



Federal Democratic Republic of Ethiopia
Ministry of Health

Quality Improvement Training

Participant Manual

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APPROVAL STATEMENT

FOREWORD

The Ethiopian Federal Ministry of Health (FMOH) started implementing its Health Sector Transformation Plan (HSTP) 2015/16 – 2019/20 (2008 to 2012 EFY) in July 2015, and one of the four transformation agendas contained in this plan is quality and equity of health care. Improving the quality of healthcare services into high quality person-centered health service provision is a timely agenda and critical to deliver on the promise of universal health coverage.

The Ethiopian National Health Care Quality Strategy (ENHCQS) was launched in March 2016 with the aim of providing person-centered, efficient, effective, equitable and high-quality health care for Ethiopia, resulting in improved health outcomes for the country. A dramatic shift in the status quo requires a view to the entire system, to the issues facing health system leaders, practitioners, outreach workers, community members, and patients alike. The ENHCQS builds on the plan laid out in HSTP to further align key stakeholders across prioritized interventions that will drive large-scale improvement in quality of care delivery over the next five years. Indeed, despite the tremendous achievements to date, the creation of the national quality strategy acknowledged that more work remains to be done to ground the concept and practice of quality across the healthcare system.

Human resources for health (HRH) is one of the six building blocks of the World Health Organization (WHO) framework for health systems, and as such they play a pivotal role in achieving the aims of the ENHCQS and the HSTP as a whole. From leaders of the system at different levels to the front-line staff that provide the health service, the complex health system is animated through professionals. It is for this reason that the ENHCQS outlines the building of leadership across all levels of the health system who see quality as one via increasing the knowledge of quality assurance and improvement approaches among leaders and provide training opportunities for leadership in quality improvement methods under the second strategic focus area of ENHCQS i.e. *Activating key constituents*. To this end significant efforts have been made by the FMOH and different development partners. In addition to provision of major

national and regional trainings, different sessions on Quality Improvement (QI) methods and reform tools have been provided to strengthen HRH throughout the system.

The development of a comprehensive quality improvement training and mentorship manual is essential to making progress in the necessary capability building activities for health system leaders, mentors, and health care workers. As such, the Health Service Quality Directorate in the FMOH has stressed the development of the manual as one of its major activities. To this end this manual has been developed through a series of consultative sessions and the involvement of various experts and organizations.

This manual is a testament to the FMOH's firm commitment to improving quality of care across the nation, and as such concerned stake holders should act in synergy towards achieving the aim of the ENHCQS which is *"to consistently improve the outcomes of clinical care, patient safety, and patient-centeredness, while increasing access and equity for all segments of the Ethiopian population, by 2020."*

The FMOH would like to thank all individuals and institutions who contributed for the development of this Healthcare Quality Improvement Training Resource package.

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ACRONYMS

ANC	Antenatal care
AP	Activity/Action Period
BTS	Breakthrough Series
CS	Caesarean Section
DAC	Development Assistance Committee
CME	Continuing Medical Education
EFMoH	Ethiopia Federal Ministry of Health
ENHQS	Ethiopian National Health Care Quality Strategy
FADE	Focus, Analyze, Develop, Execute
FMOH	Federal Ministry of Health
FP	Family Planning
GHS	Ghana Health Service
GMoH	Ghana Ministry of Health
GOE	Government of Ethiopia
GTP	Growth and Transformation Plan
HC	Health Center
had	Health Development Army
HEW	Health Extension Workers
HMIS	Health Management Information System
HP	Health Post
HSDP	Health Sector Development Plan
HSTP	Health Sector Transformation Plan
KPI	Key Performance Indicators
IOM	Institute of Medicine
IHI	Institute for Healthcare Improvement
LC	Learning Collaborative
LS	Learning Session

MFI	Model for Improvement
MM	Master Mentor
MNCH	Maternal Newborn and Child Health
NQS	National Quality Strategy
OECD	Organization for Economic Co-operation and Development
OPD	Out-Patient Department
PDSA	Plan-Do-Study-Act
PHCU	Primary Health Care Unit
PPC	Peer Practice Co-coordinator
QA	Quality Assurance
QI	Quality Improvement
QMT	Quality Management Team
QMU	Quality Management Unit
RDT	Rapid Diagnostic Test
RHB	Regional Health Bureau
RQMU	Regional Quality Management Unit
SBM-R	Standards-Based Management and Recognition
SMART	Specific, Measureable, Ambitious, Realistic, Time-Bound
SOP	Standard Operating Procedure
TB	Tuberculosis
TOT	Training of trainers
USAID	United States Agency for International Development
US	United States
VHF	Viral Hemorrhagic Fever
WHO	World Health Organization

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INTRODUCTION

Rationale: Over the past 20 years, the Federal Ministry of Health has been focusing on improving the quality of health care through designing and implementing different strategies and initiatives and it will remain a major area of focus in the years to come. The HSTP, one of the major health sector plan, has set out quality improvement and assurance as one of its pillars of excellence which are believed to help the sector to achieve its mission and vision. The Ministry has also developed a five-year National Health Care Quality strategy to aid the attainment of the HSTP goals. Therefore this Training manual is prepared in response to gaps (mainly standardization, design and delivery) of existing quality improvement training manual. Moreover, as a standardized training manual, it is also aimed to contribute to the accomplishment of the goals and strategies of quality improvement in the Health sector.

Purpose of Healthcare Quality Improvement Training: This health care quality improvement training is designed to strengthen the capacity of healthcare workers to contribute at all levels of health care quality improvement initiatives and/or activities. This training will equip health care workers with the required level of knowledge, attitude and skill to improve quality of health care services through effectively implementing quality improvement initiatives/projects, running learning networks, and providing mentorship and coaching.

Competencies: This training aims to equip participant with the following core competencies:

- Implement healthcare quality improvement initiatives/projects
- Run healthcare quality improvement learning networks
- Provide mentorship and coaching for healthcare quality improvement initiatives/projects

Target Participant for this training: This health care quality improvement training is prepared for health care workers in healthcare facilities and offices. Target participants/trainees of this training are health care providers, health care data and record personnel, health care facility leaders at different levels and health care quality experts working at the various levels of health system (Regional health bureaus, Zonal health offices and Woreda health offices) so that they

can effectively implement quality improvement initiatives/projects, run learning networks, and provide mentorship and coaching.

Organization of the Training Guide: This health care quality improvement training, Participants' manual, is developed in a user-friendly, flexible format using adult learning principles. Participatory approaches and techniques are used throughout the activities to help participants acquire the required knowledge, attitudes, and skills. The activities encourage the participants to see, analyze and share their practice and experiences on health care quality improvement.

This health care quality improvement training Participants' manual can be used in a variety of ways depending on the healthcare facility's needs assessment, participants' needs and background, program objectives and goals, time availability etc. for health care quality improvement personnel's working in healthcare system.

The training is prepared in a sequential order with a structured approach depending on the participant's needs. The methodology may also change depending on the number of participants attending the training, activity, time allocated and materials available. Regardless of the format used, however, it is important to maintain the basic principles of competency-based approach and strengthen knowledge and skills to enhance transfer of learning.

The 4-day training (basic QI course for implementers) covers all QI related activities. The following 9 modules are going to be covered during the 4-day training:

- **Module 1:** Introduction to Healthcare Quality
- **Module 2:** Quality Improvement Model
- **Module 3:** Learning Network
- **Module 4:** Science of Improvement
- **Module 5:** Problem Identification, Prioritization and Aim Statement
- **Module 6:** Generating Change Ideas
- **Module 7:** Measurement
- **Module 8:** Test Change
- **Module 9:** Plan for Quality Improvement in your Facility

Interactive power point presentations are used to guide the sessions. However, in situations where the use of power point presentation is not possible, flipcharts can be used as an alternative.

COURSE SYLLABUS FOR BASIC QI COURSE: A FOUR DAY TRAINING

Course Description: This 4-day training course is prepared for health care workers (clinical care providers, documentation and data personnel, and health care facility leaders at all level) to implement effective health care quality improvement practices at all levels in the health care system.

Course Goal: To provide the participant with the required level of knowledge, skills, and attitudes needed to improve quality of health care services.

Participant Learning Objectives: By the end of this training, the participant will be able to:

- Describe quality in the Ethiopian healthcare system
- Describe quality improvement models
- Facilitate quality improvement learning network
- Explain the science of improvement
- Use appropriate problem identification and prioritization tools for aim setting
- Generate change ideas for healthcare quality improvement
- Design measures for healthcare quality improvement
- Test changes occurred due to healthcare quality improvement interventions
- Plan quality improvement at your facility

Training/Learning Methods

- Illustrated lectures and group discussions
- Individual and group exercises
- Individual reading and reflection
- Projects
- Teach back sessions
- Role plays
- Games

- Case studies
- Guided practice activities

Training Materials/Aids

- Healthcare quality improvement training participant manual
- Healthcare quality improvement training facilitators guide
- Healthcare Quality Improvement Training PPT slides
- Ethiopia National Health Care Quality Strategy
- Ethiopian Health Sector Transformation Plan
- LCD projector, flip charts, markers, laptop computers
- Short video on: [1] CRC real case based short video [2] The Big bang theory TV series: Season 2, Episode 13 - The Friendship Algorithm.
- Quality improvement Project work book with sample project

Participant Selection Criteria: Participants for this course should be healthcare workers with:

- Relevant work experience in clinical care, and/or data monitoring and review
- A role in enabling or implementing quality improvement activities

Method of Course Evaluation

- **Participant**
 - Formative
 - Pre-test
 - Group exercises
 - Evaluation of participant developed activities and materials
 - Summative
 - Knowledge assessment (30 %): Post-course questionnaire
 - Project (50%): Health care Quality improvement project book
 - Participant’s contribution during group activity, attendance, interaction with other trainee and participation throughout the course: (20%)

- **Course**
 - During session participant reaction
 - Daily Evaluation
 - Daily trainers feedback meeting
 - End of Course Evaluation
- **Certification criteria**
 - Participants will be certified when they score more than 80% in the summative assessment

Trainers' selection criteria

- Having TOT certificate for this course, and involved in at least one health care quality improvement training as co-trainer, or
- Proficient health care quality improvement practitioner with minimum of 2 years' service and participated and significantly contributed in this training package development.

Course Venue

- Accredited in-service training centers venue having functional service for the course (internet, movable chairs, space for break out, toilet facility ...)

Course Duration

- 4 days

Course Composition

- 20 – 25 participants
- 3 – 4 trainers

COURSE SCHEDULE (4 Day)

QUALITY IMPROVEMENT TRAINING			
	AM (4 hours) 8:30 AM – 12:30 PM	PM (3 hours) 2:00 PM – 5:00 PM	Assignment
Day 1	<p>Introductory activity (1 hr. and 45 min.)</p> <ul style="list-style-type: none"> • Registration • Opening and welcome • Participant introduction • Expectations • Group norms • Course, Goal, objectives and schedule • Training logistics • Pre-course test <p style="text-align: center;">Tea break (15 min.)</p> <p>Module 1: Introduction to healthcare Quality (2 hr.)</p> <ul style="list-style-type: none"> • Interactive presentation: 1 hr. and 05 min • Small group/individual activity: 55 min. 	<p>Warm up (5 – 10 min.)</p> <p>Module 2: Quality improvement model (1 hr. and 30 min.)</p> <ul style="list-style-type: none"> • Interactive presentation: 60 min. • Small group/individual activity: 40 min. <p style="text-align: center;">Tea break (15 min.)</p> <p>Module 3: Learning networks (3 hr.)</p> <ul style="list-style-type: none"> • Interactive presentation: 1hr. • Small group/individual activity: 2 hr. <p>Daily participant evaluation feedback</p>	<p>Reading assignment</p> <ul style="list-style-type: none"> • Module 1 • Module 2 • Module 3 • Module 4 • Module 5 <p>Project activity</p>
Day 2	<p>Warm up (5 – 10 min.)</p> <p>Day 1 sessions Recap (5 – 10 min.)</p> <p>Module 3: Learning networks (3 hr.) ... Continued</p> <p style="text-align: center;">Tea break (15 min.)</p> <p>Module 4: Science of improvement (1 hr. and 45 min.)</p> <ul style="list-style-type: none"> • Interactive presentation: 1 hr. and 10 min. • Small group/individual activity: 1 hr. and 20 min. 	<p>Warm up (5 – 10 min.)</p> <p>Module 5: Problem identification, prioritization and aim setting (2 hr. and 40 min.)</p> <ul style="list-style-type: none"> • Interactive presentation: 1 hr. • Small group/individual activity: 1 hr. and 40 min <p style="text-align: center;">Tea break (15 min.)</p> <p>Module 5: Problem identification, prioritization and aim setting (2 hr. and 40 min.) ... Continued</p> <p>Daily participant evaluation feedback</p>	<p>Reading assignment</p> <ul style="list-style-type: none"> • Module 1 • Module 2 • Module 3 • Module 4 • Module 5 • Module 6 • Module 7 <p>Project activity</p>

<p>Day 3</p>	<p>Warm up (5 – 10 min.)</p> <p>Day 2 sessions Recap (5 – 10 min.)</p> <p>Module 6: Generating change (3 hr. and 25 min.)</p> <ul style="list-style-type: none"> • Interactive presentation: 1 hr. • Small group/individual activity: 2 hr. and 45 min. <p style="text-align: center;">Tea break (15 min.)</p> <p>Module 6: Generating change (3 hr. and 25 min.) ... continued</p>	<p>Warm up (5 – 10 min.)</p> <p>Module 7: Measurement (3 hr. and 10 min.)</p> <ul style="list-style-type: none"> • Interactive presentation: 1 hr. • Small group/individual activity: 2 hr. and 10 min. <p style="text-align: center;">Tea break (15 min.)</p> <p>Module 7: Measurement (3 hr. and 10 min.) ... continued</p> <p>Daily participant evaluation feedback</p>	<p>Reading assignment</p> <ul style="list-style-type: none"> • Module 1 • Module 2 • Module 3 • Module 4 • Module 5 • Module 6 • Module 7 • Module 8 • Module 9 <p>Project activity</p>
<p>Day 4</p>	<p>Warm up (5 – 10 min.)</p> <p>Day 3 sessions Recap (5 – 10 min.)</p> <p>Module 7: Measurement (3 hr. and 10 min.) ... continued</p> <p>Module 8: Testing change (2 hr.)</p> <ul style="list-style-type: none"> • Interactive presentation: 2 hr. and 05 min. • Small group/individual activity: 1 hr. and 30 min <p style="text-align: center;">Tea break (15 min.)</p> <p>Module 8: Testing change (2 hr.) ... Continued</p> <p>Module 9: Plan for healthcare quality improvement in your facility (2 hr.)</p> <ul style="list-style-type: none"> • Interactive presentation: 55 min. • Small group/individual activity: 2 hr. and 50 min. 	<p>Warm up (5 – 10 min.)</p> <p>Module 9: Plan for healthcare quality improvement in your facility (2 hr.) ... Continued</p> <p style="text-align: center;">Tea break (15 min.)</p> <p>Training Closeout activities (1 hr.)</p> <ul style="list-style-type: none"> • Post course test: 30 min. • Daily evaluation feedback and end of training evaluation feedback: 10 min. • Closeout remark and certification: 20 min 	

Note for Facilitator:

- This is a sample syllabus/agenda, based on the actual learning need of the participant you can tailor or modify the time, content and modality using this as a sample.
- Please give relevant examples and opportunities to practice QI project planning and implementation at different level.

MODULE 1: INTRODUCTION TO HEALTHCARE QUALITY

Module Description: This module will provide an overview of the healthcare quality and Ethiopian healthcare system. Mainly, the module presents quality in healthcare, the Institute of Medicine (IOM) dimensions/domains of quality in healthcare, the context of quality in healthcare in Ethiopia and key quality gaps in Ethiopia health system. Juran trilogy and the key drivers of improvement in healthcare are also discussed in this module.

Module Objective: By the end of this module the participants will be able to describe quality in the Ethiopian healthcare system.

Enabling Objectives -By the end of this module the participant will be able to:

- Discuss the context of health care in Ethiopia
- Identify key quality gaps in the Ethiopian health system
- Define quality in healthcare
- Identify the key drivers of improvement in healthcare

Module outline:

This module has the following sessions:

- Introduction
- Context of Healthcare and Quality in Ethiopia
- Quality in healthcare
- The drivers of improvement in healthcare
- Summary

1.1 INTRODUCTION

Reflection questions? (Time: 10 minutes)

- What is quality in healthcare?
- What are the causes of poor quality in healthcare in Ethiopia?
- What are the costs of poor quality in healthcare?
- What are the benefits of quality in healthcare?
- What are the six dimensions of Healthcare quality?

A health system is the organization of people, institutions and resources that deliver healthcare services to meet the health needs of target populations. The Ethiopian Health system is based on the core principles of the 1993 National Health Policy.

The Cambridge International Dictionary defines quality as “the standard of excellence of something, often a high standard”. We look at certain attributes to say a product or service is of a good quality or bad (poor) quality. The attributes that we look out to say a product or service is of high quality depends on our expectations or perceptions.

In healthcare, key stakeholders’ perspectives of quality are different. However, everyone unanimously agrees that the pursuit of quality is a fundamental requirement in the health sector.

1.2 AN OVERVIEW OF THE ETHIOPIAN HEALTHCARE SYSTEM

The Ethiopian Health system is based on the core principles of the 1993 National Health Policy, which includes the following: democratization and decentralization of the health system, prevention of disease and promotion health, ensuring accessibility of Healthcare to all population, promoting inter-sectoral collaboration and promoting and enhancing national self-reliance in health by mobilizing and efficiently utilizing internal and external resources. Ethiopia has achieved significant improvements in priority areas such as maternal and child health, malnutrition, communicable and chronic diseases, as well as in quality of emergency and surgical services.

1.2.1 THE ETHIOPIAN HEALTHCARE TIER SYSTEM

The Ethiopian health service is currently structured into a three-tier system; primary, secondary and tertiary level of care.

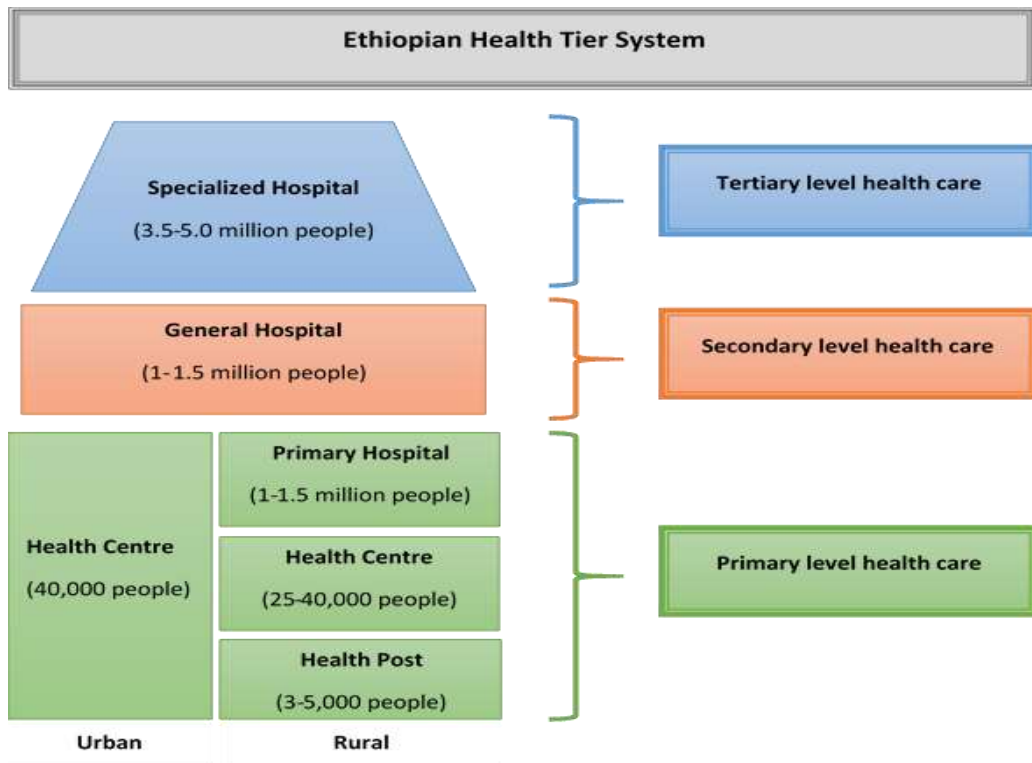


Figure 1: Ethiopian health tier system

The primary level of care includes primary hospital, health center (HC) and health post (HP). A health post serves as an extension of the health center and provides basic disease prevention and health promotion services as well as some essential curative service for an average of 5,000 people. There are around 16,660 HP's in Ethiopia. A HC provides both preventive and curative services. It serves as a referral center and practical training institution for health extension workers (HEWs). There are around 3,622 HC's in Ethiopia. A primary hospital provides inpatient and ambulatory services to an average population of 100,000. In addition to what a HC can provide, a primary hospital provides emergency surgical services that includes cesarean sections and gives access to blood transfusion service. It also serves as a referral center for HCs under its catchment areas, a practical training center for nurses and other paramedical health professionals.

A general hospital provides inpatient and ambulatory services to an average of 1,000,000 people. It serves as a referral center for primary hospitals. It serves as a training center for health officers, nurses and emergency surgeon's categories of health workers.

A specialized hospital serves an average of five million people. It serves as a referral for general hospitals. They basically serve as the last lines of defense for health conditions that require sophisticated care. Recent figures show a total of 266 functional and 96 under construction hospitals (all levels) in the nation and.

1.2.2 TRANSFORMING THE HEALTHCARE SYSTEM

In the last 20 years the massive investment on health infrastructure construction and health workforce development for expansion of primary and secondary Healthcare unit has been a huge success for Ethiopia. However, the wide disparity of equity and Quality of Healthcare delivery across the region and within the region in terms of quality and equity have been a worrisome for the ministry.

The Ministry of Health embarked on an envisioning exercise to develop its next 20-year plan after the Health Sector Development Plan (HSDP)-IV mid-term review. The objective of the long-term

envisioning exercise was to define a framework for subsequent strategic actions which will enable Ethiopia to achieve the best health outcomes that would be expected of a lower middle-income country by 2025 and to achieve at least median health outcomes of an upper middle-income country by 2035.

The Health Sector Transformation Plan (HSTP) 2015/16 - 2019/20 (2008 – 2012 EFY) is therefore the first phase of the ‘Envisioning Ethiopia’s Path towards Universal Health Coverage through Strengthening Primary Healthcare’, and part of the second Growth and Transformation Plan (GTP)-II of the country.

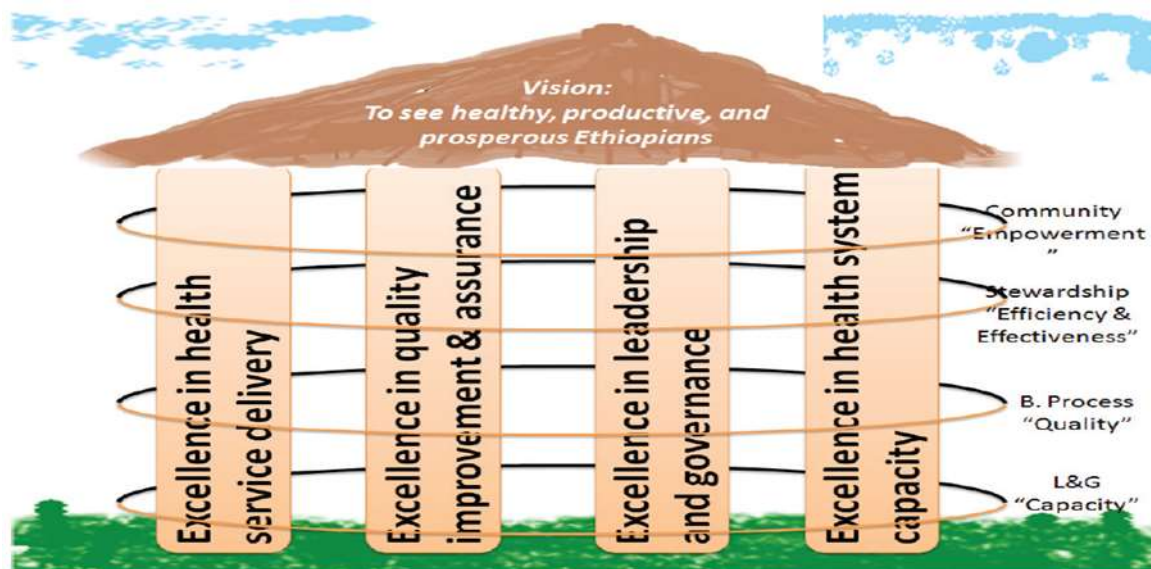


Figure 2: The HSTP pillars of excellence mainstreamed under a "power house"

The HSTP sets out four agendas which are believed to help transform the sector to achieve its mission and vision. These are:

1. Quality and Equity
2. Woreda Transformation
3. Information Revolution
4. Compassionate and Respectful Care

Transformation in quality and equity of Healthcare are central to the HSTP. Improving the quality of healthcare services into high quality person-centered health service provision is a timely

agenda and the only means required to deliver the promise of universal health coverage. In line with the HSTP, a detailed National Quality Strategy (NQS) was developed to actualize the health sector quality agenda.

The National Healthcare Quality Strategy was launched on March 2016 with the aim of providing person-centered, efficient, effective, equitable and high-quality Healthcare for Ethiopia, resulting in improved health outcomes for the country. Moreover, the strategy builds on the plan laid out in the HSTP to further align key stakeholders across prioritized interventions that will drive large-scale improvement in quality of healthcare delivery. Indeed, despite the tremendous achievements to date, the creation of the NQS also acknowledged that more work remains to be done and in a coordinated manner across partners.

The NQS identified five priority health areas where there is highest need and improvements in healthcare service quality have the potential to make a great impact on health outcomes. These are:

- 1. Maternal and Child Health:** Reduction of neonatal mortality through improving the prevention and management of top causes of mortality (e.g. asphyxia and neonatal sepsis), and the reduction of maternal mortality through improving the prevention and management of top causes of death (e.g. postpartum hemorrhage).
- 2. Nutrition:** Reduction of child mortality through the prevention and management of severe acute malnutrition.
- 3. Communicable Diseases:** The focus is to further reduce the incidence of the following diseases: HIV/AIDS, Malaria, and Tuberculosis (TB).
- 4. Chronic Diseases:** The focus is the treatment and prevention of acquiring the chronic diseases as well as prevention of associated morbidity through addressing risk factors such as physical inactivity, unhealthy diet, alcohol consumption and cigarette smoking. Specific target illnesses are diabetes, cancer, cardiovascular disease, mental health, and chronic respiratory disease.
- 5. Clinical and Surgical Services:** To improve in emergency services at the facilities to ensure that the population has confidence in its health system to provide high quality care.

1.3 QUALITY IN HEALTHCARE: DEFINITIONS AND PERSPECTIVES

Reflection question? (Time: 16 minutes)

- After watching the short video and reflect on the following questions:
 - How did this woman’s story make you feel?
 - What were the key learning points for you as a healthcare provider in the perspective of quality?
 - Which dimension of quality do you identify with from the women’s story?

Generally, there is no universal definition of quality. Most people refer to the definition of quality given by US Institute of Medicine (IOM) that states, “the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge.”

Dlugacz, Restifo, and Greenwood (2004) also defines quality as, “care that is measurably safe, of the highest standard, evidence-based, uniformly delivered, with the appropriate utilization of resources and services.”

In Ethiopia, as highlighted in the HSTP, quality and equity are defined together, believing that the two must go together. Based on this, quality in Ethiopia defined as, “Comprehensive care that is measurably safe, effective, patient-centered, and uniformly delivered in a timely way that is affordable to the Ethiopian population and appropriately utilizes resources and services efficiently.” (NQS 2016).

1.3.1 SIX DIMENSIONS/DOMAINS OF QUALITY IN HEALTHCARE

Generally, there are six accepted dimensions or domains or aims of quality by IOM. These are:

1. **Safe:** avoiding injuries to patients from the care that is intended to help them.
2. **Timely:** reducing waits and sometimes harmful delays for both those who receive and those who give care.

