THE QUALITY IMPROVEMENT COACH HANDBOOK

A Toolbox for Supporting Quality improvement Teams and Efforts

March 2013

DRAFT
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INTRODUCTION TO QUALITY IMPROVEMENT AND COACHING

FHI 360 integrates quality improvement in its health programs by using evidence-based models to achieve specific service quality and health outcomes objectives by strengthening health systems’ functions. Formal quality improvement efforts are necessary to address complex and recurring performance issues that have multiple causes and require the involvement of many stakeholders to find out what parts of the system of care needs to be redesigned. Changing a system is the central concept to any improvement effort: without changes, the performance of the system will remain the same; but not every change leads to improvement. This is why the effects of changes must be tested and validated, usually through a four-phase cycle of planning, doing, studying and acting (called PDSA\(^1\) cycle) before implementing, sustaining and scaling them up. FHI 360 uses a generic framework for small-scale quality improvement efforts, adapted from a PDSA-based improvement model (called the improvement model\(^2\)), and a management model (called the improvement collaborative\(^3\)) for large scale replication of quality improvement efforts. Both models are succinctly described here:

**Generic PDSA-based Improvement Model**

The improvement model contains four steps:

- **Identifying explicit improvement aim and objectives** that express in measurable terms a benefit for the communities.

- **Developing the improvement measurement system**: the improvement team collects a few indicators, frequently, on a small sample of sites or beneficiaries, and analyzes through run charts.

- **Generating ideas for changes**: ideas for changes are generated by communities, using a list of known change concepts.

- **Testing/Implementing system changes** (with the PDSA cycle): Effects of changes are assessed on the improvement aim/objectives. If a specific change yields improvement, it is sustained and replicated. If not, it is abandoned and another change is tested.

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\(^1\) PDSA stands for Plan-Do-Study-Act and is one of the tools described in this handbook.


\(^3\) The Breakthrough Series: IHI’s Collaborative model for Achieving Breakthrough Improvement. Innovation Series 2003.
The Improvement Collaborative Model for Managing Large-Scale Improvements Projects

The Collaborative Model (figure 2) is used to manage and replicate improvements in many sites. It is a time-limited strategy (usually 12 to 18 months) that brings together a large number of QI teams/communities to rapidly test many changes and scale up significant improvements. This innovative model has 7 key features:

- Common improvement aim and objectives.
- Common improvement monitoring system where a few indicators are collected frequently and interpreted through run charts.
- An operational structure organized around teams that perform specific roles and responsibilities: quality improvement teams, management, strategic leadership, QI expertise and content-expertise.
- A change package, which is a combination of explicit and evidence-based standards of services and best practices for the organization of service delivery.
- A coaching system for supporting the quality improvement teams in implementing the change package and measuring its effects.
- The generic PDSA-based improvement model described above and focused on identifying and implementing changes and testing their impact during specific action periods.
- Learning sessions during which teams share their experience with the implementation and results of the change package, learn about best practices and plan their replication.

This handbook describes the roles and responsibilities of a coach, how to organize a coaching session and focuses on the tools (processes and templates) that coaches must master in order to support effectively the work of quality improvement teams (QITs). These teams are usually based at the point of service delivery (health facility or community) and supported by managers (usually at the district or regional levels) during coaching visits (conducted by external coaches such as district supervisors). The coach can also be a member of the QIT, receiving support from an external coach from the district. There are plenty of tools developed for coaching a QI effort and many are available on the internet. This handbook describes the most useful tools to help a team perform the activities under each step of the QI model, and consistent with the scope of work of a coach.

The table below organizes the specific tools that are described in this handbook (in italic) under the phases of a QI effort, from designing to scaling-up, and follows the steps of the QI model. The handbook also describes two cross-cutting tools: prioritization matrix and brainstorming, which can be used at every step of the QI process to facilitate consensus of the team. Since the steps of a QI effort are performed by the QI team, the coaches must master the tools so that they can build the capacity of the teams in using them. Some tools are for coaches only (e.g. team assessment form), while others are designed to assess the performance of the coaches by a mentor or supervisor (coach assessment form). The sequence of steps may vary; some teams start with a comprehensive baseline assessment to identify improvement opportunities, the results of which will inform the final composition of the team, while others can start forming an improvement team first. Team composition (and QI charters) can always be finalized later.
## Quality improvement tools most used by QI teams and their coaches

<table>
<thead>
<tr>
<th>Phases of a QI initiative</th>
<th>Steps of the QI Process</th>
<th>Tools &amp; Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitoring and analysis step</td>
<td>6. Analyze the system to be improved 7. Develop an improvement monitoring system 8. Conduct a root cause analysis to identify the main causes of the issues 9. Validate the hypotheses on causes</td>
<td>6. System modeling &amp; flowcharting 7. QI indicator form and instructions for an improvement monitoring system; run charts 8. Fishbone, tree and driver diagrams 9. Focus group discussion key stakeholders and data collection/survey</td>
</tr>
<tr>
<td>Designing intervention and developing a change package</td>
<td>10. Generate ideas of changes</td>
<td>10. Gap analysis; Benchmarking; Change concepts</td>
</tr>
<tr>
<td>Testing and implementing the changes</td>
<td>11. Plan the test of changes 12. Monitor the implementation of the changes</td>
<td>11. PDSA cycle &amp; plan template 12. Plan template</td>
</tr>
<tr>
<td>Assessing the effects of the changes and interventions</td>
<td>13. Interpret run charts</td>
<td>13. Run chart</td>
</tr>
<tr>
<td>Sharing progress through learning sessions</td>
<td>16. Prepare storyboards 17. Organize &amp; facilitate learning sessions</td>
<td>16. Storyboards 17. Agendas of learning sessions</td>
</tr>
<tr>
<td>Scaling-up improvements</td>
<td>22. Develop a scale-up plan</td>
<td>22. Spread planner tool</td>
</tr>
</tbody>
</table>
GENERIC JOB DESCRIPTION OF A QUALITY IMPROVEMENT COACH

A QI coach is a position that is responsible for guiding and mentoring quality improvement teams and building their capacity as they go through the steps of the QI model, using the appropriate tools. A QI coach is a formal position or function that can be either internal or external to the team or both (an internal coach supported by visits from an external coach). An internal coach is identified among the team members, whereas an external coach can be the supervisor of the team, ideally with some decision making power to be able to support the team at the managerial level (district) to address issues identified by the QI team and under the authority of the district.

MAIN RESPONSIBILITIES
1. Provides quality improvement support in the form of training, facilitation of improvement projects, and ad hoc consultation to improvement teams and their leaders;
2. Guides team in the identification of improvement aim and development of the improvement charter;
3. Visits improvement teams, preferably once a month. Assesses their performance, reviews team worksheet and provides constructive feedback. Conduct quality assurance of the data/improvement indicators;
4. Help teams to interpret run charts and conduct root cause analysis;
5. Helps teams to document the process;
6. Organizes learning sessions and prepares teams to present their work on storyboards;
7. Maintains communication with teams via emails, listserv and calls;
8. Helps teams to plan for and scale up best practices;
9. Advocates for teamwork and results and helps to address system issues;
10. Identifies challenges to the QI work and helps addressing them;
11. Contributes to evaluation of the QI project and the communication of lessons learned.

REQUIREMENTS
- Capacity to explain the QI models and principles of QI;
- Proficiency in QI tools;
- Capacity to facilitate teamwork through good interpersonal communication skills.
ORGANIZATION OF A QUALITY IMPROVEMENT COACHING SESSION

Coaches support improvement efforts and teams through regular communication and face-to-face interactions during frequent (monthly) visits. The following checklist will help coaches prepare for and conduct a coaching session, where both the coach and the QI team learn from each other about the system that they are trying to improve. It is possible that more than one coach visits a QI team, especially at the beginning of a QI initiative when a coaching system is being developed and local coaches (such as supervisors) are being mentored by external coaches (from a donor-supported program, for example) to transfer skills and build their capacity.

PREPARATION OF A COACHING VISIT

- Inform the team (clinical facility or NGO members) of the date of the visit in advance and confirm the availability of the leader and as many team members as possible. Decide of a time (usually the afternoon), when the visit creates minimal disruption to their service delivery activities.
- Review in advance the performance data of the improvement team you are planning to visit, if available (see team performance tracking form later). If this is the first coaching visit, be prepared to introduce the QI model and help teams review data and identify an improvement topic.
- Identify the stage of the QI effort/process and set specific goals for the visit, including a list of topics to be covered. Develop an agenda appropriate to the objectives and the availability of the team and, ideally, share the agenda with the team in advance.
- Prepare questions for the team based on the project monitoring form and make copies of the tools that are relevant to the stage of the QI process for distribution to the team.
- Identify and bring materials associated with the content of the improvement topic (e.g. policies, protocols, guidelines, training materials, job-aids etc.).

CONDUCTING A COACHING SESSION

- Stick to the agenda (see table below), but be flexible, depending on the circumstances with the team.
- Value both quantitative data (what is measurable through run charts) and qualitative information (what the team says) to understand the issues.
- Show support and highlight the positives to motivate the team to continue its work.
- Ask for feedback about how the coaching visits/session can be improved.
- Focus on systems and processes during the visit and avoid comments on individuals’ performance/competence unless it is mentioned by the team itself.

FOLLOWING-UP AFTER THE VISIT

Coaches should keep the communication with the teams between two coaching visits to discuss how recommendations are implemented. This can be done through a follow up conference call within 10 days of the visit or the use of information technology.
### Sample agenda of a 3-hour coaching visit, to be customized as needed

<table>
<thead>
<tr>
<th>Main Activities</th>
<th>Specific tasks</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Introduction of the session</strong></td>
<td>• Introduce participants</td>
<td>10 min</td>
</tr>
<tr>
<td></td>
<td>• Present the agenda of the session</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Identify a time keeper and a note taker from the QI team</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Describe the objectives of the session and revise them as necessary</td>
<td></td>
</tr>
<tr>
<td><strong>Update on the QI work and progress</strong></td>
<td>• If the team has developed an improvement charter, ask someone to summarize</td>
<td>15 min</td>
</tr>
<tr>
<td></td>
<td>it and the progress in implementation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• If the team does not have an improvement charter, ask them to describe</td>
<td></td>
</tr>
<tr>
<td></td>
<td>their progress with the improvement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>aim/objectives, indicators, and changes (planned or introduced)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• If the team has no formal ongoing improvement effort, spend the rest of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>the session reviewing performance data and identifying improvement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>opportunities</td>
<td></td>
</tr>
<tr>
<td>**Identification of issues to address during the</td>
<td>• Ask the team leader to list the priority issues that they have, both with</td>
<td>15 min</td>
</tr>
<tr>
<td>coaching visit**</td>
<td>the QI process and with the health system that they are addressing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Assess the performance of the team, using the <em>team performance tracking</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td>form</td>
<td></td>
</tr>
<tr>
<td><strong>Quality assurance of the data</strong></td>
<td>• Validate the reliability of the improvement indicators</td>
<td>45 min</td>
</tr>
<tr>
<td></td>
<td>through observation of the data collection process by the team for the past</td>
<td></td>
</tr>
<tr>
<td></td>
<td>month and data verification</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Make corrections if necessary and interpret results and run charts</td>
<td></td>
</tr>
<tr>
<td><strong>Technical assistance to the team</strong></td>
<td>• Provide feedback to the team based on the <em>team performance tracking</em></td>
<td>45 min</td>
</tr>
<tr>
<td></td>
<td>form</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Identify and use the relevant coaching tool(s) to help the team address its</td>
<td></td>
</tr>
<tr>
<td></td>
<td>challenges and move to the next step. It could be the analysis of a system/</td>
<td></td>
</tr>
<tr>
<td></td>
<td>process of care through systems modeling, flowcharting, root-cause analysis</td>
<td></td>
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<tr>
<td></td>
<td>or reviewing the data and construct a run chart or planning the test of a</td>
<td></td>
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<td></td>
<td>change. For more advanced QI efforts, the focus will be on documenting</td>
<td></td>
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<tr>
<td></td>
<td>lessons learned, and planning the spread of changes. This is an opportunity</td>
<td></td>
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<tr>
<td></td>
<td>to build the capacity of the team.</td>
<td></td>
</tr>
<tr>
<td><strong>Planning for next steps</strong></td>
<td>• Summarize what has been done and learnt during the session</td>
<td>40 min</td>
</tr>
<tr>
<td></td>
<td>• List and prioritize the issues to be addressed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Brainstorm possible solutions/next steps</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Plan the implementation of the next steps, including the role of the</td>
<td></td>
</tr>
<tr>
<td></td>
<td>coach to address the priority issues</td>
<td></td>
</tr>
<tr>
<td><strong>Follow up planning</strong></td>
<td>• Identify the next communication (email, telephone, etc.)</td>
<td>10 min</td>
</tr>
<tr>
<td></td>
<td>• Set a date for the next coaching session</td>
<td></td>
</tr>
</tbody>
</table>
PROBLEM STATEMENT AND IMPROVEMENT AIM/OBJECTIVES

A formal quality improvement effort starts with the identification of an improvement opportunity. This opportunity may be expressed as a problem that needs a solution, or as a process or system whose performance needs to be improved. Overall, we can organize these opportunities under three broad categories:

- **An effectiveness issue**: the system does not deliver according to its performance expectations. Examples of effectiveness issues are: stocks-out of drugs; low cure rate; increased case-fatality rate; high rate of lost-to-follow-up patients; incomplete medical records; canceled supervision visits.
- **An efficiency issue**: the system uses too many resources to deliver its performance. Examples of efficiency issues are: long waiting times to receive care; lost laboratory exams; over-prescription of antibiotics/drugs; excessive administrative costs.
- **A responsiveness issue**: the system does not address the needs of its clients in a satisfactory way. Examples of responsiveness issues are: lack of timely response to emergencies; rudeness of service providers; discrimination and stigmatization of patients; culturally insensitive care; gender-bases biases in delivering care.

