Embracing Quality in Public Health

A Sequel to
Embracing Quality in Local Public Health:
Michigan's Quality Improvement Guidebook

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FOREWORD FROM THE ROBERT WOOD JOHNSON FOUNDATION

The Robert Wood Johnson Foundation (RWJF) seeks to advance initiatives and resources that strengthen the public health system and advance its quality and impact. We are pleased to support *Embracing Quality in Public Health: A Practitioner's Quality Improvement Guidebook* which plays an invaluable role in helping public health professionals continue to apply quality improvement tools and methods to public health practice; refine their use; and foster a culture of quality improvement within their agencies.

The Foundation's work in performance improvement dates back to 1997 with *Turning Point: Collaborating for a New Century in Public Health*, a national initiative to strengthen the public health infrastructure in the United States. Since that time, we have supported multiple initiatives to continue to build momentum around the lessons drawn from *Turning Point,* the recommendations of the Institute of Medicine's 2002 report *The Future of the Public's Health*, *NACCHO's Operational Definition of a Functional Local Health Department,* and efforts to develop the national public health accreditation system that is now in place with the Public Health Accreditation Board, which has quality improvement as its cornerstone.

Between July 2005 and December 2011, RWJF sponsored selected states with experience in public health assessment, accreditation and quality improvement (QI) to share their experiences with other states through three phases of the *Multistate Learning Collaborative* (MLC). During the first phase of MLC, the Michigan Public Health Institute (MPHI) conducted an extensive search of QI methods, tools, and training. This experience identified gaps in the availability of QI resources specific to public health. In response to this void, the project team at MPHI in collaboration with the Michigan Department of Community Health created a public health-specific QI resource called *Embracing Quality in Local Public Health: Michigan's Quality Improvement Guidebook.* The Guidebook—written by public health practitioners for public health practitioners—has been a go-to resource for many public health practitioners looking to apply QI to public health practice and prepare for accreditation. The online version of the Guidebook has received more than 105,000 downloads since its release in 2008 and has helped shape QI as an essential, practical public health tool.

Now more than ever health departments need guiding lights to understand how to use QI tools and techniques to increase their effectiveness and efficiency. This new edition of the Guidebook—with examples from health departments of different sizes, types and locations—will assist public health agencies in using QI tools and processes to advance the impact of their health departments; prepare for accreditation; and continually improve their ability to anticipate and respond to pressing public health needs.

The Foundation is committed to providing support to public health practitioners to improve their work and impact. This new edition of the Guidebook can serve as a valuable resource to practitioners, policymakers, and funders, and can help strengthen the ability of public health agencies to protect and improve the health of the communities that they serve.

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PREFACE

THE GUIDEBOOK'S STORY: HISTORY AND DEVELOPMENT

The second edition of Embracing Quality in Public Health reflects five years of study, action, and learning among the authors and many other generous, thoughtful individuals who contributed their time and talent to informing this resource. In the spirit of documenting the process used to translate on-the-ground learning and quality improvement (QI) science into a practical guide, what follows is a brief description of how the original and second edition Guidebooks were developed.

History of Michigan's Quality Improvement Guidebook

The first ever QI Guidebook was developed with and for public health practitioners as part of Michigan's Multi-state Learning Collaborative-2 (MLC-2) grant. MLC-2 was designed to complement the recommendation for a Voluntary National Accreditation Program for State & Local Public Health Departments authored by the Exploring Accreditation (EA) Steering Committee, which concluded that a voluntary national accreditation program should:

- Promote high performance and continuous quality improvement
- Recognize high performers that meet nationally accepted standards of quality

MLC-2, funded by the Robert Wood Johnson Foundation (RWJF) and coordinated by the National Network of Public Health Institutes (NNPHI), complemented this recommendation by working toward the following objectives:

- Bolster public health agency assessment/accreditation programs with funding to support the application of QI techniques in the context of local and state agency assessment/accreditation
- Convene 10 states that are conducting assessment/accreditation programs through multiple venues (teleconferences, site visits, and on-site meetings) to apply and evaluate QI methods and techniques from a variety of sectors
- Collaborate to produce documents and tools that will serve as resources to advance QI efforts for the larger public health community
- Inform the public health practice community about the proceedings and findings of the MLC-2 project

As one of 5 states participating in MLC-1 and one of 10 states awarded an MLC-2 grant, Michigan produced this Guidebook to support local health departments (LHDs) as they worked toward these objectives. As Michigan's MLC-2 team began their work, they found that while there was a substantial amount of information available on QI, there was little practical guidance available on the implementation of QI in a public health context. The Guidebook was developed to address this gap and fill a need recognized by the public health community in Michigan.

The first Guidebook was developed based on QI literature, and it was also informed by the efforts of the four pioneering LHDs in Michigan that implemented QI projects as part of MLC-2. These LHDs—Berrien, Genesee, Kent, and Ottawa—applied the Deming Cycle of Plan-Do-Study-Act (PDSA) to QI projects within their agencies, and they helped Michigan's MLC-2 team discover what health departments needed to know in order to apply PDSA in a public health context. This groundbreaking work would not have been possible without the significant effort of these four pilot LHDs. In addition, the learning community that included these health departments, the Michigan Local Public Health Accreditation Program, the Michigan Public Health Institute (MPHI), the Michigan Department of Community Health, and the broader Michigan MLC Steering Committee, as well as expert consultants who worked with us, produced a wealth of practice-based knowledge that shaped the first edition.

The first Guidebook was authored by MLC-3 Steering Committee leadership, including Debra Scamarcia Tews and James Butler, and the MLC-3 project team at MPHI, including Marti Kay Sherry and Angela Martin. These principal authors spent countless hours in research, writing, reviewing, and conversing to generate a Guidebook that would provide a practical resource for all Michigan LHDs wanting to begin or advance implementation of QI.

Beyond those mentioned, several additional public health staff contributed to segments of the Guidebook. Moreover, several public health QI experts served as reviewers and created an example of a public health improvement using PDSA. Leaders from the national MLC team were asked to review and provide input as well. Ultimately, the first Guidebook was written by public health personnel for public health personnel.

Although the Guidebook was intended to serve primarily as a "home-grown resource," the work of these authors and their partners unexpectedly resulted in a Guidebook that has, at the time of this publication, been downloaded over 105,000 times from the Michigan Local Public Health Accreditation Program's website alone. In addition, the Guidebook has been distributed across the country by national partner organizations and state and local health departments. It has been used in university settings and as a practical training tool. The overall volume of requests for the Guidebook has been extraordinary, and it is a key resource for QI efforts in Michigan and beyond.

Considering a Second Edition

The Guidebook was truly tested in the third iteration of the MLC. This on the ground application of the Guidebook highlighted for Michigan's MLC-3 team opportunities to strengthen the Guidebook by incorporating feedback on the Guidebook from users, new literature on the application of QI in public health, lessons learned through QI practice in a public health context, and case studies from public health agencies across the country.

An evaluation of the Guidebook was conducted with the support of NNPHI through MLC-3. The evaluation was designed to assess the utility of the Guidebook for users in LHDs and to assess the strengths of the Guidebook and identify its limitations. It involved both interviews with key informants who were experienced users of the Guidebook and a survey of Guidebook users from across the country.

Evaluation results indicated that users have found the Guidebook a helpful resource for learning about PDSA, learning about QI methods, guiding a QI project, and learning about QI tools. Users indicated the Guidebook is helpful because of the practical style in which it is written, its straightforward organizational structure, its helpful inclusion of public health examples, the provision of specific guidance on QI projects, its ability to help users get started, and its usefulness to support training—its intended purpose.

> *The Guidebook is a sensible, necessary, practical, and living document that staff understand and refer to when in doubt.* —*Guidebook Evaluation Participant*

Results also suggested that the field would be highly interested in and supportive of a second edition, and participants identified opportunities for improvement and expansion. Interview and survey results suggested 10 specific areas that could be targeted for expansion in the second edition: QI tools, data, building a culture of QI, accreditation and QI, organizing a QI project, engaging customers, public health examples, forming an aim statement, conducting a basic evaluation, and incorporating additional resources.

RWJF awarded MPHI a grant to complete a second edition of the Guidebook, incorporating lessons learned from the evaluation. This second edition is envisioned as a product of the MLC, reflecting the experience of QI practitioners in public health from across the country.

Developing a Second Edition

The Guidebook was enthusiastically revised by a dedicated team of staff from MPHI, the lead author of the first Guidebook, and a public health consultant from outside of the state.

Debra Scamarcia Tews, the lead author of the first edition, contributed her knowledge of the science and application of QI in other fields, five years of experience with the MLC, an in depth understanding of accreditation, a wealth of experience with and knowledge of state and local public health systems, and her educational background in the field of organizational development. Debra's voice resonated with readers of the first edition who valued her ability to break down big ideas into manageable, logical, understandable components and illustrate how to put ideas into action. As such, it was Debra who again led the writing of this edition.

In order to broaden the Guidebook's applicability and incorporate examples of QI in public health from across the country, Dr. Kusuma Madamala contributed her talent to the development of the case studies and to the review of overall content. Kusuma served as a consultant with the MLC-3, and she offered a wealth of knowledge of how QI has been used by health departments in a variety of contexts across the country.

MPHI—Julia Heany, Jessie Jones, and Robin VanDerMoere—and our partners worked together to create this second edition throughout 2011. The revision process was guided by eight principles, which were developed during initial planning meetings based on what users valued about the first edition. These principles are listed here:

1. Content will be developed to meet the needs of QI novices.
2. The Guidebook will describe QI as a process that engages staff at all levels, in all roles, and in all programs.
3. The style should be user-focused, accessible, simple, and clear.
4. The focus on PDSA should be maintained.
5. The content should be directly and clearly applicable to a public health context.
6. The Guidebook should be usable as a teaching tool.
7. The information should be evidence-based, up-to-date, and in line with available data.
8. The content should help users understand the relationship between QI and National Voluntary Accreditation.

The lengthy revision process involved reviewing evaluation findings and articulating which chapters would be revised, as well as what additional content would be incorporated. The team thoroughly reviewed the literature that has been published since the first edition and reviewed countless other resources regarding QI, performance management, accreditation, and other related topics. Chapters were revised, written, and reviewed multiple times internally. At the end of 2011, the team requested feedback from public health QI experts, consultants, practitioners, and novices from across the nation. These individuals hailed from local, state, tribal, federal, national, and non-profit organizations. The team used the extensive feedback provided by these reviewers to further improve the second edition.

Ultimately, the second edition of the Guidebook has the same goals as the first. It is our hope that it will build on the successes of the first Guidebook and become a valued resource for you and other state, local, and tribal public health practitioners who wish to begin or advance a rewarding journey to quality!

ACKNOWLEDGEMENTS

Julia Heany, Jessie Jones, and Robin VanDerMoere of the Michigan Public Health Institute's Office of Accreditation and Quality Improvement within the Center for Healthy Communities, along with Debra Scamarcia Tews—lead author and consultant, and Kusuma Madamala—case study consultant, are genuinely grateful to many for their substantial contributions in developing this second edition of ***Embracing Quality in Public Health: A Practitioner's Quality Improvement Guidebook***.

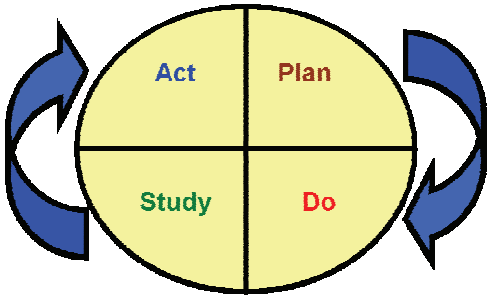
The Robert Wood Johnson Foundation and the National Network of Public Health Institutes provided generous financial support, leadership, and vision. Numerous public health colleagues across the nation having growing expertise in quality improvement (QI), performance management, and accreditation enthusiastically reviewed the new chapters in the Guidebook and provided an abundance of thoughtful commentaries and valuable suggestions for improvement. We are thankful for their many contributions.

We are also genuinely appreciative of the vision and assiduous work of the original Guidebook authors—Debra Scamarcia Tews, Marti Kay Sherry, James Butler, and Angela Martin—and acknowledge their tireless efforts during the early days of the Multi-State Learning Collaborative in developing a practical QI resource tailored specifically for today's public health professionals. We also acknowledge and thank the focus group participants and survey respondents who contributed to the evaluation of the first edition.

Additionally, we recognize and thank our local, state, territorial, tribal, federal, and national public health colleagues across the country for carrying the QI torch, promoting the use of QI tools and methods, and enthusiastically encouraging this Guidebook's revision and expansion. We offer additional thanks and appreciation to the health departments that generously shared their QI stories via the case studies included in this edition.

Most important, we thank you, the users of this Guidebook! You were and are the catalysts for this second edition. You viewed or downloaded the first edition from the internet more than 105,000 times! In essence, you were the experimenters that tested the first edition. In some cases you courageously jumped into QI activities with little more than the Guidebook and a strong desire to make the public's health better in your communities! We hope this second edition complements your efforts, provides enhanced utility, and facilitates your continued QI journey. Best wishes!

Start now.
Start today.
Just start.



Public health will be better because you did.
Best wishes on your quality journey!

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What's New and Improved in the Second Edition?

Chapter:	Description of Improvement:
Chapter 1: Quality Fundamentals	This first chapter of the Guidebook is new and begins to address what quality improvement (QI) looks like for public health. It: • Provides public health definitions for quality and QI • Offers a preview of Plan-Do-Study-Act (PDSA) • Describes QI principles • Discerns between QI and quality assurance • Highlights what QI can do for you
Chapter 2: Customers, Clients, and Stakeholders	Revisions and additions include: • Ideas for involving and communicating with customers, clients, and stakeholders • A sample customer satisfaction survey and distribution process
Chapter 3: Organizing a QI Project	The first edition did not include information on Organizing a QI Project. This new chapter includes information on: • QI training, building a QI team, and holding team meetings • Developing a QI team charter and managing documents
Chapter 4: Using the Plan-Do-Study-Act Cycle	Additions include: • Lessons from the field • Case study highlights
Chapter 5: Writing an Aim Statement	Revisions and additions include: • Using SMART criteria to develop a SMART Aim Statement • Expanded examples of aim statements • An aim statement worksheet
Chapter 6: The Importance of Data and Measuring Improvement	Previously, the Importance of Data and Public Health Measures of Improvement were separate sections. The two sections now serve as one chapter; revisions and additions include: • Data terms to know • Developing a performance target • Establishing a baseline
Chapter 7: Quality Improvement Tools	Significant revisions include the addition of step-by-step QI tool guides for: Brainstorming, Process mapping, Fishbone diagrams, Check sheets, Pareto charts, and Run charts. A detailed QI tool selector chart is available to help guide tool selection.
Chapter 9: Building a Culture of Quality – In Public Health	Building a culture of quality in public health is new to this edition. The chapter provides information on: • Defining, constructing, and sustaining a culture of quality • Weaving QI, accreditation, and performance management into a culture of quality • Making quality a part of everyday public health work by using practical ideas and strategies
Appendix A: Case Studies	The number of case studies is significantly expanded to include nation-wide examples that represent a range of focus areas and lessons learned. A case study selector chart is included to aid in selecting case studies for review.
Appendix B: How to Conduct a Basic Evaluation	Revisions and additions include: • Key differences between evaluation and QI • Guidance on conceptualizing your evaluation • A new evaluation example

INTRODUCTION

We are pleased to share with the public health community this second edition of the first-ever quality improvement Guidebook designed specifically with and for local public health practitioners. Released initially by the Michigan Local Public Health Accreditation Program, the Michigan Public Health Institute, and our partners, this edition was produced as a product of the Multi-state Learning Collaborative (MLC), an initiative designed to explore the use of quality improvement in public health, which was funded by the Robert Wood Johnson Foundation and coordinated by the National Network of Public Health Institutes.

An important feature of this Guidebook is that its content and structure are flexible enough for use by public health practitioners across the country and at every layer of the public health system. The Guidebook has utility within the context of accreditation or performance assessment programs, but may be used absent that context to improve the quality of any public health process, program, organizational capacity, or systems effort.

A distinguishing characteristic of this QI Guidebook is its public health focus and application. The Guidebook is intended for individuals and/or teams to begin or advance their use of a quality improvement (QI) model to improve public health practice and move toward improving outcomes. The QI model and strategies contained here are science-based and move beyond the traditional counting of public health outputs by laying the groundwork for actually measuring outcomes. The information in the Guidebook can be used in conjunction with current performance management and QI methods already in use, such as the Malcolm Baldrige approach, Turning Point Performance Management National Excellence Collaborative, the Public Health Accreditation Board's national public health department accreditation program, or the National Public Health Performance Standards Program.

Users of this Guidebook will be engaged around the use of a principle model—the Deming cycle of Plan—Do—Study—Act (PDSA). The model can be used by individuals seeking to make programmatic improvements or by teams seeking to make improvements that span traditional program or organizational unit boundaries.

The QI model, strategies, methods, and tools contained in this Guidebook are the basis of myriad approaches available in the marketplace today. In many fields, this approach to QI has achieved dramatic results, such as reduced costs, increased efficiencies, and improved outcomes. The approach described in this Guidebook was used by Michigan local public health practitioners to accomplish organizational capacity improvements within their jurisdictions. Specifically, sixteen local health department teams chose opportunities for improvement and used PDSA to plan, implement, test, and institutionalize the results. Similarly, through the MLC, health departments all over the country have been experimenting with implementing QI in a public health context. This Guidebook is based on the actual experiences of the pioneering health departments that participated in the MLC as they advanced their QI efforts and borrows from QI successes in other fields.

The QI methods in this Guidebook can apply to a single process or program. However, these methods do not stop there in terms of potential utility or application. They have been applied to efforts targeting a local health department's organizational capacity and can extend to improving the public health system. Necessary though, is a philosophy and dedication to QI. For greater gains, QI must become part of the agency's culture, taking its place alongside and becoming integrated with program planning, monitoring, and evaluation; health assessment, health improvement planning, and strategic planning; and performance management and accreditation.

Public health practitioners often ask why they should take on a QI effort or work toward developing a QI culture when it appears to be more unfunded work and will most likely compete with the pressure to provide services. That is an important and reasonable concern. To help address it, one might look at our current and historic public health challenges related to:

- Significant staff shortages due to our aging workforce or other factors
- Reduced or flat funding from many federal, state, and local sources
- An increased demand for many services
- The emergence of global threats due to infectious diseases, acts of terrorism, or the possible return of diseases once thought eradicated

Some health departments have addressed this concern and these challenges by using the following strategies: institutionalizing QI as a part of daily work, incorporating QI into grant development and proposals, and utilizing health department leadership to clear the deck and make QI a priority. QI efforts open the door to two elusive, yet essential, keys to understanding public health. First, "what is the cost for this activity, process, program, or service," and second, "what is the outcome?"

A QI philosophy recognizes there are costs to everything we do and costs to everything we do not do, but should. Until we are completely satisfied with our public health funding levels and accomplishments, we should continually seek quality improvements that reduce costs and improve outcomes. QI methods can help document costs, identify outcomes of our activities, and provide ways to make improvements that will ultimately improve the health of all.