3. **Efficient:** avoiding waste, including waste of equipment, supplies, ideas, and energy.
4. **Effective:** providing services based on scientific knowledge to all who could benefit and refraining from providing services to those not likely to benefit.
5. **Equitable:** providing care that does not vary in quality because of personal characteristics such as gender, ethnicity, geographic location, and socioeconomic status.
6. **Patient-centered:** providing care that is respectful of and responsive to individual patient preferences, needs, and values and ensuring that patient values guide all clinical decisions.

Small group exercise

- Read the Case Scenario and identify how the IOM six dimensions/domains are reflected
- Each participant should reflect on the case scenario (contributing as a group)
- Prepare for report out during the plenary session
- Time: 20 minutes

Case Scenario

A woman presented at a hospital with acute watery diarrhea. She was admitted and then she was re-hydrated while other treatments were given as per the guideline. Her care team, to follow standard precautions, isolated the patient so that the disease was not transmitted to others, and ensured that everyone wore personal protective equipment (at all times when in contact with patient or environment). The patient was very modest and shy so the team ensured that she was cared for by a female nurse and that her body was not seen by men. The hospital had a process for cleaning and disinfecting her soiled clothing safely. The team provided information about the risk of transmission to all the healthcare workers and used the case to reinforce the use of isolation precautions when necessary with all healthcare workers. The team provided information to families and the community about prevention and care of patients.

1.3.2 THE DONABEDIAN FRAMEWORK

Quality is defined as, “the extent of resemblance between the purpose of healthcare and the truly granted care” (Avedis Donabedian 1986). The “Donabedian model” is a conceptual model that provides a framework for examining health services and evaluating quality of healthcare. According to the model, information about quality of care can be drawn from three categories: “structure,” “process,” and “outcomes”. Donabedian has noted that these are not attributes of quality but are approaches to the acquisition of information about the presence or absence of the attributes that constitute or define quality.

This framework provides a crucial insight into factors that contribute to poor quality as each of these components has several quantifiable elements that can be accurately defined and measured.

- 1. Structure:** Includes all the factors that affect the context in which care is delivered: physical facility, equipment, and human resources, as well as organizational characteristics such as staff training. These factors control how providers and patients in a healthcare system act and are measures of the average quality of care within a facility or system. Structure is often easy to observe and measure, and it may be the upstream cause of problems identified in process.
- 2. Process:** These commonly include diagnosis, treatment, preventive care, and patient education but may be expanded to include actions taken by the patients or their families. Processes can be further classified as technical processes, how care is delivered, or interpersonal processes, which all encompass the manner in which care is delivered.
- 3. Outcome:** Contains all the effect of healthcare on patients or populations, including changes to health status, behavior, or knowledge as well as patient satisfaction and health-related quality of life. Outcomes are sometimes seen as the most important indicators of quality because improving patient health status is the primary goal of healthcare.

1.3.3 QUALITY IN HEALTHCARE FROM PATIENTS/CLIENTS PERSPECTIVE

In healthcare, key stakeholders' perspectives of quality are different. For example:

- Health managers at different levels (Ministry, Regional, Zonal, Facility etc.) may focus on the image of the facility or the health system, human resources, efficient use of resources, performance in key health indicators, cost recovery etc.
- Healthcare provider's expectation may be availability inputs, an enabling environment, staff motivation, outcomes of morbidity and mortality etc.
- Client's expectation will be staff attentive listening, friendliness, privacy, confidentiality, waiting time, technical competence, clean environment, availability of drugs, good clinical outcomes, providing information and obtaining feedback etc.
- Community's expectations are access to care, affordability, societal norms etc.

Overall, the pursuit of quality is a fundamental requirement in the health sector.

Patients generally look at quality from three perspectives. They are,

1. Don't harm me
2. Heal me
3. Be nice to me

1.3.4 CORE COMPONENTS OF QUALITY MANAGEMENT IN HEALTHCARE

There are three core components of quality management in Healthcare, quality planning, quality improvement, and quality control. They all go hand in hand. It just like a three-leg stool. If one of the legs is not there you cannot sit on it. Leveraging all three pillars (namely quality planning, quality control and quality improvement) in a holistic way is one of the key foundations of the Ethiopia National Healthcare Quality Strategy.

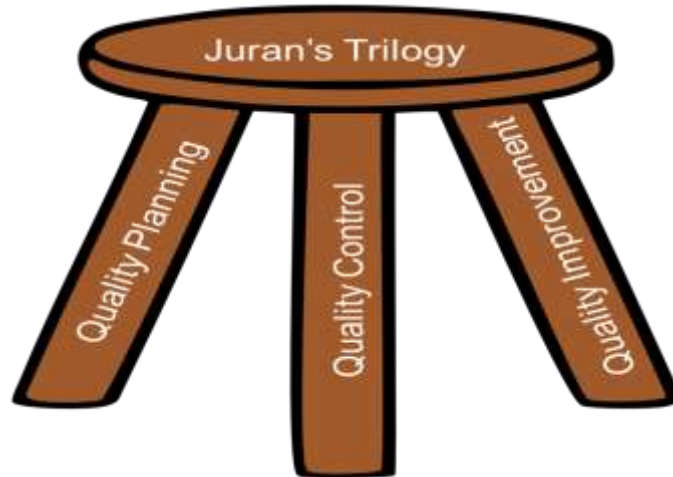


Figure 3: Juran Trilogy (quality planning, quality control quality improvement)

Quality Planning: as outlined in the HSTQ, it is a systematic process that;

- Brings systems thinking to the highest levels of leadership and governance.
 - Priorities
 - Structures (e.g.: quality directorate)
 - Data systems
 - Building capability
- Responds to the measured gap between what the population needs and what is currently being delivered in the health system.
- It then establishes the goals, policies and strategies to close this gap and ensures that the resources are allocated to do this effectively.
- Involves designing a structure that delivers the right care to patients at the right time, every time.

In the facility level quality planning can include the following but not limited to:

- Establishing and strengthening quality structure.
- Adopt/adapt/develop service standards.
- Regular performance monitoring activities.
- Institutionalize the principles and practice of QI.
- Undertake regular capacity development programmes.

Quality Control: *“the regulatory process through which we measure actual quality performance, compare it with quality goals, and act on the difference”* (Juran, 1988). Quality assurance (QA) measures compliance against certain necessary standards.

- Seeks to ensure that quality is maintained or improved, and errors are reduced or eliminated.
- Programs evaluate current Healthcare quality, identify problem areas, create a method to overcome issues, and monitor the method taken to improve quality.
- Processes consist of both internal quality assurance and external quality assurance (for instance, these monitoring and improvement activities may be internally motivated (problems are identified and addressed from within a Healthcare facility by a facility based QI team) or externally required (standards are set, and problems are identified through inspection by government agencies (woreda, zone, region, federal))).
- Internal monitoring – continuous measurement.
- External inspection – intermittent inspection.
- Internal and external regulations – professional oversight, accreditation.

Quality Improvement (QI): *“the organized creation of beneficial change; the attainment of unprecedented levels of performance”* (Gibbons, 1994).

- Set ambitious aims.
- Iteratively test.
- Measure changes in work routines.
- Spread best practices for rapid uptake at a larger scale to address a specific issue or suite of issues they have determined to improve.
- Observation, testing and feedback.

The figure below further elaborates the interplay of quality planning, quality control and continuous quality improvement in attaining a goal over a time period. The vertical axis is operations or the variable that we are trying to manage; while, the horizontal axis is time since change has to be followed over time.

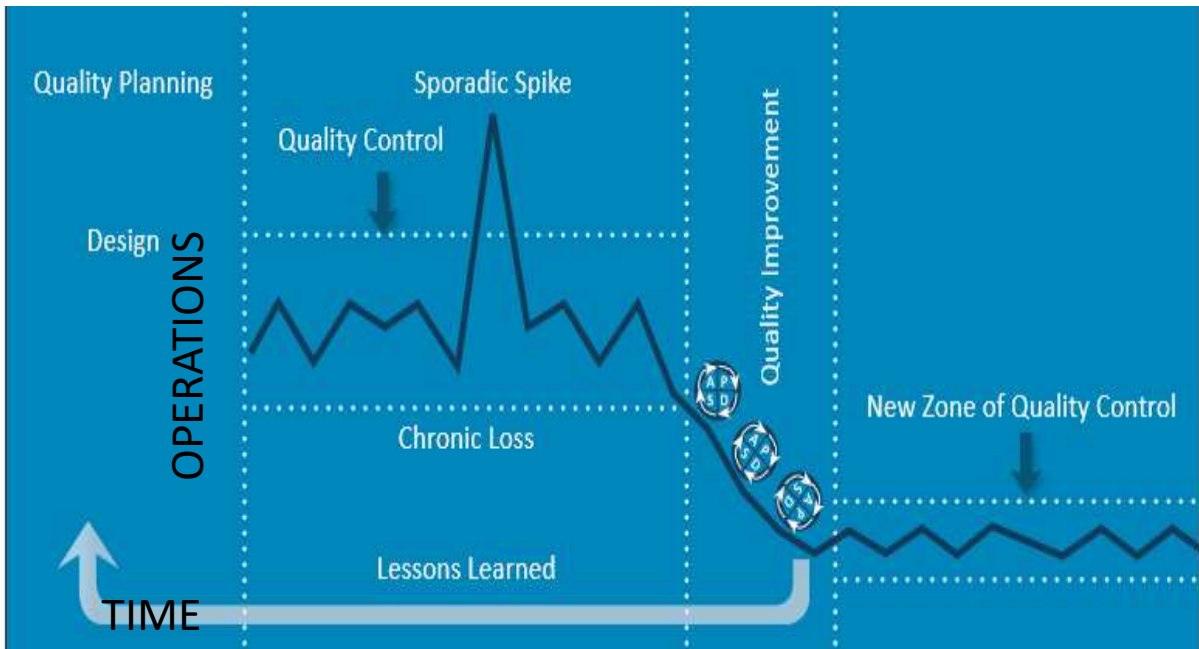


Figure 4: Juran Trilogy: The Interrelation of the Three Core Components of Quality: Quality Planning, Quality Control and Quality Improvement

1.4 DRIVERS OF IMPROVEMENT IN HEALTHCARE

The drivers of Improvement are:

1. Will: Having the **Will**(desire) to change the current state to one that is better.
2. Ideas: Developing **Ideas** that will contribute to making processes and outcomes better.
3. Execution: Having the capacity to apply QI theories, tools and techniques that enable the **Execution** of the ideas.

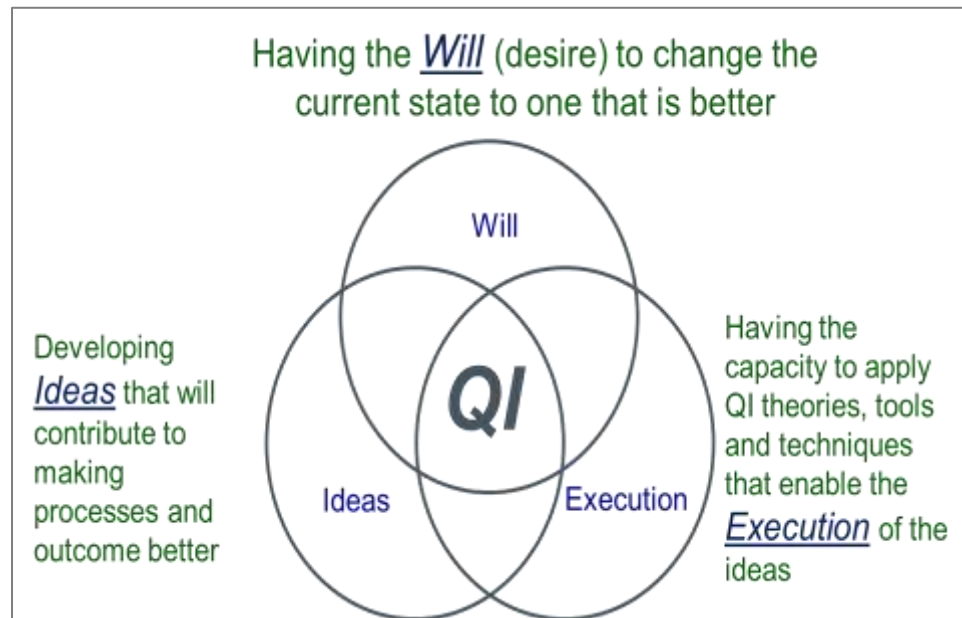


Figure 5: The Drivers of Improvement

1.5 MODULE SUMMARY

Quality is defined by the US Institute of Medicine (IOM) as, “the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge” The dimensions of quality are safety, timely, effective, efficient, equity and patient centered. There is a gap between what we can do and what we actually do. Quality management consists of quality planning, quality control/assurance and quality improvement. The drivers of quality are the will, ideas, execution.

MODULE 2: QUALITY IMPROVEMENT MODELS

Module Description: This module provides a brief introduction to specific QI models that many Health care organizations and countries use to successfully shape their quality program infrastructures and guide their QI activities to improve care for their patients.

Module Objective: By the end of this module, the participants will be able to describe quality improvement (QI) models.

Enabling Objectives:

- Discuss the rationale for quality improvement models.
- Identify some commonly used quality improvement models in health care settings.
- Describe quality improvement models in Ethiopia.

Module outline:

This module has the following sessions:

- Introduction
- Why QI models
- Commonly used QI models in health care settings
- Quality improvement models in Ethiopia
- Summary

2.1 INTRODUCTION

Reflection questions? (Time: 10 minutes)

- Why quality improvement (QI) models?
- What are some commonly used QI models in Health care?
- List the QI models in Ethiopia?

QI models offer a systematic approach for assessing and improving care services. QI models are framework or roadmap that is used to organize the work of an improvement initiatives. Using QI models help an improvement team to focus on changes that have already proven to be effective. They also provide guidance on different ways to approach change. Some of the QI Models are: Six sigma, Lean, Lean six sigma, Challenge, Standards Based Management and Recognition (SBM-R), Care, FADE, Kaizen, Model for Improvement, etc. To improve learning and avoid confusion with different QI methodologies, the Kaizen and the Model for Improvement (MFI) are the QI models highly recommended to be used in Ethiopia by the Federal Ministry of Health by all stakeholders including development partners working in the Ethiopian health sector.

2.2 WHY QUALITY IMPROVEMENT MODELS

Quality Improvement (QI) Models are frameworks or roadmaps that are used to organize the work of improvement initiatives or activities. It encourages planning based on theory, empowers people in the organization/facility to take action, facilitates use of team work and emphasizes and encourages iterative learning.

All QI models have the following characteristics:

- A. Set an aim
- B. Collect data
- C. Analyze data
- D. Test change: Focus on changes that have already proven to be effective and provide guidance on different ways to approach change, implement or sustain change.

2.3 COMMONLY USED QUALITY IMPROVEMENT MODELS IN HEALTH CARE

There are several overlapping and complementary QI models currently being used in health care by different organizations and countries. They all stem from the Science of Improvement (starts with an aim, develops tests toward improvement etc.). Some QI models provide framework to improve patient care (Care Model, Lean Model etc.) and some focus on processes that monitor the results of measures (Six Sigma Model, FADE, MFI, and etc.).

Some Common QI Models:

1. Lean
2. Six Sigma
3. Lean Six Sigma
4. Challenge
5. Standards-Based Management and Recognition (SBM-R)
6. Care Model
7. Kaizen
8. Model for Improvement
9. Etc.

2.4 QUALITY IMPROVEMENT MODELS IN ETHIOPIA

None of the QI Models is superior over the other. They all have repeated presentation of an essentially similar set of QI ideas and methods under different names and terminology known as *pseudo innovations*. A common approach promotes increased effectiveness and efficiency in both the impact of the changes and the learning (for the individuals and the organization). To improve the learning and avoid confusion with use of different QI methodologies, Federal Ministry of Health of Ethiopia highly recommends using the selected QI models by all stakeholders including development partners working in the Ethiopian health sector. The two selected QI Models used in Ethiopian Health care are Kaizen and Model for Improvement.

2.4.1 KAIZEN

KAIZEN: Kaizen is a Japanese word for “Change for the better” or “Continuous Improvement”. Kaizen uses personal creativity and ingenuity to identify problems and then develop and implement ideas to solve those problems. Kaizen philosophy says that everything can be improved and everything can perform better or more efficiently.

It helps to identify 3 MU’s:

- Muda (wastes),
- Mura (variation/inconsistency) and
- Muri (strain/burden on people and machines).

Its guiding principles are:

- Good processes bring good results.
- Go see for yourself to grasp the current situation.
- Speak with data, manage by facts.
- Take action to contain and correct root causes of problems.
- Work as a team.
- It is everybody’s business.

The **key feature** of the Kaizen Model is big results come from many small changes accumulated over time.

While Kaizen is a system of continuous improvement where effective process and flow are part of the system, **5S** is the part of the Kaizen system that establishes a workplace that can be ideal for continuous improvement.

5S is a philosophy and a way of organizing and managing the work space and work flow with the intent to improve efficiency of work. **5S** is conducted systematically with full participation of all staff serving the institution.

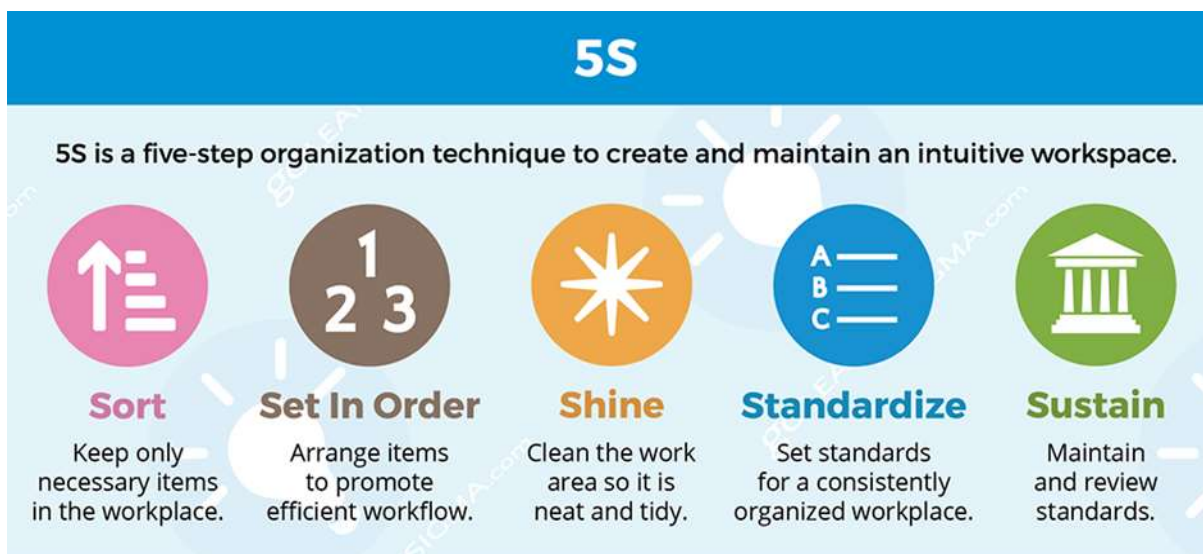


Figure 6: The 5S (5 steps) in implementation of KAIZEN

1. Sort (seri): remove unused stuff from working place by:

- Categorizing and color code the items.
- Developing inventory list for all categorized items.
- Storing (keep) “may be needed” items.
- Regularly sorting of unused items.
- Developing culture of returning items to where they belong.

2. Set (seiton): organize all necessary items in proper order for easy services provision (proper orderliness) by:

- Organizing cabinets with labeling/numbering.
- Keeping items at their respective areas and label them accordingly.
- Directional arrows leading to services areas.
- Labeling of service rooms.
- Updating stock/equipment inventories.

Note: the rules and regulation must be written and well known to all Staff.

3. Shine (seiso): maintain high standards of cleanliness.

- Routine cleaning and mass cleaning campaign.
- Clean not only the place that comes into your view but also behind and under furniture or equipment.
- Clean and attractive environment will be appreciated by internal and external clients.

4. Standardize (seiketsu): the first three components set the stage for the facility to develop and implement standard operating procedure to maintain good working environment.

- Set up the sort, set and shine as a norm in every section of the health facility.
- Work instruction.
- Standard operating procedures (SOPs).
- Standards and regulations for both administrative and technical staff.

5. Sustain (shitsuke): train and maintain discipline of the health care workers engaged (consistent practice of 5S).

- To train and maintain discipline of the health workers engaged.
- Apply regular self-assessment.

An example of 5S activities in Medical Records Room:



Figure 7: An example of before and after 5S activities in Health Facility Medical Records Room

Importance of 5S

- The workplace gets cleaned and better organized.
- Hospital and office operation become easier and safer.
- Results are visible to everyone inside and outside.
- Visible results enhance the generation of more and new ideas.
- People will be proud about their clean and organized workplace.
- As a result, the health facility's good image generates more business.

In summary, Kaizen is the engine driving improvement or the entry point of all QI activities in Ethiopia. It focuses on improving efficiency and lowering cost, through a methodology that can be integrated with other complementary quality improvement tools and approaches, such as the Model for Improvement.

2.4.2 MODEL FOR IMPROVEMENT

Model for Improvement: This model focuses on three questions: (1) to set the aim or organizational goal, (2) to establish measures or define measurements and (3) select changes or find promising ideas for change). It incorporates Plan-Do-Study-Act (PDSA) cycles to test changes on a small scale (figure 12).



Associates in Process Improvement

Figure 8: Model for Improvement

In summary, Model for Improvement as one of the adopted QI Models by Ethiopian FMOH is a vehicle that provides structure for improvement. Please refer to modules 5, 6 and 7 for more details and the application of Model for Improvement.

2.5 MODULE SUMMARY

It is widely recognized that organizations and countries benefit by having a consistent framework or roadmap or QI model for conducting their improvement work. Different QI models are being used by different organizations and countries but all with the same concepts. Organizations and countries need a “constancy of purpose” - alternating between different QI methods has not lead to sustained improvement.”

Ethiopian health care has adopted two of the QI models:

- Kaizen: an entry point for all QI or the engine driving improvement
- Model for Improvement: driving all QI initiatives or the vehicle that provide structure for improvements.

At the heart of both Kaizen and Model for Improvement are small rapid tests of change that lead to sustained improvement.

MODULE 3: LEARNING NETWORKS

Module Description: In this module we will discuss an overview of learning networks and structures of learning networks across health facilities, which aims to improve quality of care across the system and reduce variations across health facilities in the Ethiopian health care system. We will also discuss recommended approaches to make existing learning structures more organized and targeted towards a common purpose.

Module Objective: By the end of this module the participants will be able to facilitate quality improvement learning networks.

Enabling Objectives:

- Define learning network
- Discuss goals of a learning network
- Discuss structure of a learning network
- Discuss phases of a learning process among the members of a learning network
- Describe the key elements of a learning network

Module outline:

This module has the following sessions:

- Introduction
- Goals of a learning network
- Learning network in Ethiopian context
- Structure of a learning network
- Key elements of a learning network
- Summary

3.1 INTRODUCTION

Reflection question? (Time: 3 minutes)

- What is a learning network within the health care system?
- What learning network structures exist in Ethiopia?

Learning networks in health care enables health facilities and health care providers to improve and maintain the quality of care they provide to the population. Learnings are essential both at an individual facility level and at a larger system level to close the gap between usual practice and the best care for a specific topic. In a facility, learnings could happen among professional and facilities design systems of routine learning networks to reduce variation of care provided to patients by the health care providers within the facility. These networks include a mechanism of sharing information and updating on current professional knowledge through morning sessions and team discussions. Learnings also happen between health facilities through different arrangements like meetings and support mechanisms within the system.

3.2 GOALS OF A LEARNING NETWORK

The overall goal of a Learning Network is to get results and close the gap between usual practice and the best care for a specific topic. It also fosters peer learning, bringing together the 'right' people (i.e. leadership with all levels of health system serving a given population) to solve a problem and address complex issues like continuum of care and referral collectively.

To achieve these goals a learning network is designed to be:

- Multi-disciplinary teams working on common topic and common aim.
- Learning sessions or meetings to energise, focus effort and learn from previous action periods and make the case for new topics. It also enables participants to share and learn from their collective experiences and challenges.
- Action periods where change ideas are tested, and data is analysed to establish whether changes are leading to an improvement.
- Real-time data, plotting key outcome and process measures.
- Coaches assigned to support on subject matter and profound knowledge.

However, a learning network is not a single or one-time training event or a research model to develop new clinical knowledge.

3.3 LEARNING NETWORKS IN ETHIOPIAN CONTEXT

In the past few years different learning networks are being implemented in the country including the establishment of Ethiopian Hospital Alliance for Quality (EHAQ) network in 2012 and Ethiopian Primary Care Alliance for Quality (EPAQ) network in 2017. These (EHAQ and EPAQ) are platforms whereby facilities are organized into clusters, constituting of a LEAD facility and 3 -6-member facilities. The facilities in a cluster collaborate, learn and support each other through different intervention mechanisms. With the leadership of the Federal Ministry of Health and Regional Health Bureaus, the alliances have been used to introduce and scale up different initiatives and change packages, thus making them a good exemplification of Learning Networks.

In addition, review meetings were being executed for long periods at different levels including Woreda level review meetings which bring health centers, health posts and the Woreda Health Office every quarter. Zonal health departments and regional health bureaus also conduct such review meetings by including the health structures under them. Similarly, there are different review meetings focused on specific programs, for example: MNCH review meeting, HIV review meeting and immunization review meeting etc. at different levels with different level of implementation status.

Small group exercise

- Read the below question carefully and respond accordingly
- Share your response to the group you are assigned with or to the plenary
- Time: 15 minutes

Question: In your woreda or zone or region, list down current existing learning networks within the health care system and identify their associated aims, participants and facilitators. Also, identify strengths, weaknesses and challenges for each of the learning network you listed and any recommendation to make them more effective.

The following are characteristics of an effective learning network:

- Clear common aim towards which the participants of the learning network are focusing.
- Defined for a definite time on a specific priority topic.
- Structured approach for improvement – example the use of Model for Improvement as a learning and improvement framework.

In the below sections we will learn about a learning network between health facilities and administrative structures in a format that will make them effective in achieving a defined objective within a timeframe based on the EHAQ/EPAQ, other review meetings and learning collaborative frameworks.

3.4 STRUCTURE OF A LEARNING NETWORK

The structure of learning networks could be using a permanent administrative structure, or a temporary structure established for a defined period to achieve a short-term goal. At Woreda level, health facilities are administered and supported by Woreda Health Office where it organizes support systems in a form of supportive supervision and learning session in a form of review meeting. These arrangements for a Woreda could be more organized with the fellow learning network arrangement for sustainable continuous improvement. It will involve preparatory activities, regular quarterly review meetings and coaching visits in between review meetings. At the end, the network will develop change packages for sustaining the improvement and spread and will celebrate their successes.

- Preparatory Phase:
 - Focus area selection for improvement.
 - Core indicator selection.
 - Baseline assessment.
 - Set high level aim for the learning network.
- First Quarter Review Meeting:
 - Learn key components of a quality improvement process.
 - Design improvement projects to be tested over 3 months.
 - Plan for testing new change ideas.
 - Plan for documenting process data and tracking results.
- Second Quarter Review Meeting:
 - Share and learn with peers about changes being tested and results achieved.
 - Refine existing projects and add more improvement projects.
- Third Quarter Review Meeting:
 - Share and learn with peers about changes being tested and results achieved.
 - Refine existing projects and add more improvement projects.

- Fourth Quarter Review Meeting:
 - Compile change packages proven to be effective for sustaining the improvements gained and for further scale up into other networks.
 - Share and learn with peers about changes being tested and results achieved.
 - Plan for next year’s improvement focus area.

In between the review meetings, health facilities will receive supports from improvement coaches that are assigned for the learning network. Improvement coaches are assigned by Woreda Health Offices and hospitals that are linked with the members of the learning network. Coaches could be pulled from different hierarchies of the facilities. In the learning process, facilities should receive at least one QI focused support visit regularly to ensure that the QI techniques are used appropriately in solving the problems being identified.