Labeling these categories is not important; what matters is that the improvement goal be clearly expressed. This can be done by developing a problem statement and transforming this statement into improvement aim and objectives, hence answering the question “what do we want to accomplish?”

HOW TO DEVELOP A PROBLEM STATEMENT

The following questions can help developing a problem statement:

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

A problem statement is a concise description of a process in need of improvement, its boundaries, the general area of concern where QI should begin, and why work on the improvement is a priority. In creating a problem statement, it is important to avoid listing potential causes or solutions, and to focus on describing the problem. It is also important to note that problem statements should be carefully constructed to not assign blame to a particular person or unit. The following is an example of a problem statement developed after answering the questions above:

A team at a hospital in Zambia noted a shortage in medication for Acute Respiratory Infections (ARI) for children under five.

- **What is the problem?**
  A shortage of ARI drugs for children under five exists.
- **How do you know it is a problem?**
  Drugs run out by the third week of the month.
- **How frequently does it occur?**
  This shortage has occurred every month for the past nine months.
- **What are the effects of this problem?**
  Patients develop complications and increased referrals to a first-level facility.
- **How will you know when it is resolved?**
  The problem will be resolved when ARI drugs last until the end of the month.

Recurring shortages of drugs to treat children for acute respiratory infections has resulted in many patients developing complications and needing to be hospitalized in a referral facility. Resolving this problem will allow rapid recovery of children and will avoid unnecessary costs to their families and the health system.
HOW TO DEVELOP SMART-A IMPROVEMENT AIM AND OBJECTIVES

Once a team agrees on the problem that they want to address, they need to develop their improvement aim and, depending on the complexity, some improvement objectives. The aim statement specifies, at a minimum, the beneficiary population, the services targeted for improvement and the system that deliver these services. An example is provided in the charter above.

Sometimes, when the aim is addressing the performance of an entire system, it is useful to break it down into specific improvement objectives, each one addressing the performance of a process that contributes to achieving the aim. For example, achieving the aim to “decrease the transmission of HIV to newborns by 10% within a year” will require address an entire system of care, hence multiple processes: Identifying HIV+ pregnant women; referring them to a care & treatment service; enrolling them into care and treatment; ensuring/monitoring adherence to treatment; providing care to the neonate; counseling on breastfeeding and nutrition; testing the infant for HIV; etc. Depending on the knowledge of the team about which processes need to be improved, the improvement aim can then be complemented with improvement objectives, such as in the following example.

Aim and objectives should meet the SMART-A criteria. SMART stands for:

- **Specific** – Objectives should specify what they want to achieve.
- **Measurable** – You should be able to measure whether you are meeting the objectives or not.
- **Achievable** – Are the objectives you set, achievable and attainable?
- **Realistic** – Can you realistically achieve the objectives with the resources you have?
- **Time** – When do you want to achieve the set objectives?
- **Target Audience** – Who is your target audience?

Examples of good aim/objectives:

- In our clinic we will reduce postpartum hemorrhage rates among women delivering at our clinic by 50% within 12 months through application of the active management of third stage labor;
- We will reduce child mortality from malaria in catchment areas of 3 health centers by 50% in 12 months through impregnated bed nets.
IHI offers following tips for setting an aim:

1. State the aim clearly.

2. Include numerical goals that require fundamental change to the system. Setting numerical goals clarifies the aim, helps to create tension for change, directs measurement, and focuses initial changes. Including numerical goals not only clarifies the aim but also helps team members begin to think about what their measures of improvement will be, what initial changes they might make, and what level of support they will need.

3. Avoid aim drift. Once the aim has been set, the team needs to be careful not to back away from it deliberately or "drift" away from it unconsciously.

4. Be prepared to refocus the aim. Every team needs to recognize when to refocus its aim. If the team’s overall aim is at a system level (for example, "Reduce adverse drug events in critical care by 30% within 12 months"), team members may find that focusing for a time on a smaller part of the system (for example, "Reduce adverse drug events for critical care patients on the cardiac service by 30% within 12 months") will help them achieve the desired system-level goal. This is why improvement objectives can be useful to break down the aim into more specific parts.
TEMPLATE FOR THE STAFFING STRUCTURE OF A QI EFFORT

Quality improvement projects involve many stakeholders responsible for the delivery of services and the management of the health and social systems (both public and non-governmental) through which the services are delivered.

To ensure the efficient management of the QI projects, it is therefore important to clarify the roles and responsibilities of each organization and people involved. The scientific method for quality improvement identifies five key functions:

- Overall project management and coaching support to local QI teams;
- QI implementation by leaders and members of local quality improvement teams;
- Expertise in quality improvement;
- Expertise in the technical content of the improvement topic; and
- Representation of the clients/beneficiaries.

The tables below provide a generic description of the roles and responsibilities of the organizations and individuals involved in a QI demonstration project, and a template for teams to list the names of individuals.
## Roles and Responsibilities for the Design and Implementation of a Quality Improvement Project

<table>
<thead>
<tr>
<th>Quality Management Team</th>
<th>Quality Improvement Teams</th>
<th>Quality Improvement Experts/Coaches</th>
<th>Subject Knowledge Experts</th>
<th>Clients &amp; Beneficiaries</th>
</tr>
</thead>
</table>
| • Stay informed about progress of the QI effort  
• Provide advice to the management team  
• Support scale up of an effective intervention  
• Enable institutionalization of effective changes  
• Address issues of sustainability  
• Support policy changes that are necessary  
• Attend learning sessions  
• Communicate with policy makers  
• Provide resources necessary | • Keep the team focused on the aim and charter  
• Plan and organize team meetings  
• Identify needs for and request additional support  
• Document the process (meeting minutes)  
• Assign responsibilities to team members  
• Liaise with the management team  
• Represent team during the learning sessions | • Identify the leader of the QI team  
• Agree on improvement topic and aim  
• Collect baseline information  
• Learn the improvement model and tools  
• Generates ideas of changes  
• Develop implementation plan for the changes  
• Implement changes and monitor their effect  
• Provide ideas for modifying change package during learning sessions  
• Serve as coaches for scaling-up to new teams | • Guide management and QI teams through the steps of the scientific method  
• Participate in the development of the QI charter (topic, aim, change package and measurement strategy)  
• Teach and coach teams in the scientific method and quality improvement tools during quarterly learning sessions and through monthly visits  
• Perform the quality assurance of data during the coaching visits  
• Assist the team in running effective tests of changes  
• Assess progress of the project and performance of the team and identify necessary changes  
• Support collective learning throughout the project by sharing reports and information  
• Document and evaluate the project and write technical reports  
• Identify needs for additional technical assistance and materials | • Help select and enroll teams  
• Help improvement expert to develop an improvement charter  
• Teach and share evidence based information at learning sessions  
• Assess training needs and strengthen the technical skills of the teams  
• Mentor the teams in implementing technical changes  
• Coordinate communication among all parties | • Identify access and service quality issues and communicate them to the QI team  
• Provide expert patient opinion on ways to design user-friendly services  
• Contribute to identifying changes to test  
• Identify changes in patient behavior and promote them through a network of patients  
• Attend learning sessions  
• Report on progress to his/her peers |
Template for identifying the Organizations and Individuals involved in a QI Project

REGION/DISTRICT: FACILITY/IES: PROJECT TITLE: OTHER ORGANIZATIONS:

<table>
<thead>
<tr>
<th>Quality Management Team</th>
<th>Quality Improvement Teams</th>
<th>Quality Improvement Experts/Coaches</th>
<th>Subject Knowledge Experts</th>
<th>Clients &amp; Beneficiaries</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Team Leader</td>
<td>Team Members</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


QUALITY IMPROVEMENT CHARTER

WHAT IS A QI CHARTER AND WHEN TO USE IT?
A quality improvement charter is a short document that makes explicit the aim of an improvement project/effort and provides a roadmap for a multidisciplinary team to implement its strategy according to agreed-upon roles and responsibilities of its members and according to the steps of the QI model. Charters are useful references to keep teams focused on the improvement aim. Charters can be signed to reinforce the commitment of the stakeholders to work as a team for achieving the improvement aim. They are the first document that a team should develop once they agree to address a complex or recurring issue through a structured QI effort.

HOW DO WE DEVELOP A QI CHARTER?
QI charters vary in length and level of details. The following presents a comprehensive template, with topics in bold and instructions in italic.

Program: Write the name of the program.

Project name: Write the focus of the project and the phase (demonstration, scale-up, institutionalization)

Starting Date:………….. End Date:…………..

I. WHAT ARE WE TRYING TO ACCOMPLISH? (IMPROVEMENT AIM & OBJECTIVES)

Topic for Improvement: Write a general description of the project and its main focus (access, quality, cost, satisfaction, etc.).

Business case/Problem statement: Write a short statement of the justification for the project, including the magnitude of the problem (problem statement supported with data) and the public health consequences for individuals, their communities and the health system.

Aim statement: The aim statement specifies the beneficiary population, the services targeted for improvement and the system that deliver these services.

Improvement Objectives: They describe the specific improvements expected from the systems, processes and services that are targeted by the project and will contribute to achieving the aim.

II. HOW WILL WE KNOW A CHANGE IS AN IMPROVEMENT? (IMPROVEMENT MEASUREMENT SYSTEM)

Improvement Measures: Develop a table of improvement indicators related to the objectives and the aim (these measures are not definitive and will be refined and finalized by the quality improvement teams later).

<table>
<thead>
<tr>
<th>Objective</th>
<th>Measures</th>
<th>Current Level</th>
<th>Goal</th>
</tr>
</thead>
</table>

III. WHAT CHANGES CAN WE MAKE THAT WILL RESULT IN IMPROVEMENT? (IDEAS FOR CHANGES)

Focus of the improvement project: The statement lists the components of the system (processes) targeted for improvement.
Possible changes to test: List preliminary ideas of changes (the exact list will be generated by the quality improvement teams)

Improvement model: State the improvement model and tools to be used for testing/implement the changes.

IV. WHO WILL WORK ON THE IMPROVEMENT PROJECT? (IMPROVEMENT TEAMS)

Scope of the improvement: It describes the geographical boundaries and scale of the project.

Project team: List the organization(s) and people who will perform the different functions of an improvement project team.

V. HOW WILL THE PROJECT INCREASE THE CHANCES OF SUCCESS? (RISK ASSESSMENT AND MITIGATION)

Anticipated issues/risks: List the factors that might affect negatively the implementation and results of the quality improvement project.