This Guidebook will help you and your health department advance your understanding of how to use QI to improve the processes used by your health department to implement your work and serve your community. In essence, it will provide a repeatable set of steps for making true improvements. In doing so, it aims to influence positively your thinking about:

- Learning QI terminology
- Beginning or advancing your efforts
- Using simple tools and techniques to measure, analyze, and improve results
- Making decisions based on data and identifying root causes rather than reacting to superficial symptoms of problems
- Seeking true improvements instead of hasty fixes
- Tracking your progress and communicating your successes
- Incorporating customer feedback into the quality improvement process
- Evaluating your efforts

As you begin your QI journey, you may feel uncertain at times about how to begin or what step to take next. As you get started, be sure to choose a QI effort related to a familiar process, program, or area. Avoid making your first QI effort a large-scale project that you have always wanted to tackle, but were not quite sure how to proceed. Be patient—change takes time and there will be setbacks along the way. Keep in mind that unanticipated results are not failures. QI is not about pass/fail or right/wrong. Rather, it is about testing a theory to determine if the results were as predicted or expected. If the result is not what was expected, you have a learning opportunity. Over time, these lessons will build on one another, and QI will become more accessible and routine.

This Guidebook consists of many sections and is detailed in places. You may use as much or as little of the book as needed, depending on the scope of your effort and your level of knowledge/training in QI. You might view the Guidebook as a reference document or a "How to" guide. You may choose to read the Guidebook from cover to cover. Use the Guidebook in any way that works best for you. No single book can provide all the information available or provide details on every QI tool. However, we hope this Guidebook will get you started with using PDSA in your public health work and direct you toward other helpful resources.

- Chapter 1 provides a basic overview of the fundamental principles of quality improvement and describes the PDSA cycle. It also describes why QI makes sense for public health and how QI is distinct from quality assurance.

- Chapter 2 focuses on one of the core tenants of quality improvement – involving customers, clients and stakeholders. It discusses who customers, clients, and stakeholders are, why they should be included, and how to go about meaningfully engaging them in your QI work. This chapter also includes an example customer satisfaction survey and data collection protocol to get you started.

- Chapter 3 is new to this edition of the Guidebook and provides information about organizing a QI project. It includes practical tips and tools for building your QI team, getting organized, and keeping your QI project on track.

- Chapter 4 is at the heart of this Guidebook. This is where you will find step-by-step information about using PDSA, and a checklist that describes the main steps in each stage of the PDSA cycle. Chapters 5-8 are designed to build on and deepen the foundational understanding of PDSA this chapter provides.

- Chapter 5 provides practical advice regarding developing an aim statement. It focuses on how to develop an aim statement that is SMART – Specific, Measurable, Achievable, Relevant, and Time-bound – and provides a worksheet teams can use to ensure their aim statements are SMART. It also provides tips on writing SMART aim statements, as well as real world examples of aim statements from health departments across the country.

- Chapter 6 takes a deep dive on using data throughout the PDSA cycle, which is central to all quality improvement efforts. It describes how to use data to understand the root cause of the problem you hope to address, establish a target for improvement that makes sense, and measure change against a baseline to ensure changes are truly improvements.

- Chapter 7 provides an introduction to QI tools, and provides step-by-step instructions on using six tools that have been useful in a public health context. This chapter also provides a QI tool selector chart that you can use to figure out which tools might best meet your needs.

- Chapter 8 offers an example of PDSA in action. It covers each stage of the PDSA cycle in detail and illustrates the development of an aim statement, use of data, and the application of QI tools.

- Chapter 9 introduces readers to the concept of building a culture of quality improvement. This chapter is more conceptual and less practical than the other chapters in this Guidebook because it tackles big ideas that are just emerging in public health. It is intended to help readers get their arms around how a culture of QI can be built through making QI a daily practice at every level of an organization and by weaving strong, sustainable support and vision for continuous improvement into an organization's structure.

Following the Conclusion, there are several appendices that support and expand on the material covered in the guidebook.

- Appendix A includes 10 case studies that describe QI projects completed by health departments from across the country. These case studies provide real world examples of what QI looks like in a public health context. The Appendix begins with a case study selector chart designed to help you find relevant case studies based on characteristics of the jurisdiction and characteristics of the QI project.

- Appendix B describes how to conduct a basic evaluation. It begins by describing some of the similarities and differences between QI and evaluation, as well as how they can be used hand in hand to improve practice. This appendix also describes the steps of designing an evaluation and provides an illustrative example of a public health specific evaluation.

- Appendix C provides a list of additional QI resources, including many of the resources that were used to inform the writing of this Guidebook and the resources that are recommended throughout the Guidebook. This is not a complete listing of QI resources, but it will get you started when you are ready to learn more.

- Appendix D is a glossary that defines key terms, and the last section of the Guidebook is a list of References cited in the text.

CHAPTER 1: QUALITY FUNDAMENTALS

We Have a Problem!

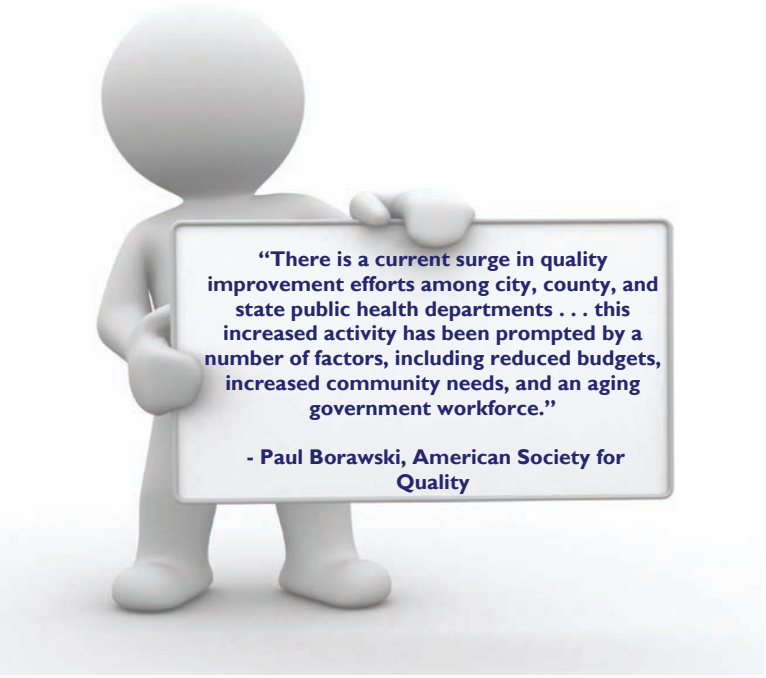
The health official charged into the 8:00 a.m. staff meeting. "Did you see this?" she spurted, forcefully slapping the daily newspaper on the conference room table, "We have a problem!" The paper's headline read, **"HEALTH DEPARTMENT MAKES PEOPLE SICK."** "Yeah, I saw it on-line this morning," responded one experienced manager. Heads around the table nodded. "It says we're not doing our jobs to keep people healthy—this is the third outbreak this month," offered another. "Well," interjected the agitated health official, "This can't go on—I want this turned around—starting now!" "We're doing everything we can," mumbled a usually silent manager, "And you know we're short staffed." "What I know," retorted the health official, "Is that additional heads will roll, if we don't sort this out! We need to do something different—something that achieves better results!" After an uncomfortable moment of group silence, a newly hired staffer hesitantly offered, "Have we looked at our data?" When met with blank looks, he added, "Or obtained and used input from our customers?" Seeing heads shake, he suggested, "Maybe a process map would help us get started on taking a quality improvement (QI) approach to this problem." This suggestion elicited more than a few icy stares from his colleagues. "QI" skeptically queried one, "Isn't that mostly for manufacturing?" "Yes and no," the new staffer replied, "Many manufacturers use QI, but so do others. We actually got good results with it at my former health department. In fact, we reduced teen pregnancy rates in several communities—and also streamlined our outbreak investigation process." "Hmmm," pondered the somewhat relieved health official, "That's good enough for me—we start today!"

Public health professionals come to work every day with a single mission—to promote health and prevent disease, injury, and disability. The many successes of public health are largely invisible—the outbreak didn't happen, the disease wasn't spread, the baby was born healthy. The failures of public health, however, make headlines, as this story illustrates. In an environment of high stakes and the best intentions, QI is an extraordinary tool. For many health departments, **QI begins with "we have a problem," but when it becomes ingrained into everyday practice it can be a catalyst for optimizing the potential of your department, your program, and YOU to serve the mission of public health.** And that's what it's all about.

Quality: What's the Big Deal?

Many fields have specific definitions for quality. These definitions vary, but frequently speak to the degree to which an action or a set of actions has the desired effect. You know that health departments are constantly looking for better ways to address health issues, deliver services, and keep people healthy and safe, but did you know that public health has its own definition for quality?

"Quality in public health is the degree to which policies, programs, services and research for the population increase desired outcomes and conditions in which the population can be healthy."[1]



You can see that this definition emphasizes outcomes—outcomes that relate to population health. We know achieving desired population health outcomes is not easy, and it stands to reason that to move the needle on health outcomes, an approach or strategy that goes beyond usual program planning and evaluation is needed. What might that look like for public health? This first chapter of the Guidebook begins to answer that question. It provides public health definitions for quality and quality improvement (QI), offers a preview of Plan-Do-Study-Act (PDSA), describes QI principles, discerns between QI and quality assurance, and highlights what QI can do for you.

Quality Improvement: It Ain't Just for Toyota

You probably know the auto industry and others successfully use QI methods to improve processes, products, and services. Health departments across the country are also making their communities healthier by using QI methods, tools and approaches. Have you seen the recent public health definition of QI? It states:

"QI is the use of a deliberate and defined improvement process, such as Plan-Do-Study-Act, which is focused on activities that are responsive to community needs and improving population health. It refers to a continuous and ongoing effort to achieve measurable improvements in the efficiency, effectiveness, performance, accountability, outcomes, and other indicators of quality in services or processes which achieve equity and improve the health of the community." [2]

So, QI looks at processes and their outcomes to make processes more effective. Does this really work in public health? It sounds like we should take a serious look at PDSA, right?

Plan-Do-Study-Act: A Quick Look

PDSA is an iterative four-stage problem-solving model for improving a process or carrying out change. PDSA was made popular by Dr. W. Edwards Deming, an American statistician, college professor, and consultant. Best known for his work in Japan during the 1950's and after, Deming was very successful in teaching others how to improve quality. Deming built the model from many problem-solving theories, including Walter A. Shewhart's production process known as Plan-Do-***Check***-Act or PDCA. Deming replaced the "check" stage with "study," to create Plan-Do-***Study***-Act, a cycle for learning and improvement. In Japan, the model is called "the Deming cycle" in honor of the significant contributions Deming made to Japan's QI efforts. PDCA and PDSA are often used interchangeably.

No matter what you call it, PDSA is widely used by process improvement engineers, quality professionals, QI teams, and others involved in continuous improvement efforts. If you have a science background you may know PDSA stems from the scientific method—hypothesize (plan), experiment (do), and evaluate (study/act). PDSA remains one of today's most popular QI methods and continues to evolve.

The idea of iteration is common to both the scientific method and PDSA. Once a hypothesis is supported or negated, executing the cycle again will extend what you have learned. A similar way of thinking about the cycle is that a deduction (prediction) based on some theory is made, observation is taken (data collection), a comparison is made of the data to the prediction, and then a modification of the theory (learning) is done when the prediction and the data fail to agree. Simply stated, the PDSA cycle is the primary means for turning ideas into action and for connecting that action to learning.

Just as a circle has no end, the PDSA cycle should be used again and again for continuous improvement. It's a continuous process—not a one-time pursuit. The PDSA cycle provides a model with a repeatable set of steps that any public health team or individual can learn and follow. It provides a systematic way of accomplishing change. Using PDSA may seem complicated, costly, or labor intensive. That may be true in some instances, but in many cases it is a simple, straightforward process that can yield very positive results in the form of true public health improvement. You'll read a lot more about PDSA in Chapter 4. Figure 1 depicts PDSA as a cycle for improvement and learning.

PLAN-DO-STUDY-ACT: Cycle of Continuous Improvement and Learning
Increased Frequency and Number of Cycles Results in Continuous Improvement and Greater Learning

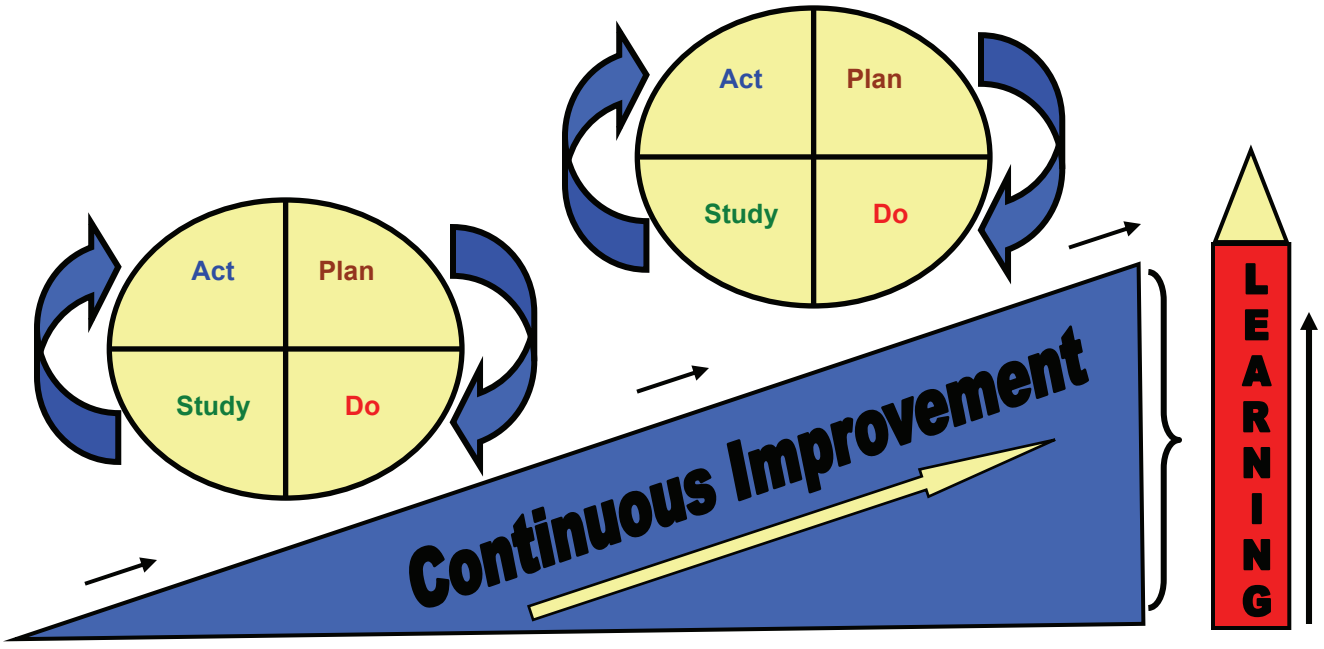


Figure 1

Three Key Questions, Four Guiding Principles, Five Minutes of Your Time

When applying PDSA there are three key questions[3] and four QI principles that will guide your efforts and help build your health department's culture of quality. Here are the three questions—keep them front and center to stay the course:

1. **What are we trying to accomplish?**
2. **How will we know that a change is an improvement?**
3. **What changes can we make that will result in improvement?**

Besides knowing the three key questions, you'll need some other guideposts, right? If you were to search for basic QI principles, you'd come up with quite a few. Perhaps you'd land on Deming's 14 Points.[4] Many QI principles in use today stem from these 14 points. They won't be discussed here, but are worth examination later as part of your quality journey. Rather, to get started, it's best to begin with a handful of principles. The *Public Health Memory Jogger II: A Pocket Guide of Tools for Continuous Improvement and Effective Planning*[5] offers practical advice and suggests four basic principles:

1. **Develop a strong customer focus**
2. **Continually improve all processes**
3. **Involve employees**
4. **Mobilize both data and team knowledge to improve decision-making**

Let's take a brief look at each principle.

Principle #1: Develop a strong customer focus
Principle #1 involves identifying and understanding internal and external customer wants, needs, expectations, and preferences. In public health terms, this means using customer input and feedback to improve public health programs and services. It also requires structuring public health to meet the needs and requirements of communities served. By listening to the voice of the customer you gain valuable information to drive improvement efforts. To develop your customer focus, survey your customers—and include them during meetings, ask them to serve on QI teams, or otherwise find ways to obtain and use their input about your process, program, or organization-wide effort. You will find more information in Chapter 2 on Customers, Clients & Stakeholders.

Principle #2: Continually improve all processes
Principle #2 reflects the iterative nature of QI efforts. By continually working to improve all processes, you increase your learning and knowledge. Improvement needs to be a regular part of daily work. Don't stop with one process or one cycle of improvement—keep it going. Continually improving all processes moves toward improvement in the public health system and improvement in public health outcomes. It also moves your health department toward a culture of quality.

Principle #3: Involve employees
Principle #3 is highly important; involve all employees. Most employees arrive at work each day planning to do a good job. Involving more than traditional decision makers in QI efforts allows staff closest to the job and most knowledgeable about the process or program to offer experienced-based suggestions for improvement. QI is not a job for one or two staff. Involving all employees is a key to success and also fosters an organization-wide philosophy of quality.

Principle #4: Mobilize both data and team knowledge to improve decision-making
Principle #4 asserts that mobilizing both data and team knowledge to improve decision-making will ultimately lead to the outcomes you seek. Data are needed to analyze processes, identify problems, and measure performance. Teams are needed to identify root causes, test improvements, and implement change. Together they are unbeatable!

Now that didn't take too long, did it?

Quality Assurance or Quality Improvement: Which is it?

Now that you're familiar with some basic quality fundamentals, do you know the difference between quality assurance (QA) and quality improvement (QI)? Frequently these terms cause confusion and not just in public health!

You may be familiar with QA, depending on your job. QA looks at compliance against standards.[6] The aim of QA is to demonstrate that services in your health department meet a set of requirements. Your processes (or outcomes) are compared to pre-defined criteria. QA usually involves a retrospective or reactive approach, which may include inspection. QA asks these questions, "Were standards met? Were deficiencies corrected?" Sometimes QA asks the question, "Who is responsible or at fault?" In your health department, for example, you check for a client's signature on a consent form as part of a chart review process, check temperatures for vaccine storage, and assure food-handling requirements are met. You may do this as part of an accreditation process. **QA guarantees quality and is good for public health!** Standards and measures related to your QA activities can and should inform your QI work.

QI goes beyond QA. QI uses learning and relates to your ongoing efforts to make processes, services or outcomes better. This can be improvement over time or all at once, but the emphasis is on continuous, purposeful efforts and teamwork. QI is usually a proactive approach, but could involve reviewing where you've been. It is aimed at enhancement or betterment—measuring where you are, and figuring out ways to make things better. When possible, QI encourages preventing problems before they occur. QI examples in your health department would include figuring out ways to increase the rate of immunization, improve media relations, reduce client wait time, expand outreach efforts, reduce tobacco use, enhance cultural competency, decrease permit or inspection errors, improve customer satisfaction, or work toward reducing health disparities. **QI raises quality and is great for public health!** The following table summarizes some differences between QA and QI.

Quality Assurance vs. Quality Improvement	
Quality Assurance	***Quality Improvement***
Guarantees quality	Raises quality
Relies on inspection	Emphasizes prevention
Uses a reactive approach	Uses a proactive approach
Looks at compliance with standards	Improves the processes to meet standards
Requires a specific fix	Requires continuous efforts
Relies on individuals	Relies on teamwork
Examines criteria or requirements	Examines processes or outcomes
Asks "Do we provide good services"	Asks, "How can we provide better services?"