The members of a network could vary depending on the aim. The following examples (table 1) below elaborate how different bodies could come together to improve a common topic in the form of a learning network. The members of the network could either get together voluntarily because they are interested to solve a common problem and achieve their common goal or they could come together because of an already existing platform for learning as in EHAQ, EPAQ, Woreda review meetings and catchment area meetings.

Table 1: Example of learning network members and purpose

Purpose	Network Members
Improve care provided to a population living in a Woreda	Primary hospital, all health centers in the Woreda with their health Posts, community representatives, Woreda Health Office and the referral hospital for the Woreda
Implementing defined set of standards like as in HSTQ standards	Facilities required to implement the standards as in EHAQ and EPAQ cluster
Improving survival of NICU admitted newborns	Facilities with NICU services and committed to reduce mortality

3.5 KEY ELEMENTS OF A LEARNING NETWORK

The key elements of a learning collaborative are:

1. Defining the members of the learning network and participant selection

The members of the learning network should be defined based on the purpose of the network and by considering the natural relationship and mandates of the members. This will help to mainstream the activities of the network into a naturally happening arrangement. Once the participants are selected, the coordinating body of the network should communicate with all stakeholders within the health system and reach an agreement about the roles and commitments required for the program to be successful.

Multidisciplinary teams relevant for the topic should be formed in the member facilities who will be participating in the network day to day activities. The leadership of facilities are expected to guide, support, create the meeting times for the QI times, encourage the QI teams and to bear the responsibility for the sustainability of teams' effective changes.

2. Topic selection

A topic is selected that represents an area where there is a gap between knowledge and practice. It is often prescribed. Topics should reflect the priorities of leaders and its relevance for the topic to both the patients and the providers. e.g.: nutrition, maternal and child health, chronic disease etc.

3. Change package preparation

It **documents what** interventions need to be performed reliably, (mostly the change specified are change concept) **but not how** this is possible within a given context (not the details of how). A comprehensive change package includes tested change ideas that have been proven to enable the change topics to be performed reliably. Usually the comprehensive change

package is obtained during the end of the collaborative and that is used during the scale-up phase of the network.

4. Baseline assessment

Baseline assessment helps the QI team to see where the gaps are within the system (at the facility level and at the collaborative overall i.e. the aggregate of individual facilities' performance). The baseline data must be for all relevant input, process and outcome data relevant for the topic of the learning network. This helps the QI teams plan during the first meeting of the learning network. Gap filling of essential supplies and skills should happen at the beginning to facilitate the execution of QI processes towards achieving the aim of the network.

5. Review Meetings

Review meetings designed as part of a learning network are aimed at facilitating learnings between multidisciplinary teams. They focus on reporting and helping each other improve quality and performance through exchange of lessons learned towards solving a problem. The meeting agenda is designed in such a way that it uses quality improvement principles and tools for rapid learning and improvement to happen across all members of the network.

Traditional review meeting, cluster meetings of EHAQ and EPAQ, could be designed to be a review meeting for learning and improvement by making them platforms to exchange ideas that are planned to be tested or already tested and lead to improvement. Members also share the successes, barriers and lessons learned.

6. Action period

This is the activities that happen between one review meeting and another. It is during this period that the team received both clinical and QI coaching from the faculty. Action period is also the period where the team that participated in the learning review meeting share information with other QI teams and other staff, who are related to the changes that they will be testing. During action periods facility QI teams will get support from improvement

coaches and their supervisors. Such supports involve facility visits by coaches, mentors and supervisors. It could also be supplemented by phone calls and other electronic communication channels with a focus on data sharing, generating change ideas and monitoring progress of QI projects.

7. Documentation, monitoring and evaluation

Key components of the learning network involve documentation of each step of the improvement process including QI team meeting notes (minutes), documentation of cause analysis, steps followed by the teams to solve problems and tracking of process and outcome data using annotated run charts. These documentations will help the team to finalize change packages and share results to broader audience for scale-up.

Small group exercise

- Read the case scenario carefully
- Design review meeting agenda for the learning network
- Time: 120 minutes

Scenario on Malnutrition

Based on the ENHQS, your team identified that Ethiopia has the highest rate of malnutrition in Sub-Saharan Africa, affecting 40% of the country's children. Your aim is to reduce child mortality through the prevention and management of severe acute malnutrition from 50% to 20% in 10 facilities within the next 15 months. Your team had some funding from donor partners to support your learning collaborative in 10 facilities in two Woredas.

Instructions:

- Create groups of four to six participants
 - Task: Develop an agenda

- A. Develop an action plan to run a learning network in a Woreda: explore the different opportunities within the Woreda that could be adjusted into a learning network format.
- B. Develop an agenda for a 2-day review meeting based on the scenario for the first and second review meetings: Based on the scenario below:
 - The LS agenda should also include the following:
 - I. *Describing in detail the QI tools and when the team will be applying or using them.*
 - II. *A clear PLAN for at least 2 PDSAs by the end of a 2-day LS that the QI team will test or work on during the Action Period.*

3.6 MODULE SUMMARY

A Learning Network is a short-term (12 - to 18-months) arrangement that brings together a large number of teams from health facilities and health administrations to seek improvement in a focused topic area. The Learning Network was adapted by taking the experiences from EHAQ/EPAQ, routine Woreda review meetings and learning networks that were aimed at improving quality. The goal of a Learning network is to get results and to close the gap between usual practice and the best care for a specific topic.

MODULE 4: THE SCIENCE OF IMPROVEMENT

Module Description: This module will provide a high-level overview of the Science of Improvement, introducing Dr. Deming’s “System of Profound Knowledge”. It will help a leader of improvement to understand the elements of science of improvement and their interactions, as well as combine this with subject matter knowledge to develop effective change.

Module Objective: By the end of this module the participants will be able to explain the Science of Improvement.

Enabling Objectives:

- Describe the two types of knowledge to develop effective change.
- Explain the four components of Deming’s “System of Profound Knowledge.”
- Explain the interplay between the four components of profound knowledge.
- Apply the central principles of improvement in Healthcare.

Module outline:

This module has the following sessions:

- Introduction
- Central principles of improvement in healthcare
- Deming’s “System of Profound Knowledge”
- Four components of profound knowledge
- Interaction of the four components
- Summary

4.1 INTRODUCTION

Reflection Question? (Time: 3 minutes)

- What is your understanding of the term “Science of Improvement?”

“Science (from the Latin word *Scientia*, meaning knowledge), is defined in *Webster’s New Collegiate Dictionary* as “knowledge attained through study or practice”. Science refers to a system of acquiring knowledge of the physical world. This system must be based on observable phenomena and capable of being tested through the scientific method for its validity. Acquiring knowledge is essential for improvement activities. Improvement is defined in *Webster’s New Collegiate Dictionary* as an “increase in value or in excellence of quality or condition”.

To be able to increase the value of the quality of care (improve quality of care) that we provide to our patients we need to apply scientific methods; this includes setting of objectives, generating hypothesis, experiments, analysis, evaluation, documentation and publication.

When improving the quality of healthcare we should keep the quote of Dr. Avedis Donabedian in mind: *“Health care is a sacred mission, a moral enterprise and a scientific enterprise, but not fundamentally a commercial one. We are not selling a product. We don’t have a consumer who understands everything and makes rational choices — and I include myself here. Doctors and nurses are stewards of something precious. Ultimately the secret of quality is love. You have to love your patient, you have to love your profession, you have to love your God. If you have love, you can then work backward to monitor and improve the system”*.

What this means is that as much as we are trying to improve the quality of care we provide, when passionate and committed, when actually caring about our patients as we care about our family, we can easily find gaps in the quality of care we provide and find ways to address those gaps. Application of the Science of Improvement and the Central Principles of Improvement will help to reduce the difference between what we know we should do and what we actually do (know-do gap).

4.2 CENTRAL PRINCIPLES OF IMPROVEMENT IN HEALTH CARE

Most people at one time or another have the desire to improve something for the better; as a health worker, you probably have been in such a situation before. You wished you could improve the health care that is provided to your patients.

Fundamental to the success of any improvement effort is the understanding that every improvement requires change. Unfortunately, not all change result in improvement. Since the two concepts cannot go without each other, we often refer to it as “*fundamental changes that result in improvement*”.

Five (5) fundamental principles for successful improvement:

- 1. *Know why you need to improve:*** this is referred to as the aim or purpose of the improvement effort. You need to identify the gap between the current performance and the desired/targeted performance, and acknowledge the gap between the two as a problem that needs to be addressed.
- 2. *Have a way to get feedback to let you know if improvement is happening:*** improvement can be identified through observation based on given criteria, or through documented data on indicators that can be analyzed. If there is no feedback system in place that can observe any changes in performance continuously, we will not be able to determine whether improvement is happening (data over time).
- 3. *Develop a change that you think will result in improvement:*** For this, we need ideas and a hypothesis or prediction. We expect that when this idea or change is introduced it will improve the care we provide to our patients. Having the idea in mind is of course not enough, we need to make the change and learn from its impact through the feedback system that has been put in place, without causing unexpected harm to the system.
- 4.** The fourth principle is ***test a change before any attempt to implement.*** Testing a change comes in four steps: **Plan the test**, including the who, what, where, when and how of the test and include the collection of information during the test to let you know what happened (feedback system).

- **Run the test.** Put the plan in action. Successfully running the test, means to be ready to learn from both expected and unexpected results.
 - **Summarize what was learned.** Review all the collected information to inform the actions that need to follow the test.
 - **What action is warranted?** On the basis of the learnings from the test, do we need to refine/adapt the change and test again or maybe we have to consider a different change and abandon the current one? If all worked out fine, we might be ready to adopt/implement the change and make it permanent.
5. The fifth principle is to **implement a change**, which is different from testing. Questions are no longer about the goodness or effectiveness of the change, but rather about how to make the change permanent and introduce it in a way that it is well accepted by everybody.

4.3 DEMING'S SYSTEM OF PROFOUND KNOWLEDGE

All the things we do in our daily life are based on the knowledge we have, we call this *subject matter knowledge*. This knowledge can be acquired either through formal or informal learning. For instance, the knowledge you use in your professional life as a doctor, nurse or midwife is acquired through your education, on-the-job training (formal learning) as well as through self-learning and experience (informal learning). Subject matter knowledge is vital for developing changes that result in improvement, however there is another kind of knowledge useful for developing effective change.

Dr. W. Edwards Deming called this other type of knowledge a “Profound Knowledge”. It makes you view your facility from a different perspective, like looking through a lens. A lens allows you to look at something from outside with a certain view. If you look through a red lens, you will see everything red; if you look through a lens with zoom, you will see everything enlarged. Looking with the lens of profound knowledge allows a person to see the interplay between four components: system, variation, knowledge and psychology. To make change that will result in improvement, you need to consider the impact the change will have on these four components.

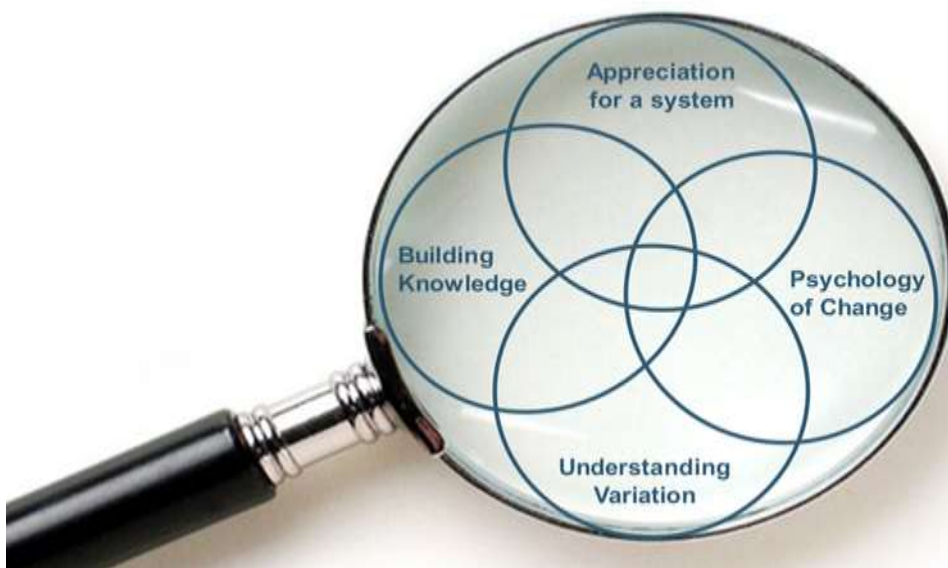


Figure 9: The lens of profound knowledge (appreciation for a system, psychology of change, understanding variation, building knowledge)

4.4 FOUR COMPONENTS OF PROFOUND KNOWLEDGE

The profound knowledge has four major components: [1] appreciation for the system, [2] understanding variation, [3] building knowledge, and [4] psychology – human side of change. Below each component will be discussed in more detail. Note: subsequent modules will build further on the four components of profound knowledge.

4.4.1 APPRECIATION FOR THE SYSTEM

Because most products and services, including health care, result from a complex system of interactions among interdependent groups of people, procedures and items/equipment working together toward achieving a common goal, it is vital to understand the components/parts of the system. Parts of the system can be optimal; however, this does not mean that the system as a whole is optimal. It is the interaction of the various parts that makes a system to perform at a certain level.

“Every system is perfectly designed to get the results it gets” – Attributed to Dr. Paul Batalden.

The health care system works the same, it is **not** the health workers (doctors, nurses, midwives etc.) who are not working hard enough or who do not have all the knowledge; it is **not** the lack of resources such as medication, health workers, equipment etc.; it is **not** poor leadership; it is **not** incorrect data or poor documentation; it is **not** our clients and their behavior and attitude. It is how the system is designed that produces the outcomes we are getting. If we want to get different results, we need to redesign the system.

4.4.2 UNDERSTANDING VARIATION

To understand how the system is performing, we need to have some documentation in place. That is why reliable documentation in patient charts, registers and the HMIS is very important. Without this information, leaders cannot make informed decisions – what are the performance gaps or gaps in resources that need attention?

Every system or process has variation embedded in it, this is what we call **common cause variation**. If the common cause variation is within relatively small limits we talk about a predictable process/system, we can predict what the next outcome will be. The other type of variation is **special cause variation**. As the word already indicates, this variation is due to a special cause or event. Therefore, this variation is not part of the process or system and does not affect the process or system all the time, as much as it does not affect everyone in that process or system.

Example: Body temperature

If you check your body temperature every morning at 6 AM you likely observe that it ranges between 36.1 and 37.2 Degrees Celsius. The little variation you see between the days checked is common cause variations. It is part of how your body functions. However, one morning you wake up with a temperature of 39.3 Degrees Celsius, you feel sick and have body pains. This is what we call special cause variation. It is due to the illness that your body temperature has increased beyond the normal range.

4.4.3 BUILDING KNOWLEDGE

The theory of building knowledge talks about the need to learn from the hypothesis or prediction we have about something and to test whether this prediction is right. Every change that you introduce is predicted to lead to improvement. Your *subject matter knowledge* tells you that this should work - maybe that is how you were taught in your professional training; how it is described in the policy; or how it worked for others. The better you understand the system you are trying to change, the better the prediction and the greater the likelihood that the change will result in improvement.

However, this prediction needs to be tested to understand how it is influencing/impacting the system you are trying to improve. Does it work well? How does it affect the variation in our performance? How do the people respond to the change (both the staff and the patients)? Comparing predictions to results is a key source of learning. Remember in the central principles

of improvement, we spoke about a feedback system through observation or documentation. This feedback is the results that will inform you whether you are improving and whether your prediction was right.

A framework that is often used to facilitate this learning process is the Model for Improvement. This framework summarizes the central principles of improvement and will be explained in more detail in **Modules 6-8**. Specifically, a cycle of testing, learning and acting – referred to as the Plan-Do-Study-Act cycle - is key in building knowledge for improvement.

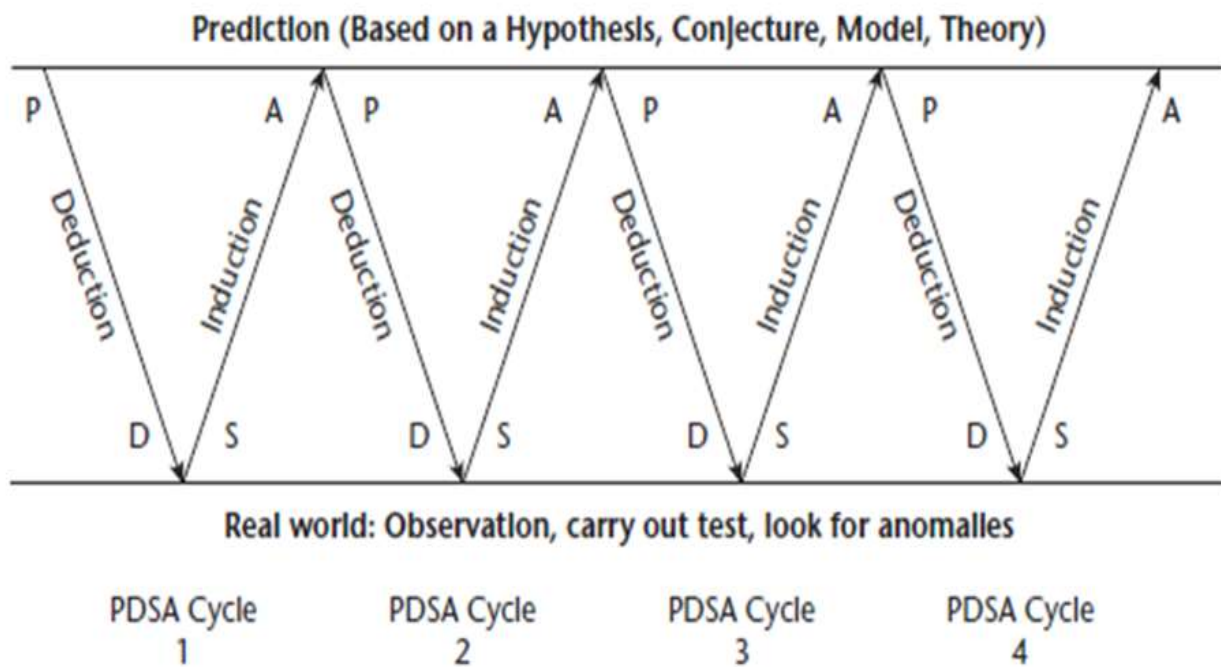


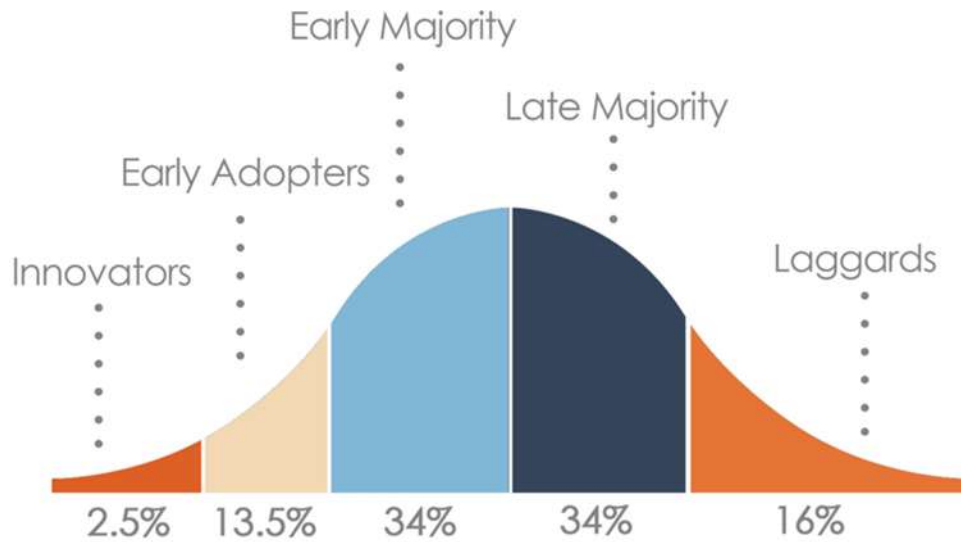
Figure 10: The iterative deductive and inductive approach to learning and improvement

At the start of the PDSA cycle we have a plan based on our prediction (influenced by subject matter knowledge, literature, etc.). When we run the test (Plan to do), we go through a process called deductive learning. The theory/prediction is tested than expected and unexpected findings are documented. From the Do to Study is called inductive learning in which we study the findings and update our theory based on the new knowledge acquired of how to make improvement. This will inform us on the action to take.

4.4.4 PSYCHOLOGY – HUMAN SIDE OF CHANGE

The psychology of change also known as the human side of change, talks about the people involved. Everything we do and change in the way we work affects both the health workers and patients. Therefore, this needs to be considered all the time to avoid resistance to change as much as possible. There are several factors that should be considered here:

- People are different and react different to new things – This is influenced by peoples’ culture, beliefs, values, religion, preferences, education etc. For example, if you are a Muslim, your values may differ from that of a Christian. A Muslim husband may have different preferences for his wife’s gynecologist as compared to a Christian husband.
 - Besides peoples’ preferences, beliefs etc., we all respond to innovation different which is explained in Rogers’ Diffusion of Innovation curve (see figure 8). This curve explains that we do not all take on innovation at the same pace, some accept it earlier (innovators and early adopters); whereas, others need more time to be convinced and have little interest in the innovation during the early stages (late majority, laggards). Even among the laggards in the Rogers’ Diffusion of Innovation Curve, most do not comply with the proposed change for three reasons: they do not know about the new change or they lack the skills to perform the change. Only the minority are deliberately resisting for some reasons.



Rogers Diffusion Of Innovation Bell

Figure 11: Rogers's diffusion of innovation bell



Figure 12: Resistance to Change Triangle

- Fundamental attribution error – we often hold people responsible for the poor outcome of our work, we blame the people. However, we should rather review the process and identify the gaps in it and how it affects behavior of those involved.

Example: Fundamental attribution error

The facility had a maternal death. The midwife was blamed by the medical director for not taking prompt action, and the midwife blamed the doctor on duty for not being available when she needed his assistance. Rather, we should have reviewed the processes involved. Did the woman arrive early or late? In which condition did she arrive in the facility? Was the midwife able to monitor her effectively or did she lack some key equipment to check blood pressure and other vitals? Was the midwife alone and responsible for monitoring several women at the same time? She tried to reach the doctor on duty but couldn't reach him so she had to send someone to his house to prompt him.

- Intrinsic and extrinsic motivation – when introducing change, it should be made attractive by the fact we are aiming for something better. To make the new situation attractive we can use both intrinsic and extrinsic motivation. **Intrinsic motivation** comes from within, satisfaction comes from the activity itself e.g. it gives satisfaction to not have any neonatal deaths for two months. **Extrinsic motivation** comes from outside, e.g. your supervisor acknowledged you during the staff meeting for excellent work done.

People will usually have some reaction to change. This reaction can range from total commitment to open hostility. Some guidelines that can help people commit to change more readily are:

1. Begin by letting people know why the change is needed. This should begin as soon as the ideas for change are being developed.
2. Gather input about the ideas from those affected by the change.
3. Continue to inform everybody of the progress made (results) during testing of the change.
4. Share specific information on how the change will affect people once it is implemented.

Reflection questions? (Time: 10 minutes)

- How do you respond to change in your facility?
- Are you an innovator, early adopter or maybe a laggard?
- What motivates you to participate in change, intrinsic or extrinsic motivation?

4.5 INTERACTION OF THE FOUR COMPONENTS

Though it is very important to consider each of the four components of the profound knowledge independently. Improvement is derived mainly from the interaction of these components.

Small group exercise

- Read and discuss the scenario below to answer the questions provided below.
- Share your response.
- Time: 35 minutes

Case scenario

Hospital X has a long elective surgical case waiting list which has led to significant complaints. The hospital has two well equipped operating rooms functioning twice a week for elective surgeries. The hospital has 4 surgeons who alternate to operate on elective cases as per their schedule. The hospital director regularly communicates the complaints on the prolonged time patients are waiting to get a scheduled for the elective surgery. The surgeons justify the high case load the hospital is accommodating with how busy they are in their day-to-day activities. One day the hospital director wants to discuss the problem with the surgical department and came up with his regular monthly KPI reports. The KPI report states that, the previous month, the delay for elective surgical admissions was 145 days, while major surgeries per surgeon were only 20. He explained to the surgeons that they did not even operate 1 case a day since the waiting list is so long. Finally, he told them his subsequent expectations of at least 3 surgeries a day from each of the surgeons, which ended the agreement.

Answer the following questions:

1. Describe how the components of profound knowledge were applied in this scenario?
2. What did the hospital director do well?
3. What could the hospital director have done better, if he had had knowledge of profound knowledge?

4.6 MODULE SUMMARY

To introduce change for improvement in your facility, you need to understand the central principles of improvement. While applying these principles, two types of knowledge need to be combined. Subject matter knowledge and profound knowledge are the deep understanding of systems, variation, building knowledge and psychology of change. Dr. Edwards Deming said: *“One need not be eminent in any part of profound knowledge in order to understand it and apply it. The various segments of the system of profound knowledge cannot be separated. They interact with each other. For example, knowledge about psychology is incomplete without knowledge of variation”*. This indicates that a leader in improvement need not to be an expert in e.g. understanding variation or psychology of change; however, he/she needs to be able to understand how the various parts interact and together drive towards improvement.

Leaders of QI:

- Understand that there are poor systems and not poor performing people.
- Value differences amongst people and how individuals contribute to teams.
- Look at the interactions between all the parts of profound knowledge.
- Look behind decisions and actions to find underlying fundamental assumptions.

MODULE 5: PROBLEM IDENTIFICATION, PRIORITIZATION AND AIM SETTING

Module Description: One major step in finding a solution to a problem is to go through a detailed problem identification process. There are various methods available that will aid in the problem identification process. This module focuses on identifying quality gaps; use of data, prioritization tools; and development of complete problem statement and SMART aim statement.

Module Objective: By the end of this module the participants will be able to use the appropriate problem identification and prioritization tools for aim setting.

Enabling Objectives:

- Identify problems using the dimensions of quality.
- Utilize different types of data to identify problems.
- Apply tools to prioritize problems.
- Develop problem statement.
- Develop SMART aim statement for identified problems.

Module outline:

This module has the following sessions:

- Introduction
- Identify Quality Gaps
- Identify Problems using Data
- Prioritization Tools
- Problem Statement
- Aim Statement
- Quality Improvement Project Work – Section I
- Summary

5.1 INTRODUCTION

Reflection question? (Time: 5 minutes)

You have had an ongoing problem with frequently occurring maternal mortalities (more than 3 per month) in your facility. You have been tasked to bring a solution to this problem.

What should be done differently to reduce the maternal deaths in the facility?

A problem is a difference between the existing state and the desired state. It is easy to observe this gap but addressing or resolving the problem can be challenging. Tools that can help in identifying such a difference include: data collected from the routine data system such as the Health Management Information System (HMIS), the facility registers, through observation of clinical skills or through conducting a walk-through. Prioritization tools such as a Pareto chart or a prioritization matrix can be used to help prioritize problems or factors contributing to the problem.

It is important to identify the gaps we have in the quality of care we provide if you are aiming for improvement. Albert Einstein once said: “If I had an hour to solve a problem I’d spend 55 minutes thinking about the problem and 5 minutes thinking about solutions.” In the next two modules you will get introduced to problem identification tools, which are often a key step in finding solutions to the problem.

5.2 IDENTIFY QUALITY GAPS

The first question of the central principles of improvement is identifying the need for improvement. Quality Improvement in health care is all about improving the quality of care that is provided to the patients we serve, adding value to the patient and increasing provider satisfaction. Problems that we can identify in the care we provide can be grouped in three main categories:

- 1. Effectiveness issues:** In these situations the system does not deliver according to the expected performance. This is seen in situations in which we have issues with medication stock-outs, increases in case-fatality rate, low cure rate, incomplete medical records, canceled supervision visits or canceled outreach services.
- 2. Efficiency issues:** In these situations the system uses too many resources to deliver the service it is expected to delivery. Examples of efficiency issues are: long waiting times to receive care, over-prescription of antibiotics or other drugs and charging patients with high administrative costs to provide a patient chart.
- 3. Responsiveness issues:** The system does not address the needs of its clients to their satisfaction. For example, we delay attending to emergencies, and we discriminate certain groups of patients.

