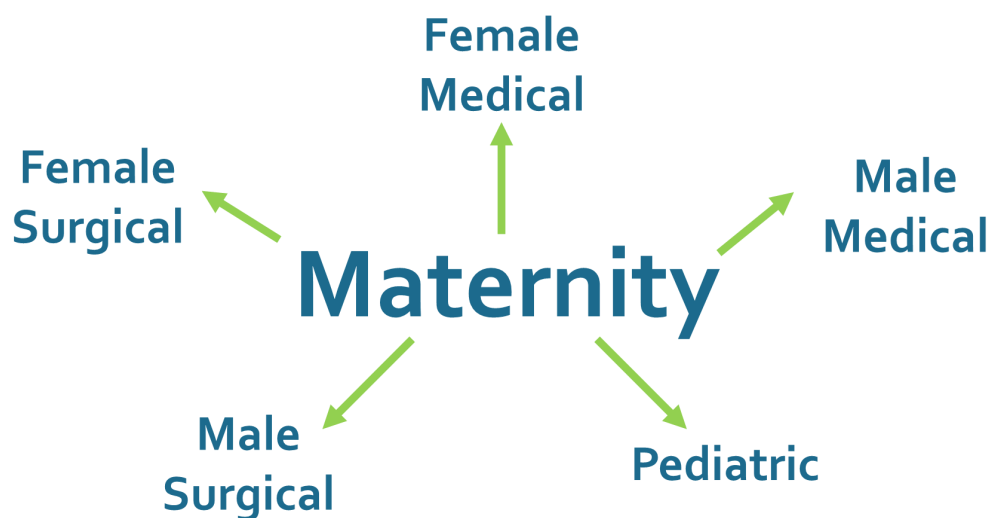
Figure 38: Spread within Inpatient Wards

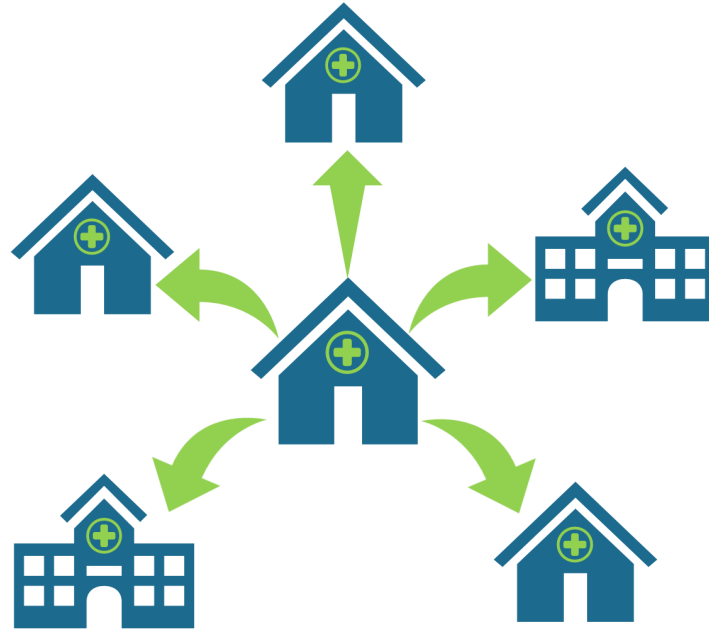# Chapter 8: Sustaining & Spreading Improvement

Figure 39: Spread between Health Facilities

Spreading Improvement between Health Facilities

On the other hand, you may want to share your successes and spread improvement to other health facilities in your area. Clinics and hospitals in Lesotho often face similar challenges and have similar goals for patient outcomes. What works in one setting might work in another setting.

Try talking to the Nursing Services Manager, the Public Health Nurse, or the District Health Manager in your district about your project successes and sharing ideas and interventions. You can also report on QI project successes at district meetings like the quarterly Primary Health Care (PHC) meeting.

Simply put, it is important to spread your improvement within your facility and to other facilities that may face similar challenges.

"Strive for continuous improvement, instead of perfection."
-Kim Collins

Chapter 8: Sustaining & Spreading Improvement

Summary of Key Points

- After meeting your improvement aims, your QI team should focus on sustaining any improvements made.

- Thinking about sustainability during the early stages of your improvement project can help your team anticipate challenges.

- Early success can provide momentum for future success on current and future QI projects.

- Performance boards and improvement huddles help keep the focus on improvement and can motivate staff.