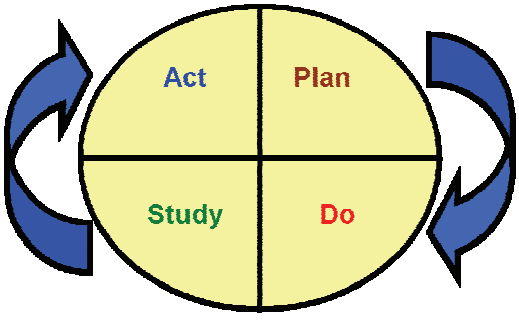
QI: What's in it for You?

You are familiar with public health outputs. Your health department knows how many permits were issued and how many clients were served. You probably know how much training was conducted over the course of a year and the number of flyers distributed. What we in public health are less certain about is "have we actually improved the public's health?" Are we keeping our communities healthy and disease free? Does what we do make a difference? How do we know? The application of tried and tested QI methods moves public health practitioners in the direction of actually measuring the extent to which we are achieving our mission. QI efforts allow us to connect the work we do each day to results. These results may be realized through:

- Reduced costs and redundancy
- Eliminated waste
- Reduced cycle time; streamlined processes
- Enhanced ability to meet demands for services
- Increased customer satisfaction
- Improved employee morale
- Greater consistency
- Improved learning and increased knowledge
- Increased productivity
- Improved health status and outcomes

QI can bring about substantial, lasting, and positive changes in your health department. It all begins with an approach—a strategy—a method. That's where this Guidebook will be helpful. Use this Guidebook as a companion on your QI journey, and . . . .

Start now.
Start today.
Just start.



Public health will be better because you did.
Best wishes on your quality journey!

CHAPTER 2: CUSTOMERS, CLIENTS, AND STAKEHOLDERS

Developing a strong customer focus is a basic tenet of quality improvement (QI). The reason for this is simple – customers have a unique and valuable perspective on how you do things and the results of your efforts. Incorporating feedback from customers, clients, and stakeholders into QI activities can help ensure that the change you implement actually addresses the underlying or root cause of your problem and is responsive to the concerns of all groups involved. This chapter will help you identify your customers, clients, and stakeholders, as well as introduce ideas for effective ways to gather information from and communicate with these groups.

Let's start out with a real public health example that illustrates the importance of involving clients in QI activities.

When Sunnyside County Health Department (SCHD) noticed months of decline in the number of women receiving services through their Breast and Cervical Cancer Control Program (BCCCP), staff embarked on a QI project to address the issue. The QI team assumed that some internal program function, such as communication about appointments, satisfaction with clinic services, or follow-up was causing the issue, and conducted a survey to gather customer feedback on which of these was the root cause of the declining service rate. However, survey results showed that the internal functioning of the program was not likely the root cause; overall, clients were satisfied with program operations. The team decided to involve their clients further, convening a focus group of current and former clients to gain insight that program staff did not have. Findings from the focus group indicated that members of the small, close-knit community were foregoing services because they thought that their participation in the program would prevent others, who may have more need for reduced or no cost services, from being enrolled. The team designed and implemented new strategies to promote the BCCCP program and educate eligible women in the county about service availability. When they studied their data after the test period, the QI team found that enrollment of new women in the program had increased by 40%.

The team learned an important lesson – while staff have a wealth of program knowledge, they may not have it all. Customers, clients, and stakeholders can provide important insight into the cause of program issues that staff may never have guessed.

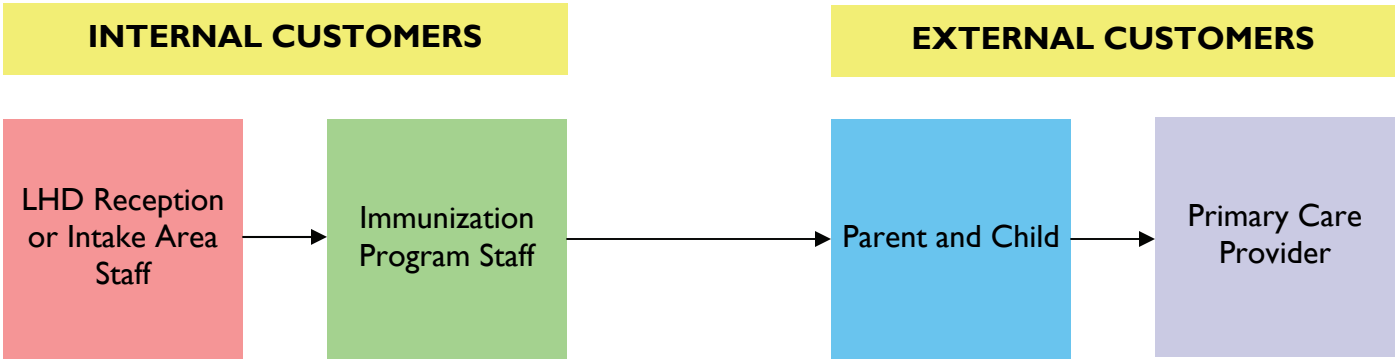
Customers, Clients, and Stakeholders: Who are They?

Before your team involves customers, clients, or stakeholders, you have to identify who they are. The Public Health Memory Jogger II states that a total customer focus "includes the needs of both external and internal customers."[1] These two groups may be hard to define at first glance. Internal customers are your coworkers and/or the other organizational units in your health department. For example, in conducting a disease outbreak investigation, a public health nurse may be an internal customer of the environmental health unit and vice versa. Similarly, a health department's WIC Program or Immunization Program may be internal customers of the clinic receptionist or central intake area.

In some health departments, external customers may be known as clients, community members, residents, license holders, operators, beneficiaries, consumers, participants, or patients. Typically, the health department's external customers are the end users of a program or service. In this Guidebook, the term 'customer' is used to encompass both internal and external groups.

Health department stakeholders include internal and external customers as well as others who have a stake in your processes, programs, or services. They include, but are not limited to, hospitals, universities, community based organizations, elected officials, school officials, governing entity members, law enforcement entities, the media, or primary care providers.

If you are unsure about who your customers are for a particular program, you may want to create a simple customer chain. An example customer chain related to the process of providing an immunization service for a child follows.



Why Include Customers?

When deciding whether to involve customers, clients, and stakeholders in your QI work, **it may be helpful to remember that customers define quality**. They can provide feedback about what works due to their unique view of processes, programs, and services. Involving customers and stakeholders in QI activities may bring out information that can help contextualize issues and point you in the right direction when determining the root causes of the problem you are addressing with your QI project. Additionally, the act of involving customers and stakeholders in QI efforts may increase satisfaction with the improvement or program as a whole – involving customers demonstrates that you care about and will act upon their thoughts and concerns. Involvement of customers, clients, and stakeholders in public health QI processes is a best practice.[2]

Ideas for Involving Customers

You may be wondering exactly how you should go about involving customers, clients, and stakeholders in your QI activities. This may seem somewhat difficult to figure out at first, but there are many ways to meaningfully involve these groups when doing QI. One of the most straight-forward ways might be by using your existing data collection activities, such as your health department's customer satisfaction surveys. You might also gather information from external customers or stakeholders through existing coalition or other community-level meetings. You probably already have information on hand from internal customers as well. Meeting notes, for example, could be used to identify sources of dissatisfaction within your health department. A good source of information from internal or external customers might be complaints received by your department, which can provide valuable information regarding potential opportunities for improvement. If you start to see the same complaints over and over again, you may have just found your next QI project!

Stakeholder input can also be gathered through implementing a survey or by observing clients who use your service. Alternately, you might conduct interviews or focus groups with clients, guiding them through a set of open -ended questions. When collecting data from customers and stakeholders using surveys or other data collection methods, it is important to make sure that the method you are using is applied consistently in order to get the most reliable information (for more information see Chapter 6 on The Importance of Data and Measuring Improvement). Using a customer satisfaction survey across your entire health department that is delivered in a consistent manner to customers or clients, is one way to find out where problems may exist and what groups of customers are experiencing these problems. The example of a customer satisfaction survey at the end of this chapter provides a useful, general template that can be customized for your health department, or even for specific programs within your department. You can also download this survey template and sample process protocol for consistent administration of a customer satisfaction survey from the following web address: http://www.accreditation.localhealth.net/QI%20Resources.html

In addition to providing input through surveys, interviews, focus groups, or meetings, you might want to consider directly involving a small set of involved customers, clients, or stakeholders as active members of your QI team. Customers, clients, and stakeholders can provide invaluable feedback throughout the QI process, and they can help ensure that your team truly maintains a strong customer focus. Also, by involving internal customers on your QI team, you can help to spread the use of QI throughout your department.

Communication is Crucial!

It is important to communicate with customers throughout your health department's QI processes. Most likely you are using information they provided, and sharing how you used their input shows respect and appreciation. Some ways to communicate with customers throughout your QI process are:

- Let customers know that you are seeking to improve services or programs your health department delivers.
- Get their feedback to help you identify the true root cause of the problem and select the right improvement to make.
- Communicate your QI successes; let customers know why an improvement might not have worked.
- Communicating with your customers, clients, and stakeholders on a regular basis lets them know their opinions and needs are valued and important to your health department.

Health Department Name

Sample Customer Satisfaction Survey Distribution Processes

Below is the step-by-step process for the Health Department's **in-person** distribution and collection of Customer Satisfaction Surveys. Staff will be trained on this process and are expected to follow the process exactly to ensure the standard process is used across all Health Department programs. If staff have a question about the survey distribution process, they may contact [Contact Name] at [Contact Details].

1. Program Staff will distribute the department-wide Customer Satisfaction Survey to every client at the end of their visit. Program staff will encourage clients to complete the survey, emphasizing that results will be used to improve the services that the Health Department provides.
2. Clients will be given the choice to refuse at that time and not take the survey instrument, or to respond to the survey.
3. Clients will be given the survey on a clipboard with a pen and a reasonably private place to sit to complete the survey.
4. A drop box will be provided for clients to return their survey. Surveys should not be returned to program staff; instead, program staff should direct clients to place the survey in the drop box. A place to return the clip board and pen near the drop box will also be provided.
5. At the end of each week, program staff will remove completed surveys from the drop box and send them via interoffice mail to [Contact Name].
6. Once monthly, [Contact Name] will provide programs with aggregate data from survey respondents who indicated they received services through the program.

Below is the step-by-step process for the Health Department's **online** Customer Satisfaction Survey process. Staff will be trained on this process and are expected to follow the process exactly to ensure the standard process is used across all Health Department programs. If staff have a question about the survey distribution process, they may contact [Contact Name] at [Contact Details].

1. Program staff will distribute a half-sheet with information about how to access the online survey to every client at the end of their visit. Program staff will encourage clients to complete the survey, emphasizing that results will be used to improve the services that the Health Department provides.
2. One week following the client's date of service, program staff will print out the client's name and address on a mailing label and attach it to a prepared reminder post card, which again encourages clients to complete the survey.
3. At the end of each day, post cards will be put in the mail to be sent to applicable clients.
4. Once monthly, [Contact Name] will provide programs with aggregate data from survey respondents who indicated they received services through the program.

Health Department Name
Customer Satisfaction Survey

Thank you for choosing the *Health Department Name*. In order to continuously improve the services we provide our clients, we kindly ask that you complete the following survey. The survey will only take a few minutes of your time. The responses you provide will be confidential. No identifying information about you will be collected.

If you have any questions about the survey, please contact:
Contact Name
Phone Number
Email Address

We thank you in advance for your valuable feedback.

Instructions for Completing the Survey
For each question please select the answer that best represents your response. When you are finished completing the survey, please return your survey to one of the drop boxes located at each reception area within the health department.

Please tell us about your experience with the *Health Department Name*.

1. During your most recent visit with the *Health Department Name*, what program(s)/service(s) did you receive? (please check all that apply)

   ☐ Dental Health Visit
   ☐ Women, Infants, and Children (WIC)
   ☐ Child or Adolescent Immunization
   ☐ Adult Immunization
   ☐ Travel Immunization/Clinic
   ☐ Well Child/Adolescent Visit
   ☐ Family Planning Services
   ☐ Breast and Cervical Cancer Control Program (BCCCP) Services
   ☐ Mental Health Visit
   ☐ STD/HIV
   ☐ Birth/Death Records
   ☐ Environmental Health Permit
   ☐ Environmental Health Inspection
   ☐ Car Seat Inspection
   ☐ Other, please specify: _____

2. Where did you learn about our available services?
   ☐ From a friend or family member
   ☐ From a Health Department staff member
   ☐ From a Health Department brochure or flyer
   ☐ Other, please specify: _____

3. Where did you receive your service(s)?
   ☐ Health Department Office
   ☐ Home Visit
   ☐ By Phone
   ☐ Other, please specify: _____

The following questions pertain to your experience scheduling the service(s) you received today.

4. Please respond to each of the following questions by checking the box under 'yes' or 'no' as appropriate.

	Yes	No
Was the phone system easy to use?	☐	☐
Did the staff answer the phone promptly?	☐	☐
Were the staff courteous on the phone?	☐	☐

5. Please indicate if you agree or disagree with each of the following statements by checking the box under your response. If you disagree with any of the statements below, please help us understand how we can improve by providing a comment under question 9.

	Strongly Disagree	Disagree	Agree	Strongly Agree
Health Department staff were friendly.	☐	☐	☐	☐
The service(s) I received were delivered promptly.	☐	☐	☐	☐
Health Department staff were respectful.	☐	☐	☐	☐
The wait time for the service(s) I received was appropriate.	☐	☐	☐	☐
Health Department staff were helpful.	☐	☐	☐	☐
The services I received met my social, cultural, and/or special needs.	☐	☐	☐	☐
Health Department staff took the time to listen to my concerns.	☐	☐	☐	☐
Health Department staff understood my needs.	☐	☐	☐	☐
The office hours met my needs.	☐	☐	☐	☐
Overall, I am satisfied with the service(s) I received today.	☐	☐	☐	☐
I was able to get what I needed from *Health Department Name* today.	☐	☐	☐	☐
I would recommend the *Health Department Name* to my friends and family.	☐	☐	☐	☐

The following statements pertain to the service(s) you received today.

6. Did Health Department staff give you information during today's visit about other services for which you might be eligible?
   ☐ Yes
   ☐ No

7. Did anyone provide outstanding service? If so, whom?

8. What did we do well during your visit today?

9. What can we improve? (Please be specific.)

The following questions ask for basic demographic information. Your answers to these questions will not affect the services you receive in any way.

10. What is your gender?
    ☐ Male
    ☐ Female

11. What is your current age?
    ☐ 18-24 years old
    ☐ 25-39 years old
    ☐ 40-64 years old
    ☐ 65 + years old

12. What is your race?
    - ☐ White, Non-Hispanic
    - ☐ Black
    - ☐ Hispanic or Latino
    - ☐ American Indian or Alaska Native
    - ☐ Asian
    - ☐ Native Hawaiian or Other Pacific Islander
    - ☐ Two or more races
    - ☐ Other

13. What is the highest level of education you completed?
    - ☐ Less than High School
    - ☐ High School graduate
    - ☐ Some College
    - ☐ Associate's Degree
    - ☐ Bachelor's Degree
    - ☐ Graduate or Professional Degree

14. What is your total household income?
    - ☐ Less than $19,000
    - ☐ $20,000 to $34,000
    - ☐ $35,000 to $49,000
    - ☐ $50,000 to $64,000
    - ☐ $65,000 to $79,000
    - ☐ $80,000 or greater

15. How many children under the age of 18 live in your household?
    - ☐ 0
    - ☐ 1
    - ☐ 2
    - ☐ 3
    - ☐ 4 or more

CHAPTER 3: ORGANIZING A QI PROJECT

Once your health department has identified a focus area for your quality improvement (QI) project, it's time to get organized! A good first step is to identify a team sponsor. The sponsor is a person outside the team that gives approval to conduct the project, provides support and direction, and reduces barriers. The sponsor also provides the team with the assurance that the project is valuable to the health department. Many teams struggle because they don't have a "go to" person when they get stuck, so it's smart to identify your "go to" person up front—it may be your health officer, department director, or a formal QI champion or mentor.

Once you have a sponsor, start to think about the best way to organize your project. You don't need all the details laid out to begin the process, but consider planning out these components before you get started:

- QI team members
- Meeting schedule
- QI training
- System for documenting and storing project work
- QI Team Charter

Building a QI Team: Who Should Participate?

Once you have a team sponsor and approval to conduct your QI project, putting together a solid QI team to carry it forward is the next step. A QI team "is typically cross-departmental, interdisciplinary, serves a single purpose, and is more informal in nature"[1] than a basic work team. All selected team members need not have prior QI experience. When structuring the team, think about the following:

- Keep the team small; a 5-6 member team is typical.
- Involve both internal and external stakeholders, when appropriate. For example, if the QI project is occurring in your Environmental Health (EH) division, involve staff working internally in EH and externally, like a contractor or customer.
- Involve staff from multiple divisions. They may not have specific knowledge of the area targeted for improvement, but they can provide other knowledge and experience. Involving staff from other divisions will also help grow QI throughout your department.
- Include frontline staff closest to the day-to-day improvement work who understand the current processes best.
- Add staff who have data and technology expertise.
- Consider staff with current knowledge, experience, or training in QI or who have interest in QI.
- Involve additional staff and/or stakeholders in specific parts of the project, as needed.

Team Roles

Once your team is identified, assign team roles beginning with team leader. The leader should have some QI experience or be willing to become familiar with QI methods and tools. Additionally, as noted in *Success through Quality* "improvement requires leaders who can inspire people to strive to achieve the ideal."[2] The leader provides momentum, while ensuring that adequate progress is made. The role is important and "good leadership generates happy and productive people,"[3] which is key to having a team that works together. It's also helpful to assign a few other roles like facilitator, recorder (scribe), document manager, data manager, or other roles appropriate to the needs of your team. Team roles will vary by QI team—be sure to establish roles that work well and keep the team organized.

Teamwork

Teamwork is especially important when conducting a QI project. Good teamwork allows for shared learning, fair distribution of work and responsibilities, support and encouragement, and innovation. Under the right circumstances, teams harness the knowledge, skills, experience, and perspectives of different individuals to make lasting impressions.[4] Not only will a team effort make lasting impressions, it helps your health department make significant, lasting improvements.

Coming together with a common purpose and defining team roles are the early steps in embracing teamwork. Typical teams go through four stages known as forming, storming, norming, and performing during team development. More information on the four stages of team development can be found in *The Public Health Quality Improvement Handbook.*[1] Additional strategies for team building include:

- Establishing trust
- Defining team processes and procedures
- Embracing growth
- Celebrating results

Spending time on each component will keep teamwork at the center of your QI project and lay the groundwork for success.

Team Meetings: Too Busy to Meet?

In a hectic health department setting, meetings can always be cancelled, but they cannot easily be scheduled. You know from experience it's difficult to accomplish a project without regular communication and exchange of ideas. So, once your health department's QI team is established, set regular, recurring, in person meetings. The Public Health Memory Jogger II suggests that you "make time for improvement in normal work schedules."[5] Make QI a priority by setting frequent meetings. Try bi-weekly, especially during the Plan stage of the PDSA cycle. You may be able to adjust your schedule once the Plan phase is complete.