Risk mitigation measures: List the factors and interventions that would affect positively the quality improvement project.

VI. WHICH ACTIVITIES WILL PROMOTE LEARNING, SUSTAINABILITY AND SCALE-UP?

Learning platform: Describe the communication strategy for learning (meetings, documentation, exchange of information)

Scale-up strategy: list the anticipated scope and strategy for scale up of the improvements.

VII. IMPLEMENTATION SCHEDULE OF THE QUALITY IMPROVEMENT PROJECT

Project milestones: List the main steps of the improvement project and by what deadline they should be completed

SIGNATURES:
MANAGERS  QI TEAM LEADERS  CONTENT EXPERT  QUALITY EXPERT
Example of A Quality Improvement charter

Program: Improving HIV/AIDS Services among Most at Risk Populations in country X.

Project name: Demonstration project on access of people who inject drugs (PWIDs) to quality HIV services

Starting Date: 1 March 2013  End Date: 31 December 2013

I. IMPROVEMENT AIM & OBJECTIVES

Topic for Improvement: This project will address issues of access and quality of HIV-related services to PWIDs, including clinical and social support services known to be effective for prevention, care and treatment.

Business case: The growing population of PWIDs in country/region X (estimated at 20,000) is experiencing an increased incidence of HIV/AIDS (+20% in the last 2 years), with increasing HIV transmission to their sexual partners (30% prevalence). It is estimated that 50% of PWIDs have no access to clean needles and 30% are also engaged in sex work with inconsistent condom use, spreading HIV to the general population. PWIDs have difficulties accessing health and social services due to issues of stigmatization and the low coverage of the country/region with appropriate service delivery points. As a result, 40% of them do not know their HIV status and only 65% of HIV+ PWIDs received the services they need. This long standing issue is receiving stronger commitment from local health authorities who recognize the seriousness of the situation and its effects on already stretched budgets.

Aim statement: To decrease the prevalence of HIV among PWIDs and their partners by 50% over 2 years through evidence-based risk reduction strategies and services delivered by the district health department and three NGOs.

Improvement Objectives:
1. Increase to 75% the number of PWIDs who use safe injecting practices;
2. Increase condom use with regular partners of PWIDs from 30% to 90%;
3. Increase utilization of HIV counseling and testing services by PWIDs so that 80% of them know their HIV status;
4. Improve the quality of HIV care and treatment services for PWIDs who are HIV+ (enrollment in care, prophylaxis of opportunistic infections, ARV based on CD4 and retention in care) so that 90% of PWIDs receive services according to needs.

II. IMPROVEMENT MEASUREMENT SYSTEM

Improvement Measures:

<table>
<thead>
<tr>
<th>Objective</th>
<th>Measures</th>
<th>Current Level</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Rate of PWIDs who use clean needles</td>
<td>50%</td>
<td>75%</td>
</tr>
<tr>
<td>2</td>
<td>Reporting of condom use during last sexual activity</td>
<td>30%</td>
<td>90%</td>
</tr>
<tr>
<td>3</td>
<td>Knowledge of HIV status</td>
<td>60%</td>
<td>80%</td>
</tr>
<tr>
<td>4</td>
<td>Service quality index against evidence-based standards</td>
<td>65%</td>
<td>90%</td>
</tr>
</tbody>
</table>
III. IDEAS FOR CHANGES

Focus of the improvement project: The improvement project will test and implement changes in the following processes/strategies: outreach processes to identify and engage PWIDs through a peer-to-peer approach; referral processes to a healthcare facility; needle exchange processes; condom distribution processes; service delivery processes (counseling, testing, CD4, ARV initiation and retention).

Possible changes to test:
- Change locations of needle exchange based on PWIDs preferences;
- Change communication channels about HIV testing services;
- Introduce “prevention for positives” counseling services;
- Develop a checklist for measuring quality of HIV services during supervision visits.

Improvement model: the QI teams will use a PDSA-based improvement model to test the effects of the changes on the improvement objectives and aim.

IV. IMPROVEMENT TEAMS

Scope of the improvement: The improvement project will be implemented in two districts of region X, and the 5 main health clinics serving the urban population where most PWIDs are concentrated.

Project team:
- Management team: manager of the district health department and the local NGO
- QI team(s) leaders: head of peer and outreach programs and of the 5 health clinics
- QI team(s) members: peers, outreach educators & staff of the 5 health clinics
- QI expert and coaches: technical staff of FHI 360
- Content experts: local and FHI 360 experts in PWIDs programs and evidence-based best practices
- Customers: one volunteer PWID per QI team and/or the organization who represents them

V. RISK ASSESSMENT AND MITIGATION

Anticipated issues/risks: resistance from local population utilizing the same health clinics; PWIDs’ fear of repression for illegal behavior might limit their use of facilities and interactions with programs; resistance to change from clinical specialists used to deliver services in a certain way; contradictory regulations; competing interests among NGOs and public institutions.

Risk mitigation measures: address confidentiality issues; engage local law enforcement authorities; clinical champions are identified, lead the QI work and influence their peers; policy makers are engaged and informed; capacity building benefits for all organizations are made explicit.

VI. LEARNING, SUSTAINABILITY AND SCALE-UP

Learning platform: The managers of the quality improvement project will organize quarterly learning sessions during which the QI team leaders will share their progress, results and challenges. The coaches of the QI teams will visit the teams monthly to support, document and evaluate progress and will report to managers and decision makers of public and private organizations involved. The teams will post their results on a website accessible to all for sharing of best practices. An annual conference to present the results of the project will allow other districts to prepare for the scale up.
**Scale-up strategy:** Once a final change package has been developed from the best practices of the demonstration phase, the leaders will play an active role in scaling up the changes to new sites, with a multiplicative effect where each clinic will coach three clinics in the first six months who, in turn, will coach themselves three clinics and so on. We expect the improvements to be scale up to the entire region (six districts) over a period of three years.

**VII. IMPLEMENTATION SCHEDULE**

**Project milestones:**
- QI teams established: March 2013
- Aim statement and objectives finalized: April 2013
- Charter signed: April 2013
- Quality monitoring system in place: June 2013
- Systems analyzed: July 2013
- Changes identified: August 2013
- PDSA completed: December 2013
- Demonstration phase evaluated: January 2014
- Scale up plan developed: February 2014

**SIGNATURES:**
MANAGERS QI TEAM LEADERS CONTENT EXPERT QUALITY EXPERT

**PREVENTING ERRORS IN QUALITY IMPROVEMENT CHARTERS**
The main risks with the development of a charter are that it is not enough documented to be a useful roadmap (hence teams will question the purpose and lose commitment) or, on the contrary, that teams wait until they have a perfect document before starting their QI effort, taking a long time to write a charter with too many details. The right balance has to be found, with the goal of having a shared understanding and commitment of the team members of what they want to achieve and of the QI process.
SYSTEM MODELING

WHAT IS SYSTEM MODELING AND WHEN TO USE IT?

System modeling shows how a system should be working by examining how various parts interact to produce a particular result. It produces a visual representation and a holistic view of a system (called a system’ view), organized under three components: inputs, processes, and outcomes:

- **Inputs** are the resources used to carry out the activities (processes). Inputs can be raw materials, or products or services produced by other systems. For example, in the malaria treatment system, inputs include anti-malarial drugs (drug production system) and skilled health workers (education system).
- **Processes** are the activities and tasks that turn the inputs into products and services. For malaria treatment, this process would include the tasks of taking a history and conducting a physical examination of patients complaining of fever, making a diagnosis, providing treatment, and counseling the patient.
- **Outcomes** are the results of processes and are of three types: outputs (immediate/direct outcomes), effects and impact (indirect/longer term outcomes).

  - **Outputs** are the direct products or services produced by the process. The outputs of the malaria treatment system are patients receiving therapy and counseling.
  - **Effects** are the changes in client knowledge, attitude, behavior, and/or physiology that result from the outputs. For the malaria treatment system, this would be reduced case fatality from malaria (patients getting better) and patients or caretakers who know what to do if the fever returns. These are indirect results of the process because other factors may intervene between the output (e.g., correct treatment with an anti-malarial) and the effect (e.g., the patient’s recovery).
  - **Impacts** are the long-term and still more indirect effects of the outputs on users and the community at large. For malaria treatment, the impact would be improved health status in the community and reduced infant and child mortality rates.

System modeling shows the processes (which are often the focus of the improvement effort) as part of a larger system whose objective is to serve a specific client need and achieve a defined health outcome. When teams do not know where to start an improvement effort, system modeling can help in locating problem areas or in analyzing the problem by showing the various parts of the system and the linkages among them. System modeling can also inform data collection needs to measure indicators of inputs, processes, and outcomes. Finally, system modeling is helpful for identifying the gaps between the ideal and the current system and generating ideas for interventions and changes. Systems contain many interconnected parts that must be woven together. The utility of system modeling is its ability to depict how parts interact. The strength of the system depends on the strength of its parts and how well they relate and influence each other.

![Diagram of inputs, processes, and outcomes](image-url)
HOW TO DEVELOP A SYSTEM'S VIEW?

**Step 1.** Identify the major process or “system” to be modeled and/or the desired impact. If starting with the process, identify the needs in the community that this process should be addressing. If starting with the impact, identify what process (or processes) is/are carried out to create the services or products (outputs) that would be expected to have an appropriate effect on clients, which could in turn be expected to result in the desired impact.

**Step 2.** Draw, label and fill the impact and the process boxes.

**Step 3.** Work backwards through the outcomes, beginning with the desired impact, and determine what effects the product or services (outputs) must produce in the clients to achieve that desired impact. Think about the various groups affected by the products and services. Draw and label the outcome box.

**Step 4.** Identify the specific outputs produced by the process that lead to the outcomes just identified. In many instances, there will be more than one kind of output. For example, a vaccination system should produce vaccinated children and “knowledgeable” mothers.

**Step 5.** Identify the major steps in the process: e.g., taking the history, giving the physical, making a diagnosis, giving a treatment, and counseling. Write these in the process box. Review the outputs (e.g., patient history recorded, patient diagnosed, patient treated).

**Step 6.** Identify the various inputs needed to carry out the process. These inputs should include manpower, material, information, and financial resources. Draw boxes for the various inputs and label them. Determine which support systems (such as logistics, training, supervision) produce each of these inputs and write the sources in the boxes.

**EXAMPLE OF A SYSTEM VIEW**

*System model of the case-management of malaria*

**HOW TO ANALYZE A SYSTEMS VIEW?**

Review the various elements of the system and discuss whether they are functioning as they should or not and if inputs/resources are in sufficient amount. When there are standards, determine whether they are met.
Determine what data are needed to know whether the system is sufficiently productive or adequately functioning to achieve the outcome and impact desired. Use these data to assess whether the system is performing the way it should be according to the system model you have drawn.

Identify weak or missing components of the system by seeing where in the process quality falls short. Identify the broken connections/interactions between parts of the system.

**PREVENTING ERRORS IN MODELING SYSTEMS**

Make sure to involve people who know the system being modeled and ask external reviewers to validate the system. When drawing a systems view of the current system, make sure that people describe the reality and not the ideal system.
FLOWCHARTING

WHAT IS FLOWCHARTING AND WHEN TO USE IT?
A flowchart is a graphic representation of how a process works, showing, at a minimum, the sequence of steps. A flowchart helps to clarify how things are currently working (real process) and how they could be improved (ideal process). It also assists in finding the key elements of a process, while drawing clear lines between where one process ends and the next one starts. Developing a flowchart stimulates communication among participants and establishes a common understanding about the process. Flowcharts also uncover steps that are redundant, missing or misplaced. In addition, flowcharts are used to identify team members to involve in the improvement process, to identify who provides inputs or resources to whom, to establish important areas for monitoring or data collection, to identify areas for improvement or increased efficiency, and to generate hypotheses about causes. Flowcharts can be used to examine the flow of patients, information, materials, clinical care, or combinations of these processes. It is recommended that flowcharts be created through group discussion, as individuals rarely know the entire process and the communication contributes to improvement.