Looking at the six dimensions of quality care as defined by the Institute of Medicine, care should be Safe, Effective, Efficient, and Person Centered all the time and for everyone (STEEEP). If you analyze the health care we provide and you can identify an issue around one of these six dimensions you are certain that you have a problem which should be addressed to improve the quality of care.

5.3 IDENTIFY PROBLEMS USING DATA

There are a lot of data sources that can be used to identify problems relating to the quality of care we provide. The choice for a specific data source might depend on the level of detail you need or the impact the problem has on health outcomes.

1. You may for instance use the Health Management Information System (HMIS) to detect major gaps in performance leading to low coverages, high morbidities or mortalities. Information in the HMIS is not very detailed since you cannot trace back information about the individual clients. However, it can serve as an excellent starting point to determine performance gaps of the facility or Kebele/Woreda/Region.
2. Another rich source of information/data are the numerous registers that are being used in the facilities to capture a summarized version of information for the clients we served. The advantage of the use of registers is that we have information available for individual clients and includes the clients' identification numbers to get to the patients' charts for more details.
3. Patient charts have very detailed information about each step of the care that we have provided to a client. This can provide an incredible amount of information to identify quality of care gaps, however it may be a time-consuming process to retrieve information from the charts.
4. Observation of clinical skills is another source of data that can help identify problems with the quality of care provided. Identifying weaknesses in clinical skills or patient-centered care through observation is a very useful way to identify areas for improvement.
5. Another observational method is the walk-through, during which a health professional experiences the health service as a patient, including all the frustration, confusion, anxiety and other emotions. It helps providers better understand the experience of care from the patients' perspective and since QI is predominantly focusing on the patient, a very useful method to identify areas for improvement.

These are just some examples of using data for problem identification. Try to think of some other examples in your own facilities.

5.4 PRIORITIZATION TOOLS

You will not always have all the resources available to address all the problems you have identified. In order to decide which problem to focus on first, you can make use of prioritization tools such as the Pareto Chart and the Priority matrix.

5.4.1 PARETO CHART

Did you know that it is possible to address 80% of your problem by only solving 20% of the contributing factors to the problem? This is based on the Pareto Principle. The 80/20 rule, as how it is often called, indicates that approximately 80% of the problem is the result of only 20% of the causes of the problem. This was based on a theory of Vilfredo Pareto, an Italian economist, who identified that 80% of Italy's wealth was located at 20% of its citizen. The rule is not cast and stone but can be applied everywhere.

Examples: The Pareto rules

- *Approximately 80% of the mortalities in the facility is due to 20% of the morbidities.*
- *Approximately 80% of the skilled deliveries is coming from 20% of the catchment area.*
- *Approximately 80% of the late care seekers are coming from 20% of the communities in the catchment area.*
- *Approximately 80% of your salary is used for 20% of the monthly expenses.*

The Pareto Chart is a graphical tool that allows us to organize the data we have for a problem per category/group in descending order. In addition, the cumulative percentage indicates the vital few (those categories/groups that make up close to 80% of the problem) and the useful many (all other contributors which are important but only account for approximately 20% of the problem).

When trying to resolve the problem, start addressing the vital few first since it gives the biggest impact.

Steps in constructing a Pareto Chart:

1. List all the possible categories/groups.
2. Collect the data – how many of each (tallying).
3. Arrange the categories/groups from the highest to the lowest (descending order).
4. Calculate the total and add up the frequencies of the data collected.
5. Calculate the percentage for each of the categories/groups.
6. Calculate the cumulative percentage.
7. Draw the axes:
 - a. Horizontal: categories/groups.
 - b. Vertical left: frequencies/ 'raw' data.
 - c. Vertical right: cumulative percentage.
8. Plot the data in your graph.

Below is a sample of a Pareto Chart on Causes of Neonatal Deaths in 2016 in Facility X, presenting both the frequencies and the cumulative percentage. The vital few and useful many have been identified to easily identify which causes should be prioritized when developing interventions.

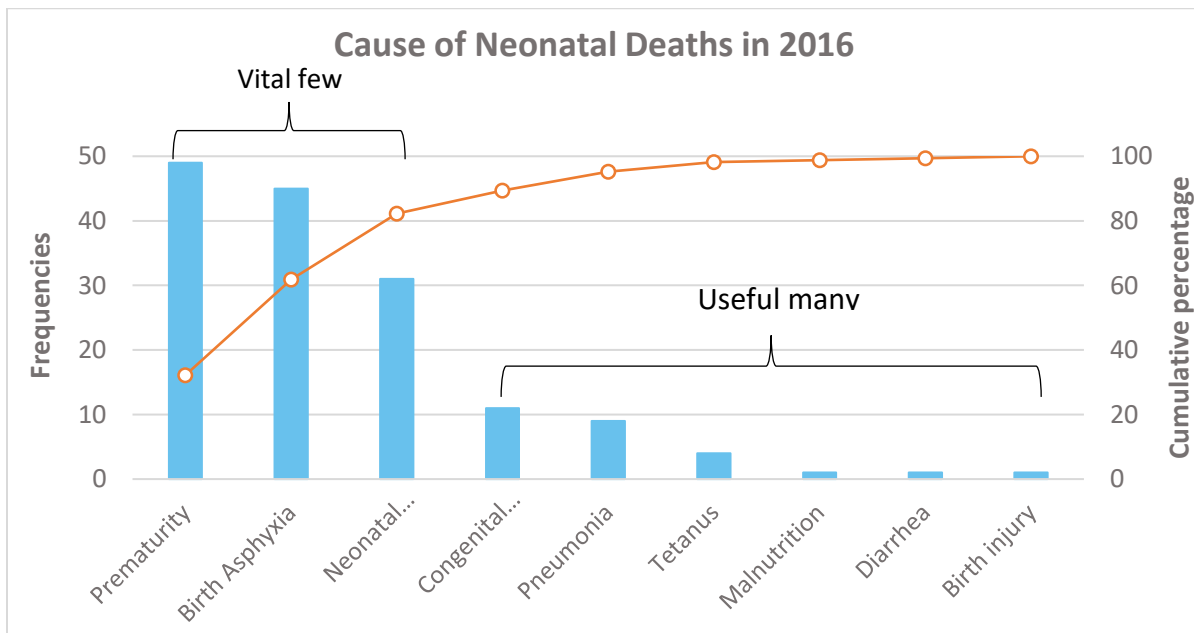


Figure 13: Causes of neonatal deaths for 2016 at facility X

5.4.2 PRIORITY MATRIX

Another easy tool to help prioritize problems or even ideas to address the problem identified, is the priority matrix. It is a very helpful tool when resources are limited or when health problems are considered from a number of criteria.

Step-by-Step Instruction for the Development of a Prioritization Matrix

1. Create a table/matrix.
2. List all the health problems in the left most column (vertically).
3. List all the criteria for rating in the top row (horizontally) e.g. feasibility, cost, time, and size/impact.
4. Ensure you have one empty column on the right side of the table/matrix for your ***priority scores***.
5. Determine a rating scale, for example: 1 (strongly disagree), 2 (disagree), 3 (neutral), 4 (agree), and 5 (strongly agree).
6. Weigh the criteria, as some criteria may have a different level of importance so you may attach a heavier weight. (twice or three time) Whereas, other criteria are less important to the team and weigh at a low rating.
7. Rate the health problems against each of the criteria.
8. Calculate the priority scores.
9. You can now identify which health problem has the highest priority.

5.6 PROBLEM STATEMENT

After identifying the problem, it is important to state the problem statement, a clear and concise statement that describes the symptoms of a problem and helps to clarify and communicate the identified problem for improvement. The following questions can help to describe the problem:

1. What is the problem (not the cause or the solution)? What is not functioning as we desire? What are the boundaries of the problem? (**Size**).
2. How do we know it is a problem? What information do we have to support or confirm the existence of the deficiency?
3. How long has this been a problem? How frequently does it occur? (**Time**).
4. What are the effects of this problem on quality and on the populations served? (**Impact**).
5. Where does the problem exist?
6. How will we know the problem is resolved? What does the “desired” state look like? What data will we need to answer these questions?

Ensure a problem statement does not assign any blame or include an implied cause or solution.

Example: Problem Statement

Waiting times (elapsed time from when the patient arrives at the health center to when the patient is seen by the midwife) for pregnant women has shown over the past three months to be on average three hours. As a consequence, women do not make the desired four antenatal visits before delivery.

5.7 AIM STATEMENT

Following the problem statement, we have to answer the first principle for improvement — knowing why you need to improve— which is often referred to as the aim or purpose of the improvement. This will answer the question of the Model for Improvement, “What are you trying to achieve?”

The aim statement is an explicit description which serves, like the problem statement, as an internal and external communication tool to clarify the improvement work.

Most likely you have heard it before, an aim should be SMART. What does that mean? SMART is an acronym that stands for Specific, Measureable, Ambitious, Realistic and Time bound.

Specific: specify the system that needs to improve and/or the target group that will be affected.

Measurable: often we say an aim should have a numeric goal, something that can be measured and can be compared over time.

Ambitious: your target/aim should be ambitious for your **current** system, something you may not think is possible.

Realistic: the target/aim should be realizable in the **redesigned** system, after introducing something different/new to the system (this should also into consideration the resources needed to bring the change).

Time bound: specify the beginning and the end, so that the duration to achieve the aim becomes clear.

5.8 QUALITY IMPROVEMENT PROJECT WORK

Section I: Problem Identification, Prioritization and Aim Statement

Instruction:

- Use the quality improvement project workbook template given in the annex section (quality improvement project workbook) to prioritize identified problems, to state a problem and declare an aim statement for your prioritized problem.
- This project work should be based on the real situation (problem) at your facility or a facility you supervise.
- You should be able to implement this project at the facility. Therefore, please consult the required body before you engage on this exercise.
- Also, use the project workbook template in your practical work at the facility after the training.

5.9 MODULE SUMMARY

Effective quality improvement starts with problem identification, without identifying the problem you will not know how and what to improve. Various problem identification tools can be used to identify and/or prioritize a problem for improvement. In this module we discussed the following tools:

- Six dimensions of Quality Care.
- Data (HMIS, registers, observations, walk-through).
- Pareto Chart.
- Priority Matrix.

For each problem that you are targeting to improve, write a problem statement and an aim statement to communicate clearly the problem at hand and the target in resolving the problem.

MODULE 6: GENERATING CHANGE

Module Description: This module will focus on the second question of the MFI: “What change can we make that will result in an improvement?” The key word in this module is ‘change.’ The two types of change, change ideas vs change concepts, and various tools and methods that can aid QI teams to generate change ideas will be discussed.

Module Objective: By the end of this module the participants will be able to answer the second question of the Model for Improvement, “What change can we make that will result in an improvement?”

Enabling Objectives:

- Differentiate between fundamental change and reactive change.
- Differentiate between change concepts and change ideas.
- Apply logical thinking methods.
- Use creativity methods to generate new ideas.

Module outline:

This chapter has the following sessions:

- Introduction
- Developing Change through Logical Thinking
 - Process Mapping
 - Fishbone Diagram and 5 WHYs
 - Driver Diagram
- Developing Change through Lateral Thinking
 - Provocations
 - Change Concepts
 - 6 Thinking hats
- Quality Improvement Project Work – Section II
- Summary

6.1 INTRODUCTION

To get different outcomes, we need to change the way we work or behave. According to Einstein, we cannot continue doing the same things and expect to get different results. QI means the **organized creation of beneficial change, which is the attainment of unprecedented levels of performance** (Juran, 1989); something that may seem unrealistic at first, but can be realized by redesigning processes of work; reduce waste and increase value; by addressing root causes to our problems; by prioritize the major contributors to the problems and by generate new ideas to address existing challenges. We need to understand that every improvement needs change, although not every change is an improvement.

We can identify two types of change. **Reactive change** responds to a sudden problem that has occurred and the change aims to reset the system back to its old performance. These kinds of changes have a short-term impact and only impact certain parts of the system. The other change is a **fundamental change** which focuses on system redesign, to bring the performance to unprecedented levels. This kind of changes often has long term impact and effect multiple parts of the system.

When introducing change, be cautious of two things:

- First, doing **more of the same**, as said this will not really bring improvement. However, often the first solutions suggested are to add more staff, more equipment etc. This might be a reactive change fundamental change is QI.
- Secondly, the **Utopia syndrome**, which delays testing of any change, because the team is trying to find the perfect change. Testing change with the MFI and running several PDSAs will allow you to learn from



Figure 14: Developing change, the second of the Model for Improvement

your change's impact without causing harm to the system, minimizing the risk; therefore, there is no need to find a 'perfect change' before starting.

- Another common mistake is having the ***perfect solution to the wrong problem***, this refers to the need to do detailed problem identification and analysis. Once we know the details of the problem, its root causes; it will be easier to generate change ideas that lead to improvement.

Example: Long waiting time at the laboratory

The facility had a problem with long waiting times at the laboratory. To improve quality of care, the team identified the need to add a microscope and a laboratory technician.

After doing so the waiting time did not reduce. Closer inspection of the problem revealed that the root cause of the problem was a shortage of microscope slides, resulting in the need to wash the few available slides multiple times a day.

When generating ideas, the brain follows certain patterns. We make connections to things we know, hear, read or see and link it to the new situation to come up with solutions. These normal thought patterns are what we call ***logical thinking***. It comes in two forms:

- Logical positive thinking: reasoning on ways to make a new idea work.
- Logical negative (critical) thinking: finding reasons why the new idea might not work well.

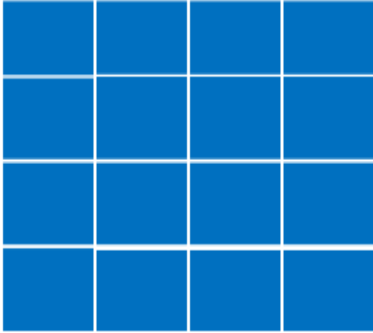
We have various tools and methods that can guide us in logical thinking to generate ideas for identified problems e.g. process map, fishbone diagram, Pareto chart, 5 WHYS, line graph, run chart, driver diagram, literature, benchmarking, best practice, ask expert etc.

Another way of thinking is ***lateral thinking***, which makes use of our creativity, often we hear "think outside the box." However, thinking outside the box doesn't always come by itself, it is a learned skill. We therefore need methods and tools to guide the lateral thinking process, as how we have tools to help in logical thinking. Let's focus on logical thinking methods first and we will discuss lateral thinking later in this module.

6.2 DEVELOPING CHANGE THROUGH LOGICAL THINKING

Reflection question? (Time: 5 minutes)

- How many squares can you see here (in the below picture)?



We have various methods and tools that can guide us to generate change ideas through **logical thinking**, for example through the use of brainstorming, benchmarking, fishbone diagram, process map, Pareto chart and driver diagram methods.

Brainstorming is a well-known tool, used in combination with almost all the tools. It is allowing the brain to use normal thought patterns to come up with possible solutions for the problems identified.

After brainstorming about possible ideas to address your problem, you can decide to group ideas in thematic areas. For instance, in a brainstorm session to improve Family Planning (FP) coverage various ideas relate to educating the clients on the benefits of FP methods; or various ideas relate to restructuring the processes of care to avoid wasting time of clients who come for FP counseling and/or commodities. By grouping the ideas in thematic areas (or **change concepts**), you are creating an **affinity diagram**. This can be helpful to organize the available ideas. The thematic areas can be used to generate more change ideas, and we will discuss this more under lateral thinking later in this module.

Benchmarking: Identify high performers or best practices in the area of desired improvement and learn what they do different compared to you. This learning is not limited to organizations working in the same field. As a health care facility you can learn from other industries. For

example, aiming at improving patient-centered care or customer care, a lot can be learned from the hospitality industry (hotels); aiming at improving patient safety, a lot can be learned from the aviation industry.

6.2.1 PROCESS MAP CONSTRUCTION AND ANALYSIS

Everything we do is a process, made up of a sequence of actions through which inputs are converted into outputs. The interaction of all the parts (processes, people, material etc.) with a common goal is what we call a system.

For instance, our Health care system is made up of various processes, health workers, patients, equipment, medication etc., all this needs to come together and interact to be able to cure our patients.

Lack of understanding of how systems work and how the various parts interact to achieve its common goals results into poor functioning systems that are not able to achieve the goal.



Figure 15: A boat sinking in one side due to the leaking hole

Example: A system thinking (a system performs only as good as its parts)

- *I am a midwife who conducted a delivery resulting in a fresh stillbirth. However, because I didn't want to document a fresh stillbirth, I reported a macerated stillbirth (indirectly blaming my colleagues at ANC for not doing their work well).*
- *I am a triaging nurse who is receiving a critical case. The patient needs oxygen; however, the oxygen cylinder on the ward is empty and I now have to search for a cylinder to use. By the time I get back, the patient has passed away, within 1 hour after arriving in the facility. I don't want to document the death of the patient and get blamed for it, so I write BD (Brought Dead) in the register.*

A pictorial presentation of a process in the form of a **process map** or **flow chart** helps to:

- Understand the process and communicate to others.
- Standardize the process and the procedures involved.
- Identify steps/actions that add value and steps that don't add value (**muda** or waste).
- Identify opportunities for improvement.

Steps to follow in constructing a Process Map:

1. Define the process boundaries - beginning and end.
2. Spell out the focus of the process map: **a Patient/Client**; an expense claim form; a patient folder etc.?
3. Be clear on what you are mapping: **current** or ideal process.
4. Show the steps of the process.
5. Follow one path at a time at decision points.
6. Defer for future completion if team lacks the detail understanding to complete a section.
7. Review the completed diagram.



Figure 16: Process Map symbols

Small group exercise

- Map a work process that you are all familiar with.
- Follow the steps as directed above.
- Write the various steps/actions on sticky notes before putting it on a flipchart.
- Connect the steps with arrows and follow the flow of the process.
- Review the process map to ensure it is complete and the order of the steps is accurate.
- Share and/or discuss the process map.
- Time: 60 minutes

After you map an existing process it is important to analyze the process mapped. Most processes will be mapped from the patient/client's perspective. During the analysis we will therefore review to what extent steps/actions are adding value to the patient/client. The aim of a process map analysis is **to improve value for the patient/client (and possibly the providers) and to reduce waste.**

Poor performing systems are often due to:

- Inefficiency of processes.
- Poor interaction between processes/parts of the system.

However, usually we blame the people involved without addressing process failure, this is known as a ***fundamental attribution error***.

During process map analysis, look out for the following:

- Are steps repeated or out of sequence?
- Are there steps that do not add value to the output/patient?
- Is the process standardized?
- Are there steps where errors occur frequently?
- Are there steps that can run in parallel?
- Are there bottlenecks (areas with a lot of delay)?

Small group exercise (continued)

- Analyze the Process Map we constructed in the previous exercise.
- Identify steps that do not add value to the patient/output.
 - Put a circle around these steps.
- After identifying all the waste/muda, plan change ideas to address some of the identified problems and map the ideal process.
- Share and discuss the process map.
- Time: 45 minutes

6.2.2 ROOT CAUSE ANALYSIS FOR DEVELOPING CHANGE IDEAS

The first step in getting change ideas that will lead to improvement is to conduct a problem identification, when doing so it will basically guide you to the solution. As Einstein said when solving a problem, he will spend 55 minutes analyzing the problem and 5 minutes to find a solution. Since health care problems are often complex, with many factors (internal and external) contributing to the problem, it is difficult to find solutions if we don't analyze the problem and its root causes. Often, we end up treating symptoms of the problem rather than solving the problem, which will result in reoccurrence of the problem. E.g. *to treat malaria we can provide*

analgesia such as Paracetamol, the headache and the fever might reduce and we feel better, however the parasites are still replicating.

The **root cause analysis** is a good method to apply to avoid treating “symptoms” and target treating the “parasites”. Two common methods are the **5 WHYS** and the **Fishbone (Ishikawa) Diagram**.

The **5 WHYS** method is based on what children in the age 3-6 years naturally do, asking why several times, irrespective of what your answer to their question is, they will ask ‘why?’ again. The idea is that by the time you ask ‘why?’ to a response given, 4-5 times, you find it difficult to respond and you have reached the root cause of the problem.

After reaching the root cause of your problem you can now brainstorm or use other methods such as benchmarking, literature study etc. for ideas that target the root cause of the problem.

Example of the 5 WHYS

- *Why don't women exclusively breast feed for 6 months?*
 - *Because they think when the baby cries after a feed it is still hungry.*
- *Why do they think when the baby cries after a feed it is still hungry?*
 - *Because that is what their mother-in-law is telling them.*
- *Why is their mother-in-law telling them this?*
 - *Because when she had her babies this is what everyone believed.*
- *Why is this what everyone believed?*
 - *Because babies died of malnutrition in their villages so people feared that inadequate breastmilk supply was the cause.*

As much as the 5 WHYS method is a very quick method used to get to the root cause of **one** of the contributing factors of the problem and to generate ideas based on the identified root cause; a fishbone diagram summarizes **all** knowledge we have about the problem and its contributing factors. A **fishbone** or **cause and effect diagram** is a pictorial tool that can be used to organize contextual knowledge we have about a problem. Group participation is encouraged when

constructing a fishbone diagram, since group knowledge will add to the completeness of the diagram. All group members brainstorm about possible contributing factors to the problem and write them down, after which all these information is organized under major causes and their sub-causes. Similar to process mapping, when using a fishbone diagram to get to the root-cause of the problem, it is essential to have the relevant people part of the team. Many health care problems have patient/clients/family and community components that contribute to the problem. Do not assume what the root cause for these areas is but include a patient and/or community representative in the team to get the patient/community view included in the analysis.

Steps to construct a Fishbone diagram:

1. Define problem (*negative form*).
2. Draw a line horizontally along the page. This line will be the "spine" of the fish.
3. Draw the head of the fish and write the problem inside.
4. Brainstorm and identify the main categories (causes) contributing to the problem (ensure to include internal and external causes).
5. Draw the "bones" – label each bone with a main cause using a **noun**. All the bones/lines should point in the direction of the problem.
6. Brainstorm on sub-causes and why for each of cause – write them alongside the bones
7. Review the diagram.
8. Give an appropriate title.
9. Identify areas where immediate changes can be tested.

After constructing the Fishbone diagram step 9 is key in generating change ideas, focus on the areas that within your capacity to work on.

Small group exercise

- We want to get a better understanding of the problem: **“Delay in Health Care seeking at the facility”**.
- Brainstorm within your group and write down all the causes/contributors that are being mentioned, include both internal (facility-based) and external (patient/community/family-based). Spend approximately 10 minutes on the brainstorm session.
- When the group feels you have exhausted all causes/contributors, organize the causes under major topics/areas which will be described as **nouns**.
- Write the organized information in the fishbone structure, if you have to draw the structure first, follow the instructions above. In the annex is a template that can be used as a sample.
- Review the fishbone diagram to assess whether it is complete.
- Identify 1-2 area(s) for improvement and generate a change idea.
- Time: 45 minutes

The fishbone structure can also be used to generate solutions to our problem. In that case we called it a **“reverse fishbone”**. The head of the fish will now point to the left and you write your solution/outcome (effect) in the head of the fish. Draw the backbone to the right side and the main bones will present main areas (change concepts) of solutions, with the smaller bones representing specific change ideas achieve your aim.

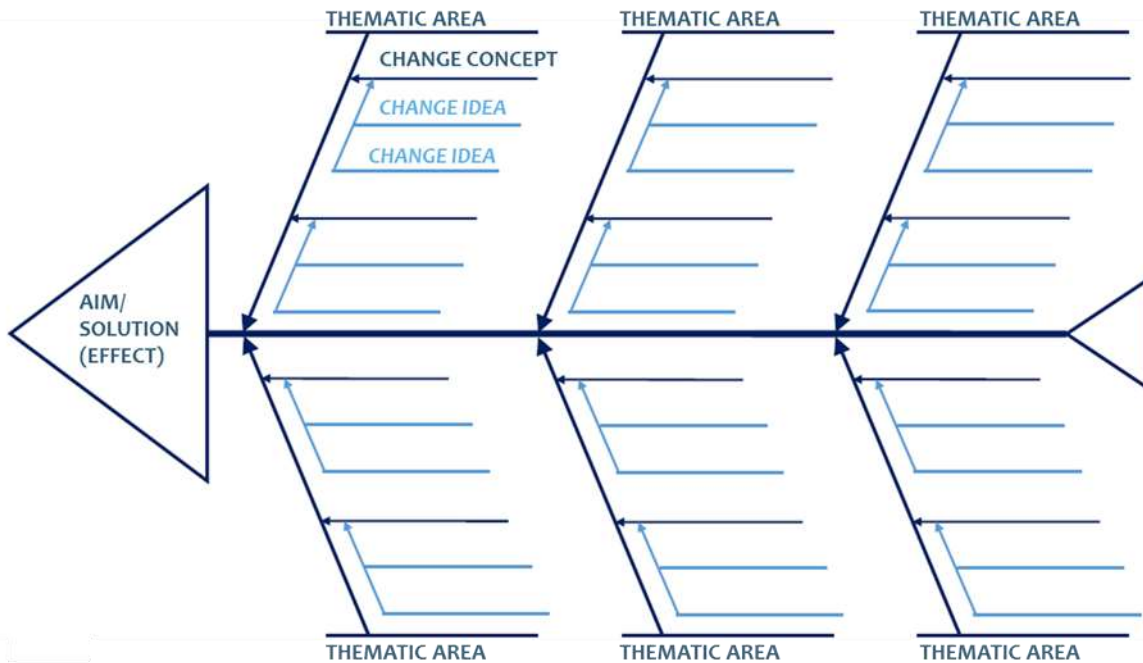


Figure 17: Reverse Fishbone Diagram for generating change ideas to achieve your aim

6.2.3 DRIVER DIAGRAM

A driver diagram is a pictorial tool that allows us to display the system we are trying to improve, the boundaries of that system and the factors (processes, structures, norms) that directly or indirectly cause the outcome (aim). A driver diagram is based on theory, hypotheses and/or contextual knowledge.

Structure of Driver Diagram:

- 1) On the left side of the driver diagram you present the **aim** or outcome.
- 2) Right to the aim we list the **primary drivers** (vertically), these are factors that directly contribute to the achievement of the aim.
- 3) Connect the primary drivers with the aim, using **arrows** pointing towards the aim.
- 4) On the right of the primary drivers, list the **secondary drivers** (vertically), these are elements that are affecting the primary drivers. *You can have one secondary driver connecting to more than one primary driver and you can have multiple secondary drivers per primary driver.*

- 5) Connect the secondary drivers with the primary drivers using arrows pointing towards the primary drivers.
- 6) Use the secondary drivers to list the **change concepts/ideas**.

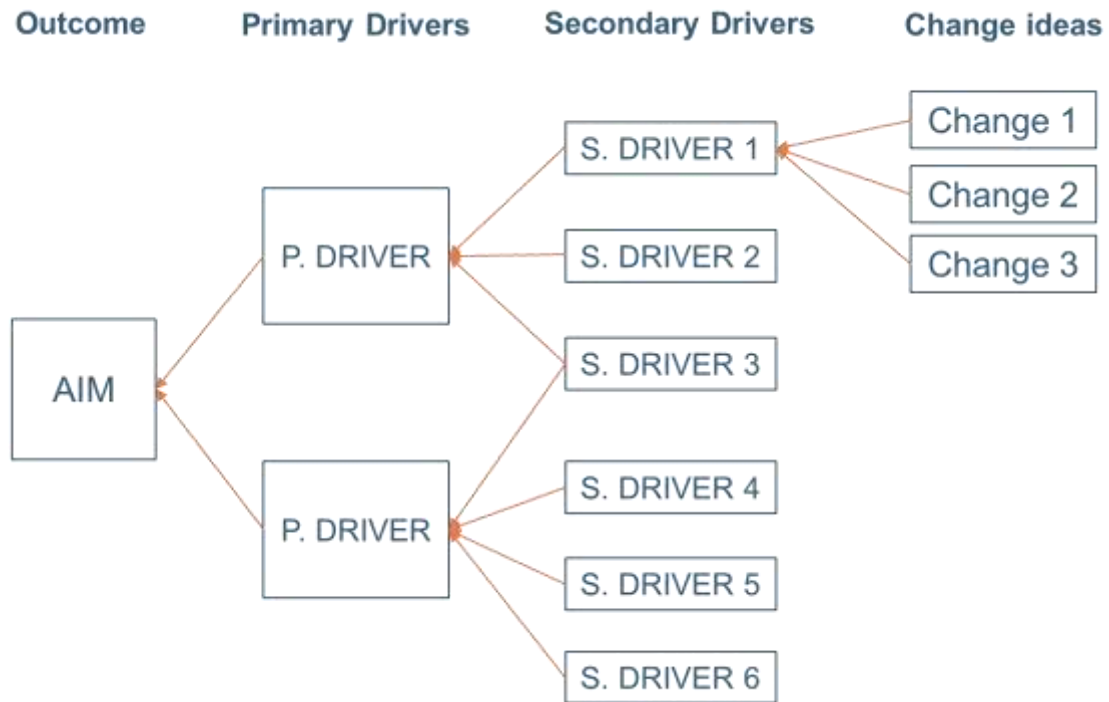


Figure 18: Structure of a driver diagram for generating change ideas

Driver diagrams are often used more at the programming/project level to list, similar to the (reverse) fishbone diagram the causes (drivers) contributing to achieving the aim. Subsequently, secondary drivers can be used as a basis of generating change concepts/ideas as well as the foundation for developing a program/project level measurement framework (linking it to indicators to track progress of the program/project).