QI Training: Who Needs it?

It's not essential that all selected QI team members have prior knowledge, training, or experience in QI. Learning through experience and independent study is definitely possible. However, it's important that the team leader understands the tenets of QI and receives formal training in a proven QI method, such as PDSA. Additionally, it's a good idea to set up some type of initial QI training for your entire team. You can bring in a QI expert, call on another health department with experience, or attend QI training. The goal is to lay a basic foundation of knowledge before your QI team gets rolling.

Managing Documents: Do we Really Need a Paper Trail?

You never know when you might need to refer back to an early aim statement, graph, or early set of meeting notes. Sometimes the significance of an idea or product does not become apparent until further down the road. So, during your health department's first few QI team meetings, agree on a method for documenting and storing project work. Preserve work from the beginning as you work through each step of the PDSA cycle. Some health departments establish folders on network drives to store project related information. Others use an internet based method, like Google Docs or SharePoint. Use an approach that works well for the whole team and serves as the primary place to store project information.

QI Team Charter: Is it Useful?

Another essential task during your first meeting or two is developing a team charter. The charter is your team's roadmap; it helps reduce the "now what?" feeling many teams experience early on. It is typically a one or two page document that describes the team's purpose and describes the targeted improvement. A good charter sets team direction and helps the team come to agreement regarding communication, accountability, and delivery of products.

The team charter is also a way for sponsors to communicate their interest in and support for the project. It's a good idea to preview your project idea with your sponsor, obtain approval to proceed, complete the charter, and then return to the sponsor for concurrence. If it works better for your team, complete parts of the charter first and then use it as a discussion tool when seeking project approval from your sponsor. While QI team charters vary slightly in the information they convey, most charters capture the following:

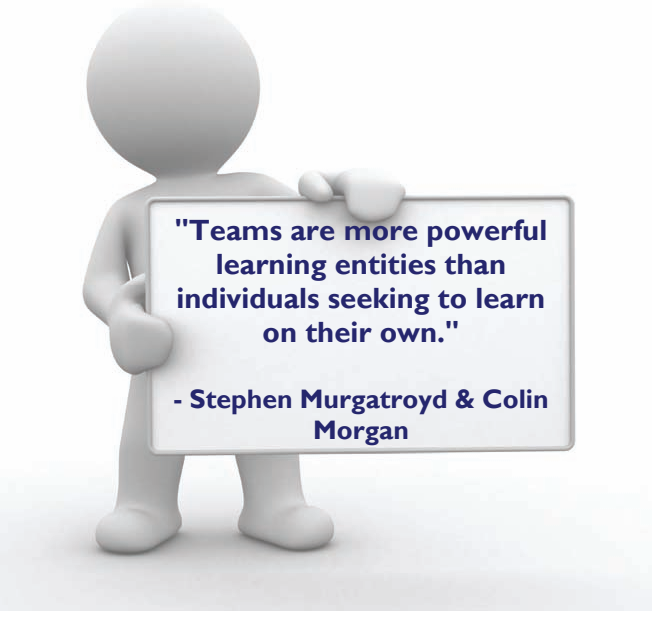
- Team sponsor
- Team members and roles
- Problem, issue, or opportunity statement
- Description of the process improvement
- Aim statement
- Customers and their needs
- Timeline for completing each stage of the PDSA cycle
- Timeline and frequency of team meetings
- Internal and external stakeholders
- Improvement theories (If…Then)

The team charter will evolve over the course of your project, and you will not be able to complete the entire document before beginning your project. For example, your improvement theory will not be developed until step five of the Plan stage, so you'll add this to the team charter later in the process. Similarly, you may not be ready to construct an aim statement until later. Complete as much of the team charter as you can, revise it as you obtain more information, and each time save, date, and number your changes to chronicle team efforts. Your charter will go through several iterations during your health department's QI project—use it as a tool to track progress and update your sponsor.

To get you started, a sample QI team charter follows. The template you use is less important than time spent in conversation with your sponsor and team members to assure your project is understood by all involved, realistic, relevant, and contains measures. The goal is to have a living team tool that serves as a useful roadmap.

Organizing for Success

The approaches discussed in this section are simple steps that will help your QI project run smoothly and keep your QI team moving forward on the same path. Investing time upfront to organize your team pays dividends down the road. You will create a meaningful structure for team members to be productive and successful on your first QI project, and you will develop ways to make organizing for success easier with each QI project!



QI TEAM CHARTER

1. Team Name:	2. Version:	3. Subject (Target Area):

4. Problem / Opportunity Statement:	
5. Team Sponsor (Health Official):	6. Team Leader & Scribe:
7. Team Members:	Role:

8. Process Improvement Area:
9. Initial Aim Statement:
10. Revised Aim Statement (s):
11. Scope (Boundaries)/Team Authority:

12. Customers (Internal and External):	13. Customer Needs Addressed:

14. Success Measures (What does success look like?):	
15. Considerations (Assumptions / Constraints / Obstacles):	

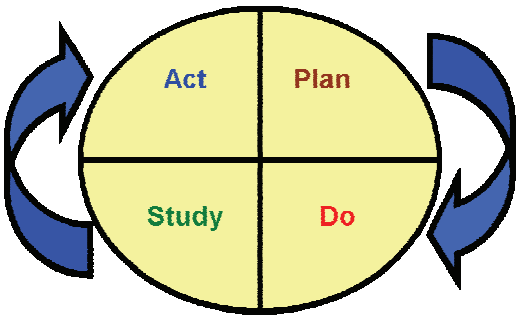
16. PDSA Timeline:	Date:
Plan	
Do	
Study	
Act	

17. Meeting Frequency:
18. Communication Plan (Who, How, and When):
19. Stakeholders (Internal and External):

20. Improvement Theories (If…Then):	
If	Then
If	Then

CHAPTER 4: USING THE PLAN-DO-STUDY-ACT CYCLE

When to Use PDSA



When would your health department use the Plan-Do-Study-Act cycle? The simple answer is that it can be used each day in every process or program. It can be used to assist your health department in meeting accreditation standards. It can also be used on an organization-wide basis to increase organizational capacity or to implement community-wide efforts to improve the public health system. It may be used by all public health practitioners in your health department including health officers, nurses, sanitarians, epidemiologists, clerks, administrators, health education staff, emergency preparedness coordinators, medical directors, and others.

The American Society for Quality (ASQ), the world's leading membership organization for improving quality, suggests using PDSA in the following ways:[1]

- As a model for continuous improvement
- When developing a new or improved design of a process, product, or service
- When planning data collection and analysis to verify and prioritize problems or root causes
- When implementing any change

The Turning Point Performance Management Collaborative, *From Silos to Systems: Using Performance Management to Improve the Public's Health*[2] indicates that PDSA is a tool that public health professionals can use to carry out a quality improvement (QI) process by:

- Using data for decisions to improve policies, programs, and outcomes
- Managing change
- Creating a learning organization

PDSA can be used on a relatively small scale, such as improving your health department's intake or complaint process, or on a much larger scale, such as improving your health department's organizational capacity to respond to diseases or outbreaks. It can be used to improve programs, service delivery, health status, financial and information systems, customer satisfaction, and public health capacity. PDSA can be of benefit as you prepare for accreditation and to meet accreditation standards previously unmet by your health department.

In applying PDSA, return to these three fundamental questions:[3]

- What are we trying to accomplish?
- How will we know that a change is an improvement?
- What changes can we make that will result in improvement?

The important attributes of PDSA are that:

- Planning is based on theory
- The same people who plan a change, carry out the change
- It provides a team focus
- It offers a framework for the use of data and QI methods
- It facilitates an iterative learning process
- It requires documenting learning

PDSA: A Four-Stage Approach to QI

This chapter details the PDSA cycle. Each of the four stages is described. At the end of each stage, you will note a Quality Tool Tip caption. This caption alerts you to suggestions for relevant quality tools that may be of value. Further, you will find a description of common QI tools listed in Chapter 7 of this Guidebook. It is important to note that some health departments have used *Tool Time: Choosing and Implementing Quality Improvement Tools*[4] as an instructional aid in applying PDSA. The following information is similar, but not identical to the Tool Time approach. For easy reference, a PDSA Checklist has been developed and is located at the end of this chapter.

Stage One — PLAN: Identify an Opportunity and Plan for Improvement

The purpose of Stage One—**PLAN**—is to identify an opportunity for improvement and then develop a plan for how that improvement effort will occur. Remember that spending adequate time in the PLAN stage should positively affect all subsequent stages of the cycle. The PLAN stage of the PDSA cycle contains the five key steps as follows:

Step One: Getting Started

To get started, you will need to identify an area, problem, or opportunity for improvement. Begin to think about any data (numerical or descriptive information) related to the current status of your problem. For example, what were the results of your last accreditation review? Were all standards and indicators met? That may be a good place to start. Alternatively, perhaps you have collected performance measurement data or data related to health indicators. A community health assessment, health status report, or behavioral risk factor survey results would provide useful information. You may want to consider data related to births, deaths, and diseases in your community. Perhaps you have survey data related to customer/client satisfaction. This too, may spur ideas for improvement. Maybe you have evaluation data or data related to the internal operations of your health department, such as time studies, response rates, employee morale, or workforce development. Whatever the source, let data be your guide to identifying opportunities for improvement. Once you have settled on a general area for improvement, estimate and secure necessary resources, if possible. Remember to obtain approval from your health officer, supervisor, or team sponsor to conduct your QI effort, if needed.

Lesson from the field:
Public health QI teams have found that the Plan stage is by far the most time consuming component of the cycle. In fact some think of PDSA as PPPDSA!

Step Two: Assemble the Team

Next, you will need to think about identifying a team to work on the improvement effort. Include colleagues (internal customers) within your health department who have knowledge about the problem or opportunity for improvement. Include external customers and stakeholders, if appropriate. Once your team is assembled, discuss the problem or opportunity for improvement. You will also want to spend

Lesson from the field: Don't be afraid to modify your aim statement! Some public health QI teams have modified their aim statement 3, 5… even 10 times before they felt it was right.

some time identifying team member roles and responsibilities. Then establish an initial team charter, a timeline for improvement activities, and a regular team meeting schedule. More information on organizing your QI project, including organizing your team, can be found in Chapter 3 of the Guidebook.

At this point, it will be important to begin the process of developing an initial aim statement. An aim statement states what you are trying to accomplish—it is time specific and measurable and defines the specific population that will be affected. As you proceed with your QI effort, the aim statement will most likely become more specific and will be modified based on what you are learning.

More information on writing an aim statement, including examples, can be found in Chapter 5 of the Guidebook.

Once the aim statement is fully developed (during later stages of the QI cycle), you will have answered these three key questions:[5]

1. What are we trying to accomplish?
2. How will we know that a change is an improvement?
3. What change can we make that will result in improvement?

Step Three: Examine the Current Approach

Step Three begins with examining how the process you are improving happens now. You may want to consider the following questions:

- What are we doing now?
- How do we do it? What are the major steps in the process?
- Who is involved? What do they do?
- What is being done well? What could be done better?

Case Study Highlight Capturing each step of the current process is important! See p. 138 in Appendix A for an example of one health department's detailed process map.

Creating a process map depicting the current approach or process flow is generally useful at this point. Next, obtain existing baseline data or collect data as needed to understand the current approach. Depending on the nature of your QI effort, it may be appropriate to consider some of the following questions when establishing your baseline, pinpointing the problem areas, and analyzing your data:

- How long does this process take now? Is it efficient?
- Is there variation in the process? Is our process stable?
- Are we doing the right things, the right way? Are we consistent?
- What is the cost?
- What is the trend over time?
- How does our current performance compare to others or national standards?
- Are we meeting our goals?

Remember to obtain input from customers and/or stakeholders, if appropriate. Think about the users of the process, program, or service (e.g., what do they care about and/or what is the most frequent complaint?).

A good way of developing conclusions from the analysis is to compare the data to your target, aim statement, or other thresholds. Share and display the baseline data graphically, if possible, so that all team members have access to it. It will later serve as a component of your QI story.

Lesson from the field:
Gathering information from customers is well worth the effort. Public health QI teams have found their customers can offer a different and very helpful perspective on the problem under study.

To continue the examination of your current approach, determine all possible causes of the problem with the goal of identifying the root cause of the problem. Find dominant causes rather than symptoms. QI tools such as a fishbone diagram (i.e., cause and effect diagram) are helpful at this point. You may also want to consider a technique called the Five Whys. The Five Whys is simply a process of asking why five times in a row to detect the root cause or meaning of a particular problem or situation. Once you have identified the root cause, revisit your aim statement and revise it based on the root cause and/or baseline data, if needed.

Step Four: Identify Potential Solutions

In Step Four (based on the root cause(s) identified in step three), all potential solutions to the problem are identified. If appropriate, spend some time reviewing model or best practices to help identify potential solutions. If available and applicable, use evidence based practices or guidelines. Narrow potential solutions to those within the team's control or influence. Further refine your aim statement based on any new information you have gleaned. When refining your aim statement, be sure you have listed a numerical measure for the future target. Finally, pick the best solution—the one most likely to accomplish your aim statement.

Note: Some users of PDSA prefer to develop their theory for improvement (see next step) before refining the aim statement. Take whichever approach works best in your situation.

Step Five: Develop an Improvement Theory

The focus of Step Five is developing a theory for improvement. What do you predict the data will show? What outcomes (changes) are you seeking? Define the specific outcomes you want (i.e., what do you want to accomplish?) What is your prediction?

Use an *"If . . . . Then"* approach to describe your theory (i.e., "if we do such and such, then we predict such and such will happen"). Then develop a strategy to test the theory. Your strategy should specify what will be tested and how. Think about when the test will occur and who needs to know about the test. Consider what could go wrong and ways to avoid these problems. Again, adjust your aim statement, if needed.

Lesson from the field:
The more specifically public health QI teams define what they want to measure, how they want to measure it, and how they will compare data before and after their change, the better positioned they are to move to Stage Two.

Quality Tool Tip: Cause and effect diagrams (Fishbones), logic models, histograms, check sheets, Pareto charts, flow charts, run charts, and control charts may be useful throughout the **PLAN** stage. The "Working with Ideas" tools in the Public Health Memory Jogger may also be useful throughout this stage.

Stage Two — DO: Test the Theory for Improvement

Now that the PLAN stage is complete, the DO stage begins. The purpose of Stage Two—**DO**—is to carry out the plan you developed, testing your theory for improvement.

Step Six: Test the Theory

During this step, you will test your theory—preferably on a small scale. In other words, you will do that which you said you would do. During the process, collect, chart, and display data to determine the effectiveness of the improvement. Be sure to document problems, unexpected observations, and unintended side effects because these occurrences will aid in the learning process.

Case Study Highlight
Want to see an example of RCI in action? See p. 146 in Appendix A to see how one health department used RCI to test improvements quickly on a small scale.

Should you want to test small changes quickly, you might consider the use of the Rapid Cycle Improvement (RCI) method. RCI is a QI method based on the work of W. Edwards Deming's PDSA cycle, and used by the Institute for Healthcare Improvement (IHI), available online at www.ihi.org. Depending on the aim or goal of a QI project, a team would choose promising changes based on their experiences, data, and previous studies and test them rapidly on a very limited basis. The tests done during an RCI cycle are typically small in scale to learn how the changes work. Following implementation, if data show the changes had the desired effect, the team would refine them if necessary, and then implement the changes on a broader scale. The IHI website listed above is a good resource for learning more about RCI.

Quality Tool Tip: Check sheets, flow charts, and run charts may be useful during the **DO** phase.

Stage Three — STUDY: Use Data to Study Results of the Test

The purpose of Stage Three—**STUDY**—is to use data to study or check the results of the test conducted during the DO stage. In essence, you will determine if your test was successful. Additionally, you will describe and report what you learned.

Step Seven: Study the Results

The primary focus of Step Seven is to determine if your test was successful. To do this, you may begin by comparing results against the baseline data and the measures of success documented in the aim statement. Consider these questions:

- Did your test work? How do you know?
- Did the results match the theory/prediction? What do your data show?
- Are there trends?
- Did you have unintended side effects?
- Is there an improvement?
- Do you need to test the improvement under other conditions?

Lesson from the field:
In an effort to come to a solution and move on to the next challenge, public health QI teams can get stuck in a plan-do-plan-do cycle. Take the time to study and learn from your test before moving on.

Explain and document what was learned though the improvement process. Be sure to spend some time capturing, describing, and reporting what you observed. This will aid in the planning and development of your next PDSA cycles. As you study and plan for additional improvement cycles, continue to compare your results with benchmark (best practice) or performance measurement data, if available. You may want to consider the Ten Essential Public Health Services, NACCHO's Operational Definition of a Functional Local Health Department,[6] the National Public Health Performance Standards Program,[7] Healthy People,[8] or standards from state or national accreditation programs. Benchmarks or best practices from other health departments across the nation also provide ideas for improvement, including measures.

Case Study Highlight
What happens if you don't achieve your aim? See p. 128 in Appendix A to find out what one health department did.

Quality Tool Tip: Pareto charts, control charts, or run charts may be useful throughout the **STUDY** stage.

Stage Four — ACT: Standardize the Improvement and Establish Future Plans

The purpose of Stage Four—**ACT**—is to standardize your improvement or develop a new theory. This will be followed by determining next steps and establishing future plans. The objective during this stage is to reflect and act on what you have learned.

Step Eight: Standardize the Improvement or Develop a New Theory

The focus of Step Eight is to move your learning forward by standardizing the improvement. If your improvement was successful on a small scale, now is the time to test it on a wider scale. Continue testing until you are confident the change will result in an acceptable level of improvement. You will also need to determine whether your change will improve performance in the future. If the likelihood of continued success is promising, then you can make plans to standardize and institutionalize the improvement. When standardizing the improvement, think about whether current policy needs revision or if training is needed for colleagues involved in the process. Basically, you want to determine how you will keep the new or changed process going (i.e., how can we do it right every time?).

Lesson from the field:
Strange as it may sound, sometimes the most successful projects are those where the test reveals that the change was not an improvement. Finding out that a good idea does not work has helped teams become more creative in their thinking, more sophisticated with their data, and better at root cause analysis.

Conversely, if your change was not an improvement, develop a new theory and test it. Consider these possibilities:

- Did we attack the wrong cause?
- Was the plan poorly tested?
- Did we pick the wrong solution?
- Will a different approach work?
- Are better or different data needed?

Record your thoughts and begin again, repeating the cycle starting with PLAN to define a new or additional change. Even successful changes can benefit from further improvement. The aim is to conduct iterative PDSA cycles until you are completely satisfied with the results. Each cycle is an opportunity for learning and for additional improvement. **Bear in mind that the learning that occurs with each cycle is as important as the improvement. An unsuccessful test or change should not be considered a failure, but an opportunity to learn and apply that learning in a subsequent cycle.** Often several cycles are required to produce the desired improvement.

A note to first-time users of PDSA: you may experience frustration when your data do not support your theories for improvement. Not reaching your aim through your initial test is fairly common among both new and experienced PDSA users! When your proposed change does not pan out as expected, think about what you learned, review the process used, and then look for another way to improve. Take what you have learned to conduct a new cycle. This iterative process **WILL** lead to improvements.

Step Nine: Establish Future Plans

Step Nine is used to establish future plans. During this step, preserve your gains by acting to sustain your accomplishments, and make long-term plans for additional improvements. When needed, conduct repeated PDSA cycles. For example, revisit what you accomplished to see if it still meets the needs of internal and external customers.