EXAMPLES OF FLOWCHARTS
Several types of flowcharts exist: the most basic (high level), a detailed version (detailed), and one that also indicates the people/units involved in the steps (deployment or matrix):

- **A high-level flowchart** shows the major steps in a process. It illustrates a “bird’s eye view” of a process, such as the example below. It can also include the intermediate outputs of each step (the product or service produced), and the sub-steps involved. It is useful for identifying appropriate members of the QI team (those who are involved in the process) and for developing indicators for monitoring the process because of its focus on intermediate outputs. Most processes can be adequately portrayed in four or five boxes that represent the major steps or activities. In fact, it is a good idea to use only a few boxes, because doing so forces one to consider the most important steps. Other steps are usually sub-steps of the more important ones.

- **A detailed flowchart** provides a detailed picture of a process by mapping all of the steps and activities that occur in the process. This type of flowchart indicates the steps or activities of a process and includes such things as decision points, waiting periods, tasks that frequently must be redone (rework), and feedback loops. This type of flowchart is useful for examining areas of the process in detail and for looking for problems or areas of inefficiency. For example, the detailed flowchart below reveals the delays that result when the record clerk and clinical officer are not available to assist clients.
- **A deployment flowchart** (also called a cross-functional flowchart) maps out the process in terms of *who* is doing the steps. It is in the form of a matrix, showing the various participants and the flow of steps among these participants. It is most useful in identifying who is providing inputs or services to whom, as well as areas where different people may be needlessly doing the same task. The example below shows a referral process for HIV infected people from a wellness center to the ART center where he is provided with treatment and follow up.

Each type of flowchart has its strengths and weaknesses; the high-level flowchart is the easiest to construct but may not provide sufficient detail for some purposes. If you're unsure which to use, start with the high-level one and move on to detailed and deployment.

**HOW TO FLOWCHART A PROCESS?**
Regardless of the type of flowchart, there are several basic steps to its construction.

**Step 1.** Agree on the purpose of the flowchart and which format is most appropriate.

**Step 2.** Determine and agree on the beginning and end points of the process to be flowcharted.
- What signals the beginning of this process?
- What are the inputs?
- What signals the end of the process?
- What is/are the final output(s)?

**Step 3.** Identify the elements of the flowchart by asking:
- Who provides the input for this step? What is done with the input?
- What is the output to this step? Who uses it to do what?
If you are developing a flowchart to identify weaknesses in your processes, the steps and decision points you put into the flowchart should reflect the *true* process (what is actually done, not what should be done). Accuracy in creating the flowchart will assure you of being able to see what can or needs to be improved. If ideas for improvement are generated while developing the flowchart, do not discuss their merits at this time, but record them for future discussion.

**Step 4.** Review the first draft of the flowchart to see whether the steps are in their logical order. Areas that are unclear can be represented with a cloud symbol, to be clarified later.

**Step 5.** After a day or two, review the flowchart with the group to see if everyone is satisfied with the result. Ask others involved in the process if they feel it reflects what they do.

Flowcharts use specific symbols to indicate the nature of a step, whether the beginning and end of the process, or activities, or decision points, all linked with arrows indicating the direction of the flow. Decision symbols are appropriate when those working in the process make a decision that will affect how the process will proceed. For example, when the outcome of the decision or question is YES, the person would follow one set of steps, and if the outcome is NO, the person would do another set of steps. Be sure the text in the decision symbol would generate a YES or NO response, so that the flow of the diagram is logical. When a step is unclear, draw a cloud instead of a rectangle.

### HOW TO ANALYZE A FLOWCHART?

Once the flowchart has been constructed to represent how the process actually works, examine potential problem areas or areas for improvement using one or more of the following techniques.

- Examine the overall process: Is the flow logical? Are there fuzzy areas or places where the process leads off to nowhere? Are there parallel tracks? Is there a rationale for those?
- Examine each activity symbol: Is this step redundant? Does it add value to the product or service? Is it problematic? Could errors be prevented in this activity?
- Examine each decision symbol: Does it represent an activity to see if everything is going well? Is it effective? Is it redundant?
- Examine each loop that indicates work being redone (rework): Does this rework loop prevent the problem from recurring? Are repairs being made long after the step where the errors originally occurred?
- Examine each transition where one person finishes his or her part of the process and another person picks it up: Who is involved? What could go wrong? Is the intermediate product or service meeting the needs of the next person in the process?

### PREVENTING ERRORS IN FLOWCHARTING PROCESSES

Flowcharts for quality improvement should always reflect the actual process (what really happens), not the ideal process. Involve people who know the process, either while developing the flowchart or as reviewers when the chart has been completed. Be sure that the flowchart really focuses on the identified problem (i.e. the process that is the focus of improvement). Another common error is to flowchart a process that is outside the focus of the
improvement objective. For example, flowcharting a facility-based care process when the issue selected by the team is the loss-to-follow up of patients (non-users).
# QUALITY IMPROVEMENT INDICATOR FORM

**Name of Indicator:** STI cure Rate

**Indicator #:** STIQual 1

<table>
<thead>
<tr>
<th>Improvement Objective or Standard</th>
<th>Operational Definition of Indicator</th>
<th>Composition of the Indicator</th>
<th>Steps of the Process and Sources of Data (How to calculate it)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients diagnosed with STI, when treated according to the national guidelines of the Ministry of Health, are cured within a period that varies from 7 to 14 days after the beginning of the medical treatment.</td>
<td>The cure rate expresses the proportion of people with STI whose clinical signs and symptoms have disappeared within a period of 7 to 14 days after the beginning of the medical treatment</td>
<td>Denominator (D): Total number of patients treated for STI at the facility during the month prior to the previous month (2 months ago). Ex: In June, collect this information on STI patients seen in April.</td>
<td>1. Take the <em>register</em> of the facility; 2. Count the number of patients treated for STI 2 months prior; 3. If more than 30, then randomly select 30 patients from the list and retrieve their <em>medical records</em>; Write 30 as the denominator in the table below (D) 4. If less than 30, retrieve all medical records and write this number as denominator in the table below (D)</td>
</tr>
</tbody>
</table>

| Numerator (N): Number of STI patients seen at a follow-up visit in the previous month and declared cured. | 5. Review all retrieved medical records and count the number of patients who came back for follow-up and were declared cured; 6. Report this number in the table below (N) |

<table>
<thead>
<tr>
<th>Month</th>
<th>Jan</th>
<th>Feb</th>
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<th>May</th>
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<td>Numerator (N)</td>
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Unit of the Indicator (number, percent, other); Frequency of Data Collection; Responsible person(s) for data collection; Potential issues;
# Template of the Data Collection Form for Quality Indicators

**Name of Indicator:**

**Indicator #:**

<table>
<thead>
<tr>
<th>Improvement Objective or Standard</th>
<th>Operational Definition of Indicator</th>
<th>Composition of the Indicator</th>
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</table>

Numerator (N)

Denominator (D)

N/D x 100

**Unit of the Indicator (number, percent, other):**

**Frequency of Data Collection:**

**Responsible person(s) for data collection:**

**Potential issues:**
INSTRUCTIONS FOR USING THE INDICATOR FORM ABOVE

The indicator form is designed to standardize the quality improvement monitoring system so that different staff would measure the indicator in the exact same way, without running the risk of different personal interpretations (and different ways to collect the data). The last column on the right describes the process (step-by-step) and indicates the sources of data (in bold and italic) for both the denominator (to be collected first) and the numerator.

The indicator form provides the data collection support for one year of monthly tracking of each indicator and can be easily computerized to allow teams to draw the run charts automatically.

RECOMMENDATIONS FOR DESIGNING THE IMPROVEMENT MONITORING SYSTEM

We are recommending that the quality monitoring system be designed with the following features:

1. **Limit the number of measures** to a feasible data collection effort by focusing on clear improvement aims and objectives. Most experts recommended between 5 and 7 measures.

2. **Have a balanced set of measures** across different types of indicators: process, output and outcome.

3. **QI teams must measure themselves, frequently, on small samples**. A monthly frequency of measure is the minimum; the more frequent the measurements, the sooner an improvement team will know if a change yields an improvement. It is not necessary to measure the indicators on the total number of patients (or improvement units). Small samples are powerful enough to provide a sufficient level of precision of the indicator. The sampling technique needs to be appropriate to the improvement aim (that defines a specific population) and the patterns of utilization of services and patient flow. In some situations, a random sample is appropriate, but judgment sampling should be considered first. For example, if the aim is to reduce waiting time for patients, and the longest waits affect mostly patients who come after 10:00am, then the sampling should be drawn from this segment of the population of patients only and could, for example, focus on the first five patients each day who arrive after 10:00. When drawing a monthly random sample from all patients registered as having attended the services (the sampling database), we would recommend a minimum sample size of 30.

4. **Coaches conduct the quality control of data**. Teams might make errors in measurement, especially at the beginning, when the indicators are new to them and not part of their usual health information system. It is important for the QI coaches to verify the accuracy of the data through some quality assurance process during their visits.

5. **Teams use appropriate job-aids** to facilitate the data collection process. The indicator form was developed to facilitate data collection and minimize errors and should be used by the QI teams.

6. **Teams plot data on run charts**, which they interpret together and display. A key condition of successful QI efforts is working in teams. The collection of data and their interpretations on a run chart should be done with all members of the team.
RUN CHARTS

WHAT IS A RUN CHART AND WHEN TO USE IT?
A run chart is an essential tool for QI teams to track their progress against their improvement aim/objectives. Run charts provide a visual representation of the variations in performance occurring in some process over time and help understand what might influence a change in performance. They add value to the traditional descriptive summary statistics (such as average, median and range) by showing trends over time. Run charts graphically display non-random patterns (variations in performance due to external factors) such as shifts, trends and cycles, that can be used to identify problems (showing a trend away from the desired results) and to monitor progress when solutions are carried out (positive trend after a change/intervention is implemented).

WHAT DOES A RUN CHART LOOK LIKE?

The X axis represents equal time intervals, reflecting the frequency of data collection. The Y axis is the value of the performance indicators, usually a percentage. The centerline is the median of the dataset before any change is introduced. A run is the consecutive points running either above or below the center line. Each point is the value of the indicator. A run is broken once it crosses the center line. Values on the center line are ignored: they do not break the run, nor are they counted as points in the run. Arrows indicate when a change or intervention is introduced in that process/system. A horizontal line can be added to indicate the value of the performance improvement aim.

HOW TO CONSTRUCT A RUN CHART?
Step 1. Collect at least 25 data points (number, time, cost), recording when each measurement was taken. Arrange the data in chronological order.

Step 2. Determine the scale for the vertical axis as 1.5 times the range. Label the axis with the scale and unit of measure.

Step 3. Draw the horizontal axis and mark the measure of time (minute, hour, day, shift, week, month, year, etc.) and label the axis.

Step 4. Plot the points and connect them with a straight line between each point. Draw the center line (the median of all the data points before the changes).

HOW TO INTERPRET A RUN CHART?
A run chart can be interpreted from two perspectives: a non-statistical or a statistical interpretation.
The non-statistical interpretation would only look at whether the process achieves the desired performance (improvement aim/objectives) over time. In this case, the centerline is not necessary, but indications of changes/interventions are useful to interpret their effects.

The statistical interpretation requires identification of visual patterns, but does not necessitate any statistical tests that are usually beyond the capacity of local QI teams. The following patterns are the most important: shifts and trends. They rely on the “rule of 6” to identify patterns that indicate a “statistically significant difference” in quality/performance, and require that the centerline be drawn.

- 6 successive points ascending or descending indicate a trend.
- 6 consecutive points above or below the centerline represent a shift.

Both trends and shifts are patterns that indicate a statistically significant difference in the performance of a process (which could be an improvement or not, depending on the direction). Because performance does not vary significantly without a change in the process, any pattern raises the issue of identifying the change that did occur (whether planned by the team as part of their improvement effort, or unexpected/unplanned). The rule of 6 is appropriate for a number of points/dots between 20 and 30.