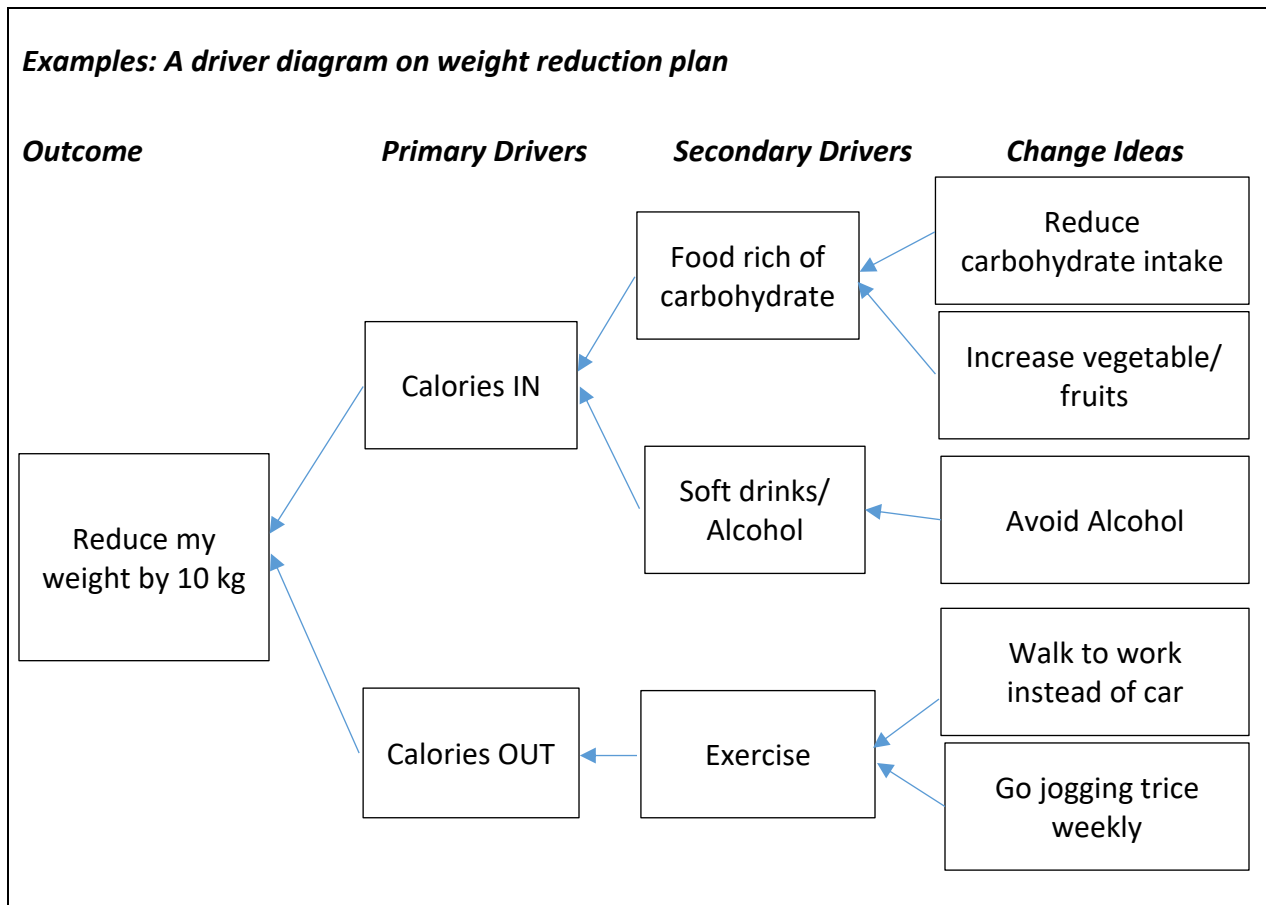


Figure 19: Driver diagram

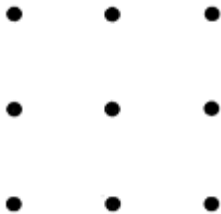
Table 2: Summary of Logical Thinking

Methods/Tools	Application	Generate Change Ideas
Benchmarking	Learn from high performance	Use change concept and generate ideas
Driver Diagram	Define the system	Based on secondary drivers
Process Map	Pictorial presentation of a process	Identify areas that do not add value and generate ideas to increase value
Prioritization tools (Pareto Chart, focus matrix)	Prioritize areas with greatest impact	Ideas that impact the major contributors
Root Cause Analysis (Fishbone and 5 WHYS)	Contextual knowledge about a problem and its causes	Potential solutions to the root cause(s) of the identified problem

6.3 DEVELOPING CHANGE THROUGH LATERAL THINKING

Reflection Exercise? (Time: 3 minutes)

- Connect the 9 dots with 4 straight lines without lifting the pen from the paper.



Edward de Bono developed the concept of lateral thinking and provides various tools and methods to help people deliberately produce thoughts that are outside normal thinking patterns. Lateral thinking should be used supplementary to logical thinking and not as a replacement of. The way to apply lateral thinking is in developing changes aimed at root causes that have been identified already using the standard approaches. Don't use these terms with mentees. That you use them as techniques in coaching.

Some of the creative methods are provocations, 6 thinking hats, change concepts and random entry. However, there are many more methods available. More information can be found in the article on creativity: *Lloyd P. Provost and R.M. Sproul. (1996). Creativity and Improvement: a vital link. Quality progress.* The article is included as an addendum to this training package.

6.3.1 PROVOCATIONS

Provocation techniques can be used to help develop changes aimed at a specific root cause. There are various ways to provoke new thought patterns.

- **Reversal:** think in the opposite direction of the normal situation. E.g. Ambulance is there to bring people to facility. Reversal was used to think of how people could become

ambulances – evolution of bicycle ambulance in Ghana. Patients treat the health workers. Students lecture the teacher (which happens more and more in university).

- **Exaggeration:** exaggerate the problem. E.g. no routinely collected data (HMIS) can be trusted; all referrals come in late; no patient follows instructions on how to take medication.
- **Escape:** define the usual way (what is taken for granted) of doing something and then produce a statement that cancels/removes what is taken for granted. E.g. there is no shortage of health workers.
- **Distortion:** change to well-known relationships or boundaries such as time. E.g. Children are the boss in house for a day; clinic staff can only work for 4 hours a day; CEO will be front desk worker for one week.
- **Wishful Thinking:** like living in a fantasy and everything could be possible. E.g.: in Malawi NICU, there was a shortage of infant cots. The coach encouraged team members to imagine that there was no shortage of cots and that they could ‘see cots everywhere’. Then when they looked around, they found that there were several crates being used to store medical records that could be easily transformed into additional cots which became a change idea.



Figure 20: Provocation – harnessing local ideas for change

6.3.2 RANDOM ENTRY

Get a random noun as an entry to generate new ideas. The mind will try to connect this random word to the problem and aim, and new thought patterns will be formed resulting in ideas that most likely would have not come up using logical thinking. Different methods can be used to get a random entry word, for example:

- Use a watch with a second hand. One person says stop. The number the second hand is pointing at, is the number you use. Go to a noun list (see “List of 60 Random entry words” in the Annex on page 188) and pick the word that corresponds to your number as entry word.
- Same list as above can be used, randomly pick a number in between 1-60.
- Take a book (with page numbers) and call out a number (1-... depending on the book), this is the page of the book we use. Someone else calls another number 1-30, this is the line/row we use, and the last number (1-15) is the word we use.
- Open a book, close your eyes and randomly point your finger somewhere on the page. Take the word under your finger or the nearest noun to the point the finger points at.

6.3.3 CHANGE CONCEPTS

Change concepts are general descriptions on what to change, and this general description can be used to generate specific change ideas. There is an existing lists of change concepts available in the Annex of this manual on page 189(from *the Improvement Guide*). As much as we have change concepts that can be used to generate specific change ideas, a change idea can also be turned into a more generalizable change concept to subsequently generate more change ideas such as in the example below. This is an important method used to generate context specific change ideas based on lessons learned from benchmarking.

Example for the change process:

Midwives wrote their phone number in the Antenatal care booklet of women, so that when labor starts, a family member calls the midwife who would then inform the facility ambulance to get the woman and bring her to the facility. This was improving skilled delivery rates of the facility.

One facility wanted to learn from this during a benchmarking visit but had no ambulance available. However, they identified that the concept of skilled delivery is the facility's responsibility to get midwife and client together in one place, preferably in the facility. With this concept in mind, they developed a change idea that a family member would organize a motor bike to bring the woman to the facility. However, because of the pregnancy, sometimes the woman can't be transported on a motor. Therefore, the facility developed the idea of an ambulance motorbike for easier transport of patients to the facility.

6.3.4 6 THINKING HATS

Hats are items that we can put on and take off when we want. The **6 thinking hats** is a method that encourages a group to think deliberately in a certain way with a certain mood. As the method says, there are 6 hats, each with its own color and meaning.

- **Blue** is the facilitator's hat, who manages the thinking process.
- **Red** is for incorporating feelings such as intuition, hunches, gut feeling, emotions.
- **Green** is for thinking about fresh new ideas. It comes with a lot of possibilities and alternatives.
- **White** is about facts, data, information. What evidence is available? What does the data say?
- **Yellow** is bright, sunny and thus positive and optimistic. Why is the idea that we brought up in our green hat session so good; why can it work; what is positive about it?
- **Black** is cautious, critical and negative. It identifies problems, tells the weaknesses of our ideas; why can't it work; what are the challenges?



Figure 21: The six (6) thinking hats

Reflection question? (Time: 5 minutes)

- Individually reflect on the below question.

“What color of hat do you naturally wear when trying to resolve a problem?”

6.4 QUALITY IMPROVEMENT PROJECT WORK

Section II: Developing Changes

Instruction:

- Continuing the section I (problem Identification, prioritization and aim statement) component of your quality improvement project. Develop changes using the process map, fishbone diagram and/or driver diagram.
- Use the project workbook (annexed on this manual) you started to use in the previous section.
- Also, use the project workbook template in your practical work at the facility after the training.

6.5 MODULE SUMMARY

Change ideas can be generated through logical thinking using tools such as process map, fishbone diagram, Pareto chart, line graph, run chart, 5 WHYS, benchmarking, literature etc.; and through lateral thinking using tools such as provocations, 6 thinking hats and change concepts. The two types of thinking should be used supplementary to each other, one cannot replace the other.

Summary Discussion

A QI team has attempted to improve the waiting time at the Outpatient Department (OPD) of the facility for several months. They have tested various change ideas but without much success.

What would your recommendation be?

- What tool(s)/method(s) to use?
- How to use them (summary)?
- How will it help to generate ideas?

MODULE 7: MEASUREMENT

Module Description: This module explains the importance of documented observations and the results of performing a measurement process. The goal in obtaining data is to aim for usefulness not perfection. The data collected over time could be graphically displayed by a Run chart.

Module Objective: By the end of this module, the participants will be able to design quality improvement indicators and measures.

Enabling Objectives:

- Explain the importance of data/measurement.
- Define an indicator.
- Design quality improvement indicators.
- Link measurement and aim statement.
- Construct a run chart.
- Interpret a run chart using the run chart rules.

Module outline:

This module has the following sessions:

- Introduction
- The purpose of data collection
- Data collection tools
- Indicators in Health care
- Design quality improvement indicators
- Linking measurement and aim
- Measures of central tendency
- Run chart and its use
- Construct a run chart and its interpretation
- Quality Improvement Project Work – Section III
- Summary

7.1 INTRODUCTION

Reflection questions? (Time: 10 minutes)

- What is data?
- Why are we measuring?
- What is the use of measurement?

Data is defined as documented observations or the results of performing a measurement process. In quality improvement work, data plays an important role. Data is only a helpmate to improvement but improvement cannot act without it. If we **do not measure and document what we are doing** (changes being tested), we will not know if what we are doing (changes being tested) is/are leading to improvement. The **use of measurement** is essential for identifying and measuring problems and setting goals for improvement—lets us know if we have achieved our goals or whether we need to be doing something different. Measurement also helps in answering the question, “how will we know that a change is an improvement?” in the Model for Improvement.

Data helps QI teams to learn about the impact of their changes being tested by.

- A. Keeping track to see if the system is meeting the customer/ client needs and expectations.
- B. Knowing if a particular change being tested should be kept (adopted), modified (adapted) or rejected (abandoned).
- C. Understanding causes of the problem.
- D. Clarifying aims for improvement.

7.2 THE PURPOSE OF DATA COLLECTION

The purpose of **data** in quality improvement is **for learning** and **not for judgement**. Learning comes from understanding patterns in data. Patterns are easier to recognize when data are plotted over time because it allows the QI teams to see the impact of their changes on the system and they maximizes learning from the data.

It is difficult for most of the QI teams to collect data to track changes being tested. It is always advisable for the QI teams to ask themselves the following questions when planning for data collection.

- What are my indicators?
- How do I collect the data?
- How frequent (daily, weekly, monthly, etc.) is it collected?
- Who is responsible for the collection of the data?
- Is it routinely collected/documented?
- What is the data source?
- Do I have to develop any tool(s) to collect the data?
- How do I want to present the data?

7.3 DATA COLLECTION TOOLS

In collecting data for monitoring quality of care, you need to know the appropriate tools to use. The common tools used for data collection in the facilities are:

Registers: Registers are the standard collection tools used in all facilities to record the service delivery data. They mainly serve as the primary source of data for the services being rendered. If the service is provided and it is not documented in the registers, it makes it difficult to know the performance of the service that we are delivering to the population. Examples of registers are delivery register, outpatient register, admissions and discharge registers, postnatal care registers etc.

Reporting forms: These forms are used to summarize service delivery from the registers periodically (weekly, monthly, quarterly, etc.). These forms are usually submitted by the facilities to its Primary Health Care Unit (PHCU) and/or Woreda Health Office to be entered into HMIS for onward transmission to the Regional Health Bureau and Federal Ministry of Health.

Checklist: It is a form used to collect information on a particular service delivery e.g. Surgical Safety Checklist.

Observational guide: It is a tool that contains information to record observations on processes and procedures in service delivery e.g. observation guide could be used to observe and record how health staff care for and manages a woman in labor.

Questionnaire: This could be closed-ended (provides alternative responses for the interviewee to choose from) and open-ended (does not provide any alternative responses and interviewee is encouraged to express their view). The commonly used questionnaire in Health care is client satisfaction survey.

Interview guide: It is a set of broad open-ended questions to be used by the interviewer as a guide for the interview.

Chart audit: An examination of medical records to determine what has been done and see if it can be done better.

7.4 INDICATORS IN HEALTH CARE

An indicator is defined by OECD/DAC as "*A **quantitative or qualitative factor or variable that provides a simple and reliable means to measure achievement, to reflect changes connected to an intervention, or to help assess the performance of a development actor***". (OECD/DAC Glossary of Key Terms in Evaluation and Results Based Management, May 2002).

According to the definition adopted by USAID, an indicator is: "*A **quantitative or qualitative variable that provides reliable means to measure a particular phenomenon or attribute***". (USAID Glossary of Evaluation Terms, March 2009).

An indicator needs to have the following:

- A. Numerator (data element that is how many patients received this step in the care pathway).
- B. Denominator (data element that is how many patients we expect to receive this step in the care pathway).
- C. A multiplier or factor.
- D. The data source.
- E. The frequency (daily, weekly, monthly, etc.) of data collection.

Generally, in order to know whether our performance is good, we often take two measures and calculate a rate/percentage. The calculation gives the team a reference point. For example, your clinic could have tested 30 new ANC patients for HIV this week. Is that good or bad? You don't know without a reference point. How many new ANC patients did you see in total this week? If it was 30 then your performance is excellent, if it was 100 it's rather disappointing. I can't interpret your 30 tests until I know the total number of patients who should have received this service.

Components of an indicator

Proportion of patients HIV tested at first ANC visit =
$$\frac{\text{Number tested for HIV at first visit}}{\text{Number needing an HIV test at first visit}} \times 100$$

Numerator (Data element)

Denominator (Data element)

For percentage.....

Figure 22: Component of an indicator

Key tips for defining an indicator

The following are the tips for stating an indicator:

- A. Number of...
- B. Average...
- C. Proportion of...
- D. Percentage ...
- E. Rate of...

Very often most QI teams state an indicator/measure wrongly. The indicators or measures are **not** stated using the following word.

- A. Improve
- B. Reduce
- C. Increase
- D. Decrease

7.5 DESIGN QUALITY IMPROVEMENT INDICATORS

Based on Module 6.4, participants should guide a quality improvement team to come up with indicators on the following topics areas: reducing clients waiting time, improving adherence to partograph, reducing Emergency Caesarian response time, reducing stock out of oxygen, improving adherence to malaria protocol and reducing cervical dilatation of laboring pregnant mothers.

Small group exercise

- Each group would be assigned one the following.
- **Design a quality improvement indicator for a QI team working on the following:**
 - Reducing clients waiting time at OPD from 5 hours to 3 hours from February 2018 to July 2018 – **Group 1.**
 - Improving adherence to partograph from 40% to 80% from February 2018 to July 2018 – **Group 2.**
 - Reducing Emergency Caesarian response time (time doctor was called and the time of incision) from 2 hours to 45 minutes from February 2018 to May 2018 – **Group 3.**
 - Reducing stock out for oxygen from 20% to 5% from February 2018 to April 2018 – **Group 4.**
 - Improving adherence to malaria protocol from 40% to 90% from February 2018 to July 2018 – **Group 5.**
 - Reducing average cervical dilatation of a laboring pregnant woman on arrival at the facility from 7cm to 5cm from February 2018 to December 2018 – **Group 6.**
- Write out the indicator, its components and the data source.
- Report out your work.
- Time: 75 minutes

7.6 LINKING MEASUREMENT AND AIM

Measurement addresses the question, “How will we know a change is an improvement?” in the Model for Improvement framework. There are three types of measures:

- **Outcome measure:** this measures the aim statement. Based on what you are trying to improve or reduce, there is the need to measure this regularly (daily, weekly, monthly) and track the performance over time. You can have multiple outcome measures to measure the PDSA aim and the overall aim.
- **Process measure(s):** this measures the change idea and its specific activities. Based on your change idea you have, you probably have to do a few things (activities) to test the change. Each activity comes with a certain target. To measure how well you have executed the activities as against how you planned to do it, (this will be documented in the PDSA plan) we need to collect data on the processes we are trying to impact.
- **Balancing measure(s):** in module 5 we learned about systems and processes and how several parts of a system interact with each other. When trying to fix one part of the system, other parts might experience a negative or positive impact of the change you are testing even though it is not your intention to change these other parts of the system since they are not causing a problem. A balancing measure is an indicator that tracks some of these other parts of the system so that any harm caused will not go unnoticed.

It is important to always keep in mind that measuring does not bring improvement so don't overdo measurement. As much as possible rely on data that is already routinely collected by the system; measure key indicators to be able to tell what you are doing; and try to keep measurement as simple as possible since it should be something that becomes part of the daily routine.

Example: Measures (delayed start of CS)

A facility has a problem with delayed start of emergency caesarean section (CS) since the facility has only one theatre and two anaesthetists. However, management has noticed that the number of CSs has increased in the past year and the number of fresh stillbirths has equally increased. A process map analysis was done and it was estimated that from the time the doctor request for CS to the time CS starts it takes on average 125 minutes. This delay is mainly due to delayed arrival of the anaesthetist at the theatre.

The facility aims to reduce the average emergency CS response time from 125 minutes to 45 minutes between 1st January 2018 and 31st March 2018. The change that is being tested is to create a doctors' room for the anaesthetist to rest when on duty to avoid travel from home in the night.

Outcome measure(s):

- 1) *Emergency CS response time in minutes (from decision to incision).*
- 2) *Fresh stillbirth rate.*

Process measure(s):

- 1) *Average time the anaesthetist takes after being called to arrive at the theatre.*
- 2) *Percentage of times the anaesthetist uses the doctors' room to rest.*

Balancing measure:

- 1) *Cost involved in creating a doctors' room to rest.*

7.7 MEASURES OF CENTRAL TENDENCY

The measure of central tendency is also known as center or location of a distribution. It is a central or typical value that describes a distribution. The most common measures of central tendency are:

- 1. Arithmetic Mean:** This is calculated as the sum of collection of numbers divided by the count or number of numbers in the collection. The arithmetic mean is the mostly used measure of central tendency but this is greatly influenced by outliers. Outliers are values that are very much larger or smaller than most of the values.

Example: The age (in days) of six newborns with infection who were admitted in a health centre X in the month of September 2017 are 7, 8, 10, 7, 9 and 27.

$$\text{Arithmetic Mean} = \frac{7+8+10+7+9+27}{6} = \frac{68}{6}$$

$$\text{Arithmetic Mean} = 11.3 \text{ days}$$

- 2. Median:** The median is the middle value of an order (i.e. either arranged from the least to the highest or arranged from the highest to the lowest). If the data set is an odd number of observations, then the median is the middle value; but, if the data set is even number of observations, then there is no single value of the median. The median is then calculated as the average of the two middle values. One of the advantages of a median over the arithmetic mean is median is not influenced by outliers.

Example: In the above case, the median is 8.5 days (Re-ordering from lowest to highest: 7, 7, 8, 9, 10, and 27).

- 3. Mode:** The mode is a frequently occurring value in the data set. In a given data set or observation you may have no mode or the mode will be one value (unimodal) or two values (bimodal).

Example: In above case the Mode is 7 days (because it is the highest occurring number i.e. it occurs two times).

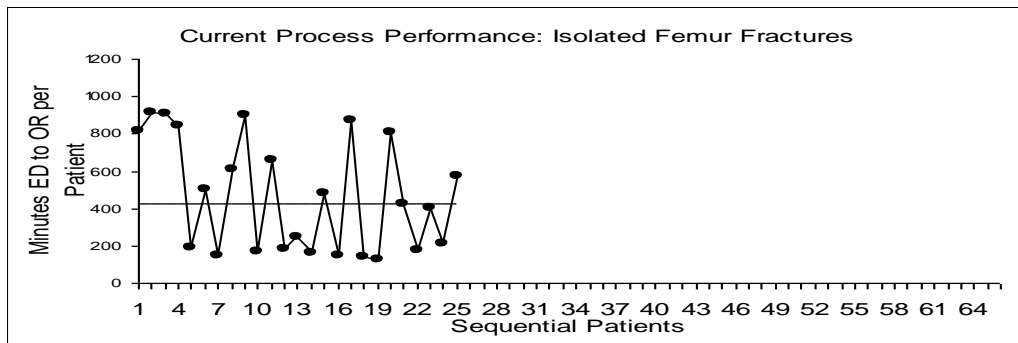
Small group exercise

- Using the following data:
 - 5,19,3,0,16,14,8,7,4,3 – **Group 1**
 - 48,6,57,39,52,25,33,37,41 – **Group 2**
 - 2,9,7,5,24,3,7,7,6,6,2 – **Group 3**
 - 0,19,29,14,2,7,22,25,9,7 – **Group 4**
- Calculate the mean, median and mode.
- Time: 30 minutes

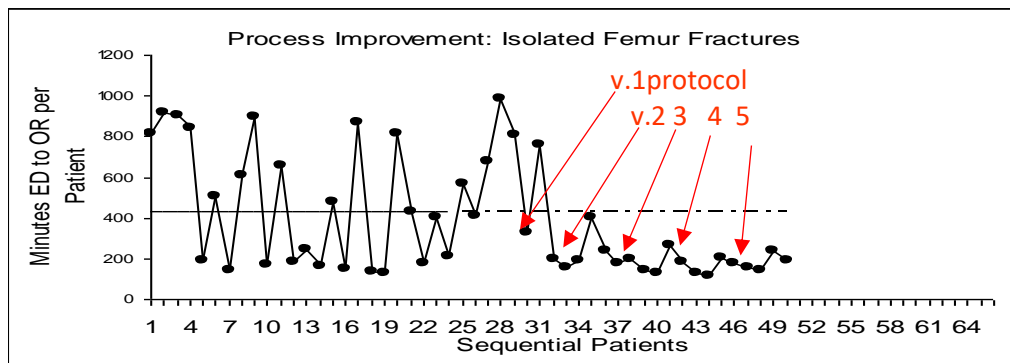
7.8 RUN CHART AND ITS USE

A Run Chart is also known as Time Series Chart or Trend Chart. It is a graphical display of data plotted in some type of order. A run chart is a line graph with a median line. It is used for communicating and understanding variation. The following are the fundamental uses of a run chart in quality improvement.

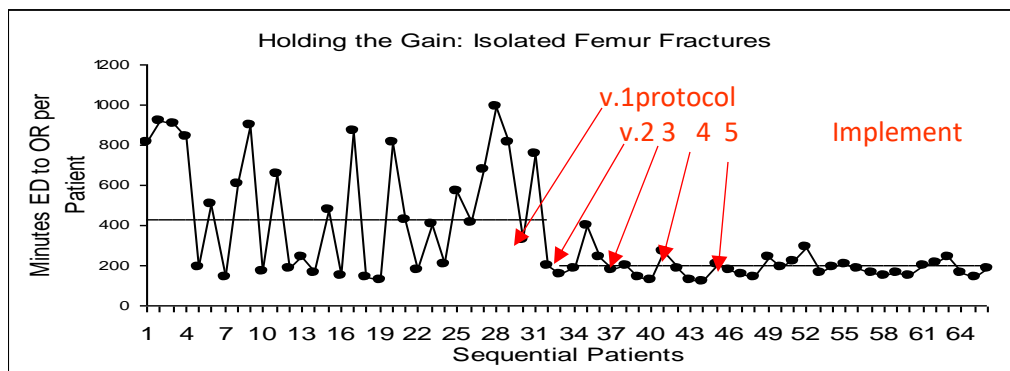
- A. Display data to make process performance visible.



- B. Determine whether a change resulted in evidence of improvement.



- C. Determine whether we are holding the gain made by our improvement.



7.9 CONSTRUCTING A RUN CHART

The following are the steps involved in constructing a run chart:

- 1) State the question that the run chart will answer and obtain data necessary to answer this question.
- 2) Develop the horizontal axis. This is usually a time scale (days, weeks, months, quarters, years etc.).
- 3) Develop the vertical axis.
 - Estimate the range (the smallest value to the largest value) of the data points to be plotted on the vertical axis.
 - Then use this range to develop a vertical scale for the run chart.
 - Be sure to construct your vertical scale so that it is high or low enough to encompass variation in future data and reference values such as your goal or a benchmark if it is meaningful to the chart.
- 4) Plot the data points.
 - Make a dot or another symbol.
 - The dot should always be distinguishable from the line.
 - The data are communicated through the dots, not the line.
- 5) Label the graph completely with a useful title.
 - Label the horizontal axis with the sequence of data (case 1, case 2 or Jan, Feb etc.).
 - Label the vertical axis with the name of the measure or characteristics that you are studying.
- 6) Calculate and place the median of the data on the run chart.
- 7) Add additional information to the chart.
 - A goal or target line if appropriate.
 - Annotate unusual events, changes tested or other pertinent information at an appropriate time location.