Case Study Highlight
Not sure how to communicate the results of your QI project beyond the team? See p. 157 in Appendix A for how one health department shared their QI project.

You may want to consider establishing a regular review of accreditation standards, performance data, health indicator data, customer service data, or health department priorities to identify opportunities for additional improvements. Decide how you or others will monitor performance and what measures should trigger the team to reconvene for a closer look.

Through repeated use of the PDSA cycle, knowledge of the process increases. The more complete the current knowledge, the better the predictions. Typically, greater gains are realized as a result of continuous application of PDSA. Be sure to spend time celebrating your success and communicating your accomplishments to internal and external customers. A QI story board is a great way to share the results of your efforts. See the end of this chapter for more information on creating a story board.

Lesson from the field:
Public health QI teams that have made progress toward building a culture of quality use PDSA continuously and routinely. Don't let your first project be your last! Keep improving your process, and start working on others until PDSA becomes a habit.

Quality Tool Tip: Flow charts may be useful throughout the **ACT** stage. The "Working with Ideas" tools in the Public Health Memory Jogger may also be useful throughout this stage.

PDSA Checklist

The PDSA Checklist was created to augment the textual description and instructions contained in the preceding pages of the Guidebook. The Checklist was designed to serve as a companion to the text and as a handy reminder of the key steps to using PDSA.

PLAN-Do-Study-Act

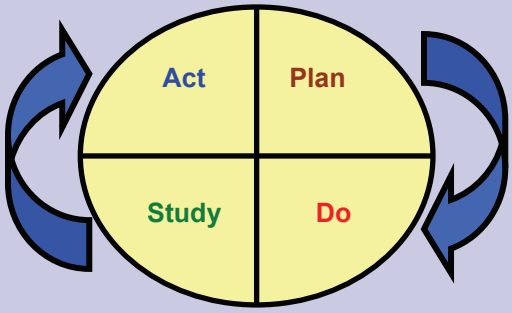
Identify an Opportunity and Plan for Improvement

Step One: Getting Started

- √ Identify area, problem, or opportunity for improvement
- √ Estimate and commit needed resources
- √ Obtain approval (if needed) to conduct QI

Step Two: Assemble the Team

- √ Identify and assemble team members (including customers and/or stakeholders)
- √ Discuss problem or opportunity for improvement
- √ Identify team member roles & responsibilities
- √ Establish initial timeline for improvement activity and schedule regular team meetings
- √ Develop SMART aim statement
  - √ What are we trying to accomplish?
  - √ How will we know that a change is an improvement?
  - √ What change can we make that will result in improvement?



PLAN-Do-Study-Act

Identify an Opportunity and Plan for Improvement

Step Three: Examine the Current Approach

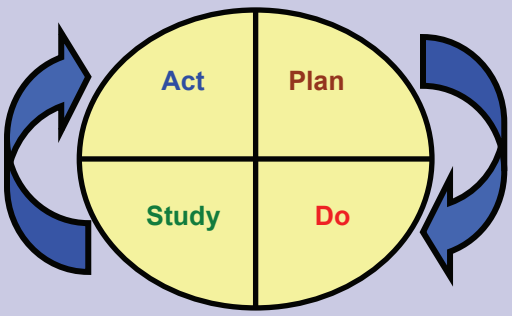
- √ Examine the current approach or process flow
- √ Obtain existing baseline data, or create and execute data collection plan to understand the current approach
- √ Obtain input from customers and/or stakeholders
- √ Analyze and display baseline data
- √ Determine root cause(s) of problem
- √ Revise aim statement based on baseline data as needed

Step Four: Identify Potential Solutions

- √ Identify all potential solutions to the problem based on the root cause(s)
- √ Review model or best practices to identify potential improvements
- √ Pick the best solution (the one most likely to accomplish your aim statement)

Step Five: Develop an Improvement Theory

- √ Develop a theory for improvement
  - √ What is your prediction?
  - √ Use an *"If . . . . Then"* approach
- √ Develop a strategy to test the theory
  - √ What will be tested? How? When?
  - √ Who needs to know about the test?

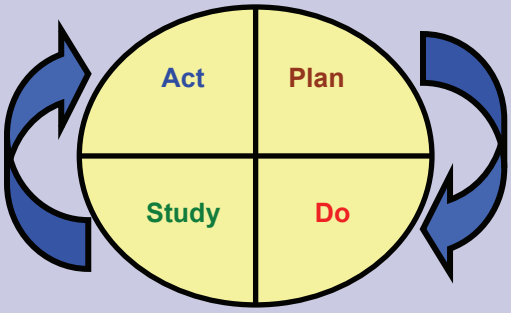


Plan-*DO*-Study-Act

Test the theory for improvement

Step Six: Test the Theory

- √ Carry out the test on a small scale
- √ Collect, chart, and display data to determine effectiveness of the test
- √ Document problems, unexpected observations, and unintended side effects

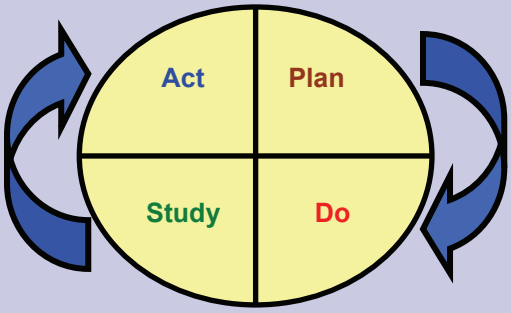


Plan-Do-*STUDY*-Act

Use Data to Study Results of the Test

Step Seven: Study the Results

- √ Determine if your test was successful:
  - √ Compare results against baseline data and the measures of success stated in the aim statement
  - √ Did the results match the theory/prediction?
  - √ Did you have unintended side effects?
  - √ Is there an improvement?
  - √ Do you need to test the improvement under other conditions?
- √ Describe and report what you learned



Plan-Do-Study-*ACT*

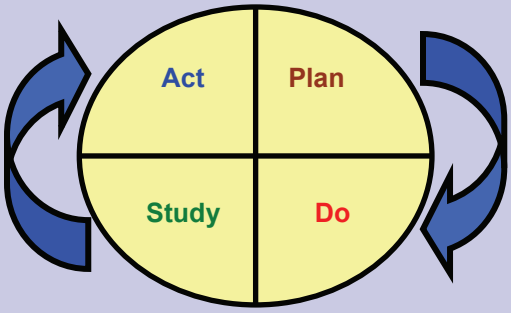
Standardize the Improvement and Establish Future Plans

Step Eight: Standardize the Improvement or Develop a New Theory

- √ If your improvement was successful on a small scale test it on a wider scale
  - √ Continue testing until an acceptable level of improvement is achieved
  - √ Make plans to standardize the improvement
- √ If your change was not an improvement, develop a new theory and test it; often several cycles are needed to produce the desired improvement

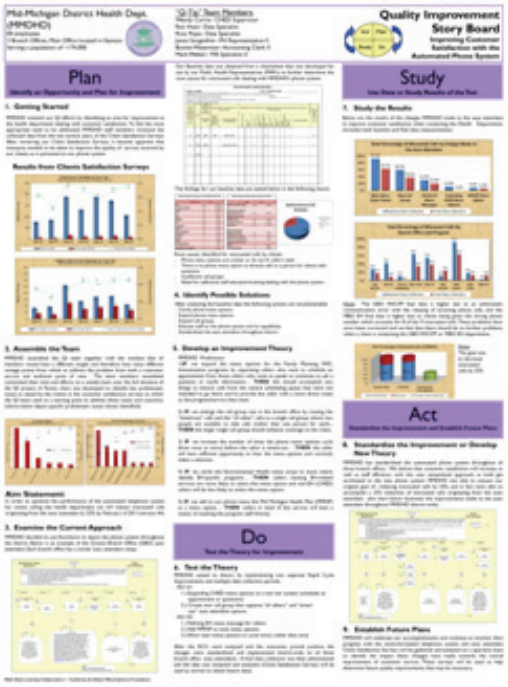
Step Nine: Establish Future Plans

- √ Celebrate your success
- √ Communicate your accomplishments to internal and external customers
- √ Take steps to preserve your gains and sustain your accomplishments
- √ Make long term plans for additional improvements
- √ Conduct iterative PDSA cycles, when needed



What is a QI Story Board?

An important part of the PDSA cycle is communicating the work of your project to internal and external stakeholders. Developing a QI story board poster is a great method to help your health department tell the story of your QI project from start to finish. Organize your story board around the steps in PDSA. Story boards are **graphic-heavy**, not text-heavy. The more charts and pictures, the better! The text included on the story board should be as concise as possible; use bullets when you can. The information available for display on your story board depends on where your team is in the process. A team just beginning the improvement process will have less information to display.



Why Use a Story Board?

- Tell your QI story in an organized way
- Harness the 'power of the visual'
- Depict your process improvement
- Give users real content that is easy to digest
- Provide an embraceable approach that needs little explanation
- Highlight your accomplishments
- Help build your culture of quality!

QI Story Board Template

It's easiest to create a story board in Microsoft Publisher, but if your health department does not have Publisher, Microsoft Word will work too. Following is a sample story board template which has been set up to include guidance as to what information should be included where on your story board. The questions under each step of the PDSA cycle are intended to help you think about the types of information you might like to include under each step.

Use these types of graphics on your story board to tell your story:

- Process Map
- Logic Model
- Fishbone Diagram
- Check Sheet
- Pareto Chart
- Run Chart
- Bar Chart
- Data Table

To take a look at an example story board visit: http://www.accreditation.localhealth.net/MLC3/MLC%20Yr%203%20Storyboards/Mid-Michigan%20Story%20Board%20MMDHD%20-%20MLC-3.pdf

Story Board Tips

- Prominently display your health department name
- Include only essential information
- Start with the information you have
- Add to your story as your team completes activities
- Use black on white with colored headers and graphics
- Keep it simple
- Make it fun!

Where to use a Story Board

- Governing Entity Meetings
- Department-wide & Team Meetings
- Conferences
- Presentations

Story Board Template

Health Department Name
Location
Size
Population Served

Insert your HD's logo here

Team Members:

Quality Improvement Story Board
Your HD's Project Title

Plan

Identify an Opportunity and Plan for Improvement

1. Getting Started

- What area, problem, or opportunity for improvement did the health department identify?
- How were resources estimated and committed?
- Was approval obtained, if needed, to conduct the QI project?

2. Assemble the Team

- How were team members identified/selected?
- What team member roles and responsibilities were assigned and how?
- What problem or opportunity for improvement did the team identify?
- What was the initial timeline for the improvement activities and how often were team meetings scheduled?
- What was the team's initial aim statement?

Aim Statement:

The aim statement should address:

- What are we trying to accomplish?
- How will we know that a change is an improvement?
- What change can we make that will result in improvement?

3. Examine the Current Approach

- What is the current approach or process flow? Insert a process map.
- What baseline data were used to understand the current approach?
- How was input obtained from customers and/or stakeholders?
- How was baseline data analyzed? Include graphics developed to display baseline data.
- How did the team determine the root cause(s) of the problem? Insert fishbone diagram or other graphics developed.
- Insert revised aim statement based on baseline data, as needed.

4. Identify Potential Solutions

- How did the team identify all potential solutions to the problem based on the root cause(s)?
- Were model or best practices reviewed to identify potential improvements?
- What solution did the team pick and why?

5. Develop an Improvement Theory

- What improvement theory did the team develop? List improvement theory.
- What strategy did the team develop to test the theory?

Do

Test the Theory for Improvement

6. Test the Theory

- How was the test carried out? Did the team carry the test out on a small scale?
- How did the team determine the effectiveness of the test?
- What problems, unexpected observations, and/or unintended side effects occurred?

Study

Use Data to Study Results of the Test

7. Study the Results

- Was the test successful?
- Did the results match the team's theory?
- Did the team experience any unintended side effects?
- Was there an improvement?
- Did the team need to test the improvement under other conditions?
- What did the team learn?

Act

Standardize the Improvement and Establish Future Plans

8. Standardize Improvement Theory or Develop New Theory

- If the improvement was successful on a small scale, did the team test it on a wider scale?
- Was the improvement standardized?
- Did the team develop a new theory?

9. Establish Future Plans

- How did the team celebrate its successes?
- How did the team communicate its accomplishments with internal and external stakeholders?
- What steps did the team take to preserve gains and sustain accomplishments?
- Were long term plans for additional improvements made? If so, what plans were made?

CHAPTER 5: WRITING AN AIM STATEMENT

The previous chapter of the Guidebook explained the PDSA approach and provided a checklist of the steps used for each stage of the cycle. Perhaps you noticed that during the PLAN Stage (steps 2 and 3) of PDSA your team begins development and then revises an **aim statement.** Writing an aim statement is a ***critically important*** component of improving a process. It takes into consideration the three fundamental questions used in applying PDSA:

- What are we trying to accomplish?
- How will we know that a change is an improvement?
- What changes can we make that will result in improvement?

This chapter of the Guidebook will describe aim statements, explain their use, and provide examples. The chapter also includes a method and worksheet for developing an aim statement.

Aim Statements—What Are They?

Aim statements are very specific declarations of what a team will focus on while striving to improve a process. They are **concise, specific written statements that define precisely what the team hopes to accomplish with its QI efforts.** They include a numerical measure for the future target, are time specific and measurable, and define the specific population that will be affected. Having an aim statement that all team members agree upon will help assure success. The aim statement will serve as your compass—it will guide you throughout your improvement effort by clearly describing the parameters of what you want to achieve.

Many public health practitioners write goals and objectives as part of program responsibilities or for grant-writing purposes. In doing so, the "SMART" method is frequently used because it facilitates a clear picture of exactly how you will meet your goals. The acronym ***SMART*** stands for **S**pecific, **M**easurable, **A**chievable, **R**elevant, and **T**ime-bound. This method is reliable and very useful in writing aim statements.

A ***Specific*** aim is detailed; it has a greater chance of being reached than a general aim. For example, a general aim may be to "reduce the number of smokers in the county," while a specific aim would be, "reduce the number of participants in a smoking cessation program that report having smoked a cigarette in the 60 days following the program by 50%." It is easier to determine when the specific aim has been met.

Aims that are ***Measurable*** provide set criteria for what it means to meet that aim. To expand on the example in the previous paragraph, the number of smokers in the county at a particular point in time may be difficult to measure. However, you can measure the number of program participants who report having smoked a cigarette in the last 60 days much more easily than you can measure the total number of current smokers in the community.

Achievable means that you set the aim to be something that can actually be reached; it is attainable. While eliminating lung cancer in the jurisdiction is an admirable goal, it is not achievable through one specific QI project. Reducing the number of smoking cessation program participants that report having a cigarette (following

participation) by a specific percentage is more achievable. You can use past experience, information from other health departments, or existing literature to help you figure out what that specific percentage should be.

For an aim to be ***Relevant***, it must be related to what you want to accomplish. It should have value, be important to your program or work area, and connect to broader organizational goals, if possible. Looking at the number of packs of cigarettes sold in the community would certainly provide a snapshot of smoking rates in your community, but it would not be relevant to whether your smoking cessation program is effective.

Time-bound aims have a set time-frame in which to meet the aim. For example, "reducing the number of participants in the smoking cessation program who report having smoked a cigarette in the 60 days following the program between January 2012 and July 2012," provides a time-frame for success. Time-bound aims keep you accountable and help set up a timeline for your work.

Let's apply SMART criteria to a few aim statements. Consider the following:

Aim Statement #1 *(Non-SMART)*
We will improve the number of hearing tests given by the health department.

Aim Statement #2 *(SMART)*
Between September1st and December 15th, 90% of first grade students enrolled in the county's schools will receive hearing tests.

Notice that Statement #1 is fairly ambiguous. For example, what does "improve" mean? Who will be receiving the hearing tests? What specific measure will indicate success? When is this improvement expected to occur? Statement #2 answers these questions. First grade students enrolled in county schools will receive the tests. The team is aiming to have 90% completion of hearing tests. The time period is September 1st through December 15th. Let's look at a few other examples in the chart that follows:

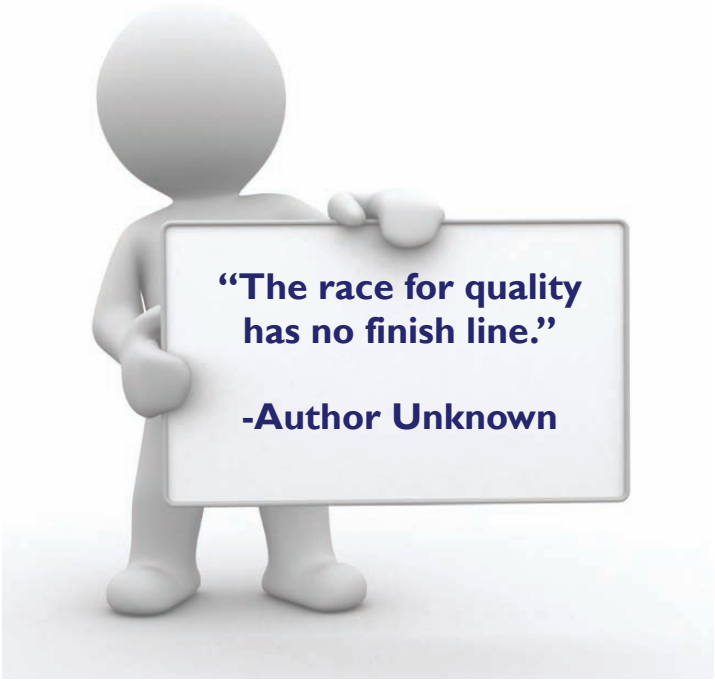
Vague or Incomplete Aim Statements	**SMART Aim Statements**
We will increase the immunization rate for children.	By the end of this fiscal year, the Health Department will increase by 40% the number of WIC infants and children who receive immunizations during the same WIC visit.
Our telephone system will improve over time.	The environmental health division will reduce the rate of misrouted telephone inquiries by 33% by February of 2014.
We will raise the rate of HIV testing to improve adult health in our community.	By September 30, 2013, the HIV Division of the Health Department will increase the percentage of women aged 35 and older residing in the metro area who received an HIV test within the preceding three years to 65%.
Our educational materials will be focused on cultural competency.	In 6 months, 95% of all health department educational materials will be available in Spanish.

In looking at the preceding chart, you may think that longer aim statements are better than short ones. This is not always true. Sometimes long aim statements cause confusion and contain extraneous information that is not relevant to the goal or project. Notice the absence (in most cases) of the word "and" in the SMART examples provided. Refrain from including more than you need when developing your aim. To help your team write SMART aim statements, use the following worksheet and instructions to help organize and display your team's thoughts.