- Spreading improvement to other areas of your health facility and to other health facilities is important.

References

1. Silver SA, McQuillan R, Harel Z, et al. How to Sustain Change and Support Continuous Quality Improvement. *Clin J Am Soc Nephrol*. 2016;11(5):916-924. doi:10.2215/CJN.11501015.

2. Berman J, Nkabane EL, Jack B, Bicknell W. Developing a hospital quality improvement initiative in Lesotho. 2012;27(1):15-24. doi:10.1108/IJHCQA-01-2012-0010.

GLOSSARY OF QI TERMS

Aim Statement- a clear description of the team's goals and desired outcomes expressed in a measurable and time-specific way

Balancing Measures- measures monitor unintended consequences of changes to a system

Brainstorming- when a group of people meet to generate new ideas around a specific area of interest

Common Cause Variation- natural variation that affects everything and is built into every system

Criteria- measurable steps within a standard that allow us to see if our standards are being met

Data- information in the form of quantitative (numerical) and qualitative (descriptive) variables

Diads/Triads- a brainstorming technique that requires groups to separate into pairs or threes to come up with new ideas

Driver Diagrams- visual displays of the system you are trying to improve that illustrate what structures, processes, and norms require change and how they can be changed through the application of specific ideas

Fishbone/Cause and Effect/Ishikawa Diagram- a graphic tool used to explore and display the possible causes of a certain effect

Five Whys Technique- a questioning exercise for moving past obvious symptoms and identifying the root causes of a problem

Focus Group Discussions- group discussions held with a small group of respondents to explore their perspectives on a particular problem, idea, program, or situation

Improvement Huddles- regular 10-15 minute meetings among facility staff to discuss current projects and review performance

In-depth Interviews- intensive one-on-one interviews also used to explore perspectives

Iterative- term used to describe PDSA cycles because they are repetitive steps towards achieving a desired goal with the results of each cycle serving as a starting point for the next cycle

Annex A: Glossary of QI Terms

Indicators- measurement tools that are used to evaluate at what level the standards or criteria are being met

Lean Management- quality improvement methodology that aims to eliminate waste and improve flow by simplifying processes and making them error-proof

Matrix Diagram/Priority Matrix- a diagram that helps you rank ideas and prioritize problems to address or ideas to pursue

Measurement for accountability- measurement that uses data to determine whether performance was achieved at a defined level or in comparison to the performance of another

Measurement for improvement- measurement that is less complex and precise than either measurement for accountability and measurement for research. Few measures are used and only the data needed to understand processes and evaluate changes is collected

Measurement for research- measurement that uses data to generate new knowledge for the scientific community and the general public

Model for Improvement- framework for improvement based on PDSA cycles and three fundamental questions that emphasizes teamwork and iterative learning to make incremental tests of change that build to create larger-scale improvement

Outcome Measures- measures that evaluate the effect of the health system on patients or the impact on the community

Performance Board- a visual display that communicates the outcome of QI projects to staff and patients

PDSA Cycle- shorthand for testing a change by developing a plan to test the change (Plan), carrying out the test (Do), observing and learning from the consequences (Study), and determining what modifications should be made to the test (Act).

Primary drivers- the high-level factors that have a direct impact on your chosen outcome and that must change to accomplish your aim

Process mapping- a method of visually displaying a map of the series of steps in a complex system or process in order to develop an understanding of that system/process

Process measures- measures that evaluate system performance and potential changes

Lesotho-Boston Health Alliance

Project Charter- a tool for developing and recording an improvement plan that the team agrees upon. Project charters usually include a statement of rationale, aims, measures, and possible tests of change

Project Goal- a broad, brief statement of intent that provides focus and vision for a project

Quality Assurance- oversight process for managing quality, including adherence to standards and guidelines. Can be a set of activities used to set standards and measure performance

Quality Improvement- the application of systematic and continuous actions that lead to measurable improvements in the health care services or in the health status of a target population

Rapid Cycle Change- the process of starting with testing small changes and conduct multiple PDSA cycles

Reflection-for-action- taking time to pause and consider the effects and unanticipated consequences of changes

Reflection-in-action- observing thoughts and actions as they are occurring in order to make adjustments as they go

Reflection-on-action- studying previous actions and apply knowledge gained to new actions

Root Cause Analysis- a method of problem solving used for identifying root causes of problems

Root Cause- the most fundamental reason why improvement is necessary or how the imperfect situation occurs

Run charts- simple analytical tools that allow us to learn from variation in healthcare processes