**EXAMPLES OF RUN CHARTS**

- Tanzania: Strengthen the Continuum of Care for HIV Patients in Dodoma

**PREVENTING ERRORS IN RUN CHART ANALYSIS**

Two common errors are over-interpreting the run chart and over-reacting to the data. Over-interpreting run charts means making conclusions on the stability of the system/process, an concluding that improvement have been sustained and predicting its future performance. To determine if a process or system is in a stable state, a Shewhart (control) chart is needed, which is more complex to use and beyond this handbook.
Over-reacting to the data means starting an investigation each time an indicator shows a slight decrease in performance from the previous result. Random variation is expected in every system and might not be significant.
FOR CAUSE AND EFFECT ANALYSIS

WHAT IS ROOT-CAUSE ANALYSIS AND WHEN TO USE IT?
Root-cause analysis (RCA) generates and sorts hypotheses about possible causes of problems within a process/system by listing all of the possible causes and factors that affect the identified problem, validating them, and then prioritizing the most important that, when removed, would solve most of the problem. RCA uses different graphic representations, such as cause-and-effect diagram, tree diagram and driver diagram, which organize a large amount of information by showing links between events and their potential or actual causes and provides a means of generating ideas about why the problem is occurring and possible effects of that cause. These diagrams identify factors that, when addressed, would lead to the desired state of performance of a system. Because everyone’s ideas can find a place on the diagram, a cause-and-effect analysis helps to generate consensus about causes. It can help to focus attention on the process where a problem is occurring and to allow for constructive use of facts revealed by reported events. However, it is important to remember that a cause-and-effect diagram is a structured way of expressing hypotheses about the causes of a problem or about why something is not happening as desired. It cannot replace empirical testing of these hypotheses: it does not tell which is the root cause, but rather possible causes.

HOW TO CONDUCT ROOT-CAUSE ANALYSIS?
There are two ways to graphically organize ideas for a cause-and-effect analysis. They vary in how potential causes are organized: (a) by category: called a fishbone diagram (for its shape) or Ishikawa diagram (for the man who invented it), and (b) as a chain of causes: called a tree diagram. The choice of method depends on the team’s need. If the team tends to think of causes only in terms of people, the fishbone diagram, organized around categories of cause, will help to broaden their thinking. A tree diagram, however, will encourage team members to explore the chain of events or causes.

- The fishbone diagram helps teams to brainstorm about possible causes of a problem, accumulate existing knowledge about the causal system surrounding that problem, and group causes into general categories. When using a fishbone diagram, several categories of cause can be applied. Some often-used categories are: human resources, methods, materials, measurements, and equipment; or: clients, workers, supplies, environment, and procedures; or: What, how, when, where. The group should choose those categories that are most relevant to them and feel free to add or drop categories as needed. We recommend organizing the categories according to the building blocks of the health system: leadership/governance; human resources; health information systems; equipment and supplies; financing; service delivery; and community. This will promote systems’ thinking and it covers all the functions of a health system.
• **A tree diagram** highlights the chain of causes. It starts with the effect and the major groups of causes and then asks for each branch, “Why is this happening? What is causing this?” The tree diagram is a graphic display of a simpler method known as the *Five Why’s*. It displays the layers of causes, looking in-depth for the root cause. This tool can be used alone or with any of the cause-and-effect diagrams.

  ![Tree Diagram Example](image)

**Question 1:** Why did the patient get the incorrect medicine?
*Answer 1:* Because the prescription was wrong.
**Question 2:** Why was the prescription wrong?
*Answer 2:* Because the doctor made the wrong decision.
**Question 3:** Why did the doctor make the wrong decision?
*Answer 3:* Because he did not have complete information in the patient’s chart.
**Question 4:** Why wasn’t the patient’s chart complete?
*Answer 4:* Because the doctor’s assistant had not entered the latest laboratory report.
**Question 5:** Why hadn’t the doctor’s assistant charted the latest laboratory report?
*Answer 5:* Because the lab technician telephoned the results to the receptionist, who forgot to tell the assistant.

*Solution:* Develop a system for tracking lab reports.

• **A driver diagram** helps to focus on the cause and effect relationships that exist in complex situations. It provides a simple way to break down improvement aims into well-defined drivers that can then form the focus of improvement efforts. It includes:
  - The aim or goal of the improvement effort;
  - The primary drivers, which are the main influences which influence directly (positively or negatively) to the chosen goal or aim;
  - The interventions or specific actions you can take that will affect these drivers;
  - The relationship arrows show the connections between drivers and interventions. A single intervention may impact upon a number of drivers.

Driver diagram can be used both to identify factors that negatively affect the issue selected, hence during a root-cause analysis, and can also present ideas for solutions by presenting the positive factors (drivers) that influence the improvement aim.
HOW TO CONSTRUCT A CAUSE-AND-EFFECT DIAGRAM
Although several ways to construct a cause-and-effect analysis exist, the steps of construction are essentially the same.

Step 1. Agree on the problem or the desired state and write it in the effect box. Try to be specific. Problems that are too large or too vague can bog the team down.

Step 2. If using a tree or fishbone diagram, define six to eight major categories of causes. Or the team can brainstorm first about likely causes and then sort them into major branches. The team should add or drop categories as needed when generating causes. Each category should be written into the box.

Step 3. Identify specific causes and fill them in on the correct branches or sub-branches. Use simple brainstorming to generate a list of ideas before classifying them on the diagram, or use the development of the branches of the diagram first to help stimulate ideas. Either way will achieve the same end: use the method that feels most comfortable for the group. If an idea fits on more than one branch, place it on both. Be sure that the causes as phrased have a direct, logical relationship to the problem or effect stated at the head of the fishbone. Each major branch (category or step) should include three or four possible causes. If a branch has fewer, lead the group in finding some way to explain this lack, or ask others who have some knowledge in that area to help.

Step 4. Keep asking “Why?” and “Why else?” for each cause until a potential root cause has been identified. A root cause is one that: (a) can explain the “effect,” either directly or through a series of events, and (b) if removed, would eliminate or reduce the problem. Try to ensure that the answers to the
“Why” questions are plausible explanations and that, if possible, they are amenable to action. Check the logic of the chain of causes: read the diagram from the root cause to the effect to see if the flow is logical. Make needed changes.

**Step 5.** Have the team choose several areas they feel are most likely causes. These choices can be made by voting to capture the team’s best collective judgment. Use the reduced list of likely causes to develop simple data collection tools to prove the group’s theory. If the data confirm none of the likely causes, go back to the cause-and-effect diagram and choose other causes for testing.

**HOW TO ANALYSE A CAUSE-EFFECT DIAGRAM?**

There are four steps to analyze a cause-effect diagram and complete a RCA:

- **Validate the cause and effect logic:** The cause-effect relationship must be direct and unavoidable.

- **Identify all root causes:** Is the cause alone enough to produce the effect?

- **Confirm the existence of the cause(s):** Collect data/evidence to support the hypothesis.

- **Assess the relative importance of each root cause:** The Pareto principle: “80% of the effects come from 20% of the causes”
PREVENTING ERRORS IN ROOT-CAUSE ANALYSIS

Remember that cause-and-effect diagrams represent hypotheses about causes, not facts. Failure to test these hypotheses—treating them as if they were facts—often leads to implementing the wrong solutions and wasting time. To determine the root cause(s), the team must collect data to test these hypotheses. The “effect” or problem should be clearly articulated to produce the most relevant hypotheses about cause. If the “effect” or problem is too general or ill defined, the team will have difficulty focusing on the effect, and the diagram will be large and complex. It is best to develop as many hypotheses as possible so that no potentially important root cause is overlooked. Be sure to develop each branch fully. If this is not possible, then the team may need more information or help from others for full development of all the branches.

<table>
<thead>
<tr>
<th>20 Clients Surveyed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rainy season: 15</td>
</tr>
<tr>
<td>Last-minute emergency: 5</td>
</tr>
<tr>
<td>Transport cost: 10</td>
</tr>
<tr>
<td>Total: 30 answers</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Distribution of Answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rainy season: 50%</td>
</tr>
<tr>
<td>Transport cost: 33%</td>
</tr>
<tr>
<td>Last-minute emergency: 17%</td>
</tr>
</tbody>
</table>
GAP ANALYSIS

WHAT IS A GAP ANALYSIS AND WHEN TO USE IT?
Sometimes, simply comparing the current system with the ideal one can generate good ideas of changes. Drawing the ideal system (using system modeling and flowcharting) can help identify the missing or flawed components in the current system, i.e. the “gaps”. Improvement teams can then brainstorm about changes to make to fill the gaps and design systems and processes that are close to the ideal ones and/or perform as well.

HOW TO CONDUCT GAP ANALYSIS?
Step 1. Using system modeling, develop a system view of the ideal system through brainstorming, answering the question “what would the ideal system look like to achieve a specific outcome”? Start with the outcomes and work backwards to identify processes and inputs.

Step 2. Model the current system and compare the two to identify the differences, i.e. the gaps. Gaps are expressed as the presence of the parts of the system (inputs and processes), the quantity of inputs, the standards met by each input, and the different interactions between the parts of the system (departments units, individuals, levels of the health system).

Step 3. Answer the question “what changes can we make to address this gap?” and use the results of a root-cause analysis (see later) to answer “why do these gaps exist?” and address the root-causes.

Step 4. Repeat the same steps, 1 to 3, for the processes involved: design the ideal processes and compare with the current ones to identify the missing steps, the wrong order of steps or the steps that do not add value.

EXAMPLE OF A GAP ANALYSIS
In the example below, a team draws an ideal flow chart of a streamlined and efficient process for CD4 count of HIV+ pregnant women, with the following features: patients requiring a CD4 counts are referred directly to the hospital lab to save time for both patients and staff; lab works at full to process 60 batches of CD4 tests at a time.

| The ideal flow of HIV positive pregnant woman to get CD4 count done |
|---|---|---|
| **Health center** | HIV positive pregnant women comes for the first antenatal visit | Health provider refers patients directly to the hospital laboratory | Exits facility |
| **District hospital** | Patient provides referral slip to the laboratory | Laboratory conducts CD4 count test | Exits facility |
The team then flowcharts the current process for HIV positive pregnant women to get a CD4 cell count to understand why so few are getting the test. Many bottlenecks are identified: long waiting time for women to be registered at the hospital and with the doctor, limited capacity of laboratory to conduct tests for bigger samples and for longer hours, etc. They notice the differences with the ideal process and start brainstorming about solutions to get the new process closer to the ideal one.
WHAT IS A BENCHMARKING AND WHEN TO USE IT?

Best practices benchmarking is a systematic approach for gathering information about process or product performance and then analyzing why and how performance differs between service units/organizations. In other words, benchmarking is a technique for learning from others’ successes in an area where the team is trying to make improvements. The term benchmarking means using someone else’s successful process as a measure of desired achievement for the activity at hand. Some sources of information for benchmarking include: literature reviews, databases, standard-setting organizations, local organizations, universities, the government, staff or customer interviews, international experts and questionnaires.

Benchmarking is most useful when trying to develop options for potential solutions. When trying to develop solutions, teams often have difficulty generating new ideas. People frequently do not know what others nearby are doing. Benchmarking helps stimulate creativity by gaining knowledge of what has been tried. It can also be used to identify areas for improvement by seeing what level of quality is possible in a similar context.

HOW TO CONDUCT BENCHMARKING?

Benchmarking can be done by identifying the best performers outside or within the health sector:

Identify other groups and organizations in other sectors that serve a similar purpose and that appear to work well. They do not need to be doing exactly what the team does, as long as it can be compared. For example, if the team is dealing with problems in hospital laundry services, the team could learn from hotels and dormitories that provide similar services, although they are not in the same field and/or do not provide exactly the same service. Examples from other sectors (non-medical) include:

- Hotels for customer service (reception of clients at health facilities)
- Library for records organizations and sorting (organizing/retrieving medical records)
- Soda company for logistics and distribution (supply chain of medicine and vaccines)
- Police department for emergency interventions (emergency ambulance service)

Identify best performers in the same sector: visit these sites and talk to managers and workers, asking them what they are doing, if they have similar problems, what they have done about it, and what levels of performance they have achieved. Ask as well what obstacles they have run into and how they have dealt with them. Review how the situation and constraints for the process in question are similar to or different from theirs and determine if changes are needed in carrying out their plan.