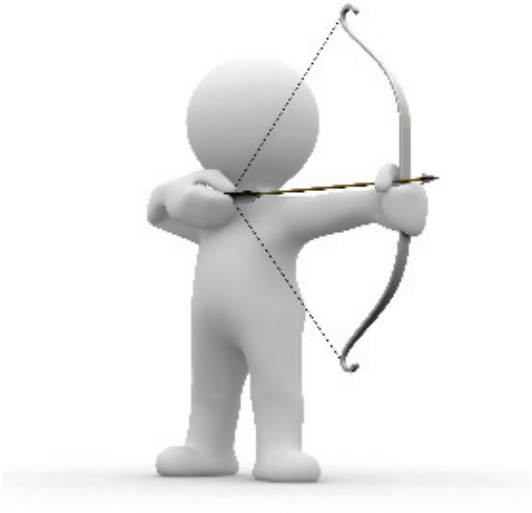
Using the 'Developing a SMART Aim Statement' Worksheet

Your QI team is ready to create the first draft of your aim statement (yes, there will be numerous iterations!). Use the SMART worksheet as follows:

1. Complete the blank sections of the worksheet (located under the developmental questions) with the parts of your improvement activity that most satisfy each letter of the SMART acronym.
2. Refer to the developmental questions and the other information in this chapter of the Guidebook to assure you're on the right path.
3. Pull all the elements together at the bottom of the worksheet by writing a complete aim statement. Some good public health examples of SMART aim statements taken from the case studies in this Guidebook are provided.



Developing a *SMART* Aim Statement Worksheet

Aim Statement Criteria:	**Developmental Questions:**
Specific	Who are the target population and persons doing the activity? What is the action or activity?
Measurable	How much change is expected? Will there be an increase or decrease? Can you measure it?
Achievable	Can it be done? Can you accomplish it in the prescribed timeframe? Do you have resources?
Relevant	Does the action relate to what you want to accomplish? Is it important & meaningful? Does it relate to broader program or organizational goals?
Time-Bound	What is the timeline for change? When will this be accomplished? Month, day, time, or year?
Aim Statement 	Write your SMART aim statement below:

Real Aim Statements—Real SMART!

To further your team's discussion of aim statements, it's helpful to review some actual aim statements used in public health settings across the country. The following examples are excerpted from the case studies included in this Guidebook. These and others included in the appendices may spur ideas as you ponder suitable and SMART aim statements for use in your own health department. Let's take a look:

Caring Community Network of the Twin Rivers, Franklin, New Hampshire:
CCNTR will work to improve documentation of BMI in electronic medical records among youth ages 2-19 in four local primary care practices to at least 65% between 2008 and 2009.

Comanche County Health Department, Lawton, Oklahoma:
By December 2010, the Comanche County Health Department will improve community engagement as evidenced by: 60% of community sectors will be represented at meetings, with an average score of 4 on the Meeting Effectiveness Survey.

Grand Traverse County Health Department, Traverse City, Michigan:
By January 15, 2011, food service workers from Chinese restaurants located in Grand Traverse County will demonstrate a 20% increase in the ServSafe exam passing rate.

Mahoning County District Board of Health, Youngstown, Ohio:
Between October 18th and November 30th, 2010, we will reduce the average time it takes to conduct septic and well evaluations for real estate transactions by 15% (from 11.8 to 10 calendar days).

Mid-Michigan District Health Department, Stanton, Michigan:
In order to optimize the performance of the automated telephone system for clients calling the health department, we will reduce misrouted calls originating from the auto attendant by 25% by February of 2011.

Ready, Aim, Refocus!

As your QI project progresses, you'll need to periodically step back and review your aim statement. Does it still reflect what you want to accomplish? Does it still adhere to SMART criteria based on any additional information or data you've gathered? Many QI teams purposefully tweak their aim statement (within reason) as they gain knowledge about the problem under study. You may also need to consider narrowing your aim to address a smaller part of your problem. Conversely, teams will want to avoid "aim drift" by moving away from the aim unconsciously. The "take-away" here is to refocus your aim periodically, if needed, in a purposeful and deliberate way, based on new facts, data, or learning. As your project continues to unfold, ask these additional questions to fit key PDSA pieces together:

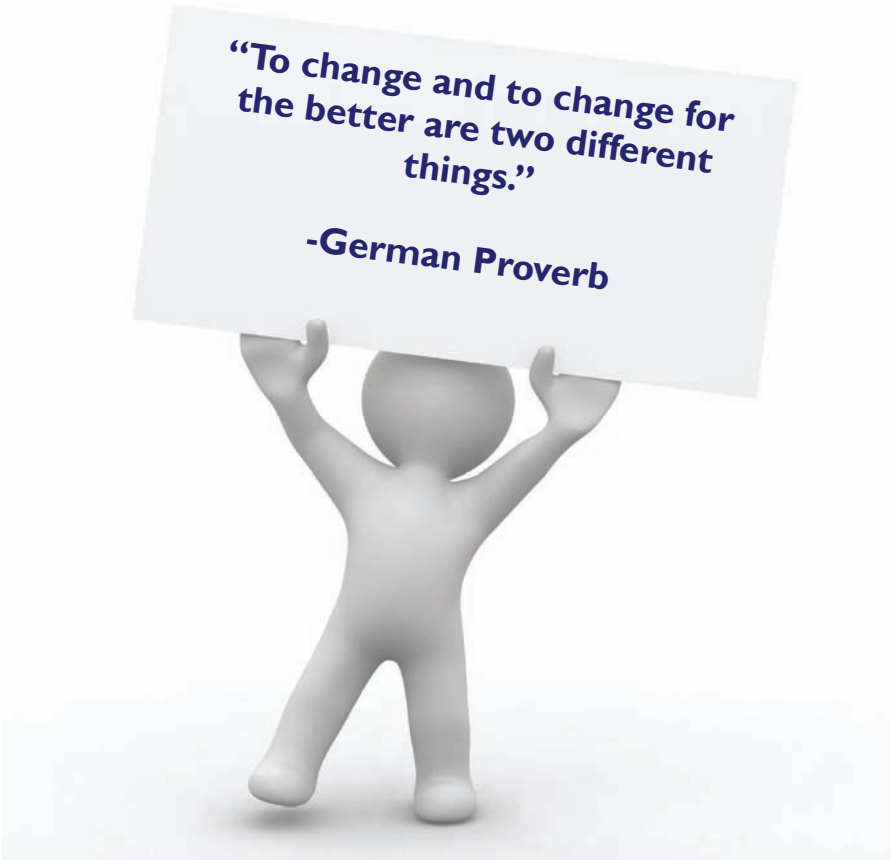
- Does our aim statement align with our "if-then" theory?
- Does our "if-then" theory align with our test?
- Does our test align with our strategy for studying our results?
- Does our strategy for studying our results align with our aim statement?

Additional information about aim statements and "if-then" theories is available in Chapter 4 of this Guidebook.

Aim Statement Pitfalls & Tips

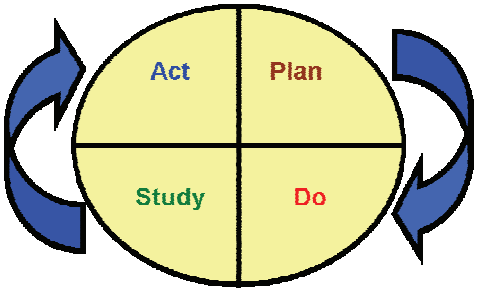
To conclude this chapter's discussion, consider the following aim statement pitfalls, tips, and reminders:

- New QI teams frequently begin with aim statements that are too broad. It is better to start small.
- Be ready to focus and refocus the aim; you may even find it necessary to work on a smaller part of the overall process you want to improve.
- Consider existing data or available evidence when developing your aim.
- Agree on the aim and state it clearly so that it can be understood by ANYONE.
- Numerical targets clarify the aim and help identify measures of improvement.
- Create an aim you can accomplish that targets something you have the ability to affect.
- Focus your aim on a single (non-compound) result.
- Refrain from using program specific jargon or acronyms.
- Use active verbs (e.g., apply, conduct, administer, explain, increase, reduce, train, etc.)
- Avoid vague verbs (e.g., understand, know, realize, be aware of, comprehend, learn, etc.)
- Keep what you think is the solution to your problem out of your aim statement.
- If you are having trouble with the sequence of S-M-A-R-T, try M, A, R, S, T.
- Use the worksheet provided in this chapter; it will keep you on the "write" path!



CHAPTER 6: THE IMPORTANCE OF DATA AND MEASURING IMPROVEMENT

Making data-driven decisions is a key element of most QI approaches. In public health, as in many other fields, data should play a key role in making informed decisions. It should also drive your QI efforts.



The idea of data playing a central role in your QI efforts might seem intimidating at first, and data-related challenges can definitely stop a QI team in its tracks. However, when you are figuring out how to use data, keep in mind these two ideas. First, data can help your team make more informed decisions, but it will not provide all the answers and it cannot make decisions for you. 'Analysis paralysis' can be avoided by staying in control of your data and not letting it control you!

Second, remember that you have data at your fingertips on all kinds of public health issues and you already use data all the time. Identifying the data you need and how to use it becomes clearer when you have specifically defined what you want to improve in your aim statement. You likely already have data about client/customer satisfaction, the number of clients served by specific programs, error rates, timeliness of permits issued by the health department, program costs, incidence of disease, breastfeeding rates, access to care, number of inspections, infant mortality, and ability to meet accreditation standards. Any of these data can be used to identify an area that needs improvement and they can be tracked over time to figure out if a specific change resulted in an improvement.

Taking a 'no fear' approach to using data is usually best! Once you know what you want to know, let your data help you answer those questions, and use the guidance in this chapter to help you along the way.

Using Data – A QI Necessity

The importance of using data throughout the PDSA cycle cannot be over-emphasized. Gathering good data and knowing how to use data are fundamental to knowing what needs to be changed and knowing if a change was an improvement. When you hear the word "data," you may think about statistics, computers, engineering, or other technical applications. However, we all collect and use data of various kinds all the time. Our banks send us data on our financial status. We collect data connected to expenditures, expenses, and taxes. We may collect data on health related activities such as exercise, nutrition, or weight loss. You may collect data associated with leisure activities such as bowling or golf. In all of these situations, focusing on data helps us understand a situation and make informed decisions.

Many health departments are quite familiar with data; every public health discipline uses it. Sanitarians, nurses, epidemiologists, health promotion managers, health officers, medical directors, consultants, coordinators, clerical staff, and others all use data to perform their jobs. There are data related to morbidity, mortality, immunization rates, surveillance, disease outbreaks, restaurant inspections, water and sewage programs, health promotion, and health assessment. There are data associated with number of clients served, tests conducted, financial and management systems, human resources, and information technology—the list is almost endless.

It is important to note that data may be defined as documented measurements *or* observations. We often think of data as the numbers that result from measurements of factors such as time, cost, and length. However, public health practitioners are often interested in data about behavior, which can be captured through observation. Observations can be quantified by using classifications or counts of the observed behavior during some fixed period of observation.[1] **If you can observe an event (or even its effects) you can measure it. If you can measure it, you can improve it.** Remember, that using good data is essential, and your data may be based on either documented measurements or documented observations.

Data - Ideas to Know

When looking at data, you may notice that there are two main forms data take – numbers, or **quantitative** data, and words, or **qualitative** data. Quantitative data are measured or identified numerically and can be analyzed using statistical methods. Quantitative data can help define a situation using pre-defined, numeric measures that can be compared across groups and over time. On the other hand, qualitative data are composed of words, and provide in-depth, contextualized, and meaning-driven descriptions of anything from an individual's experience to a community's history.

The type of data you will need depends on what you want to know. For example, if you want to know how frequently clients are not showing up for scheduled appointments, you might use a check sheet and mark the number of times each day your clinic experiences a no-show, which would be quantitative data. However, if you want to know why clients aren't making their appointments, you might ask them to describe why they missed their appointment, which would provide you with qualitative data. As you can see from this example, the two types of data may complement each other and provide you with a more complete view of a problem. Your quantitative data may tell you that a problem is occurring, and qualitative data may uncover the source of the problem.

The following table provides an example of quantitative and qualitative data you might collect through a client satisfaction survey.

Quantitative Data	Qualitative Data
Number of clients	Reason for client's visit
Client wait time	Suggestions for clinic improvement
Percent of clients who have private insurance	Name of insurance company
Rating, on a scale, of client satisfaction with services received	Description of satisfaction with services

When gathering and organizing your data, there are several factors that are important to take into consideration. For your findings to be meaningful, you will want to take steps to look at reliability, validity, completeness, and bias. **Reliability** is the extent to which the same measure would have the same result if it were repeated. For example, if your blood lead test provides the same result when completed twice on the same sample, your test is reliable. **Validity** refers to whether you are really measuring what you intend to measure. For example, if your blood lead test truly measures lead in a child's blood, your test is valid.

Completeness means that you have all the data you need to answer your questions, including data that might challenge your conclusions or provide an alternative explanation. For example, if you were gathering samples from spaces in a child's environment to identify the source of their lead exposure, but your protocol did not include testing outdoor play spaces, your measurement strategy would not be complete. Finally, **bias** refers to the degree to which your data are inaccurate due to the way you took your measurement. For example, if you used a question to ask clients about blood lead testing that suggested a certain answer, like "have you protected your child by getting his/her blood tested for lead?," your question is biased.

A Note About Constructing Surveys

Reliability, validity, completeness, and bias are particularly important when you are developing a survey or using survey data. When possible, use tools that have been tested for reliability and validity, and keep the following points in mind when working with surveys:

- Surveys should begin with clear, written instructions.
- Surveys should only include the questions you need answered – do not ask respondents to provide more or less information than you need.
- Survey questions should be carefully ordered and the order should make sense from your respondent's perspective.
- Survey questions should be clear – avoid technical jargon and acronyms.
- Survey questions should be neutral – they should not suggest a 'correct' answer.
- Each survey item should include only one idea – double-barreled questions, or questions that actually include more than one idea, are unreliable.
- Answer categories should cover all possible responses and they should be mutually exclusive.
- Response scales should be balanced and they should be clear to the respondent.
- Take care to remain neutral when administering surveys.
- Ensure confidentiality is promised and maintained.

Taking Aim!

Your aim statement and your data work hand-in-hand to shape your QI project. One of the key features of a SMART aim statement is that it is measurable and includes a specific target for improvement. When setting the target for improvement in your aim statement, consider larger health department goals or other public health performance measures. There are many places to look for performance measures when formulating the target for performance in your aim statement. Public health performance measures frequently relate to the three core functions of public health: Assessment, Policy Development, and Assurance.[2] Often they correlate to standards such as the Ten Essential Public Health Services, NACCHO's Operational Definition of a Functional Local Health Department,[3] the National Public Health Performance Standards Program,[4] Healthy People,[5] or standards from an accreditation program such as the Public Health Accreditation Board's national program.[6] Benchmarks or best practices from other health departments also provide ideas for performance measures. If your health department has a strategic plan, health improvement plan, health assessment, or QI plan these documents will provide performance measures that are particularly relevant to your health department.

Your QI project can be seen as one stepping stone toward achieving your health department's larger performance measures. So, when developing your aim statement, consider how you might tackle a piece of a larger performance measure through your project. Your aim statement should also:

- Be shaped by the data you examine about the problem you are addressing
- Identify the data you will collect to understand if your change results in an improvement
- Set a goal for how your process should perform
- Indicate how you will examine data against that goal to tell you whether you saw an improvement.

As you establish a specific aim, consider finding out what others have been able to accomplish when implementing the same program, reviewing relevant literature, or reviewing other health departments' projects. Additionally, reviewing data available within your health department or for your community may help you think about what a reasonable target may be. By looking at available data, you can ensure that your aim statement is not only measurable, but also achievable. Once you set a target for performance, it's time to start measuring!

For more about developing an aim statement, see Chapter 5.

Establishing a Baseline

In order to know whether the change you are making is an improvement, you need to know how your process is performing today. The process of gathering data to determine current program performance is known as establishing a baseline. When you look at your baseline data, you will want to answer the following questions:

1. Do we really have a problem?

Often QI projects start with the perception that a problem exists. An upset customer or a tragic event might suggest that a health department is falling short in some area – but they might also be isolated, atypical events. Before you get started on a QI project, it is important to make sure that your process truly is not performing at the target you have established, and that you have a problem that can be addressed through a QI project. By looking at your baseline data you can tell the difference between an isolated event and an opportunity for improvement. If your baseline data suggest you are falling short of your target, then you will want to ask:

2. What problem do we really have?

Root cause analysis – or finding the true cause of a problem – is a critical component of the PDSA process, and data can be really helpful in identifying root cause. For example, your baseline data might help you find times of the year, week, or day that a problem is particularly troublesome. Or it may point to variables that seem to occur at the same time as your problem. By exploring your baseline data, you might learn more about the nature of the problem you are facing, which might help you more effectively target the root cause.

Baseline data help you know if you have a problem, they help you understand the problem you have, and they provide a reference point for measuring change following your improvement. So, where might you find baseline data? **Fortunately, much of the baseline data you need for your QI project may already exist.** See what you already have available before conducting your own data gathering activities. Think about what you track in your clinic files, program records, human resources, and accounting databases. Consider using state or national data sets, such as the Census and the Behavioral Risk Factor Surveillance System (BRFSS). The County Health Rankings developed by the University of Wisconsin's Population Health Institute are also a good source of health-related data.

If you can't find existing data that fit your needs, you can often collect the data you need yourself. The QI tools chapter (Chapter 7), describes strategies for collecting both quantitative and qualitative data. Tools for collecting and gathering quantitative data are generally very structured so that they can capture data the same way from multiple people. Structured survey instruments with a limited number of pre-defined choices and forms that ask for specific information are frequently used to collect quantitative data. Qualitative data collection methods may use pre-determined questions but allow the respondent to provide information without having to stick to answer choices. Frequently used methods for collecting qualitative data include focus groups, interviews, and open-ended questions on surveys.

Understanding Variation

Now that you have identified a data source, and **before you go about implementing changes, you will want to make sure that the process you want to change is stable**. Stable processes are implemented in the same way every time, and so they produce more or less the same output every time. In other words, stable processes control variation as much as possible. If you have a stable process that has a stable output, when you see a change in your measurement of the output following an improvement, you can more easily attribute that change to the improvement. If you have an unstable process that produces different results for a variety of reasons, it is very difficult to attribute changes in the output of the process to an improvement strategy.

Much has been written about variation as it relates to quality control and QI. Almost every serious discussion about quality includes information about aspects of variation as it applies to a process or an entire system. Understanding variation will help you decide if you have a process that is ready for improvement. It will also help you decide if you need to put in place a more stable process before trying to make improvements. Some of these ideas are complicated, but a basic awareness of variation will serve as a springboard for further study within your health department.

We all experience different kinds of variation in our lives. For example, most likely the time you arrive at your health department for work each day varies a bit. Probably your morning routine has slight variations. Perhaps you overslept, received an unexpected phone call, could not locate something you needed, ran into traffic, or have children to get ready for school. Some of those factors are probably present all the time, such as your children or the traffic present during your commute. Other factors are not present at all times, such as the unexpected phone call or oversleeping.

Process variation may exist because the process is not implemented in the same way each time. In this case, standardization of the process (to reduce variation) is essential. For example, a health department may publicize its hours of operation as 8:00 a.m. to 5:00 p.m. on Monday-Wednesday-Friday and Tuesdays and Thursdays from 9:00 a.m. to 5:00 p.m. However, periodically, the health department fails to open its doors at 8:00 a.m. and opens at 9:00 a.m. on Mondays, thereby causing a "quality problem." This type of occurrence would typically be classified as unwanted variation and could have been caused by a characteristic of the process, such as always rotating days and employees who open the building.