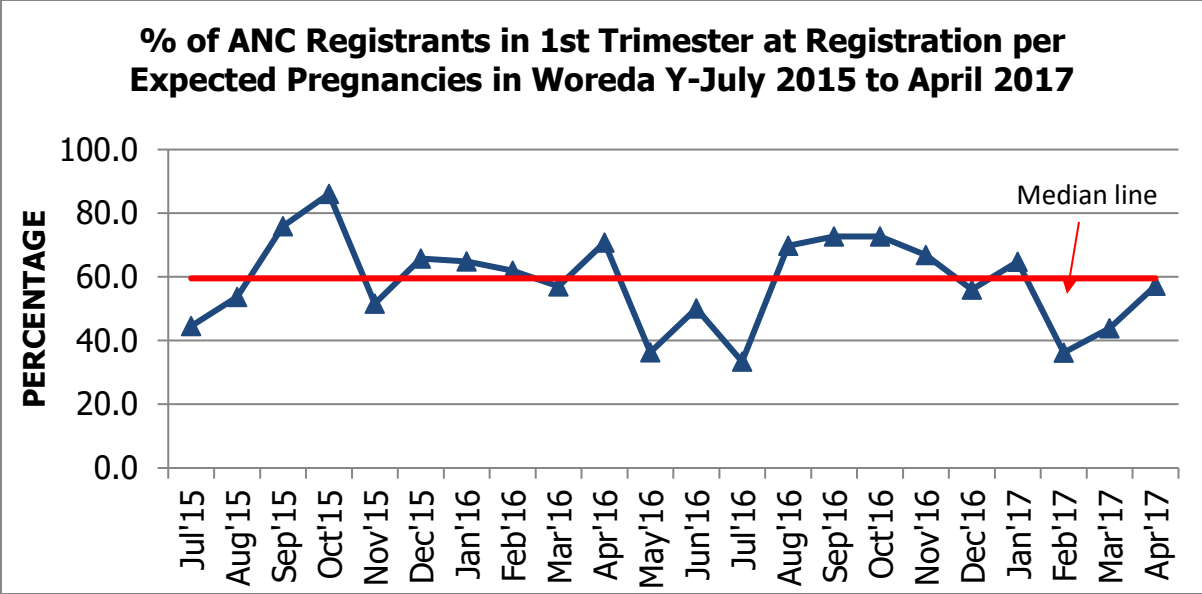


Figure 23: Example of a run chart

Small group exercise

- Work on the following scenarios.

Scenario 1 – Waiting Time in the Facility

Your facility collected the following data over the past 15 weeks on waiting time (time of entry and time of exit) of your patients. Use the data below to construct a run chart using both the flip chart and MS Excel.

Weeks	Wk 1	Wk 2	Wk 3	Wk 4	Wk 5	Wk 6	Wk 7	Wk 8	Wk 9	Wk 10	Wk 11	Wk 12	Wk 13	Wk 14	Wk 15
Total waiting time (minutes)	3350	4176	3260	4160	3110	2750	2628	2910	2860	2655	3050	2772	2920	4245	4470
Number of patients	10	12	10	13	10	10	9	10	10	9	10	9	10	15	15

Scenario 2 – Adherence to Malaria Protocol

Your facility collected data on adherence to malaria protocol for the past 9 months. Use the data below to construct a run chart using both the flip chart and MS Excel.

Month	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17
Adherence to Malaria Protocol	3	5	8	4	7	8	8	5	6
Number of folders sampled	10	10	10	10	10	10	9	10	10

Scenario 3 – Institutional Neonatal Mortality Rate

Below the neonatal deaths and live births from Woreda X. Use the data below to construct a run chart using both the flip chart and MS Excel.

Month	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17
Number of Neonatal deaths	3	0	1	4	3	6	2	5	6
Number of Live births	200	189	170	180	268	291	255	280	295

- **Task:** Construct a run chart using both flip chart and MS Excel. The chart should be well labelled.
- Time: 60 minutes

7.10 INTERPRETATION OF RUN CHART

There are four (4) rules used to identify non-random signals. Identifying non-random signals means that something has influenced the performance; the change in performance identified did not occur by chance. This in itself does not mean improvement. We need to look further after identifying non-random signals.

- **Shift:** Six (6) or more **consecutive** data points on one side (either all above or below) of the **median**. **Skip values or points on the median** and continue counting points because values or points on the median do NOT make or break a shift.
- **Trend:** Five (5) or more **consecutive** data points **all going up or all going down**. In this rule a median line can be ignored. Like points (consecutive data points with the same value) are counted as one.
- **Too many or too few runs:** this rule has 4 steps, however first we need to know what a run is. A run is a group of data points on one side of the median. To count the runs we: Step 1) **count** the number of **data points** that do not fall on the median; Step 2a) **count** the number of times the **performance line crosses/cuts the median**; Step 2b) add a **constant 1** to the value from step 2a, this gives you the number of runs; and Step 3) make use of the reference table and determine whether your runs are within or out of the normal range.
- **Astronomical data point:** a data point that is obviously different from the other points, it falls out of the normal variation of the performance.

Determine the indicator you are interpreting: coverage, morbidity/mortality, time etc. What is the expectation if you want to make improvement in this indicator, to increase or decrease?

When was the change introduced, is the signal identified due to the change?

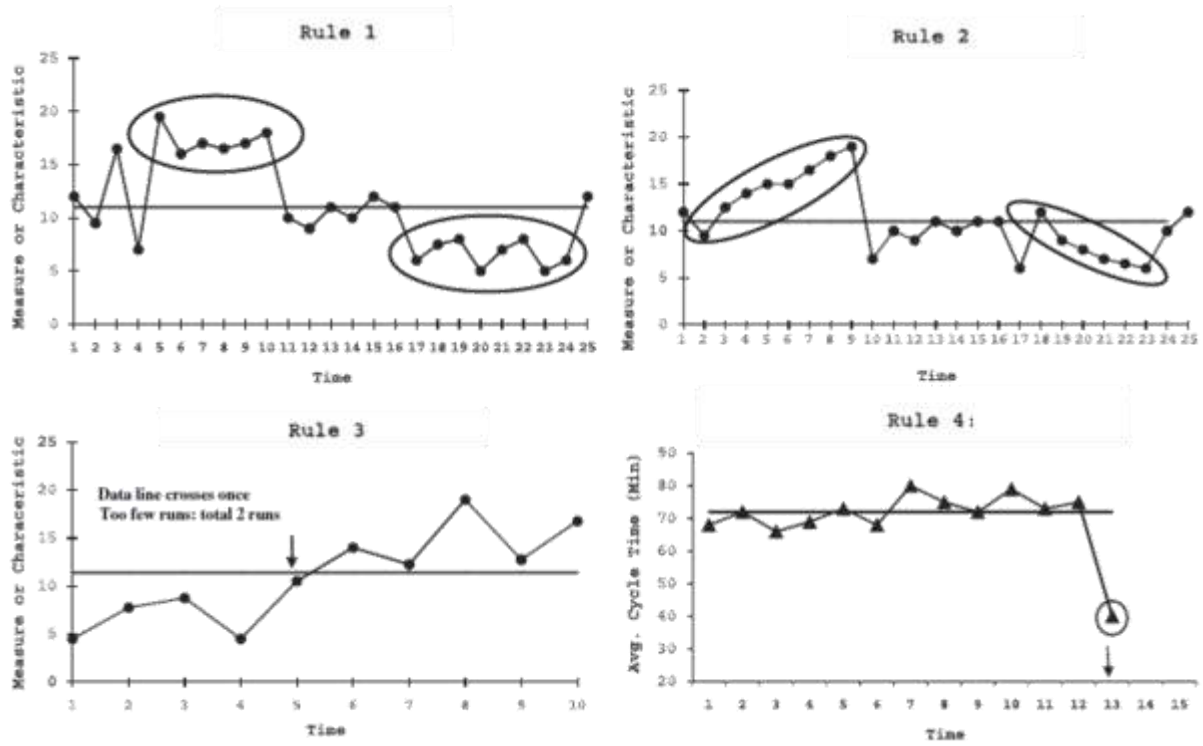


Figure 24: Example of run chart showing the four (4) rules

7.11 QUALITY IMPROVEMENT PROJECT WORK

Section III: Measurement

Instruction:

- Building on the above small group exercise, section I (problem Identification, prioritization and aim statement) and section II (developing changes) component of your quality improvement project and finalize the design of quality improvement indicators and measures specific to your quality improvement project.
- Use the project workbook template in the annex section (Annex: quality improvement project workbook).
- Also use the project workbook template in your practical work at the facility after the training.

7.12 MODULE SUMMARY

The goal of data for improvement is to aim at usefulness not perfection. Data should be used for learning but not judgement. Obtaining data for improvement involves some effort and resources and must be factored in at the planning stage of the PDSA. The main difference between a line graph and a run chart is a **line graph does not have a median** while the **run chart has a median line** plotted on the graph. Always remember this quote from Dr. Donald Berwick “some is not a number, soon is not a time”.

Using Model for Improvement, measures come in three types; outcome, process and balancing measures. The outcome measure is linked to the aim, the process measure to the change being tested and the balancing measure keeps track on other parts of the system.

Run Chart Rules: Rule 1: Shift, 6 or more consecutive points on one side of the median; Rule 2: Trend, 5 or more consecutive points all ascending or descending; Rule 3: Too few or too many runs; and Rule 4: Astronomical data point.

MODULE 8: TESTING CHANGE

Module Description: In this module participants will be introduced to the last part of Model for Improvement (MFI), a framework used for testing and implementing innovative change ideas. After answering the three questions of the MFI, it is important to plan your PDSA cycle and test the change to learn about its potential impact under different sets of conditions. In this module we learn why to test, how to test and what decisions to make based on the information we get from the test.

Module Objective: By the end of this module the participants will be able to plan, test and implement change for improvement to address identified and analyzed health care quality gaps.

Enabling Objectives:

- Apply principles of testing change.
- Test change using Plan-Do-Study-Act cycles.
- Use Run Chart rules to assess impact of the change tested.
- Differentiate between testing and implementation.

Module outline:

This module has the following sessions:

- Introduction
- Principles of Testing Change
- Plan-Do-Study-Act Cycles
- Further testing or implementation
- Quality Improvement Project Work – Section IV
- Summary

8.1 INTRODUCTION

Small group exercise

- We are going to build a bridge that can carry a small bottle of water (500ml) and is high enough for a plastic cup to pass under.
- The only material that can be used is:
 - 2 flipchart sheets.
 - Masking tape/tape.
- The bridge should stand on its own, not to be taped to or supported with any object or person.
- Time: 35 minutes

How does this exercise relate to the Model for Improvement, a framework for testing and implementing innovative changes for improvement? During the exercise:

- What was your group's aim?
- What did your group measure?
- What change(s) did your group test?
- What information was captured in your plan?
 - What did your group predict will happen?
 - Did the group have a leader?
 - Did individuals have clear roles in contributing to the overall outcome?
 - Was your group successful in building the bridge that met the requirements?



Associates in Process Improvement

Figure 25: The framework for testing and implementing innovative changes for improvement

8.2 PRINCIPLES OF TESTING CHANGE

Reflection question? (Time: 2 minutes)

- Why should we test our change and not just implement it?

Once a change has been developed, it should be further explored and refined by testing. Testing is a way of trying the change on a temporary basis and learning about its impact. The idea of testing a change does not seem to come naturally. Tests should be designed so that as little time, money, and risk as possible are invested while at the same time enough is learned to move toward full-scale implementation of the change. The PDSA cycle is a useful framework for planning, carrying out, and learning from a test of change. Results of a test sometimes turn out opposite from what was predicted. Unfortunately, many see this as a failure. The success of a test lies in what is learned from it, no matter how it turns out. This learning increases the likelihood that the effort will lead to a change that improves performance and is permanent.

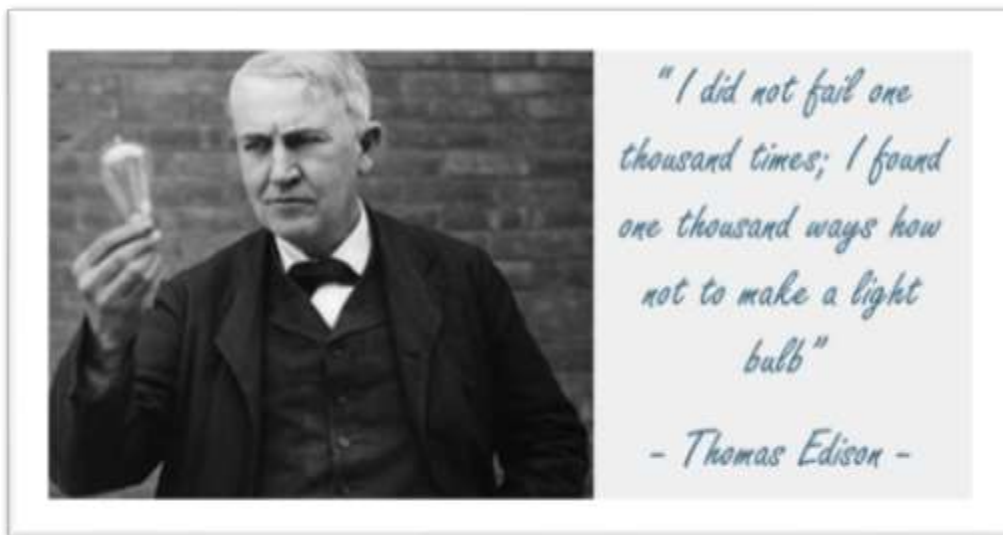


Figure 26: There is no failure in QI, unexpected results are lessons learned on how not to do it

There are certain principles you should try to follow when testing change:

1. **Test initially on a small scale and increase the scale of the test on the basis of learning;** because even though you might have a certain degree of belief that the change is the solution to your problem, there is usually some risk involved when testing change. A

change developed in an office will probably not perform as expected when put into action. By using an approach of sequential testing that starts with testing on a small scale, we can learn about the impact of the change and its side effects. Small scale is not equivalent to small change; rather the test is initially tried with for example: one person, for a short time period or with one component (such as a questionnaire) of the change. The scale of the test is then increased as the ability to predict the results of a test improves.

- 2. *As the scale of the test is expanded, include different conditions in your test.*** What may work on a quiet Wednesday afternoon in a consulting room of your facility, might not work the same way on a busy Monday morning. What may work with one consultant with high buy-in in the change, may not work with another consultant who thinks the change will not work. As you are scaling up your change, possible circumstances that could affect performance should be discussed and plans to learn about their impact should be included in the tests.
- 3. *Plan the test, including data collection.*** A test of change may not be successful because the test was not planned well. To plan a test, people should explicitly document what is being tested and who will do what, when and where. This should include a plan for the collection of data.

8.3 PLAN-DO-STUDY-ACT (PDSA) CYCLES

The Plan-Do-Study-Act (PDSA) cycle is a framework for testing and implementing innovative change ideas. The cycle allows us to learn from the impact of the change idea in a specific context and build the degree of belief that the change is effective in addressing the problem. It helps to answer the second question of the MFI, “What change can we make that will result in improvement?”

The PDSA cycle is made up of four parts. These are:

Plan: this includes the following components:

- PDSA aim.
- Prediction.
- What, who, when, where and how for each activity that is part of the change.
- Data collection.

Do: carry out the plan:

- Documentation of observations.
- Collect data for the identified indicators.

Study: review of documentation:

- Review notes of any observations.
- Analyze data and present in graphs (preferably run charts).
- Annotate the graphs.
- Interpret the data.

Act: make a decision for the next cycle:

- **Adopt:** high degree of belief that the change is working, proceed in implementation.
- **Adapt:** modify to test in another setting to increase the degree of belief.
- **Abandon:** change has not led to improvement, or has worsened the system. Drop the change and start testing something new.

Irrespective of the decision you make, you plan for a new cycle of testing OR implementing change.

We need to keep in mind that in everything we change, people are involved. Any change in the health care we provide, affects health workers and patients/families. We learned in Module 2 that introducing change is not easy due to the human side of change. People might be resistant to the change you want to make for various reasons. Testing on a small scale, involving few people, is therefore a good start. Once the degree of belief increases and you have evidence that the change is working, it will be easier to convince people to be part of the change. The more we test a change in different sets of conditions (e.g. different time in the day, different day in the week, busy times and less busy times, involving one doctor or multiple doctors, involving 5 patients or 25 patients, etc.), the more we get a higher degree of belief that a change is resulting in an improvement.

Sometimes, we test a change idea under a different set of conditions and still we see no change in our processes. In that case the change is probably not what we are looking for. It is not addressing the problem. This does not mean failure. It has allowed us to learn that this particular change is not working.

It is important to test ***small and quick cycles*** when the degree of belief is small. This means cycles of testing that don't involve too many people and resources and can be done in a day(s), week(s) to encourage quick learning from the impact of the change. Ensure to test the change in ***various conditions*** to have a good degree of belief before implementing change.

When testing changes you can test ***multiple PDSAs in parallel***; however, ensure that the different PDSAs are targeting different aims. Otherwise, testing multiple changes to achieve one aim will not allow you to determine which of the change has resulted in improvement.

You need evidence to determine whether the change has resulted in improvement so always collect ***data over time***. In QI we do not do before and after measurement since it hides a lot of detailed information about the impact from the change we are testing.

8.4 FURTHER TESTING OR IMPLEMENTATION

When studying your data in the **study** part of the PDSA, we want to analyze and interpret data over time presented in a Run Chart, which was introduced in Module 6. Application of the Run Chart rules will help to interpret the data and will answer the third question of the MFI, “How will we know a change is an improvement?”

The “Act” part of the PDSA cycle is about making the decision to adapt, adopt or abandon the change. This decision should be guided by the lessons learned from the impact of the change on the system. Whilst learning of the change and its side effects, our degree of belief on how well the change can solve our problem is changing. Once the degree of belief is high and the risk is low or moderate, we can proceed in making the change permanently part of the system.

Example: Testing

The QI team of Hospital X had the idea to improve their emergency responsiveness by using a triaging system. They assigned two nurses to triage each case arriving at the emergency unit within 5 minutes. Based on the assessment, they will tag the patient with a red, yellow or green label. The red labeled cases are in need of immediate care and will thus be attended to immediately, initiating first treatment within 15 minutes.

The idea was initially tested with two nurses and one consulted during the night shift on Tuesday. That night they received 3 patients so it wasn't too busy but the change seemed to work well.

Next the team tried it during the day with two other nurses, it took them a little while to get used to the system, but apart from some challenges — forgetting to give two patients a tag and inability to triage all patients within 5 minutes — they could still see the benefits of the change idea based on studying the collected data.

The team tested the idea under various other conditions till they were convinced that the change had brought improvement to their emergency responsiveness. At the end of the month they had triaged 85% of the patients within 5 minutes and had been able to initiate treatment to all red labeled patients within 25 minutes. They decided that going forward they will tag all patients by putting a red, yellow or green sticker on the patient chart after triaging.

8.5 QUALITY IMPROVEMENT PROJECT WORK

Section IV: Testing Changes

Instruction:

- Building on the section I (problem Identification, prioritization and aim statement), section II (developing changes), and section III (measurement) of your quality improvement project. In section IV we need to finalize our plan (including the details on the activities: Who, Where, When, How; and the data collection) before we can start testing our change.
- Use the project workbook template from the annex section
- Use the project workbook template in the annex section (Annex: quality improvement project workbook).

8.6 MODULE SUMMARY

The MFI is a framework to test, learn from and implement innovate change ideas. It has three fundamental questions that refer to the aim, change ideas and measures and the PDSA cycle, that allows to execute ideas and learn from the impact.

It is essential to plan and test change to learn from the impact and possible side effects, increase the degree of belief that the change is effective and make use of the lessons learned to refine the change, before implementing the change. Key in testing change is to start testing on small scale to minimize the risk and include various conditions when expanding the scale. When planning change, also ensure to include a plan for data collection.

The plan of the PDSA should include the PDSA aim, prediction, activities of the change idea and what, who, when, where and how activities will be executed. The do is about carrying out the plan and documenting the required info to study. In the study we put our data in run charts, we use the 4 rules to interpret the annotated run chart and then we act to adapt, adopt or abandon the change.

MODULE 9: PLAN FOR HEALTH CARE QUALITY IMPROVEMENT IN YOUR FACILITY

Module Description: In this module we will get acquainted with some of the key preparatory activities that should be taken into consideration when you are planning for Quality Improvement in your health care facility. What is a QI team? Who should be part of the team? What are their roles and responsibilities? These questions will be answered in this module. However, preparing for QI is not limited to constituting a QI team. Focus on leadership engagement and buy-in are equally important, as well as identifying your current performance to know where to prioritize your QI interventions and determine the focus area.

Module Objective: By the end of this module the participants will be able to adequately prepare and plan for quality improvement in their health facility.

Enabling Objectives:

- Describe the quality improvement structure in the facility.
- Describe the quality improvement team composition and their roles and responsibilities.
- Plan for quality improvement execution in the facility.

Module outline:

This module has the following sessions:

- Introduction
- Quality Improvement Structure – Quality Improvement Teams
- Quality Improvement Structure – Roles and Responsibilities of Quality Improvement Teams
- Planning for Quality Improvement
- Summary

9.1 INTRODUCTION

Quality improvement projects will be effectively implemented and lead towards improvement if they are carefully designed and planned at the beginning of the project. Such planning of quality improvement projects could happen at various levels and organizations. Within the health sector, improvements could be planned by the Federal Ministry of Health, Regional Health Bureaus, Zonal Health Departments, Woreda Health Offices, Hospitals, Health Centers, Health Posts and by the community.

The planning involves establishing a functional team, mobilizing resources for execution, engaging relevant stakeholders in the process, planning for baseline data collection and prioritizing improvement topics for a defined time setting a clear vision where the facility should go in improving quality.

The principles of quality improvement including the design, planning and execution processes are applicable at all levels of the system and can be applied by any team. For example, the FMOH can establish a team to reduce mortality among patients who sustained car accidents within the country while thinking big. This will involve the establishment of a team that extends beyond the health sector to include the fire and emergency department, traffic police office, transport authority, etc. On the other hand, the FMOH could also be a key driver for quality improvement implementation at hospitals and health centers through its routine work. For example, FMOH and RHB quality units are expected to support quality improvement teams at health facilities by facilitating QI trainings and providing quality improvement coaching. This support enables health facilities to design, plan and execute facility level quality improvement projects like improving adherence to clinical protocols and reducing mortality among admitted patients. Though the discussion in this module might focus on health facilities (health centers and hospitals) the principles will be applicable also at all administrative structures within the health sector and beyond.

9.2 QI STRUCTURE AT THE FACILITY – CONSTITUTION OF QI TEAMS

Reflection questions? (Time: 10 minutes)

- Who should be included in a QI team?
- Should anyone be excluded?
- How big should the team be?
- How frequently should the team meet?

Quality improvement teams in health facilities are established with a purpose of improving care and service provided to the population they serve. The members of the quality improvement team are expected to constitute facility leaders (system leader), unit heads (day to day leader), subject matter experts and representatives from the population.

Facilities and institutions might establish a stand-alone unit that is dedicated full time to take on the quality agenda at a higher level. Such structures include a quality directorate at the FMOH level, a dedicated quality unit in regional health bureaus, and quality units in bigger hospitals. These units usually take the responsibility to build quality improvement capability and provide coaching to quality improvement teams in their respective areas.

Key positions/roles to be included in a functional QI team:

- **Facility Leader (system leader):** someone with enough authority in the organization to test and implement a change that has been suggested and to deal with issues that arise; and who *understands both the clinical implications of proposed changes and the consequences such a change might trigger in other parts of the system*. E.g. Management representatives (Medical director, CEO). In addition to relating the different parts of the system, the QI projects should be owned and managed by the management so that it will get the necessary attention and resources for its success.
- **Unit Head (Day-to-day Leader):** this is the critical driving component of the team and the QI work, assuring that changes are tested and overseeing data collected by those

assigned. This person should have enough understanding of the system and how different parts interact and thus the effect of changes on the system as a whole. He or she should be able to maintain a good working relationship with systems leader and subject matter experts but needs to devote a significant amount of time to the improvement work. Unit heads are also expected to serve as Quality Improvement Coaches when there is no other designated QI coach to support the QI teams.

- **Subject Matter Expert:** Though this role is often covered by the systems leader or day-to-day leader already, it is to emphasize that we require the relevant subject matter experts, *those who work in and contribute to the process you are trying to improve*, when trying to make change to the system. E.g. doctors, nurses, lab technicians, midwives, pharmacists, etc. Moreover, this person should have a good working relationship with colleagues (be a good team player) and is *passionate/enthusiastic about improving the work* environment and the health outcomes of the facility. *E.g. a team working on Maternal and Neonatal Health needs a midwife to be included as subject matter expert on the team. Since a midwife provides a lot of health care services to this target group, she knows the ins and outs of the service delivery components that need to improve. Apart from being an experienced midwife, you would probably look out for a midwife that is well respected by his or her colleagues, works well with the team and is willing to put a little extra effort to try something new if it can change things for the better.*
- **Customer/Client/Patient:** someone who represented the patients and who has experienced the process of interest. Sometimes committees or marketing groups are already in place where a representative can be taken from to give information to the process from the perspective of the client. After all we want to improve the system to the benefit of the clients.

Good teamwork is essential in all settings, it shows that: 1) People are working towards a common goal; 2) People share their varied skills in complementary roles and in cooperation with each other. When there is effective teamwork, facilities perform better since it creates synergy – the combined effect of the team is greater than the sum of individual efforts. Working in a team can result in creating new solutions and ideas, based on individual’s perspectives,

experience and skills, that can solve complex problems that may be beyond the scope of any individual.

The core QI team should not be too big and too small. This means all relevant units/departments should be included in the QI team. A team size of 6-10 members is probably most preferable, since in such situation individual performance is still good. When team size exceeds 11 members, individuals exert less effort to achieving the team goals.

Depending on the size of the facility and the number of areas where improvement would be applied, facilities could establish one or multiple quality improvement teams.

Example: QI team

If your QI team focus is on Maternal, Newborn and Child Health (MNCH) you probably will have a core team that includes representatives of: Laboratory, Pharmacy, Management, Clinician/ Pediatrician/Obstetric Gynecologist, Maternity and Pediatric Wards. Any change targeting on improving MNCH is likely to impact on some of the care processes of these units/departments. Often senior staff of the unit or the unit in-charge are selected to be part of the core team, since they are in general well respected and have more authority to make change. This situation would result in a core QI team of 6-9 members.

9.3 ROLES AND RESPONSIBILITIES OF QI TEAMS

Reflection Questions? (Time: 5 minutes)

- **Roles and Responsibilities of QI teams**
 - Brainstorm on the Roles and Responsibilities of QI teams
 - Write your thoughts on sticky notes/notebook, each role/responsibility on a separate sticky note/page.
 - Identified roles and responsibilities under thematic areas (affinity diagram).

- **Leadership/Management engagement and buy-in**
 - The level of management support can make or break the QI team and its successes, it is therefore key to get management to support the QI initiatives.
 - Align the QI efforts with the priority areas identified by management. What are the facility's strategic goals?
 - When engaging leadership, evidence is important. Be well prepared for the meeting and be to the point. Show graphs to back the story. Demonstrate how the work will help the facility to better its performance.
 - Create a **burning platform**. Indicate that the current state is very uncomfortable and unacceptable and that the future can be bright.
 - Whenever possible make the management members be an active member of the QI team and become the leads for the QI project.

Example: A case of burning platform

The problem is we don't always see the "burning platform" until it is too late. We are comfortable in our position. It used to be great and we haven't noticed that the environment around us has changed and our current organisation, job or personal relationship has not adapted to these changes.

Normally, use the example of the frog to illustrate this point. If you put a frog in a hot pan of water, it will immediately jump out. If, however, you put a frog in a pan of cold water and slowly heat it up, the frog won't notice. Its skin is not able to detect small changes in temperature. It will just adapt its own body temperature to the external temperature without recognising the danger it is in. If you heat the water slowly enough, it will just stay in the pan until it boils!