PREVENTING ERRORS IN BENCHMARKING

Be sure to understand fully how the process in question works before looking at others’ processes. Be sure that the other facility’s process is fully understood before adapting or adopting it to the process in question.
USING CHANGE CONCEPTS

WHAT ARE CHANGE CONCEPTS?

A concept is an abstract notion (approach, thought, belief, or perception) carried out through a more specific idea. A change concept is a general notion or approach to change found to be useful in developing specific ideas for changes that lead to improvement.

The change idea is the specific change that a QI team wants to test/implement before adopting and sustaining it once it has led to improvement (achieving the aim/objectives).

The following table shows the differences and the links between a change concept and a change idea through three examples. In these examples, the team suggested change ideas #1 to solve the problems identified in the first column. Each one of these ideas relies on a change concept that, if made explicit, can help teams generate additional ideas that might also be worth testing.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Change idea # 1</th>
<th>Change concept</th>
<th>Change idea # 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not enough doctors to deliver ART services</td>
<td>Have the nurse prescribe ART</td>
<td>Task-shifting</td>
<td>Test ART delivery services by home-based care providers</td>
</tr>
<tr>
<td></td>
<td>Have all wards use the same TB screening form</td>
<td>Standardize processes</td>
<td>Have all wards perform rapid testing before sending to the lab</td>
</tr>
<tr>
<td></td>
<td>Contact patients by phone 3 days before their appointments</td>
<td>Use reminders</td>
<td>Ask a community health worker to remind patients the day before</td>
</tr>
<tr>
<td>Variations in testing rate of HIV patients for TB across wards</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Missed appointments for ART patients</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The figure below shows how ideas are generated through a thought process and how identifying the concept behind a change idea can help generate more ideas of changes to test.
Implementing this change will require more than training, i.e. other interventions (develop new job aids, skills of providers in the new guideline). However, the change is the new treatment itself and treatment guideline. Training is an intervention that will likely contribute to building creativity.

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

### Preventing Errors in Generating Ideas of Changes

The most common “error” that teams make when generating ideas of changes that they would like to test is to identify only interventions. For example, teams might suggest training service providers in a new treatment guideline. Training is an intervention that will likely contribute to building the knowledge and skills of providers in the new guideline. However, the change is the new treatment itself and implementing this change will require more than training, i.e. other interventions (develop new job aids, provide in the Improvement Guide and some of them can also be accessed on line at: http://www.ihi.org/knowledge/Pages/Changes/UsingChangeConceptsforImprovement.aspx

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

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adapt the supervision form, add new indicators to the health information system, etc.). Do not confound “change” and “interventions”. The planning tool (see below) should help make this distinction.
**PDSA CYCLE OF LEARNING AND IMPROVEMENT**

**WHAT IS THE PDSA CYCLE OF LEARNING & IMPROVEMENT?**
The scientific method for improvement involves testing the effects of a change by going through a plan/do/study/act cycle known as the PDSA, otherwise referred to as Shewhart’s Cycle for learning and improvement. Pilot-testing changes through PDSA cycles allows trying out potential solutions on a small-scale before the system-wide implementation of the successful changes.

Each step of the PDSA cycle consists of several activities, summarized here:

- **Planning** the test of the change requires planning for:
  - The implementation of the change:
    - who will do what, when, where, and how;
  - The communication of the change and its implementation plan, including its rationale;
  - The documentation of the implementation of the change;
  - The measurement of the improvement indicators;
  - The evaluation of the effectiveness of the change.

- **Doing** the test means:
  - Implementing the change
  - Recording information about the process of implementation as described in the plan
  - Collecting and beginning the analysis of the data

- **Studying** the test involves answering four questions:
  - Was the change tested/implemented as planned?
  - Is the data reliable?
  - Has an improvement occurred?
  - Did the change achieve the predicted or desired results?

- **Acting** is a decision-making process that depends on the results of the test:
  - If the change led to an improvement and achieved the desired results, then it is sustained in the sites where the test took place and the team plans its spread to the rest of the system
  - If the change did not lead to the desired results (no improvement or not enough improvement demonstrated or side-effects and resistance), then the team needs to:
    - Verify that the change was carried out as planned
    - Identify unanticipated factors that influenced the implementation
    - Consider redesigning the change or testing another change

A template for the planning phase is provided below, while the other steps mainly require the analysis and interpretation of run charts and data collected during the implementation and some decision-making process.
PLANNING THE TEST OF A CHANGE

**Planning** the test of the change requires planning answering the question “who will do what, when, where, and how” for the 5 following activities:

- ✓ The implementation of the change;
- ✓ The communication of the change, its implementation plan and rationale;
- ✓ The documentation of the implementation of the change;
- ✓ The measurement of the improvement indicators;
- ✓ The evaluation of the effectiveness of the change.

The table below provides a template for the planning of the test and an example

**TEMPLATE FOR PLANNING THE TEST OF A CHANGE THROUGH A PDSA CYCLE**

<table>
<thead>
<tr>
<th>Issue:</th>
<th>Change to be tested:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>What</strong></td>
<td><strong>Who</strong></td>
</tr>
<tr>
<td>Implement the change</td>
<td></td>
</tr>
<tr>
<td>Communicate the change and the test</td>
<td></td>
</tr>
<tr>
<td>Document the implementation of the change</td>
<td></td>
</tr>
<tr>
<td>Measure the improvement indicators</td>
<td></td>
</tr>
<tr>
<td>Evaluate the effectiveness of the change</td>
<td></td>
</tr>
</tbody>
</table>
### EXAMPLE OF THE PLAN OF A TEST OF A CHANGE THROUGH A PDSA CYCLE

**Issue:** CD4 machine is subject to frequent breakdowns  
**Change to be tested:** Introduce weekly preventive maintenance

<table>
<thead>
<tr>
<th>What</th>
<th>Who</th>
<th>When</th>
<th>Where</th>
<th>How</th>
</tr>
</thead>
</table>
| Implement the change:  
  - Train lab technicians in preventive maintenance of the CD4 machine  
  - Develop and communicate standard operating procedures (SOPs) to perform preventive maintenance measures | Senior technicians from the national reference laboratory | The second week of March | At the national reference laboratory | Two-day training including presentation and practice |
| Communicate the change and the test  
  - Inform all laboratory personnel about the new maintenance measures  
  - Inform the service providers referring patients for CD4 test | Head of the facility and head of the laboratory | Next Thursday during the weekly staff meeting | In the three districts hospitals who perform the CD4 test | Prepare a presentation describing the preventive measures, the plan of the change and who is responsible for what |
| Document the implementation of the change:  
  - Monitor adherence to the preventive maintenance plan (PPM) and schedule  
  - Monitor adherence to standard operating procedures | Head of the laboratory | Once a week | At each laboratory | Through direct observation, using a checklist developed according to the SOP |
| Measure the improvement indicators  
  - Monitor, every month, the number of days when the CD4 machine is not working and/or the number of days between 2 breakdowns and plot on a run chart | Head of the laboratory and one senior lab technician processing CD4 tests | The first Monday of the month for data of the preceding month | At each laboratory | Collect the data from the lab register daily form and report on the indicator monitoring form |
| Evaluate the effectiveness of the change  
  - Monitor the improvement indicators for 3 months after performing weekly preventive maintenance activities | The QI team | Three months after the first occurrence of maintenance activities | At each laboratory | Interpret the run charts before and after the maintenance activities started |
ASSESSMENT BY QI COACHES AND TEAM’S ASSESSMENT

HOW DO COACHES ASSESS THE PROGRESS OF QI TEAMS?
The two forms below are used by coaches during site visits to assess the progress of QI teams against the QI process and results (The quality improvement assessment form) and to assess their functionality as a team (The team assessment form), ideally on a monthly basis. The data is collected through discussion with QI teams, observing their interaction, validating facts through review of documentation and occasionally through client interview. Shaded rows are only filled once at the first visit. The first form should be filled by team and updated monthly. If teams have access to the computer they can generate a run chart. If coach cannot visit teams on a monthly basis, teams should send these forms to the coach and get his feedback via email or fax.

PROJECT MONITORING FORM (TO BE FILLED BY QI TEAM)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Name of the team leader</td>
</tr>
<tr>
<td>2.</td>
<td>Date</td>
</tr>
<tr>
<td>3.</td>
<td>Title of the project</td>
</tr>
<tr>
<td>4.</td>
<td>Participating organizations and sites</td>
</tr>
<tr>
<td>5.</td>
<td>Improvement aim and objectives</td>
</tr>
<tr>
<td>6.</td>
<td>Quality improvement indicators</td>
</tr>
<tr>
<td>7.</td>
<td>Results in numbers or percentages</td>
</tr>
<tr>
<td>8.</td>
<td>Change/s tested by the team</td>
</tr>
<tr>
<td>9.</td>
<td>Barriers to improvement</td>
</tr>
<tr>
<td>10.</td>
<td>Lessons learned by the team</td>
</tr>
<tr>
<td>11.</td>
<td>Next steps identified by the team</td>
</tr>
</tbody>
</table>

Sections 3 to 6 should be filled once, the others should be updated monthly
TEAM ASSESSMENT FORM (TO BE FILLED BY THE COACH)

Based on the *project monitoring form* and the coaching session, coaches score the performance of the team and provide recommendations.

**NAME OF THE COACH**

**DATE OF THE ASSESSMENT**

**TITLE OF THE PROJECT**

**DATA IS VALIDATED**

<table>
<thead>
<tr>
<th>Situation</th>
<th>Definition</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intent to participate</td>
<td>The quality improvement charter is signed.</td>
<td>0.5-1</td>
</tr>
<tr>
<td></td>
<td>The QI team is formed.</td>
<td></td>
</tr>
<tr>
<td>Organization of the project</td>
<td>The organization of the project has begun (resources needed are identified; tools and materials gathered; meetings are scheduled and leaders identified)</td>
<td>1.1-1.5</td>
</tr>
<tr>
<td>Activity, but no changes</td>
<td>Team started measurement, data collection, analysis of system/processes and data is collected consistently and with no errors. Team started to document using the project monitoring form.</td>
<td>1.6-2.0</td>
</tr>
<tr>
<td>Changes tested but no improvement</td>
<td>First PDSA has begun. Measures are graphically displayed and project monitoring form is updated</td>
<td>2.1-2.5</td>
</tr>
<tr>
<td>Modest improvement</td>
<td>PDSA cycle is completed according to plan. There is anecdotal evidence of improvement. 20% of aim and objectives is achieved met or each measure is showing 20% improvement</td>
<td>2.6-3.0</td>
</tr>
<tr>
<td>Improvement</td>
<td>Testing and implementation continues. Improvement results are close to the target</td>
<td>3.1-3.5</td>
</tr>
<tr>
<td>Significant improvement</td>
<td>Project met the QI targets</td>
<td>3.6-4.0</td>
</tr>
<tr>
<td>Sustained improvement</td>
<td>Monitoring data shows that the improvement has been sustained since the last coaching visit</td>
<td>4.1-4.5</td>
</tr>
<tr>
<td>Institutionalization and spread</td>
<td>PDSA cycle has been completed and project aim is achieved. Organizational changes have been made to accommodate improvements and make changes permanent. The scale up is planned and the project is documented, using the <em>QI story template</em></td>
<td>4.6-5.0</td>
</tr>
<tr>
<td>Visit #</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>---------</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Date</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Score</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recommendations</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
STORYBOARDS

WHAT ARE STORYBOARDS AND WHEN TO USE THEM?
The QA storyboard serves as an ongoing visual record of the team’s progress, helping to keep team members focused on the task while sharing their progress with others. Storyboards use simple, clear statements as well as pictures and graphs to describe a problem, summarize the analysis process while it is under way, describe the solution and its implementation, and display the results. Steps in creating and maintaining a QA storyboard follow.

HOW TO CONSTRUCT STORYBOARDS?

**Step 1.** Reserve a section of the wall or secure a large board or poster board (measuring at least one and a half meters high by two meters in length) to serve as the QA storyboard.

**Step 2.** Mark off and label different areas of the storyboard for displaying the team’s progress during each of the quality improvement steps. Include areas for the problem statement, names of team members, the work plan, activities undertaken during problem analysis (e.g., root cause analysis, graphs, etc.) and the results, solution(s) selected, solution implemented, the results, and any other information that seems interesting or relevant.