Being able to tell the difference between causes of variation that come and go and those that are always present at some level is a key to improving quality. In every process and in every measurement, variability exists. This concept is well understood by scientists.[7] For example, when clinical investigators conduct research trials to determine the effectiveness of a new drug, they design them to control for unwanted variability related to differences among individuals or among disease subgroups. In essence, they are trying to focus on the "signal" (the effect of the drug) while decreasing the "noise" (all the other factors that influence health outcomes) by using an experimental design. Although in public health we often cannot use experimental methods to control variation, we can look at whether or not our processes produce consistent outputs, and if we can produce consistent outputs, we can try to improve those outputs by intentionally testing changes to our processes.

Walter Shewhart developed the concept that variation should be viewed in one of two ways—either as an indication that something has changed or as an indication that no change has occurred. A central theme to Shewhart's thinking is that one should not react automatically to each observation or measurement. He asserted that data should be plotted over time, so that one can observe the patterns in the data and understand when a change has occurred. This idea is important when interpreting your baseline data or your data following an improvement. You can expect that your baseline data will have some variation, and you can expect that there will be times when your baseline data will 'jump' in one direction or another. It's important not to assume that every 'jump' in your data is meaningful.

"Common cause" and "special cause" are the two distinct classifications of variation, which help sort out the difference between variation that should be attended to and variation that should be ignored, according to the statistical thinking and methods of both Deming and Shewhart. Definitions and examples follow:

Common Cause Variation

Processes that exhibit common cause variation are called stable or predictable.

Common causes of variation are natural parts of the process or system and are typically present all the time. Each factor present contributes a small amount to the total variation. A public health example of common cause variation in a process might be seen at the information or registration desk of your health department. How long it takes a client to complete a form might vary based on whether there is an ink pen present at the counter, how quickly the client can read the form, how many pages comprise the form, and whether or not the client feels a sense of urgency.

Special Cause Variation

Processes that exhibit special cause variation are called unstable or unpredictable.

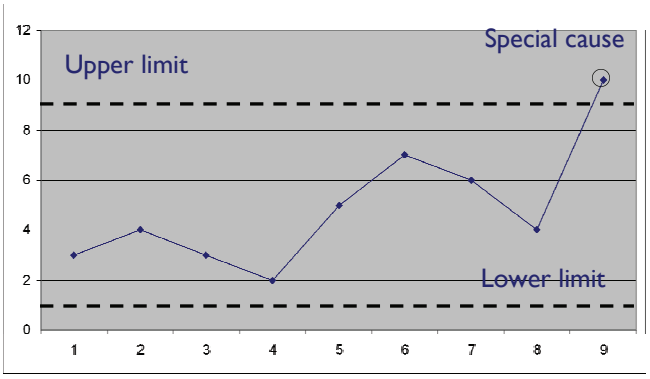
Special causes of variation are not part of the process or system all the time; they are not normal occurrences. They arise because of specific circumstances or special conditions and are usually a surprise. They disturb a process sporadically and the magnitude of their contribution to variability is larger. Using the same public health scenario as above, an example of special cause variation might be observed when that same client has a broken hand and must complete the form with the opposite hand. Another example of special cause variation would be seen if the health department's fire alarm went off and interrupted the client's completion of the form.

It is important to react to special situations when they occur, but these are not usually the foci of QI. **When doing improvement work in your health department, be sure you are trying to improve a predictable process—a stable process.** Your data will help you decide. Some basic tests for special cause variation have been refined over the years and are very effective filters in separating the random patterns of common cause variation from patterns produced by special causes:[8]

- 1 or more points outside the control limits
- 6 or more consecutive points all going up or all going down
- 8 or more points in a row all on the same side of the centerline
- 14 or more consecutive points alternating up and down

Tools such as control charts will enable you to study variation. Several examples follow:

1 or More Beyond Limits



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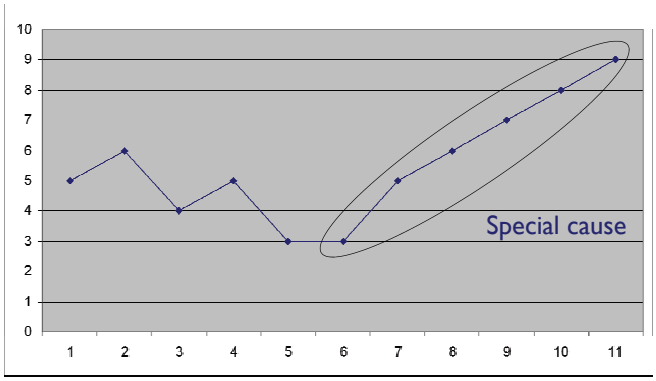
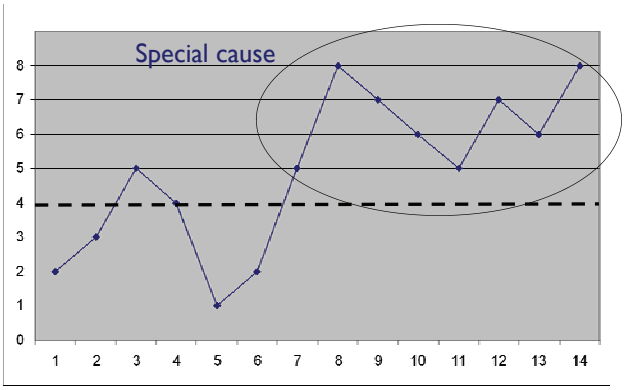
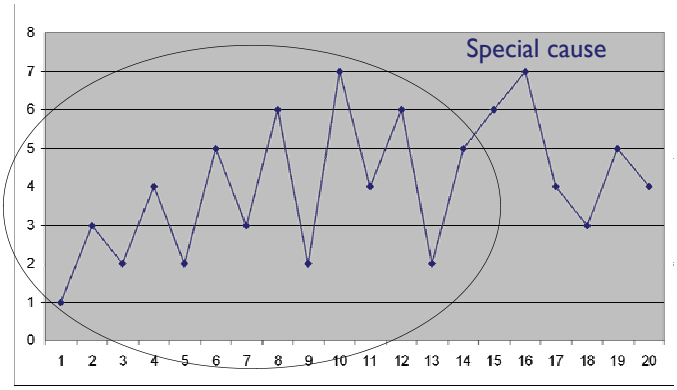


8 in a Row on Same Side of Centerline



14 or More Up and Down



Another public health example might help sort out some of these concepts. Let's imagine that your QI project has to do with ensuring that you are hearing from your customers. You decide to start by looking at your process for distributing customer satisfaction surveys and you might study your customer satisfaction survey return rates as the 'output' of your process. You can expect that your return rates will vary by a few percentage points from week to week at baseline because of the number of clients you saw and slight differences in client willingness to complete the survey. This is common cause variation, and it is a good idea to track the normal range of response rates week to week so that you know how much common cause variation you have. You might also see some weeks where the rate drops or is much higher than normal. If that change follows any of the patterns displayed above, you might be seeing special cause variation and you will want to investigate the cause. Now, you might also see that your return rates vary a lot from week to week at baseline – this might indicate that you may have a process that is unstable and needs to be stabilized before you can use survey return rates as a measure of your success in hearing from customers.

Often public health QI projects begin with process stabilization. Processes that are undefined or inconsistently implemented produce too much variation to use measures of their output as an indicator of true improvement. If you have a relatively stable process with a lot of variation, you may have a process that is inefficient, and you can begin your QI effort by tackling the problem or improvement opportunity that accounts for the largest proportion or percentage of total unwanted variation. Remember that common causes of variation are natural parts of the process or system, present all the time, and that each factor contributes to the total variation. Look for factors causing the most variation and focus on those factors, if possible. Bear in mind that if one of your processes or a part of a process is operated differently each time it is carried out, you probably have considerable variation present in that process. **Try to focus your improvement efforts where you have the best opportunity to reduce unwanted variation**. For more information about variation, refer to *Controlling Variation in Health Care: a Consultation from Walter Shewhart* by Donald Berwick.[9]

How Will You Know That a Change is an Improvement?

You learned early in this Guidebook that PDSA is an iterative four-stage problem-solving model for improving a process or carrying out change made popular by Dr. W. Edwards Deming. One of Deming's most important messages to QI practitioners was that your PDSA cycle must be designed to effectively distinguish between a change and an improvement. In fact, Deming purportedly once asserted that of all the changes he had observed, "only about 5% were improvements . . . the rest, at best were illusions of progress!" Another quote said to have originated with Deming is, "If you do not know how to ask the right question, you discover nothing."

These comments point to the importance of using data appropriately to distinguish changes from improvements. **In order to answer the question, "How will we know that our change was an improvement?" you will need to have access to good data and you will need to develop a strategy for testing your change.**

In some cases, you may be able to decide that a change is actually an improvement by informally observing the process or by using only very limited data. However, it's often necessary to use more defined strategies for testing your change theory that give you a result you can study in order to determine whether you have made an improvement. While none of these methods are fool-proof, they might help to give you a clearer picture of the outcomes of your QI work.

Pre- and post-tests are a common method for measuring change. They involve collecting a baseline measurement and a comparison measurement following a process change. Looking at the same data before and after a change may show you whether your change had the intended effect. For example, if the aim of your QI project involved improving rates of breastfeeding among WIC clients by introducing clients to the health department's lactation consultant before the baby's birth, you might look at breastfeeding rates among WIC clients before that change (pre-test) and following that change (post-test).

There are a few things to keep in mind that might affect how you can interpret a pre- post-test. Remember from the section on variation that outputs or results should be expected to vary at different points in time for a lot of reasons that might have nothing to do with your process change. Unless you consider or control for other factors that may influence your result, a difference you measure from pre- to post-test may not be wholly due to your process change. For example, if a public information campaign on breastfeeding was released at the same time as your process change, it would be difficult to sort out what caused a change in breastfeeding rates.

One way to control for confounding factors is the use of **comparison or control groups**. In this method, one group is exposed to a process change and the other is not. A comparison group is roughly equivalent to the group that is exposed to the process change, whereas a control group is assigned at random to eliminate the possibility that the group that is exposed to the process change is systematically different from the group that is not. Using the breastfeeding example, one group of clients would receive a visit from the lactation consultant prior to giving birth, and the other group of clients would not. These groups could be assigned at random to receive the visit or not (control group), or they could represent two similar groups that are not assigned at random (comparison group), such as clients at two different clinics. These two groups would be compared to see if their breastfeeding rates are the same or different.

There are a few issues to keep in mind when making group comparisons as well. Often it isn't possible to establish a true control group. It can be problematic to assign clients at random to not receive a change that is thought to be an improvement. However, if a comparison group is systematically different from the group exposed to the process change, any difference might be due to group differences instead of the process change. Using the breastfeeding example, WIC clients at one clinic might be systematically different from clients at another clinic. They might face different risk factors, represent different population groups, or have systematically different pre- and postnatal care experiences. These factors could also influence breastfeeding rates.

Another challenge with pre- post tests and comparison groups is that, in order to know if changes are just due to random variation or if they reflect a real difference, you need to use statistical methods. Statistics help identify how likely it is that the difference between two values is really just due to chance.

However, if you have a stable process, you don't need statistics training to know if a change represents a real difference. You can instead **track trends over time**, through the use of a tool such as a run chart or a control chart (see the QI Tools Chapter 7 for more information on constructing a run chart), to help determine whether the change you have implemented through your QI project is an improvement. Tools like run charts help to study the performance of a process, identify trends, and measure change in performance following a change in process. When examining your data using this type of tool, you will want to compare your result to the target you set in your aim statement. If the data you see are in line with what you set as your aim over eight or more consecutive time points following implementation of your improvement, then you may be able to conclude that the change you made is an improvement. Alternately, charting the data might show that your change did not have the desired effect, and patterns apparent in the data may give you a new area to target with your QI activities.

Finally, an alternative way to determine whether your change is an improvement might be through collecting **qualitative data** after you make the change. You can collect qualitative data on your change through one of several data collection processes, such as a focus group or through open-ended questions on surveys, or even by routinely asking clients a set question that asks their opinion of how the change you implemented has affected services. Analyzing responses from any of these methods for themes would tell you if clients consistently perceive your change as an improvement.

When questions concerning your data collection methods, results, or analyses arise, you may wish to consult with a knowledgeable team member, evaluator, statistician, or epidemiologist. Your health officer and/or medical director may also be valuable resources. You may also want to consult with colleagues in a neighboring health department or with your community partners, such as hospitals, universities, and public health institutes. The bottom line is that spending a little extra time on data, methods, and measurement will help you distinguish changes from true improvements.

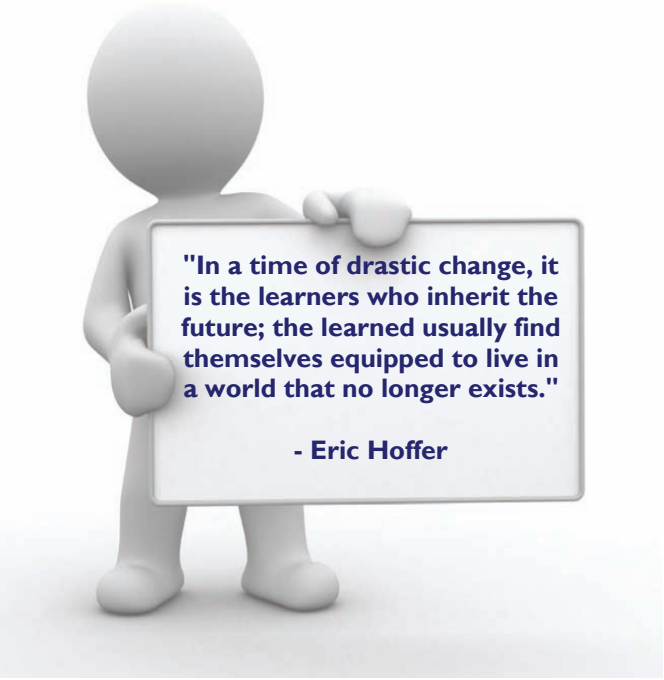
Momentum, Data, and "Low Hanging Fruit"

When an individual or team must wait months or longer before realizing success, momentum may be lost. To avoid this decline, once data begins to illuminate the process, you can work on some of the obvious problems that need fixing. Addressing this "low hanging fruit" can provide an energy boost to tackle the "high hanging fruit" in the next PDSA cycle of improvement. One risk of this approach is that in working on problems that seem to have obvious solutions, you may be tampering with the overall process, increasing variation, or failing to address the root cause. To avoid this, keep focused on your data and address issues that data indicate are really causing problems. That way you will make data-driven decisions, build momentum, and be poised to tackle more difficult improvements in subsequent cycles.

In this section we've discussed using data, determining a target for performance, establishing a baseline, understanding variation, knowing that a change is improvement, and building momentum. In concluding this section, it is essential to note that volumes have been written about the importance and use of data in QI efforts. The information offered in this Guidebook provides a sample of what is available. For further study, an excellent resource is *The Improvement Guide: A Practical Approach to Enhancing Organizational Performance* by Gerald Langley, et al.[10] Additionally, there are many valuable tools to help you work with data, such as those listed in the QI tools chapter of this Guidebook.

As you get started on working with data, remember:

- It is okay for your data to be imperfect and for your test to have flaws; that is part of the reality of working with data.
- Knowing the weaknesses of your data is part of using data to inform the decision making process.
- Data do not have to be complicated and tests of improvement do not have to be sophisticated. In fact, look for opportunities to use simple, readily available data and straightforward tests to answer your questions.
- Data can be intimidating, but using data gets easier with each PDSA cycle.
- Data is at the core of using PDSA effectively, and QI tools for using data truly make data useful for everyone.



CHAPTER 7: QUALITY IMPROVEMENT TOOLS

A Practical Look at Quality Improvement (QI) Tools

As with any task, job, effort, or project, having the right tools and knowing how to use them are critical to success. If you are using this Guidebook by reading each section sequentially, you probably noticed suggested tools for each stage of the PDSA cycle. You may have surmised that QI tools are plentiful. Often toolboxes and guides contain dozens—which can be overwhelming to new users of PDSA. This chapter of the Guidebook will help address that challenge, as well as offer ideas for practitioners who have greater experience with the selection and application of QI tools. Additionally, in this chapter you will find:

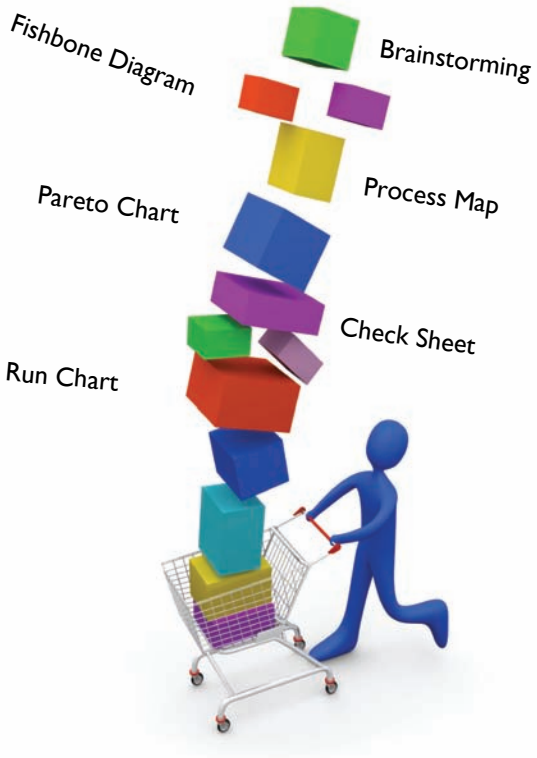
- Descriptions of QI tools
- Tool selection basics
- A tool selector chart
- Additional resources for learning

The American Society for Quality (ASQ) provides a standard list of fundamental QI tools (cause & effect, check sheet, control chart, histogram, Pareto chart, scatter diagram, and stratification). A complete description of each tool including procedures for use and examples may be found at http://asq.org/learn-about-quality/seven-basic-quality-tools/overview/overview.html. This Guidebook recommends starting with a few of the tools recommended by ASQ, as well as others that have been found to be particularly applicable to public health.

Six Useful QI Tools for Public Health

To save you some time and legwork, it is a good idea to start with a few QI tools that lend themselves easily to public health practice. Brainstorming, Process Mapping, Fishbone Diagrams, Check Sheets, Pareto Charts, and Run Charts have each been used successfully by public health departments, and they will get you started. If you have already used PDSA to improve quality in your health department, you already have a few tools with which you are familiar.

It's important to note that some tools are used to identify and display concepts (conceptual tools), while some are oriented toward numbers (numerical tools). Both are needed when using the PDSA cycle. Remember, not all tools are right for every situation and the trick is matching the tool with what you need at a particular point. Let's get started.



Tool #1: Brainstorming—Generating Ideas!

Many public health professionals have used brainstorming at some point in their careers to generate ideas—ideas that just might be useful in beginning, carrying out, and/or sustaining a QI process, project, or effort. The Public Health Memory Jogger[1] states that brainstorming is used "to establish a common method for a team to creatively and efficiently generate a high volume of ideas on any topic by creating a process that is free of criticism and judgment."

A typical brainstorming session includes defining the issue or problem (often presented as a central question), asking for and sharing ideas, capturing and recording input, analyzing all ideas, and collaborating to organize ideas into categories or identify themes. To create a productive brainstorming environment, establish a few ground rules for your QI team. Examples include taking turns to speak, listening attentively, avoiding criticism, and encouraging all participants to speak openly. To achieve maximum results, all ideas should be welcomed—even those that seem farfetched or controversial. A staff person at your health department, serving as an internal facilitator, can be helpful to guide the process. The facilitator may also capture ideas on a flipchart, whiteboard, or other visual aid so that all participants can view the ideas as they are generated. Once ideas are generated, they are often sorted into themes, or groups of ideas that are alike.