Sometimes we need to help people notice their current working practices and systems are inconsistent/at odds with the changed environment.



Figure 27: The frog in the burning platform

- **Innovators for improvement**
 - Remember the ***Rogers Diffusion of Innovation Curve*** introduced in Module 2. Not everyone accepts innovation/change at the same pace. Some are innovators and are the first to try their hands on the newest gadgets, social media platforms, fashion or QI change ideas. Others need a little more time, but once the early adopters see that the innovators are thriving, they are easy to convince. The early and the late majority need a little more time and can be convinced when data is made available to prove how good it is. Laggards take long and are difficult to convince, as a QI team you should focus on getting the early adopters and early majority on board; the others will follow when they are ready. **NB.** *To be an innovator in one area does not mean you are an innovator for everything. E.g. someone can be an innovator in use of mobile phone and has always the newest model of phone but does not follow fashion trends.*
- **Review and update PDSA cycles (plan, test, implement change) during regular QI team meetings**
 - New teams who are not very experienced in the application of the QI methodology should meet at least every other week (twice per month) to conduct problem identification, analysis exercises and effective planning to evaluate test of change ideas.
 - Experienced teams should have monthly meetings after updating the data to review the PDSA and study the data for informed decisions of the new PDSA.
 - Each meeting should be documented. Meeting minutes serve as reference material for the QI team, QI coach and (senior) leadership.
 - QI teams should make conscious effort to debrief/update leadership regularly (preferably every month but at least once a quarter).

Small group exercise

- Draft an agenda/outline for a QI team meeting following the instructions below

Health facilities providing service to “Woreda X” established a learning system where they meet (in a form of review meeting) every quarter to set an agenda for improvement and share lessons among themselves. At their first review meeting, they selected a topic and facility teams agreed to establish QI teams in each facility and proceed forward to execute the QI work based on their local changes.

- Activity 1: Post first review meeting QI team meeting (first meeting for the facility QI team)
 - Activity 2: Regular QI team meeting which is conducted every 2 weeks
 - Activity 3: QI team meeting before going for the second review meeting
 - Activity 4: Debrief meeting with management after review meeting 1
- Time: 30 minutes

Five Stages of team development – Tuckman’s model

Tuckman Model

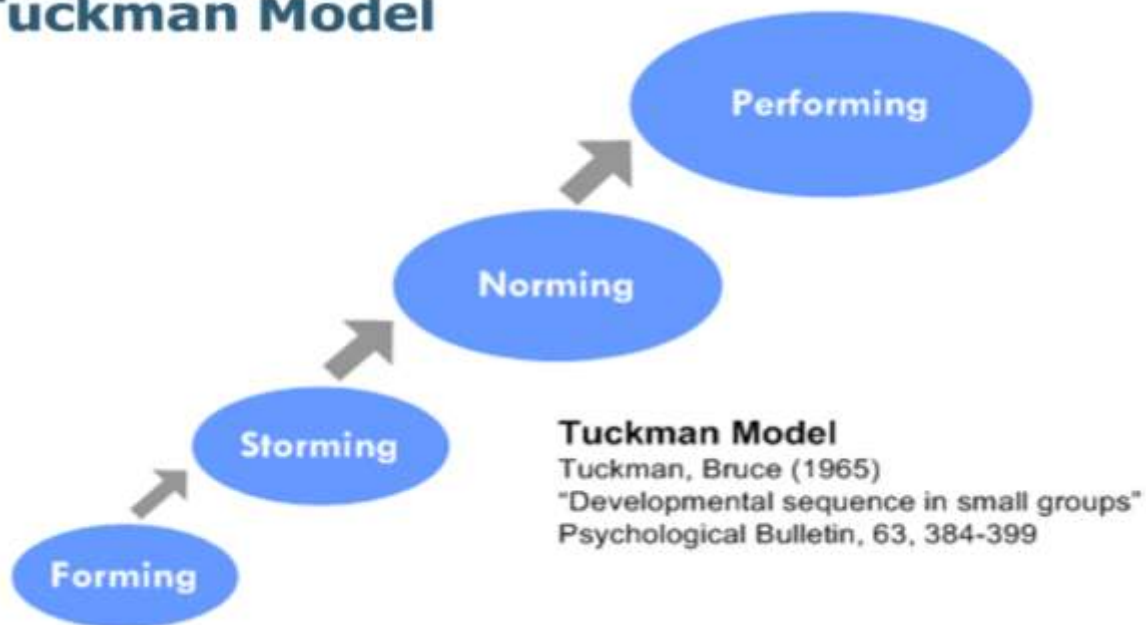


Figure 28: Tuckman Bruce 1965, Developmental Sequence in small group

1. **Bring into being:** Efforts at this stage is spent on defining goals. Individuals might be confused as to why they are in the group and might try to size up the personal benefits relative to the personal costs of being involved. They may keep their feelings to themselves and do not contribute openly.

Example: A team forming stage

Your facility has received a letter inviting 5 staff to represent the facility and be trained on Quality Improvement Methodology. The letter specified some requirements for the participants. You have been asked to attend the training. In the training they tell you that you are part of the facility's QI team. You go through the training and you get back to the facility. You are not too sure what the QI team entails, why you have been selected to be part of that team, etc. For now, you just do what is asked of you, awaiting clarifications and how best this new assignment benefits you and your professional development.

2. **Storming:** During this stage team members open up and test each other, they question values, behaviors, tasks and relative priorities of the goals as well as individuals' roles, responsibilities as contributions. They may also question the guidance and direction of the leader and/or some of the team members and may withdraw and isolate themselves at this point to avoid the emotional tension or because they recognize their values, beliefs and skills do not fit the team's goals. Storming is necessary and should be allowed. Without storming, a team may never perform well and a lot of personal feelings might not be discussed. It is a healthy process in which a team evolves, becomes stronger and develops a common set of values, beliefs and goals.

Example: A team storming stage

The QI team has had a few meetings so far, you are not too sure about the one who has picked up the role of the leader. You think it can be done better, possibly even by you. The team has also said some goals, but you don't really agree with all the goals that were set. One day, you share your concerns during the meeting. Once you have started, other team members add on. The meeting ends in an argument, no clear next steps were documented, and you are not sure whether this will be the end of this team.

- 3. Norming:** Team members resolve their differences, appreciate colleagues' strengths and respect the leader. Team members know each other better now, may socialize together and can provide constructive feedback to each other. Individuals feel stronger commitment towards the team's goals and progress towards it is starting to show. Storming and Norming can overlap and a team can go back in the storming stage severally when new things come up.

Example: A team norming stage

Meetings have continued, the leader approached you personally to talk about your feedback and asked for advice on how to improve in his leadership role. A next meeting was organized and some of the concerns raised before were address, individuals clarified their thoughts in a calmer manner and this feedback was taken on by the team. You can now see the strengths of the diversity on the team and how it improves the team's output.

4. **Performing:** All the joint action finally worked out for the good of the facility, the team is getting results and it is time to celebrate and acknowledge success. As a leader you can delegate much of the work and concentrate on developing team members.

Example: A team performing stage

The team's efforts are yielding results. You have observed that one of the improvement initiatives has shown improvement. You celebrate during the meeting with some drinks and lunch and plan to debrief with management about the achievement.

5. **Adjourning:** We have celebrated our successes and completed our tasks. Team might be formed for fixed period or teams may be separated through organizational restructuring.

Example of team adjourning stage:

You are promoted and have to take up other tasks in the facility, unfortunately your schedule is more than full. You assign someone to replace you on the team.

9.4 PLANNING FOR IMPROVEMENT

Small Group Exercise

- Use the data provided to you (see Annex of this Manual as well). This is real data from one of the facility registers.
- Analyze the data. Be able to pick the right numerator and denominator.
- Design a dashboard in excel, enter the data and plot the Run Chart.
- Determine the baseline performance (all the data provided is baseline data).
- Set a PDSA aim for a testing of one month.
- Use appropriate problem identification and analysis tool to get a better understanding of the problem.
- Develop change idea, indicators and the Plan of the PDSA cycle.
- Complete the PDSA worksheet.
- Prepare for report out.
- Time: 120 minutes (30 minutes for report out)

When you are planning for improvement in your facility you need to apply all the components that have been taught over the past few days. Remember the Science of Improvement where E.W. Deming tells us that improvement can only happen when subject matter knowledge and profound knowledge are combined. Remember the four components of the System of Profound Knowledge and how they interact.

When planning improvement in your facility, all the concepts discussed in past modules come together. What gaps can you identify? What are the indicators that you are tracking? How can you document that data over time? What is your baseline performance? What problem analysis tool can you use to get a better understanding on the identified gap (problem) in your performance? What can you do differently? What change do you want to test?

You try to answer these and other questions with your improvement team. You may need to invite few additional colleagues with the relevant subject matter knowledge to be part of the team for the specific topic identified, e.g. you have identified a problem in the laboratory but your existing QI team does not have a representative of the laboratory included.

The QI team should be informed on the facility's targets and identify where the shortfalls are. Which areas need to be prioritized by the QI team to test change ideas. As a team, you therefore ensure that Quality Improvement activities align with the facility's vision and strategic objectives. The PDSAs the team will test should all work towards achieving this vision.

9.5 MODULE SUMMARY

Planning and preparations for an Improvement Collaborative take place at different levels of the health system. However, independent of such a bigger initiative, you can start your own Quality Improvement in your facility. Some of the key things to consider when starting of a QI initiative at the facility level are leadership engagement, the constitution of the QI team and baseline assessment.

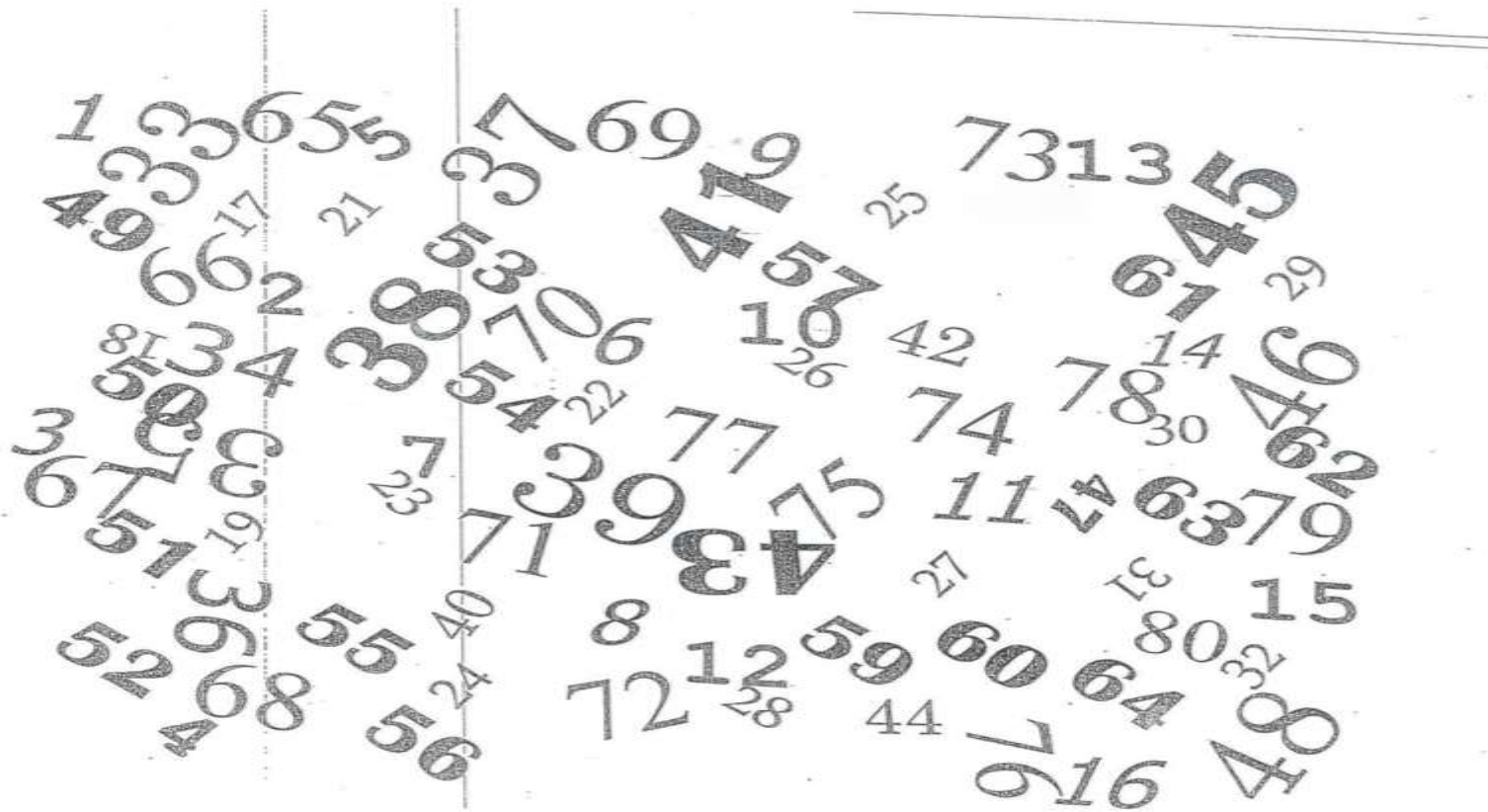
Leadership support is key for successful QI. Having their buy-in and keeping their support is therefore something to focus on from the very beginning. It is important to develop skills in how to optimize your meeting time with leadership to get out the best results; evidence-based demonstrations are the formula for success here. Use data to show where the gaps are, analyze the problem, and demonstrate that this can be resolved.

QI teams are the engine of QI in the facility, they plan, test, review and implement the change ideas. Key roles to have covered on the team are the systems and/or clinic leader, a day-to-day leader and subject matter experts. A core team needs to include representatives of all relevant units in the facility that are involved in providing services to your target group/focus area.

To determine what the current performance is as compared to the facility's targets is a key step in identifying your priority areas. A baseline assessment is a good start to determine the baseline performance for both routine and non-routine data. Baseline assessment can also include assessment of the more qualitative indicators of quality of care, e.g. does the facility have a functional QI team, and how often do they meet?

ANNEXES

MODULE 2: KAIZEN 5S EXERCISE




1
 4933
 17
 21 5
 37
 3
 81 3 4 2
 38
 25
 13 45
 3
 10 26 42
 14 29
 30 46
 37
 24 40
 22 6
 11 47
 31
 8 43 44
 27 18
 12 48 32 15
 16

1 49 33 17	21 5 37	25 470	13 45 29
2 81 34	38	26 10 42	14 46 30
3 15 35 19 61	7 3	27 39	11 47
4 95 36	24 40 8	28 12 44	31 15 48 32

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19		21
22	23	24	25	26	27	28
29	30	31	32	33	34	35
36	37	38	39	40	41	42
43	44	45	46	47	48	49

1	2	3	4	5	6	7
1	2	3	4	5	6	7
8	9	10	11	12	13	14
8	9	10	11	12	13	14
15	16	17	18	19	20	21
15	16	17	18	19	20	21
22					27	28
22	23	24	25	26	27	28
29	30	31	32	33	34	35
29	30	31	32	33	34	35
36	37	38	39	40	41	42
36	37	38	39	40	41	42
43	44	45	46	47	48	49
43	44	45	46	47	48	49

MODULE 5: SCORED DATA SHEET EXAMPLE


**Federal Democratic Republic of Ethiopia
Ministry of Health**

ANC Register

Personal information					Focused ANC					HIV Assessment			HIV+ Care and Followup			Remark/ Appointment (19)		
Serial No. (1)	MRN (2)	Age (3)	Last Menstrual Period (LMP) (DD/MM/YY) (4)	EDD (DD/MM/YY) (5)	Visit Number (6)	Date of visit (DD/MM/YY) (7)	Gestational Age in weeks (GA) (8)	Syphilis serologic screening performed (Y/N) (9)	TT provided (dose number) (10)	Ferrous sulphate / folic acid provided (Y) (11)	Identified and advised on danger signs (Y) (12)	HIV Test accepted (13)	HIV test result (R or NR or I) (14)	HIV Test results received with post test counselling (Y) (15)	Counselled on infant feeding (Y) (16)		Referred for care, treatment, and support (Y) (17)	Partner HIV Test result (R or NR or I) (18)
260	44248	25	19/11/09	24/12/09	1	8/7/09	16	Y	77	-	-	-	NR				NR	28/9/09
261	18536	27	un	un	1	8/7/09			73	-	-	-	NR				NR	21/9/09
266	44454	35	5/11/08	10/09/09	1	9/09/09	31 ^W		73	-	-	-	NR					13/08/09
267	24495	35	23/10/09	03/11/09	1	9/11/09	28 ^W		73	-	-	-	NR					15/08/09
268	22139	30	21/10/08	26/09/09	1	11/07/09	28 ^W		73	-	-	-	NR					19/08/09 15/09/09
269	44469	30	un	un	1				73	-	-	-	NR					11/08/09

count
first attendances

count
Number of women treated for syphilis

count
Positive tests AND

count
who received HIV test result

count
partner tested

Note:
 Use ANC tally to capture 4th ANC

DELIVERY REGISTER

Identification				Labor and Maternal Outcome										Obst Complications						Newborn birth Outcome							
Personal Information				Delivery date and time (DD/MM/YY-0000)	Deelivery Type				Maternal Status		Died (✓)	Pre-eclampsia/Eclampsia (✓)	APH (✓)	PPH (✓)	sepsis (✓)	obstructed labor (✓)	Other obstetric complications (✓)	Complication referred (✓)	Alive (✓)	Apgar Score 1 / 5	Sex (M/F)	Weight in grams	Weight less than 2500 g (✓)	Still birth (✓)	Live birth, died before arrival at facility (✓)	Live birth, died after arrival at facility (✓)	
Serial No.	MRN	Name of the mother	Age		SVD (✓)	Caesarean section (✓)	Forceps / Vacuum Extraction (✓)	Episiotomy (✓)	Other procedures (✓)	Stable (✓)																	Unstable / deteriorated and referred to the next facility (✓)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)
	25522		23	25/9/08	-																						
	36002		33	25/9/08	-																						
	32987		25	25/9/08	-																						
	32255		18	27/9/08	-																						
	39123		20	30/9/08	-																						
	32601		25	30/9/08	-																						
	30124		20	09/10/08	-																						
	59117		20	12/10/08	-																						
	11230		20	30/07/08	-																						
	39119		17	30/07/08	-																						
	39199		38	11/09/07	-																						
	00503		38	3/10/07	-																						
	34872		20	3/10/07	-																						
	37525		20	8/10/07	-																						
	08566		30	8/10/07	-																						
	028601		21	8/10/07	-																						

count Deliveries

count C/S

count deaths

count Live births

count all weights <2500g

count still births

count New born deaths

DELIVERY REGISTER

Maternal		Newborn		Preventive Services																Managed by	Remark											
Vitamin-A (✓)	BCG given (✓)	OPV given (✓)	Newborn's MRN	HIV Testing accepted (✓)	HIV Test results (R or NR or U)	HIV positive delivery (✓)	Counselled on feeding options (✓)	Mother and newborn referred to chronic care (✓)	Problem identified					Breast feeding identified		Treatment given						Treatment Outcome				If died, cause of death						
									prematurity (✓)	sepsis (✓)	perinatal asphyxia (✓)	Congenital malformation (✓)	Other (specify)	BF initiated within 1 hr (✓)	BF initiated after 1 hr (✓)	Other feeding (✓)	1. Oxygen/Resuscitation	2. Antibiotic	3. Blood transfusion	4. Other (specify)	1. Improved	2. Died	3. Referred	4. Other (Specify)	1. prematurity	2. Infection	3. Asphyxia	4. Congenital malformation	5. Other (specify)			
(29)	(30)	(31)	(32)	(33)	(34)	(35)	(36)	(37)	(38)	(39)	(40)	(41)	(42)	(43)	(44)	(45)	(46)	(47)	(48)	(49)	(50)	(51)	(52)	(53)	(54)	(55)	(56)	(57)	(58)	(59)	(60)	(61)
	✓			✓	NR																										Bekele 24/9/08	
	✓			✓	NR																										Bekele 29/9/08	
	✓			✓	NR																										Bekele 29/9/08	
	✓			✓	NR																										Bekele 29/9/08	
	✓			✓	NR																										Bekele 7/10/08	
	✓			✓	NR																										Bekele 7/10/08	
	✓			✓	NR																										Bekele 8/10/08	
	✓			✓	NR																										Bekele 8/10/08	
	✓			✓	NR																										Bekele 8/10/08	
	✓			✓	NR																										Bekele 9/10/08	
	✓			✓	NR																										Bekele 9/10/08	
	✓			✓	NR																										Bekele 19/9/08	
	✓			✓	NR																										Bekele 19/9/08	
	✓			✓	NR																										Bekele 19/9/08	

Count
tests
accepted Tests

HEALTH CENTER/HOSPITAL PNC REGISTER



Federal Ministry of Health

Identification					PNC services																					
Personal information					PNC Visits		Assessment: Maternal				Assessment: Infant				Postnatal Infant		HIV care				Follow-up services					
Serial No.	Mother's MBN	Mother's Age	Infant's Date of birth (DD/MM/YY)	Infant's MBN	Sex of baby (M/F)	Visit number	Date of visit (DD/MM/YY)	Normal (Y)	Complicated and managed (Y)	Complicated and referred (Y)	Diets (N)	Vitamin A for mother (N)	Mothers counseled on IPV	Weight in grams	Breast feeding (Y)	Referred (Y)	Dead (age in days)	BCG given today (N)	OPV given today (Y)	HIV tested (Y)	HIV test result (N/A, 1)	ARV prophylaxis for mother*	ARV prophylaxis for new born*	Counseling on feeding options (Y)	Mother and new born referred to clinician and support (Y)	Remark / Appointment
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
47						1																				
	45076	29	22/1/01			2	6/2/01	✓	-	-	-	-	-	380	-						AR					
						3																MI				16/2/01
48	32377	18	28/2/01			1	29/2/01	-	-	-	-	-	-	22	-						AR					3/3/01
						2																				
						3																				
49	469518	18	28/2/01			1	29/2/01	-	-	-	-	-	-	32	-						AR					5/3/01
						2																				
50	441813	27	28/2/01			3																				
50	441813	27	28/2/01			1	29/2/01	-	-	-	-	-	-	32	-						AR					5/3/01
						2																				
						3																				

↓

count first PNC visits

↓

count maternal death

↓

count deaths less than or equal to 6 days

↓

count +ve test

↓

**Mother (by type) (AZT + 3TC)

↓

*New born (by type) (NVP or NVP+ AZT)

Note: *indicate accordingly, already HIV test positive in remark column
 * complete ARV prophylaxis is complete during postnatal care, & facility should take care of the report

MODULE 5: PARETO CHART ON NEONATAL DEATHS

Use the following data to prepare a Pareto Chart.

Contributing Factor (Causes of Neonatal deaths)	Frequency	Percentage	Cumulative %
Birth Asphyxia	45		
Neonatal Sepsis	31		
Pneumonia	9		
Congenital Abnormalities	11		
Tetanus	4		
Prematurity	49		
Malnutrition	1		
Diarrhea	1		
Birth injury	1		
Total			

Contributing Factor (Causes of Neonatal deaths)	Frequency	Percentage	Cumulative %
Total			

Which of the contributing factors would you want to prioritize to reduce Neonatal deaths in your facility?

MODULE 5: CASE SCENARIO – TOOLS FOR PROBLEM IDENTIFICATION AND ANALYSIS

Instruction: After reading the scenario below reflect/respond to the these questions.

- What problem analysis tool(s) would you recommend to be used in this scenario to analyze the problem?
- Why would you use this/these tool(s)?
- How will this help you to achieve your aim?

Case Scenario

The Federal Ministry of Health has increasingly focused on improving the quality of care over the past 20 years. The Health Sector Transformation Plan discusses various elements of quality and spells out that the country will prioritize interventions that will drive large-scale improvement in quality of care delivery. This will ultimately move Ethiopia towards its long-term goals of achieving health outcomes of a lower-middle-income country by 2025 and of a middle-income country by 2035. The National Health Care Quality Strategy reiterates the country's intentions to improve the quality of health care to meet its set goals.

Over the past 20 years, the country has achieved great improvement in its health outcomes. Under-five mortality decreased from 204 per 1,000 live births in 1990 to 68 per 1,000 live births in 2013, thus achieving Millennium Development Goal Four. While under-five mortality overall has reduced significantly, the proportions of deaths that occur during the neonatal period is reducing at a much slower rate and is at a rate of 29 per 1,000 live births in 2016.

To contribute to the county's goal to reduce neonatal mortality, your facility aims to reduce neonatal deaths by 50% over the next 18 months. Currently, your facility's neonatal mortality rate stands at 46 per 1,000 live births. To be able to achieve this aim, a meeting has been organized inviting some of the key staff to share their views on why the neonatal mortality is quite high and how this can possibly be reduced.

You are aware that birth asphyxia and neonatal sepsis are part of the top causes of mortality in the country. However, opinions are divided on the leading cause of neonatal deaths in your facility. A pediatric nurse thinks that the problem is rather in the referrals your facility receives. According to him, cases come in in a very critical condition and most deaths happen within 24 hours after arrival in the facility. One of the midwives raises the issue of delayed care seeking behavior which is resulting in parents bringing the newborns late to the facility.

The meeting has brought a lot of ideas of contributing factors leading to the high neonatal mortality rate. However, there is still a lot of confusion how to address the problem to be able to achieve the aim.