Run Chart Rules
    Shift- 6 or more data points in a row that are all above or below the median
    Run- a series of points in a row on one side of the median
    Median- the midpoint of all observed data points
    Trend- 5 or more points in a row that are either going up or down

S.M.A.R.T. Criteria- Specific, Measured, Attainable, Relevant, Time-Based

Scientific Method- a process for experimentation consisting of systematic observation, measurement, and experiment, and the formulation, testing, and modification of hypotheses

Annex A: Glossary of QI Terms

Secondary drivers- more actionable approaches or opportunities within the system where change can occur

Six Sigma- quality improvement methodology that minimizes variation, eliminated defects, and establishes robust controls

Special cause variation- caused by controllable factors and should be the target of our improvement projects

Spread- the extent to which the knowledge, skills, and materials for changed work are available and used and the extent to which results are obtained beyond the pilot site

**Standards**- statements of expected performance

Standard work- a simple written or visual description of current best practices to complete a specific process

Sustainability- holding the gains of an improvement project, even in the face of staff and organizational turnover

Team- a small number of people with complimentary skills who are united by a commitment to a common purpose, approach, or performance goal

Quality Improvement Toolbox

Process Mapping
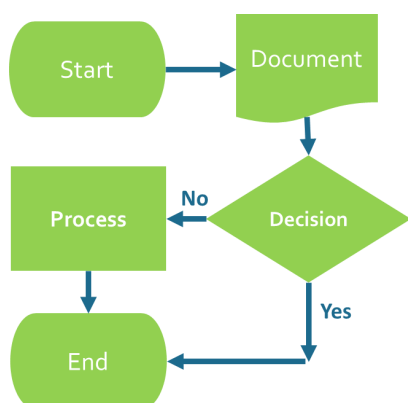
Description:

Process mapping is a method of visually displaying a series of steps in a complex system or process. This promotes understanding of the system/process and helps you identify opportunities for improvement.

When to use:

Process mapping provides a starting point for improvement projects. It is useful to map your system before setting your improvement aims.

For more information, see Chapter 4.

Brainstorming

Description:

Brainstorming refers to when a group of people meet to generate new ideas around a specific topic in a fast-paced, positive setting. One common technique is the diad/triad method which requires pairs to come up with three ideas in five minutes.

When to Use:

Brainstorming is useful at various stages of the improvement process including when you are setting aims and when you are identifying changes to test.

For more information, see Chapter 4 and Chapter 6.

Priority Matrix

	Impact	Control	Total
1			
2			
3			
4			
5			
Highest Scoring Option = _____			

Description:

A matrix diagram/priority matrix is a diagram that helps you rank and prioritize ideas by giving each idea a score for different criteria that will factor into project success.

When to use:

Priority matrices are useful when choosing areas for improvement and changes to test.

For more information, see Chapter 4 and Chapter 6.

S.M.A.R.T. Criteria

Specific
Measurable
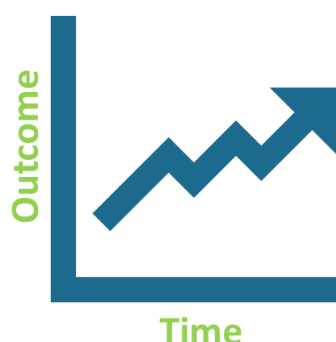**A**ttainable
Relevant
Time-based

Description:

S.M.A.R.T. Criteria provides guidelines for effective aim statements. Aims should be specific, measurable, attainable, relevant, and time-based.

When to Use:

Use S.M.A.R.T Criteria when setting your improvement aims.

For more information, see Chapter 4.

Run Charts

Outcome / Time

Descriptions:

Run charts are simple analytic tools that allow us to learn from variation in processes. Time is graphed on the x-axis while your outcome is graphed on the y-axis.

When to Use:

Set up your run charts when you establish your measures and fill them in during your PDSA cycles.

For more information, see Chapter 5 and Chapter 7.

Root Cause Analysis
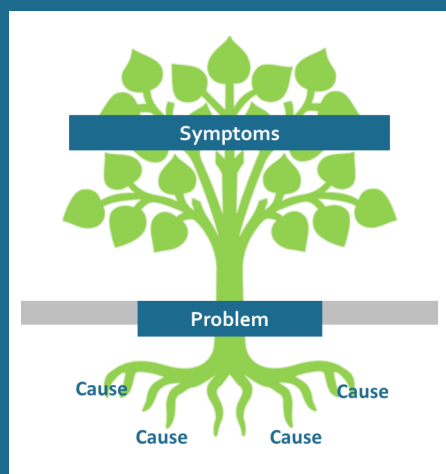
Description:

A Root Cause Analysis is a method of problem solving used for identifying root causes or the most fundamental reasons why improvement is necessary. There are many RCA tools.