**Step 3.** Post a copy of the initial statement of the problem and the names of the team members. A picture of the team may be added.

**Step 4.** Keep these up-to-date as the problem statement is refined and/or as team membership changes.

**Step 5.** Post a copy of the team’s work plan and schedule, and modify it as changes are made during the problem solving process.

**Step 6.** As work progresses, display the progress made in analyzing the problem. If analytical tools were used (e.g. flowcharts, cause-and-effect diagrams), include these items on the storyboard. It is also useful to include (if they were used) the list of indicators to be monitored, the data collection forms, and graphs displaying the results.

**Step 7.** Post the findings of the problem analysis and the solution(s) proposed and selected for implementation.

**Step 8.** Add any other aspects of the process of solution identification and selection (e.g., selection criteria or selection method) to be displayed for ready reference.

**Step 9.** Maintain an ongoing display of the progress of solution implementation. Show as much (or as little) detail as team members find helpful, either to focus their own work or to communicate their work to others.

**Step 10.** When the solution has been implemented and evaluated, post the results for all to see
St. Clair County Health Department
Location: Port Huron, MI
Size: 100 employees
Population Served: 166,119

Plan
Identify an Opportunity and Plan for Improvement

1. Getting Started

- Identify an Opportunity and Plan for Improvement
- Identify Possible Solutions
- Test the Theory for Improvement
- Identify the Next Order of Tactics
- Implement the Next Order of Tactics
- Revisit the Next Order of Tactics
- Plan

5. Develop an Improvement Theory

6. Test the Theory

- Final AIM Statement: The percentage of WIC infants and children receiving recommended immunizations during their WIC visit will be maintained at 70%.

6. Test the Theory

- The project team decided to implement the following strategies to test their theory:
  - AIM Statement: The percentage of WIC infants and children receiving recommended immunizations during their WIC visit will be maintained at 70%.
  - Study Use Data to Study Results of the Test
  - Study Use Data to Study Results of the Test
  - Study Use Data to Study Results of the Test
  - Study Use Data to Study Results of the Test
  - Study Use Data to Study Results of the Test

7. Study the Results

- Final AIM Statement: The percentage of WIC infants and children receiving recommended immunizations during their WIC visit will be maintained at 70%.

8. Standardize the Improvement or Develop New Theory

- Final AIM Statement: The percentage of WIC infants and children receiving recommended immunizations during their WIC visit will be maintained at 70%.

9. Establish Future Plans

- Final AIM Statement: The percentage of WIC infants and children receiving recommended immunizations during their WIC visit will be maintained at 70%.

Act
Standardize the Improvement and Establish Future Plans

- Final AIM Statement: The percentage of WIC infants and children receiving recommended immunizations during their WIC visit will be maintained at 70%.

- Final AIM Statement: The percentage of WIC infants and children receiving recommended immunizations during their WIC visit will be maintained at 70%.

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AGENDAS OF LEARNING SESSIONS

WHAT ARE LEARNING SESSIONS AND HOW TO ORGANIZE THEM?
A learning session is a 2-day (usually) meeting of all the QI teams (represented by their team leaders) who work on the same improvement aim/objectives, measure the same indicators and test different changes at the same time in their respective work environment. They are attended by the coaches and the managers of the health system involved and represent an opportunity to discuss the progress of the QI effort, to reach consensus on any decision needed to be made at each step of the QI model and to share results and lessons learned. QI coaches are responsible to plan and organize learning sessions according to an agenda that will evolve along with the progress of the QI teams. Traditionally, learning sessions are organized quarterly for QI projects that evolve as planned and we are providing illustrative agendas for three learning sessions.

- The first one deals with the initiation of a large QI effort managed through the Collaborative model and focuses on the design and the three questions of the QI model.
- The second one focuses on the progress with the test of changes using the PDSA cycle and can be repeated several times as needed.
- The third agenda is for a wrap up learning session with a focus on the final change package and its spread to other sites through a scale-up strategy.

These agendas should be viewed as samples and should be adjusted by coaches.

AGENDAS FOR THREE LEARNING SESSIONS.

Learning session 1

<table>
<thead>
<tr>
<th>Day 1</th>
<th>Day 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building consensus</td>
<td>Plan changes</td>
</tr>
<tr>
<td>Welcome, introductions</td>
<td>Presentation of the Measurement System</td>
</tr>
<tr>
<td>Shared vision: presentation of the</td>
<td>Working in small groups to discuss</td>
</tr>
<tr>
<td>Collaborative Charter</td>
<td>indicators</td>
</tr>
<tr>
<td>Presentation of the Quality Improvement</td>
<td>Planning changes using PDSA cycle</td>
</tr>
<tr>
<td>Model</td>
<td></td>
</tr>
<tr>
<td>Presentation of the Change Package</td>
<td>Each team presents planned changes for</td>
</tr>
<tr>
<td></td>
<td>Action Period 1</td>
</tr>
<tr>
<td>Working in small groups to discuss</td>
<td>Closing</td>
</tr>
<tr>
<td>changes</td>
<td></td>
</tr>
</tbody>
</table>
## Learning session 2

<table>
<thead>
<tr>
<th>Day 1</th>
<th>Day 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assessing the progress</strong></td>
<td><strong>Plan changes</strong></td>
</tr>
<tr>
<td>Welcome</td>
<td>Modification of the Change Package based on testing</td>
</tr>
<tr>
<td>Collaborative Progress based on assessment reports</td>
<td>Working in small groups: Each team plans changes for Action Period 2</td>
</tr>
<tr>
<td>Plenary sessions where some teams present on PDSA</td>
<td>Teams present plans on Action Period 2</td>
</tr>
<tr>
<td>Small group sessions where teams present each other lessons learned from their PDSA cycles</td>
<td>Closing</td>
</tr>
</tbody>
</table>

## Final learning session

<table>
<thead>
<tr>
<th>Day 1</th>
<th>Day 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assess the progress</strong></td>
<td><strong>Plan sustainability and scale up</strong></td>
</tr>
<tr>
<td>Welcome</td>
<td>Contributing factors to sustainability and scale-up</td>
</tr>
<tr>
<td>Final reports of the teams</td>
<td>Small group work: 1. Actions planned to sustain improvements 2. Actions planned to scale up the change package</td>
</tr>
<tr>
<td>Rewarding the teams</td>
<td>Teams report out on both activities</td>
</tr>
<tr>
<td>Small group where teams present ideas on modifying the change package</td>
<td>Closing</td>
</tr>
</tbody>
</table>
TEMPLATE TO DOCUMENT A QI STORY

The following provides an outline for documenting a quality improvement project/effort with the dual objective to scale up improvements by replicating the successful changes and to share the lessons learned on the improvement process and the system that was the target for improvement in order to inform future QI efforts and develop further the “science” of quality improvement. FHI 360 uses this template to publish its “Quality Improvement Stories” series.

Title of the QI project/effort (cover page)

◆ Title should:
  - Indicate the focus on quality and the specific dimension of quality being addressed
  - State the aim of the project
  - Specify the improvement method used

Back of cover page

◆ Recommended citation

Executive Summary

Table of Contents

Acknowledgements

Acronyms and abbreviations

Introduction

◆ Describe the background/context: where it takes place, the health system (type of facility, private or public), the population it serves, national epidemiological data and any other relevant information
◆ Specify the topic(s): health condition, targeted population/beneficiaries, local epidemiological data (if different from national), nature and magnitude of the specific local quality issue being addressed, baseline situation (quantitative/qualitative data on current issue and performance)
◆ Clarify the issue that is addressed, specify the reasons (event and persons) that triggered the decision to start this QI project and state the primary aim of the project
◆ Identify the relevance of the topic beyond the specific location (brief narrative on the issue being addressed) and summarize the standards and level of scientific evidence for this topic
◆ Mention the use of the FHI QI Model to address the issue(s) selected

Aim and objectives of the quality improvement project

◆ Describe how the QI team was formed and its composition (functions of the team members)
◆ Mention the other parts of the QI structure: leadership, QI expertise, content-knowledge expert in the topic being addressed
◆ Present the results of the systems analysis: systems view + flowcharts + cause-effect diagram (graphics and narrative)
◆ State the primary aim statement, including potential secondary aim
◆ Specific improvement objectives (make sure the objectives are SMART)
Quality Improvement Measures Monitoring System

♦ Describe the improvement measures/indicators
  o Provide an operational definition of each indicator
  o When a ratio, indicate numerator and denominator
  o Indicate any qualitative information that was collected (areas of clients’ dissatisfaction, etc.)

♦ Describe the monitoring system
  o Who measures
  o How often
  o Sources of information
  o Measurement tool/form that was developed (insert a picture of one of them)
  o Mention the plotting of data on run charts and/or any other chart that was used

♦ State level of effort and issues for data collection
  o Was the information to compute the indicators already collected somewhere or were special data collection tools developed?
  o What was the level of effort to collect the indicators? (persons/hours per month)
  o Was there any quality assurance/quality control of the data collection process?
  o Mention difficulties, errors and issues with data collection and how they were addressed

♦ Present results before the interventions/changes
  o Show run charts of retrospective data if available
  o If not, just give the baseline results (first dot on the run chart)

♦ Present additional relevant/useful information
  o Mention relevant epidemiological data that helps interpret the data

Interventions and changes

♦ Describe expected changes and why they should address the issue/cause (logical theory)
♦ Mention if there was one or several changes, whether they were “bundled” together or not
♦ Describe the interventions that are expecting to lead to the changes (logical theory)
♦ How were the ideas for interventions and changes generated?
  o Method: brainstorming, benchmarking or anything else?
  o Use of change concepts?
  o Were they generated by the team members or someone external to the team?
♦ Mention any ethical issue related to this improvement project, such as confidentiality issues or potential side-effects and how they were addressed

Testing/Implementing the changes with the PDSA cycle of trial and learning

♦ Planning the implementation/test of the change(s)
  o Insert a table that shows the plan of activities for testing the change (who, what, when, how, etc.)
  o Mention if a force-field analysis was conducted and show the results: which positive factors were in place that would likely support the QI project and which challenges needed to be addressed before
  o Report how the team communicated the test of the change to all stakeholders involved
  o Report on how the team planned to monitor the implementation of the interventions
  o Report on how the team planned to monitor whether the intervention(s) lead to the expected change(s)

♦ Implementing the interventions
  o Describe the implementation of the interventions and any discrepancy with the plan as well as their causes and how they are addressed (or not)
  o Describe the results of the monitoring of the change: did the change take place?
Were there any unexpected/unintended consequences (both positive and negative) of the intervention/change?

Insert photos of any visible intervention or change if available (physical structure, additional inputs, etc.)

- **Studying the intervention/change**
  - Show the run charts and the result of their analysis (interpretation) for each indicator, with a vertical line indicating the time when interventions/changes were implemented, and the 2 means before and after the changes
  - Did the intervention/change lead to improvement? To what extent?
  - Interpret the results according to the level of implementation
  - Comment on the time/effect relationship (should we expect an immediate effect or not? How long should we reasonably wait?)
  - Comment on unexpected effects, if any, both positive and negative

- **Acting on the results**
  - Which decision did the team make regarding the test? To adopt the changes and stop working on this issue? To adopt the changes and continue testing new changes in addition to the previous ones? To abandon the tested changes and try new ones? To abandon the tested changes and stop working on this issue?
  - Why did they make the decision they made? Was there a consensus among the team members and all parties involved or was there any disagreement?

**Next steps**

- **Sustaining the improvement in the pilot unit**
  - What was done (decisions and actions taken) to sustain the successful change(s) in the pilot unit?
  - Is the team working on a different QI project as a result of their experience with this one?
  - Is a different team setup by the leadership as a result of this QI project?

- **Spreading the improvements beyond the pilot unit**
  - How is the team/leadership planning the scaling-up of the successful changes and new system beyond the pilot unit? Describe scaling-up strategy and scope.
  - If no spread strategy or intent to scale-up, explain why.