MODULE 6: LIST OF 60 RANDOM ENTRY WORDS (NOUNS)

- | | | | |
|-------------|-------------|-------------------|---------------|
| 1. Cup | 16. Blanket | 31. Microphone | 46. Bills |
| 2. Bicycle | 17. Saw | 32. Marker | 47. Printer |
| 3. Radio | 18. Diagram | 33. Deck | 48. Bassoon |
| 4. Shirt | 19. Cloud | 34. Paper | 49. Water |
| 5. Tape | 20. Hot dog | 35. Balance sheet | 50. Break |
| 6. Airplane | 21. Horse | 36. Tile | 51. Stage |
| 7. Mouse | 22. Table | 37. Carpet | 52. Fire |
| 8. Tire | 23. Coffee | 38. Wire | 53. Light |
| 9. Record | 24. Drapes | 39. Gun | 54. Cartridge |
| 10. Paint | 25. Doctor | 40. Fastener | 55. Can |
| 11. Jazz | 26. Toy | 41. Bird | 56. Error |
| 12. Grass | 27. Glass | 42. Door | 57. Digit |
| 13. Screen | 28. Window | 43. Ice | 58. Elephant |
| 14. Porch | 29. Case | 44. Needle | 59. Life boat |
| 15. Teller | 30. Napkin | 45. Banquet | 60. Ink |

MODULE 6: LIST OF 72 CHANGE CONCEPTS

ELIMINATE WASTE

1. Eliminate things that are not used
2. Eliminate multiple entry
3. Reduce or eliminate overkill
4. Reduce controls on the system
5. Recycle or reuse
6. Use substitution
7. Reduce classifications
8. Remove intermediaries
9. Match the amount to the need
10. Use Sampling
11. Change targets or set points

IMPROVE WORK FLOW

12. Synchronize
13. Schedule into multiple processes
14. Minimize handoffs
15. Move steps in the process close together
16. Find and remove bottlenecks
17. Use automation
18. Smooth workflow
19. Do tasks in parallel
20. Consider people as in the same system
21. Use multiple processing units
22. Adjust to peak demand

OPTIMIZE INVENTORY

23. Match inventory to predicted demand
24. Use pull systems
25. Reduce choice of features
26. Reduce multiple brands of the same item

CHANGE THE WORK

ENVIRONMENT

27. Give people access to information
28. Use Proper Measurements
29. Take Care of basics
30. Reduce de-motivating aspects of pay system
31. Conduct training
32. Implement cross-training
33. Invest more resources in improvement
34. Focus on core process and purpose
35. Share risks
36. Emphasize natural and logical consequences
37. Develop alliances/cooperative relationships

ENHANCE THE

PRODUCER/CUSTOMER RELATIONSHIP

38. Listen to customers
39. Coach customer to use product/service
40. Focus on the outcome to a customer
41. Use a coordinator
42. Reach agreement on expectations
43. Outsource for "Free"
44. Optimize level of inspection
45. Work with suppliers

MANAGE TIME

46. Reduce setup or startup time
47. Set up timing to use discounts
48. Optimize maintenance

49. Extend specialist's time
50. Reduce wait time

MANAGE VARIATION

51. Standardization (Create a Formal Process)
52. Stop tampering
53. Develop operation definitions
54. Improve predictions
55. Develop contingency plans
56. Sort product into grades
57. Desensitize
58. Exploit variation

DESIGN SYSTEMS TO AVOID MISTAKES

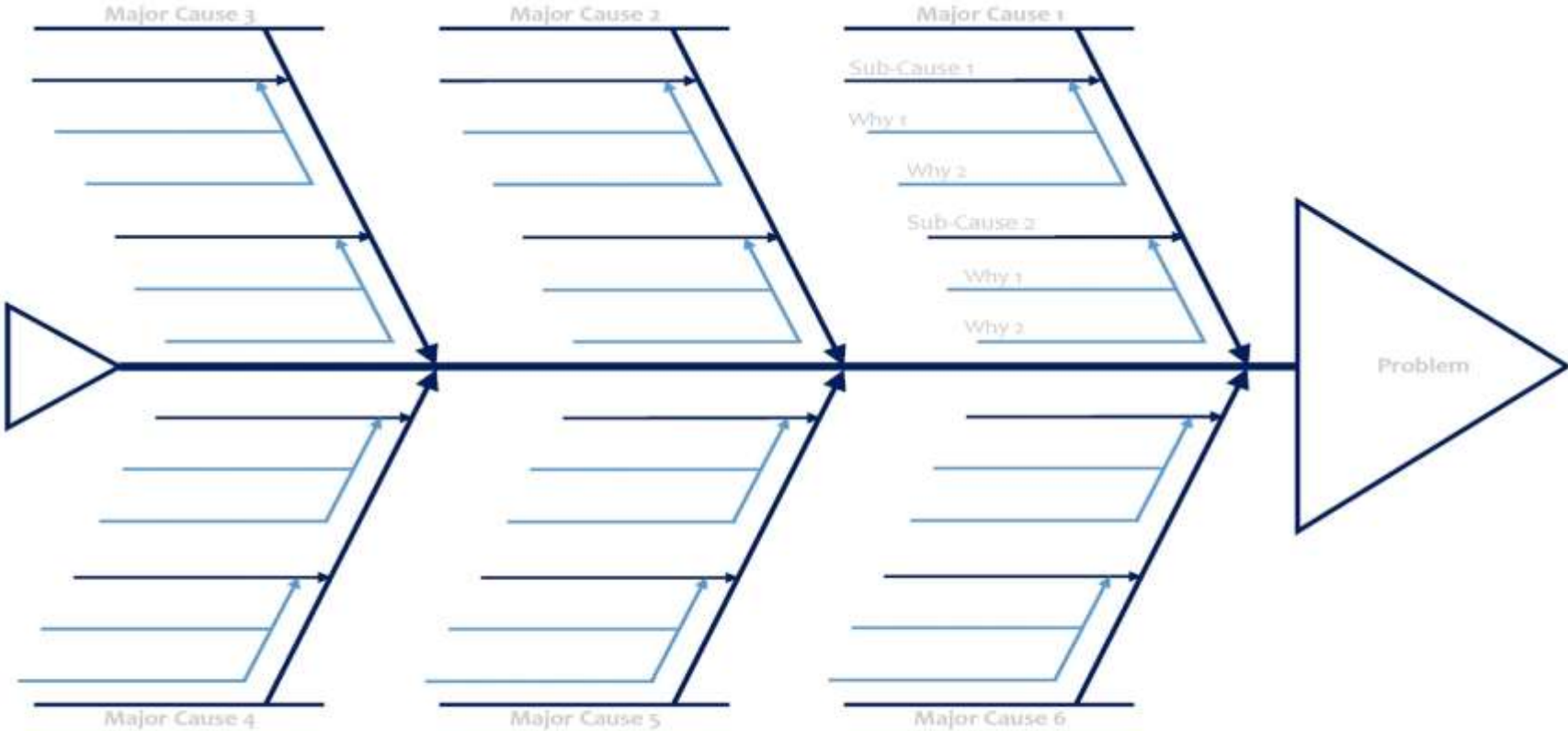
59. Use reminders
60. Use differentiation
61. Use constraints
62. Use affordances

FOCUS ON THE PRODUCT OR SERVICE

63. Mass customize
64. Offer product/service anytime
65. Offer product/service anyplace
66. Emphasize intangibles
67. Influence or take advantage of fashion trends
68. Reduce the number of components
69. Disguise defects or problems
70. Differentiate product using quality dimensions
71. Move steps in process closer together
72. Manage variation, not tasks

Reference: The Improvement Guide, Langley, Nolan, Nolan, Norman and Provost, p.35

MODULE 6: FISHBONE DIAGRAM STRUCTURE TEMPLATE



MODULE 7: FACILITY DATA

Scenario 1

Your facility collected the following data over the past 15 weeks on waiting time (time of entry and time of exit) of your patients. Use the data below to construct a run chart using both the flip chart and MS Excel.															
Weeks	Wk 1	Wk 2	Wk 3	Wk 4	Wk 5	Wk 6	Wk 7	Wk 8	Wk 9	Wk 10	Wk 11	Wk 12	Wk 13	Wk 14	Wk 15
Total waiting time (minutes)	3350	4176	3260	4160	3110	2750	2628	2910	2860	2655	3050	2772	2920	4245	4470
Number of patients	10	12	10	13	10	10	9	10	10	9	10	9	10	15	15

Scenario 2

Your facility collected data on adherence to malaria protocol for the past 9 months. Use the data below to construct a run chart using both the flip chart and MS Excel.									
Month	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17
Adherence to Malaria Protocol	3	5	8	4	7	8	8	5	6
Number of folders sampled	10	10	10	10	10	10	9	10	10

Scenario 3

Below the neonatal deaths and live births from Woreda X. Use the data below to construct a run chart using both the flip chart and MS Excel.									
Month	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17
Number of Neonatal deaths	3	0	1	4	3	6	2	5	6
Number of Live births	200	189	170	180	268	291	255	280	295

MODULE 7: RULE 3: TOO FEW OR TOO MANY

Checking for Too Many or Too Few Runs on a Run chart. Table is based on about a 5% risk of falling the run test for random patterns of data.

Total number of data points on the run chart that do not fall on the median	Lower limit for the number of runs (< than this number runs is 'too few')	Upper limit for the number of runs (> than this number runs is 'too many')	Total number of data points on the run chart that do not fall on the median	Lower limit for the number of runs (< than this number runs is 'too few')	Upper limit for the number of runs (> than this number runs is 'too many')
10	3	9	36	13	25
11	3	10	37	13	25
12	3	11	38	14	26
13	4	11	39	14	26
14	4	12	40	15	27
15	5	12	41	15	27
16	5	13	42	16	28
17	5	13	43	16	28
18	6	14	44	17	29
19	6	15	45	17	30
20	6	16	46	17	31
21	7	16	47	18	31
22	7	17	48	18	32
23	7	17	49	19	32
24	8	18	50	19	33
25	8	18	51	20	33
26	9	19	52	20	34
27	10	19	53	21	34
28	10	20	54	21	35
29	10	20	55	22	35
30	11	21	56	22	35
31	11	22	57	23	36
32	11	23	58	23	37
33	12	23	59	24	38
34	12	24	60	24	38
35	12	24			

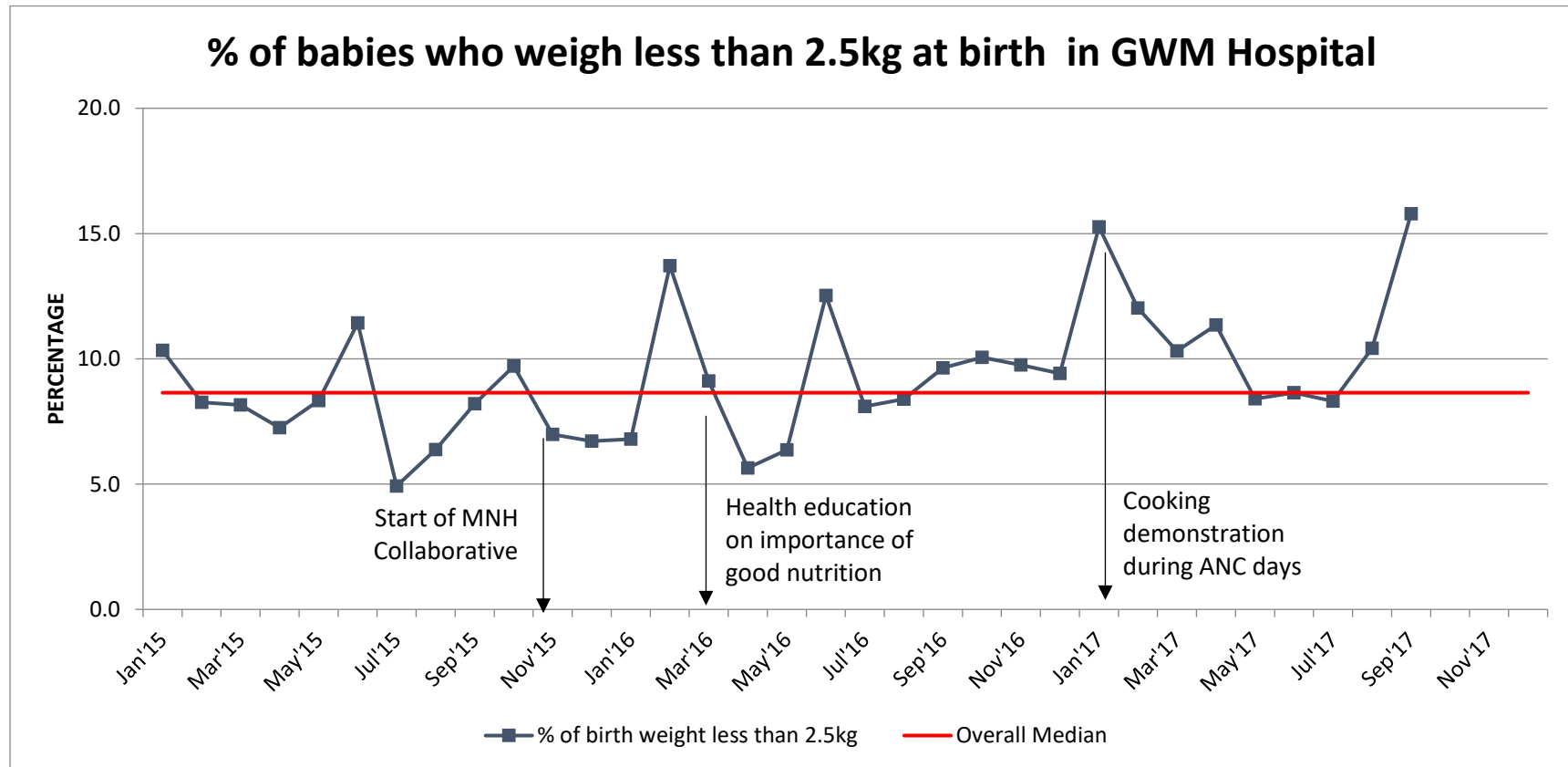
*Adapted from Swed Feda S and Eisenhart C. (1943): Tables for testing randomness of grouping in a sequence of alternatives. Annals of Mathematical Statistics. Vol. XIV, p66 and 87, Tables II and III

*The Healthcare Data Guide, p77-84

MODULE 8: CASE SCENARIOS

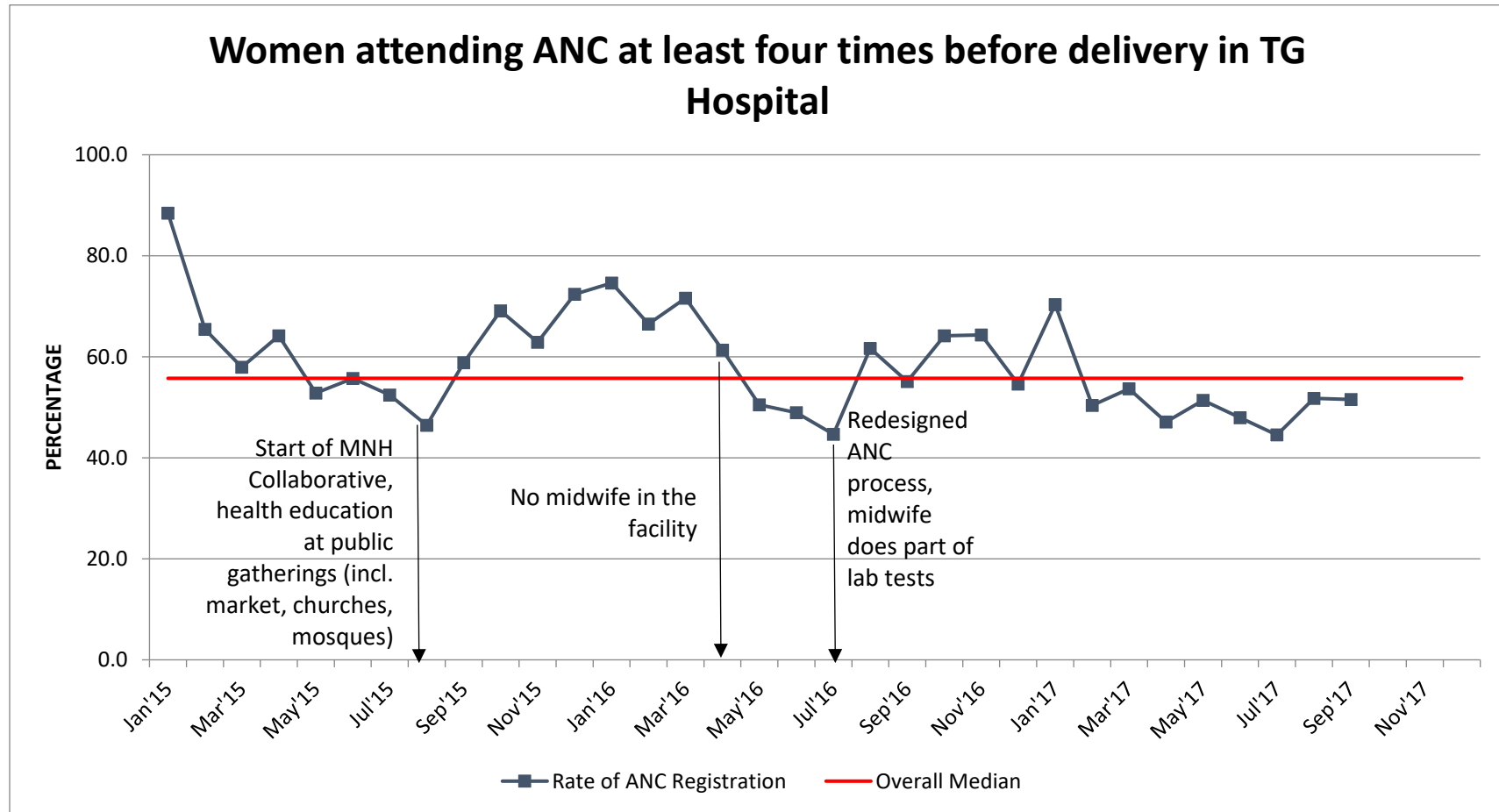
Case A: Aim to reduce the percentage of babies that have a birthweight less than 2.5 kg in GWM Hospital from 8.6% to 5% from 1st January 2016 to 31st December 2017

Interpret the graph using the run chart rules. Decide on the action to be taken (adapt, adopt, abandon) and why?



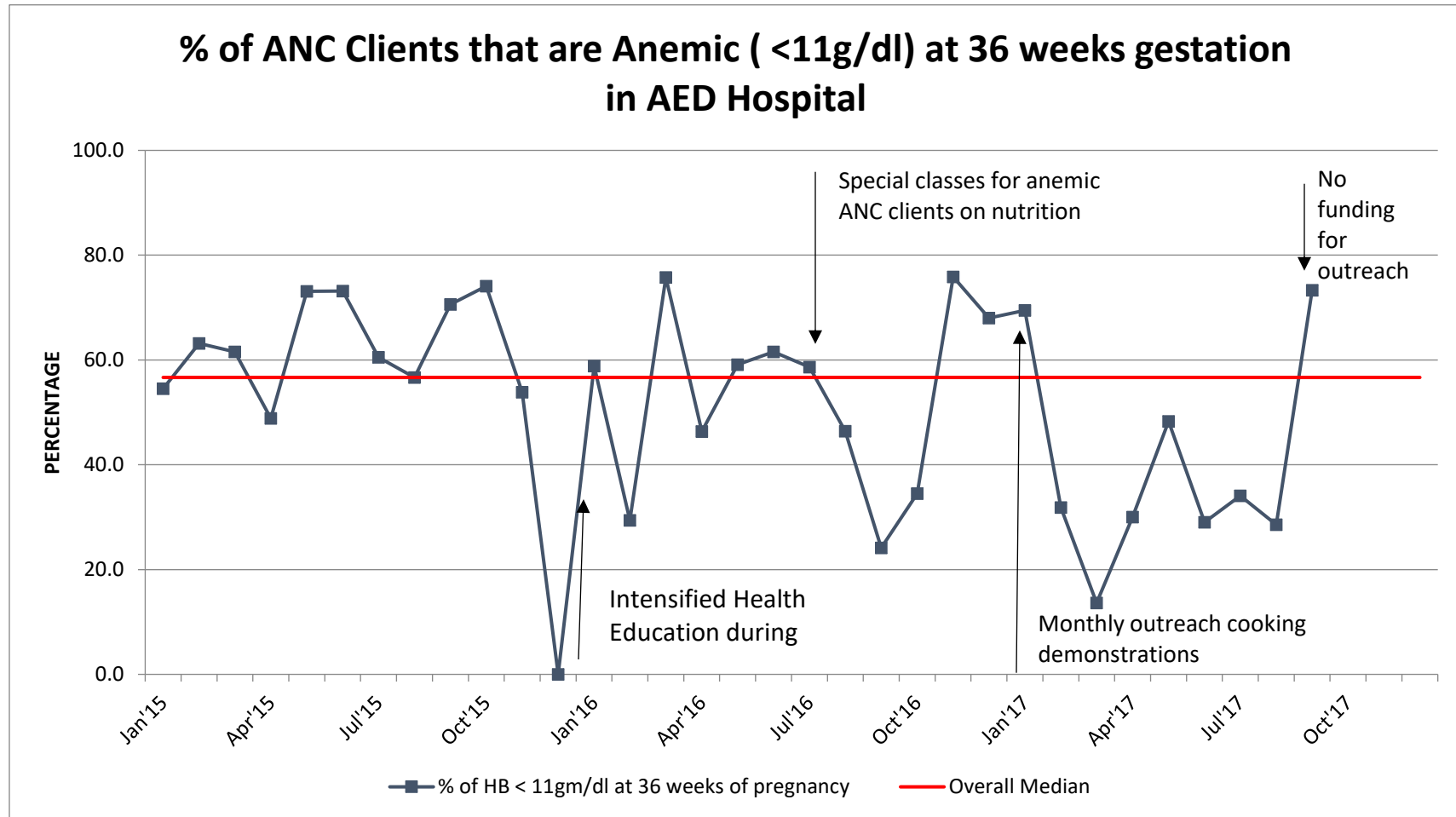
Case B: Aim to increase the percentage of pregnant women how receive at least 4 ANC visits at TG hospital from 55.7% to 75% by 31st December 2017

Interpret the graph using the run chart rules. Decide on the action to be taken (adapt, adopt, abandon) and why?



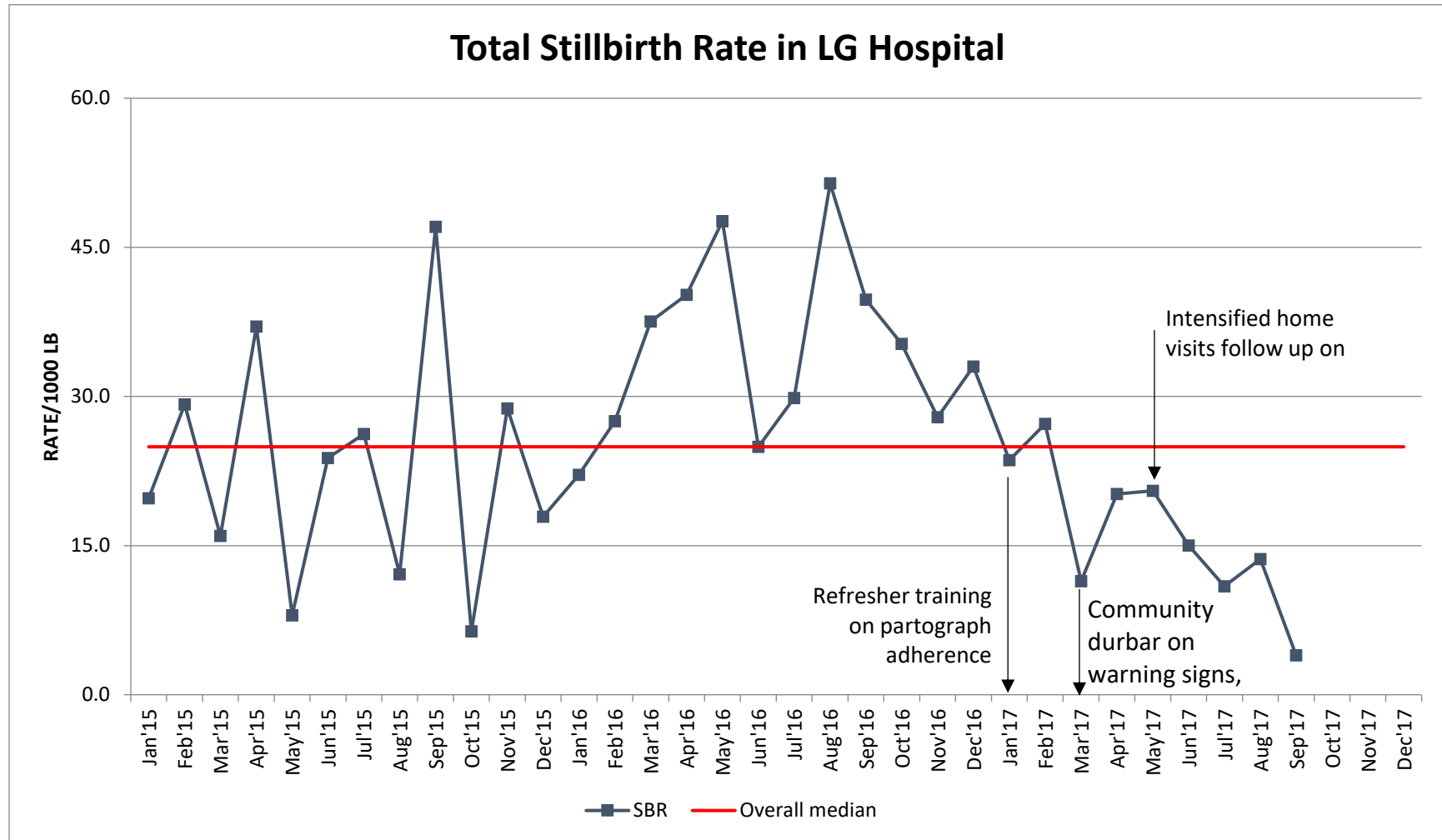
Case C: Reduce Percentage of ANC clients who have Hb below <11g/dl at 36 weeks gestation in AED Hospital from 61% to 50% from 1st January 2016 to 31st December 2017

Interpret the graph using the run chart rules. Decide on the action to be taken (adapt, adopt, abandon) and why?



Case D: Reduce stillbirth rate in LG Hospital from 26/1000 LB to 15/1000 LB from 1st January 2017 to 31st December 2017

Interpret the graph using the run chart rules. Decide on the action to be taken (adapt, adopt, abandon) and why?



MODULE 8: PDSA WORKSHEET

Overall aim			
<i>(Your target/goal/aim should be SMART – Specific, Measurable, Ambitious, Realistic, Time-specific)</i>			
Problem Analysis			
<i>(Describe and analyze the problem using the problem analysis tools e.g. fishbone, process map, Pareto chart)</i>			
PDSA aim			
<i>(Your target/goal/aim should be SMART – Specific, Measurable, Ambitious, Realistic, Time-specific)</i>			
Describe your idea to change. Address the identified cause of the problem? <i>(What)</i>			
List the activities/tasks to carry out your idea <i>(How)</i>			
Activities	Who is responsible?	When will it happen?	Where will it happen?
Data collection			
<i>(What data/indicators do you need to collect to know whether your change is leading to improvement)</i>			
Data/Indicator to collect	Who is responsible?	How frequent? <i>(daily, weekly, monthly)</i>	What is the data source/ tool to use?
What is your prediction?			
<i>(What do you expect will when you test your change ideas as planned?)</i>			

QUALITY IMPROVEMENT PROJECT WORKBOOK TEMPLATE FOR FACILITY QI TEAM

Instructions:

This Project Workbook is designed for you to get practical experience in applying the Science of Improvement in a real-life setting. This Workbook allows you to plan for improvement and document your/the team's findings during the testing of the change idea. Complete all the parts of the workbook; section I, II, III is related to planning for improvement, section IV relates to testing of change ideas and learning from the impact of change for informed decision making.

1. Identify a Problem to work on
2. Conduct Problem Identification and Analysis process (use the tools such as process mapping, fishbone diagram, 5 WHYS, Pareto chart, etc.).
3. Prioritize a problem/ root-cause to start planning for improvement
4. Write the problem statement and aim statement
5. Generate/Develop change idea(s) to test
6. Develop the relevant outcome, process and balancing measures to measure the aim and activities planned
7. Complete the **plan** part of the PDSA.
8. Execute/Do the PDSA plan as planned
9. Document data as planned and document all observations (both expected and unexpected)
10. Review the change idea and decide what to do next
11. Plan for the next cycle of testing the idea to learn more about the impact of the change idea

1.6. Background and prioritization of the problem:

1.7. Problem Analysis

a) Which tool(s) did the team use to identify and analyze the problem?

(For example, Fishbone Diagram, Process Mapping, 5 WHYS, Line Graph, Run Chart, Pareto Chart, etc.)

b) Please include a copy of the tool(s) used as separate page in this workbook

1.8. Problem Statement:

1.9. Aim Statement:

Section II: Developing Change Ideas (Module 5)

a) Describe the Change Idea(s) the team wants to test:

b) What method(s)/tool(s) was/were used to generate this idea?

(For example, brainstorming, benchmarking, expert consultation, provocations, 6 thinking hats, etc.)

c) List the activities/tasks for the team to carry out the idea (How?)

Activities	Who is responsible?	When will it happen?	Where will it happen?

Section III: Measurement (Module 6)

3.1. Measurement

a) Please complete the table below for the outcome indicator (this should be linked to the aim statement):

Outcome Indicator/Measure	Data component	How frequent? (daily, weekly)	What is the data source or tool used?	Who is responsible?
	(Numerator)			
	(Denominator)			
	(Numerator)			
	(Denominator)			

b) Please complete the table below for the process indicator(s) (this should be linked to the activities/change idea):

Activity	Process Indicator/Measure	Data component	How frequent? (daily, weekly)	What is the data source or tool used?	Who is responsible?
		(Numerator)			
		(Denominator)			
		(Numerator)			
		(Denominator)			

Activity	Process Indicator/Measure	Data component	How frequent? (daily, weekly)	What is the data source or tool used?	Who is responsible?
		(Numerator)			
		(Denominator)			
		(Numerator)			
		(Denominator)			

Section IV: Testing Changes (Module 7)

4.1. Was the team able to start testing the change idea as planned?

a) If yes, have team members documented their observations and planned measurement?

b) If no, what was the challenge the team had in starting to test their ideas?

4.2. What observations were documented by the team members when testing the change idea? Please document in the table below.

Change idea/Activity	Where was it tested?	When was it tested?	Positive Observations	Challenges

4.3 What data was collected by the team? Include the graphs as separate pages in this workbook

4.4 What did the team learn from studying the data?

4.5 What decision was made by the team for the next cycle of testing?