When to use:

Analyzing a system for root causes can help you identify problems and generate change ideas to test.

For more information, see Chapter 6

Fishbone Diagram/Cause and Effect Diagram
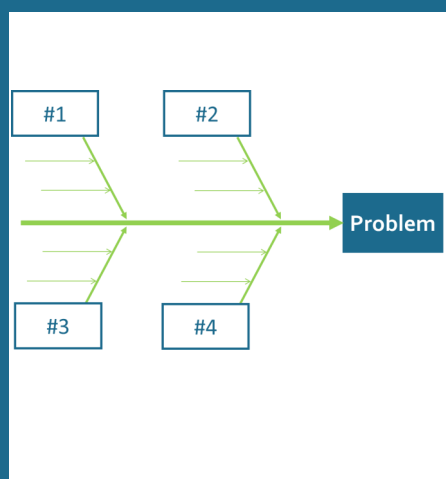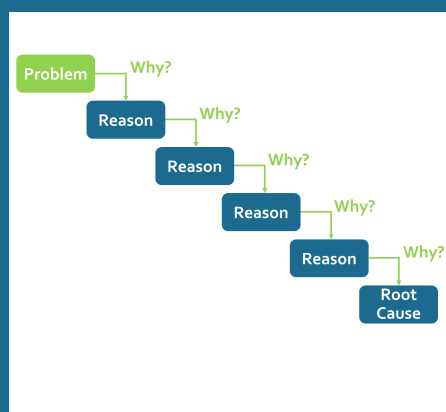

Description:

A fishbone diagram is a graphic tool used to explore and display the possible causes of a certain effect. Also called Cause and Effect Diagrams.

When to Use:

Fishbone diagrams help you identify root causes that warrant the most attention and can help generate change ideas.

For more information, see Chapter 6.

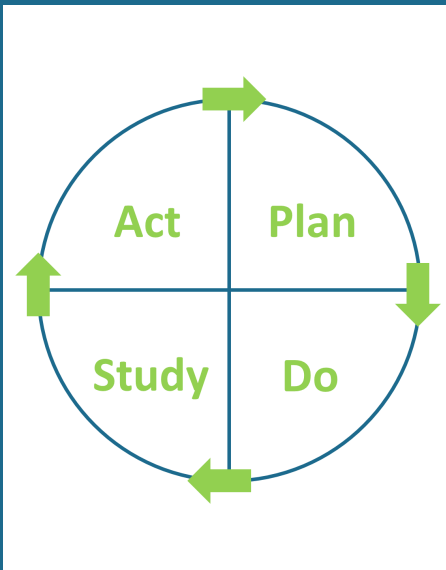# The Five Whys Technique

Descriptions:

The Five Whys Technique is a questioning exercise for moving past obvious symptoms and identifying root causes of a problem.

When to Use:

Use the Five Whys Technique in conjunction with the Fishbone Diagram.

**For more information, see Chapter 6.**

PDSA Cycles

Description:

During a PDSA cycle, you test a change by developing a plan (Plan), carrying out the test (Do), observing and learning from the consequences (Study), and determining what modifications should be made next (Act).

When to use:

PDSA cycles are essential for testing changes that you think will lead to improvement.

For more information, see Chapter 7.

Driver Diagrams
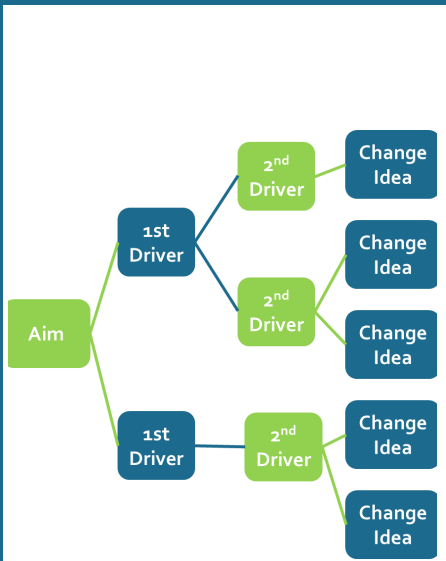
Description:

Driver Diagrams are visual displays of the system you are trying to improve that illustrate what structures, processes, and norms require change and how they can be changed through the application of specific ideas.