**Conclusion and lessons learned**

- What worked well
- What were the challenges
- What did we learn about the health system that we did not know before
- What did we learn about the population that we did not know before
- Commitment/engagement of the team
- Support of leadership
- What would we do differently?
COACH ASSESSMENT FORM

**Instruction:** This form can help assess the performance of the coach while conducting a visit. It can be filled by the coach (self-assessment) or by an external observer/mentor

<table>
<thead>
<tr>
<th>Activity</th>
<th>Performed well</th>
<th>Needs improvement</th>
<th>Feedback/Recommended Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Prepared the coaching visit (agenda, QI coaching handbook, other relevant docs)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Informed the team in advance about the visit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Explained well the purpose of the coaching visit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Assessed the progress of the team and the stage of the improvement effort</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>5. Facilitated the use of an appropriate QI tool (flowchart, run chart, RCA, etc.)</td>
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<tr>
<td>6. Encouraged the participation of all team members and facilitated consensus</td>
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<tr>
<td>7. Confirmed the reliability of improvement measures</td>
<td></td>
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<tr>
<td>8. Provided feedback to the team members</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Decided the date of the next visit</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>10. Documented the coaching visit in the team assessment form</td>
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</tr>
</tbody>
</table>
This Spread Planner provides some guidance to develop a spread plan and move the effort forward. The first section contains questions that you may find useful in beginning to plan for spread: Leadership for Spread and Set-Up for Spread. The second section includes additional issues that we encourage you to consider as your initial spread work unfolds.

**Leadership for Spread**

- **Is improvement in this area a key strategic initiative within the organization?**

  Improvement is a strategic initiative: [ ] Yes [ ] No [ ] Unsure

  If “No” establish top-level commitment before proceeding.

  If “Unsure” how can this be clarified?

  Actions:

  ____________________________________________

- **Is there an executive(s) who is responsible for the spread?**

  Who: ___________________________

  Is this person passionate about the change? [ ] Yes [ ] No [ ] Unsure

  Is success in spreading this improvement part of his/her goals/performance evaluation? [ ] Yes [ ] No [ ] Unsure

  Actions:

  ____________________________________________

- **Is there a person or team who will manage the day-to-day spread activities?**

  Who: ___________________________

  Does this person or team have sufficient time specifically dedicated to spreading this improvement? [ ] Yes [ ] No [ ] Unsure

  Actions:

  ____________________________________________
Are the goals and incentives for the organization aligned with the new system?

What organizational goals relate to: ____________________________
Are the goals sufficiently aligned with major organizational goals to motivate leaders and new adopters? Circle: Yes No Unsure
Actions: ______________________________________________________
________________________________________________________________________

Set-Up for Spread

♦ What is the target population (e.g., which facilities, units, etc.)?

Target facilities, units, etc. ____________________________
________________________________________________________________________

♦ Is there a successful pilot site that has implemented the new system?

Successful site(s): ____________________________
How do you know the site is successful? (Be sure to review tests of change and results from pilot site.)
________________________________________________________________________
Are the elements of the new system packaged in a way that facilitates adoption in other sites? If not, what needs to be done?
________________________________________________________________________
Potential role of pilot site(s) in spreading to new sites: ____________________________
________________________________________________________________________

♦ Who are the key groups who make the adoption decision in the target population (e.g., Surgeons, Primary Care Physicians, Nurse Managers, Schedulers)?

Target Groups: ______________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
What is your initial strategy to reach all sites? (Include a brief statement of 1 to 3 concise sentences.) Considerations include:
- Will certain components of the change be spread to all sites or will all the components be spread to certain sites?
- What is the relationship of units to the pilot sites?
- Where do champions exist or where can they be readily developed?
  - At the leadership level?
  - At the grass-roots level?

![Initial Strategy:](image1)

What are your plans to establish two-way communication between those leading spread and the pilot sites?
- Are there existing venues you can use?
- What new communication venues need to be created?
- Who is responsible for monitoring the effectiveness of two-way communication?

![Initial Strategy:](image2)

What is the initial strategy for reward and recognition of participation and progress?

![Initial Strategy:](image3)
Where resources are available?

Initial Strategy: 

Strengthening the Social System

Who are the key messengers that will explain the new system to the target population?
- How will you identify them?
- What will you do to help them?
- What technology will you use to help them?
- How will you continue your relationship with them?
- How will you provide feedback?

Initial Strategy: 

Can “communities of practice” (people with similar positions and responsibilities, e.g., physicians, nurses, technicians, clerks, etc.) be established to facilitate discussions among peers? Are these communities needed for your spread work?
- How will you provide a time and place for people to interact?
- What will motivate them to form communities of practice?
- How will you encourage communication and feedback among the group?
- How can you support them?
- What technology will you use to help them?

Initial Strategy: 

What are the concerns of the front-line staff in the target population? How will these concerns be addressed?
- How will you educate them about specific changes?
- What will you do to enable them to see the big picture?
- What technology will you use to help them?

Initial Strategy:

What tools or methods did the successful pilot sites use that can make it easier for the new teams to make the changes?
- How will you transfer those tools, methods, and knowledge to the other teams?
  - How will you share documents?
  - How will you encourage new teams to hear from pilot site teams?
  - How will you enable an “all teach, all learn” environment?
  - How will you encourage pilot site teams to learn from new teams?

Initial Strategy:

How will the leadership stay involved and connected to the front-line teams?

Initial Strategy:
Other Key Considerations for Successful Spread

Developing the Communication Plan

- How will awareness of the initiative be communicated?
  - Have the benefits been documented?
  - Is comparative data available?
  - What channels will be used to raise awareness in the target population?

- How will technical knowledge be communicated?
  - Have the potential changes and the ongoing learning been documented in a succinct format?
  - What face-to-face interactions are planned?
  - How will successful sites be involved to supply technical support?

- How will key measures be communicated to leadership?
- How will assessment of progress and results be communicated back to the pilot units?

<table>
<thead>
<tr>
<th>Initial Strategy:</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>

Developing the Measurement and Feedback System

- How will outcomes be measured?
- How will the rate of spread be monitored?
- Who will be responsible for collecting, plotting, and sharing the data?
- What information/reports will be used to monitor and refine the spread strategy?
- How will measures and analyses be fed back to the pilot units to support and encourage further progress?
- How will pilot units be rewarded and recognized for participation and progress?

<table>
<thead>
<tr>
<th>Initial Strategy:</th>
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<tbody>
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</tbody>
</table>
PRIORITIZATION MATRIX

WHAT IS A PRIORITIZATION MATRIX AND WHEN TO USE IT?
A criteria or prioritization matrix is a tool for evaluating options based on a set of explicit criteria the group has determined is important for making an appropriate, acceptable decision. Criteria for improvement can be weighted and ranked to help in the decision-making process. Although the prioritization matrix is the method most likely to result in consensus, at times it can be time-consuming and complex. Different versions of the matrix adapt this method for use in small or larger groups and with few or many criteria.

Matrices work best when options are more complex or when multiple criteria must be considered in determining priorities or making a decision. The matrix presented below displays the options to be prioritized in the rows (horizontal) and the criteria for making the decision in the columns (vertical). Each option is then rated according to the various criteria.

<table>
<thead>
<tr>
<th>Options</th>
<th>Criteria</th>
<th></th>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>#1</td>
<td>#2</td>
<td>#3</td>
<td></td>
</tr>
<tr>
<td>Option 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Option 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Option 3</td>
<td></td>
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</tr>
</tbody>
</table>

HOW TO DEVELOP A PRIORITIZATION MATRIX?
**Step 1:** List the options or choices to be evaluated. Make sure that all team members understand what each option means.

**Step 2:** Set the criteria for making the decision. The group can choose these criteria using brainstorming and then voting to determine the most important/relevant ones. Be sure that everyone understands what the chosen criteria mean. Criteria commonly used for choosing problems to work on include importance, support for change, visibility of problem, risks if nothing is done, and feasibility of making changes in this area. For choosing solutions, the following criteria are often applied: cost, potential resistance, feasibility, management support, community support, efficiency, timeliness, impact on other activities. These are not the only possible criteria; the group should develop a list that is appropriate for its situation. No minimum or maximum number of criteria exists, but three or four is optimal. More than four criteria would make the matrix cumbersome. One way to reduce the number of criteria is to determine if there are any criteria that all options must meet. Use this criterion first to eliminate some options. Then, list the
other criteria to prioritize the remaining options. Another way to make the matrix less cumbersome is to limit the number of options being considered. If the list of options is long (greater than six items), it may be easier to first shorten the list by eliminating some options. Commonly used criteria for eliminating potential problems from consideration include: (a) the problem is too big or complex, (b) it is not feasible to make changes in this area (beyond the team’s control or authority), and (c) lack of interest among staff to work on the problem.

**Step 3:** Draw the matrix and fill in the options and criteria.

**Step 4:** Determine the scale to use in rating the options against each criterion. Ways to rate options range from simple to complex. A simple rating scale sets a score based on whether the option meets a given criterion, e.g., Are trained staff already available? The answer (vote) “yes” would gain one point, while “no” would gain zero points. Another common rating scale scores options according to how well one option meets the criterion, e.g. "How much management support is there for this option?" The answer of “high” would garner three points, “medium” two points and “low” one point (see note in box for another example). A complex rating scale assigns a different maximum score (weight) to each of the criteria, and each option is scored on each criterion, from one up to the maximum weight of that criterion as seen in the table below.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Maximum Points</th>
<th>Option 1</th>
<th>Option 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feasibility</td>
<td>50</td>
<td>25</td>
<td>35</td>
</tr>
<tr>
<td>Client acceptability</td>
<td>35</td>
<td>30</td>
<td>20</td>
</tr>
<tr>
<td>Low cost</td>
<td>15</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>Overall rating</td>
<td>100</td>
<td>60</td>
<td>70</td>
</tr>
</tbody>
</table>
BRAINSTORMING

WHAT IS BRAINSTORMING AND WHEN TO USE IT?
Brainstorming is a way for a group to generate as many ideas as possible in a very short time by tapping into group knowledge and individual creativity. Brainstorming produces ideas by encouraging the participation of all group members through structured and unstructured thought processes on a given subject. It requires participants to be willing to express their ideas without evaluating them, remain open to new ideas, and refrain from criticizing suggestions. Brainstorming works best in an uninhibited environment where ideas are freely generated and built upon.

Brainstorming is particularly useful when trying to generate ideas about problems, areas for improvement, possible causes, other solutions, and resistance to change. By bringing out many creative ideas quickly and encouraging all group members to participate, this activity opens up people’s thinking and broadens their perspectives. It allows ideas to build on one another, which would not occur if each team member were interviewed separately.

HOW TO CONDUCT A BRAINSTORMING SESSION?
Write the question or issue to be explored through brainstorming on a flip chart, blackboard, or any place where everyone can see. Make sure that everyone is clear about the topic. Review the rules of brainstorming:

- Do not discuss ideas during the brainstorming
- Do not criticize any idea
- Be unconventional: every idea is acceptable
- Build on the ideas of others
- Quantity of ideas counts

Brainstorming can be unstructured or structured:

- **In unstructured brainstorming**, each person voices ideas as they come to mind. This method works well if participants are outgoing and feel comfortable with each other. In structured brainstorming, each person gives an idea in rotation (a person can pass if he or she doesn’t have one at the moment).

- **Structured brainstorming** works well when people are unfamiliar with one another or are less talkative: the structure encourages everyone to speak. Give people a few minutes to think of some ideas before starting. Write all ideas on a flip chart. After all the ideas have been generated (usually after about 30–45 minutes), review each one to make it clear and combine related ideas. Agree on ways to judge ideas, and use data collection, voting, matrices, or a Pareto chart to choose among options. Groups often use voting techniques first to reduce the list to about six to 10 top ideas. Then they use other techniques to choose among this shorter list.

PREVENTING ERRORS IN BRAINSTORMING
Brainstorming is a technique for generating ideas, but each idea will need elaboration. Discussing or judging ideas while brainstorming impedes the exercise and limits the flow of ideas. Save discussion at the end. If one or a few individuals dominate the discussion in an unstructured brainstorming session, shift to a structured brainstorming format.
QUALITY IMPROVEMENT REFERENCES


6. FHI 360 E–learning course “Journey to Improve Health Care Quality”.