When to Use:

Driver Diagrams are especially useful during the Plan stage of the PDSA cycle because they help you understand how change ideas will impact your system.

For more information, see Chapter 7.

TEAM CONTRACT: PART 1

First, complete the Personal Worksheet below. Then meet with your QI team to discuss your answers and develop a team contract.

Item:	My Answers:
1. What do I want to get out of this project of experience?	
a. What do I want to learn?	
b. How do I learn? (By doing, by reading, etc.)	
c. What are my goals for this improvement project and experience?	
d. What are my hopes and fears about the group?	
2. What do I have to offer others?	
a. Previous experience that might be useful to the team:	
b. Special skills that I can teach/coach others to use:	
3. My Personal Preferences/ Work Styles are:	
a. Preferences for working in groups:	
b. Role that I tend to play in a group setting:	
c. Rules that are important to me:	

TEAM CONTRACT: PART 2

Team Name: _____

Section 1: Team Goals

What is the overall goal of this Quality Improvement Team?

Section 2: Team Members

List team members & contact information:

What is each of our interest in being on this team?

Section 3: Meeting Schedule

How often will we meet?

Where will we meet?

When will we meet?

Section 4: Commitments & Expectations

What are our commitments to each other?

What do we expect from each other?

What are our team rules?

Section 5: Roles & Responsibilities

What role will each member play?

How will we delegate responsibility?

QI Meeting Sign-In Sheet

Team Name: _____ **Date:** _____

#	Name	Job Title	Cell #	Email	Signature
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

QI MEETING MINUTES

Meeting Information

Purpose of Meeting:

Date:	**Location:**
Facilitator:	**Note Taker:**

Attendees:

Agenda Items	Presenter	Time Allotted
1		
2		
3		
4		

Decisions

1	
2	
3	
4	

C5

QI Meeting Minutes

New Action Items		Person Responsible	Due Date
1			
2			
3			
4			

Other Notes & Information

Lesotho-Boston Health Alliance

QI Project Charter

Team Name:_____

Team Members: _____

_____

Project Title: _____

What are we trying to accomplish?

Aim statement (How good? For whom? By When? 1-2 sentences):

Problem to be addressed (Defines WHAT broadly; 2-3 sentences):

Reason for the effort (Defines WHY; 4-5 sentences):

Expected outcome/benefits (Defines WHAT specifically, still not HOW; 3-4 sentences):

QI Project Charter

How do we know that a change is an improvement?

(Identify outcome, process, and balancing measures; 4-5 sentences)

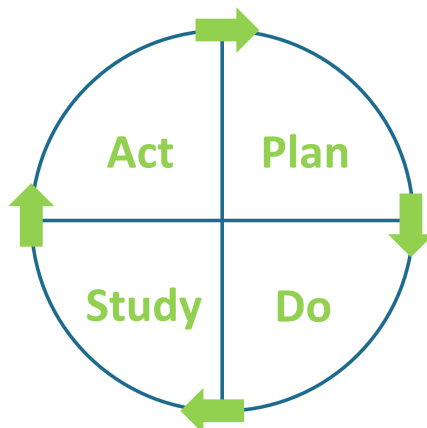**What changes can we make that will lead to improvement?**

(Initial activities and ideas for PDSA cycles, including key stakeholders; 4-5 sentences)

What are the constraints and barriers to success?

(Explain what the project will not address; 2-3 sentences)

*Adapted from the Institute for Healthcare Improvement

PDSA Cycle Worksheet

Objective: _____
_____
_____
_____

Plan: Plan the test, including a plan for data collection.

Questions and predictions:

_____
_____
_____
_____
_____

Who, what, where, when:

_____
_____
_____

Plan for collecting data:

_____
_____
_____
_____

PDSA Cycle Worksheet

Do: Run the test on a small scale.

Describe what happened. What data did you collect? What observations did you make?

_____

_____

_____

_____

_____

_____

Study: Analyze the results and

compare them to your predictions.

Summarize and reflect on what you learned:

_____

_____

_____

_____

_____

_____

Act: Based on what you learned from the test,

make a plan for your next step.

Determine what modifications you should make— adapt, adopt, or abandon:

_____

_____

_____

_____

_____

_____

Lesotho-Boston Health Alliance