Brainstorming is often used during PDSA Steps 1, 2, 3, 4, 5, and 9. A few examples of central questions that you might ask at the onset of a brainstorming session follow:

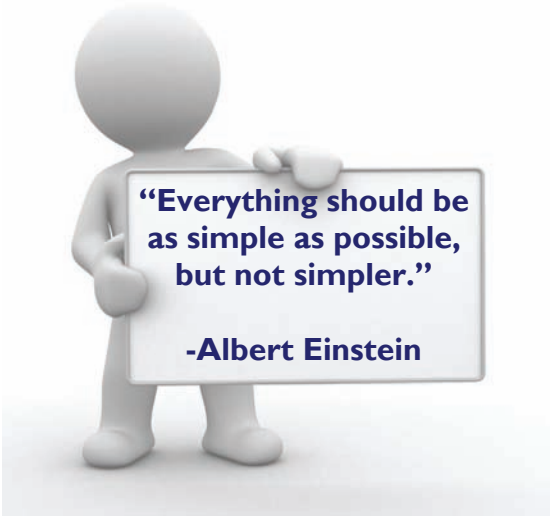
- How can we improve our rate of response to our health department's customer satisfaction surveys?
- Who are our public health partners and stakeholders related to our environmental health improvement efforts?
- What is the root cause of client failure to arrive for scheduled appointments?
- Where can we collect the needed baseline data for our health promotion project?
- What are some possible theories for improvement in better managing disease outbreaks?
- What will be our measures of success in reducing infant mortality rates?
- How can we sustain the gains achieved in our personal health services QI project?

Hints and Tips

Brainstorming is a useful tool for generating ideas and encouraging open thinking. It fosters creativity and promotes building on the ideas of other team members. As you continue your QI journey, brainstorming can even be used to generate ideas about which QI tool is right for your improvement effort!

Brainstorming Examples:
Find public health examples of brainstorming in these case studies in Appendix A:

- Comanche County Health Department
- Eastern Montana Collaborative
- Grand Traverse County Health Department
- Norton County Health Department
- Tooele County Health Department



Tool #2: Process Map—How You Get the Job Done!

PDSA is used to improve processes, but in order to improve a process you have to know that process inside and out. A Process Map (flowchart) is a diagram of the steps you take to get a job done, so it is a very useful tool for learning about the processes in your health department. You may not think of your work in terms of a process, but any task in your health department may be described as a process—checking clients into clinics, ordering office supplies, developing health promotion materials, conducting restaurant inspections, preparing for accreditation, updating policies/procedures, gathering data, working with the media, writing goals and objectives, or even answering the telephone.

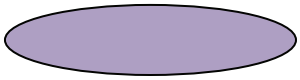
Process Maps are often used during PDSA Step 3 to:

- Document the way work gets done. They provide a tool to help staff discuss how things get accomplished in the health department.
- Analyze and improve processes. They let you identify problems with your process and rework those areas to allow for smoother workflow. They can be used to generate ideas for and illustrations of possible process improvements.
- Clarify an existing process. They help staff who have different perspectives on a process get on the same page about the steps and flow of a process.

Standard Symbols Used to Process Map

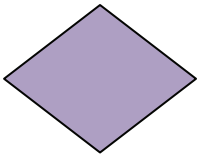
The following are standard symbols used in Process Mapping:

- **Start & End**: An **oval** is used to show the materials, information or action (inputs) to start the process, or to show the results at the end (output) of the process.

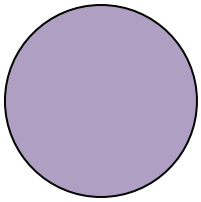


- **Activity**: A **box or rectangle** is used to show a task or activity performed in the process. Although multiple arrows may come into each box, usually only one arrow leaves each box.

- **Decision**: A **diamond** shows those points in the process where a yes/no question is being asked or a decision is required. Usually two arrows leave a diamond, one that illustrates what happens next if the answer is 'yes' and one that illustrates what happens if the answer is 'no.'



- **Break**: A **circle** with either a letter or a number identifies a break in the Process Map that is continued elsewhere on the same page or another page.



- **Flow**: An **arrow** shows the direction or flow of a process.

Getting Started with Process Mapping

1. Assemble your QI team. Involve frontline staff knowledgeable about the problem and include staff from other work areas—get the right people at the table.
   - For example, to map the process of completing a blood lead test, you might include front desk staff, nursing staff, lab staff, clerical staff, supervisors, and potentially clients.

2. Determine which process needs to be documented. As a team, think about the problem and consider all processes that might be related to the problem. You may need to create more than one process map.
   - For example, you might focus on what happens during the client's visit, the flow between the clinic and the lab, or how the department handles follow up with clients. Or you might look at all of the above!

3. Before creating the process map, agree on where the process begins and where the process ends.
   - For example, you might start with client outreach, a scheduled appointment, a clinic visit, or when the blood sample is sent.

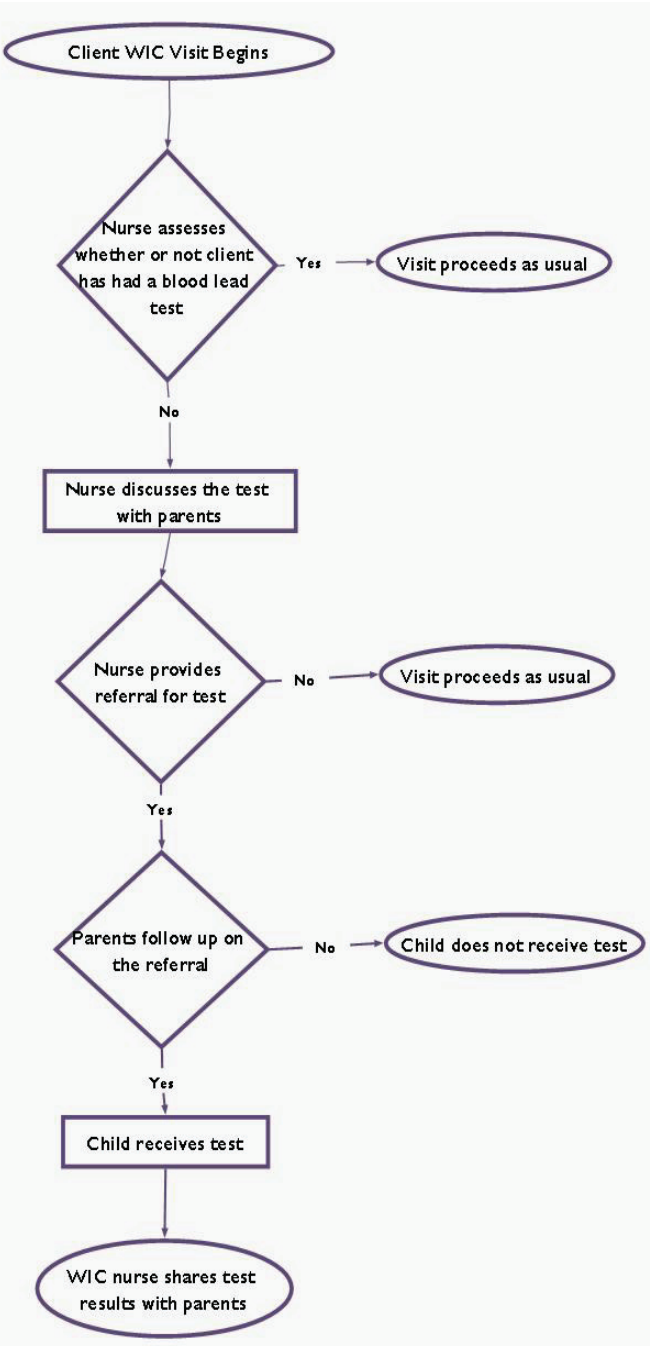
4. Agree on the level of detail that will be displayed. Will an explanation of each step of the process be provided? Will both major and minor steps be noted? Sometimes it is easiest to create a high-level macro map and fill in details later.
   - For example, you could create a very general map of the entire process from outreach to follow-up, or a very detailed map of the process from receiving a positive screening result to following-up with the family.

5. Create a list of the steps taken in the current process before actually constructing the Process Map.
   - For example, if you want to improve the process of ensuring your WIC clients receive blood lead tests, you might start with a WIC visit and list steps like checking to see if the client has had a blood lead test, discussing the test with parents, providing a referral for the test, following up on the referral, and following up on the result of the test.

6. Construct your Process Map by ordering the steps, identifying activities and decision points, and placing arrows between the steps to illustrate how the process flows from its starting point to its end point.
   - Check out the example Process Map to see our blood lead testing process in action!

7. Finally, your team may want to identify additional staff to review or provide input on your Process Map.
   - For example, if you have a WIC nurse who is not on your team, s/he could review your Process Map and provide input.

Process Map



Hints and Tips

When creating your Process Map, keep the following in mind:

1. Map the *current* process (as carried out most of the time), not what you would like the process to be. Be sure and map the basic process—don't include occasional steps that sometimes occur.
2. It is very common for staff to have different ideas about how health department processes work. One of the biggest benefits of process mapping is having the discussions that uncover these different perspectives.
3. When mapping each step, keep steps simple and begin each step with an action verb.
4. Process Mapping is dynamic and can be fun. You will often erase or modify a step. Use Post-it notes, dry erase markers, or pencils, so changes can be made with ease.
5. There is no single right way to do a Process Map. It is a tool to learn about your health department and the work that is done.
6. If your team is new to process mapping, do a trial run with a simple everyday process familiar to all team members, such as putting fuel into your car's gas tank or packing a lunch.
7. Once you are familiar with basic Process Mapping, check out related tools such as Swim Lane diagrams, which help illustrate how a process flows between people or departments.

Process Map Examples:
Find public health examples of process maps in these case studies in Appendix A:

- Caring Community Network of the Twin Rivers
- Comanche County Health Department
- Grand Traverse County Health Department
- Hennepin County Human Services and Public Health Department
- Mahoning District Board of Health
- Mid-Michigan District Health Department
- Norton County Health Department
- Tooele County Health Department

Tool #3: Fishbone Diagram—What's the Problem?

One of the tricks to PDSA is making sure your process change addresses the root cause of your problem. A Fishbone Diagram (cause and effect diagram) identifies possible causes of a problem and encourages your team to consider possible causes that might not be readily apparent.

Fishbone Diagrams are used often during PDSA Step 3 to:

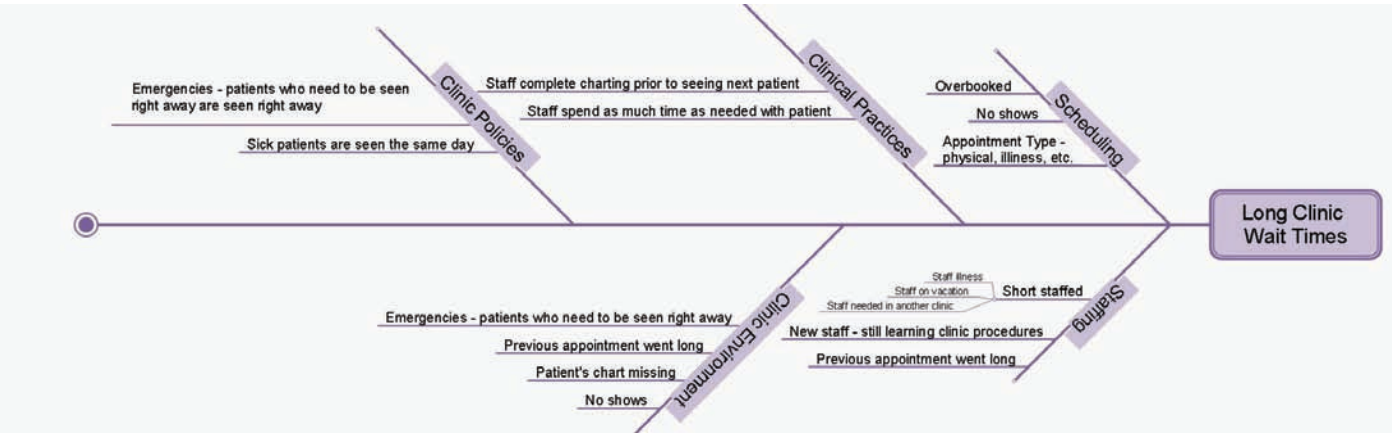
- Identify and examine underlying or root causes of a problem
- Identify a target for improvement that is likely to lead to change
- Explore possible causes of a problem

Getting Started with Fishbone Diagrams

1. Begin by identifying the effect or problem and major causes that could be leading to the problem. Major causes can be created by your team, or your team can use the following standard categories as a guide: methods/ procedures, information, materials/equipment/technology, people/partners/staff, environment, policy, or incentives.
   - For example, ***the problem*** could be long clinic wait times. ***Major causes*** could be scheduling, staffing, clinical practices, clinic environment, and clinic policies.

2. Once the problem and major causes are identified, begin constructing the Fishbone Diagram: On the far right side of a piece of flip chart paper or a dry erase board, write the problem in a box. Draw an arrow (backbone) leading to that box. Draw smaller arrows (bones) leading to the backbone, and label the arrows with your major causes.

3. Next, brainstorm minor causes related to each major cause and note them on the diagram by placing lines on each of the major bones. Note each team member's ideas on the diagram. It is helpful to think of the process of noting minor causes as brainstorming.
   - Check out the example Fishbone Diagram below to see the potential causes of our example problem, long clinic wait times.



4. Upon completion of the Fishbone Diagram, prioritize the possible causes to identify root causes. Consider causes that arise over and over again and those that team members feel are particularly important. Also, determine if additional data are available or could be gathered on the cause(s) identified.
   - For example, in the fishbone diagram emergencies are noted multiple times, as are no shows. Additionally, through discussion, team members indicated that they felt strongly that overbooking, short staffing, long appointments, and missing charts could be underlying causes of long clinic wait times.

Hints and Tips

When constructing a Fishbone Diagram, you want to find the right problem statement and reach consensus on the statement before constructing the diagram. The problem statement should be specific and reflect an outcome of a process that the department controls or influences. For example, it works better to use an effect like "low participation in the health department sponsored farmers market" than "high rates of obesity."

When identifying major causes of the problem, generate categories through brainstorming and look at current data related to the problem. Additionally, ask "why" to achieve a deeper understanding of both major and minor causes. Finally, stick to causes the QI team can control or directly influence. Returning to the example in the preceding paragraph, think about causes such as "farmer's market location" or "lack of publicity" rather than causes such as "people don't like vegetables."

Fishbone Diagram Examples:
Find public health examples of Fishbone Diagrams in these case studies in Appendix A:

- Caring Community Network of the Twin Rivers
- Comanche County Health Department
- Eastern Montana Collaborative
- Grand Traverse County Health Department
- Hennepin County Human Services and Public Health Department
- Mid-Michigan District Health Department
- Norton County Health Department
- Tooele County Health Department

Tool #4: Check Sheet—How Often Is This Happening?

We learn a lot from just carefully observing the world around us, but sometimes our perceptions are not as accurate as we think they are. A Check Sheet helps record and organize observations in order to determine how often specific events are occurring.

Check Sheets are used frequently in PDSA Steps 1, 3, 4, 6, and 7 to:

- Turn observational data into numerical data—obtained from records or newly collected
- Find patterns using a systematic approach that reduces bias
- Establish baseline data
- Track data over time to see if a process change is an improvement

Getting Started with Check Sheets

1. Identify the problem that will be studied and what your team will observe and record.
   - ♦ Building on the Fishbone example above, your team might want to investigate how often long wait times could be attributed to what the team identified as the most likely root causes: short staffing, overbooking, long visits, missing charts, and emergencies.

2. Define everything that will be observed in specific, detailed terms, and take the time to ensure that everyone who is gathering data is on the same page.
   - ♦ For example, a 'long wait time' could be identified as 10 minutes or more between the set appointment time and the time the client is called into the exam room.

3. Once the problem and the events/reasons have been identified and defined, identify where, when, and how long data will be collected. Think about confounding factors that the team will eliminate and those that will be studied.
   - ♦ For example, to study long wait times, the team could collect data for one week between 12-8 pm at one particular clinic. Long clinic wait times might be more frequent on specific days of the week, so they will track data by day of the week.

4. Design the Check Sheet and develop a protocol for how to fill it in. Include the problem or project name, name of observer, locations of data collection, dates of observation, events/reasons being observed, date of data collection, and a place to note the total for each event/reason observed. When developing a protocol, be as specific as possible to ensure data are collected consistently across observers.

5. Once the Check Sheet is developed, identify and train observers to use it. Allow for adequate time to practice and make adjustments before data collection begins.

6. Collect the data. During the data collection period(s), the QI team should review data regularly to find any errors as soon as possible. Make adjustments to the Check Sheet and protocol as necessary.

7. Once data collection concludes, summarize data across observations and observers and study the results. All data should be combined into one tracking document and studied by the team to identify trends and patterns.

   - ♦ See the example Check Sheet on the next page designed to track information about long wait times.

Problem: Long clinic wait times (10 min+)				Name: S. Baker			Time: 12-8
Location: Sunnyside Clinic				Dates: 6/8-6/14			
	Date						**Total**
Reason	6/8	6/9	6/10	6/11	6/12	6/13	6/14	
Short Staffed	3	4	3	2	3	4	0	19
Overbooked	10	12	6	3	0	0	0	31
Went long	0	0	2	3	6	1	0	12
No chart	2	2	1	2	0	0	1	8
Emergencies	2	3	1	2	1	0	1	10
Total	17	21	13	12	10	5	2	80

Hints and Tips

Use "other" as an event/reason on the Check Sheet sparingly. If an "other" category is used, ensure the observers are recording exactly why an observation was noted in the "other" category. If additional events/reasons need to be added, revise the Check Sheet and protocol, and train the observers on the revisions.

Check Sheet Example:
Find a public health example of a check sheet in this case study in Appendix A:

- Mid-Michigan District Health Department

Strike a balance between events/reasons that are really specific and events/reasons that are really broad. Both extremes result in data that are hard to interpret. Also, strike a balance between having only very few categories and having a huge list of categories. A good time to see whether your team has achieved a balance is when the observers are practicing with the Check Sheet. Make adjustments early so that you get better data in the end!

Tool #5: Pareto Charts—Frequency Matters!

Problems often have more than one cause, but a QI rule of thumb, known as the Pareto Principle, is that 80% of the problem is usually caused by 20% of the underlying causes. A Pareto Chart can help you figure out which of your causes most frequently lead to your problematic outcome. A Pareto Chart displays data (causes) in columns—organized from most to least frequent.

Pareto Charts are often used during PDSA Steps 1, 3, 4, and 7 to:

- Display numeric data on several potential causes
- Identify the causes that are most frequently leading to the problem
- Bring focus to a small number of potential causes
- Guide the process of selecting improvements to test

Getting Started with Pareto Charts

1. Identify potential causes of the problem the QI team wants to study. Brainstorming or a Fishbone Diagram could be used to generate ideas.
   - For example, the problem could again be long clinic wait times, and the potential causes could be overbooking, being short staffed, long appointments, emergencies, and missing charts.

2. Develop a method for counting the number of times each potential cause leads to the problem. Consider using data contained in your records or collecting new data.

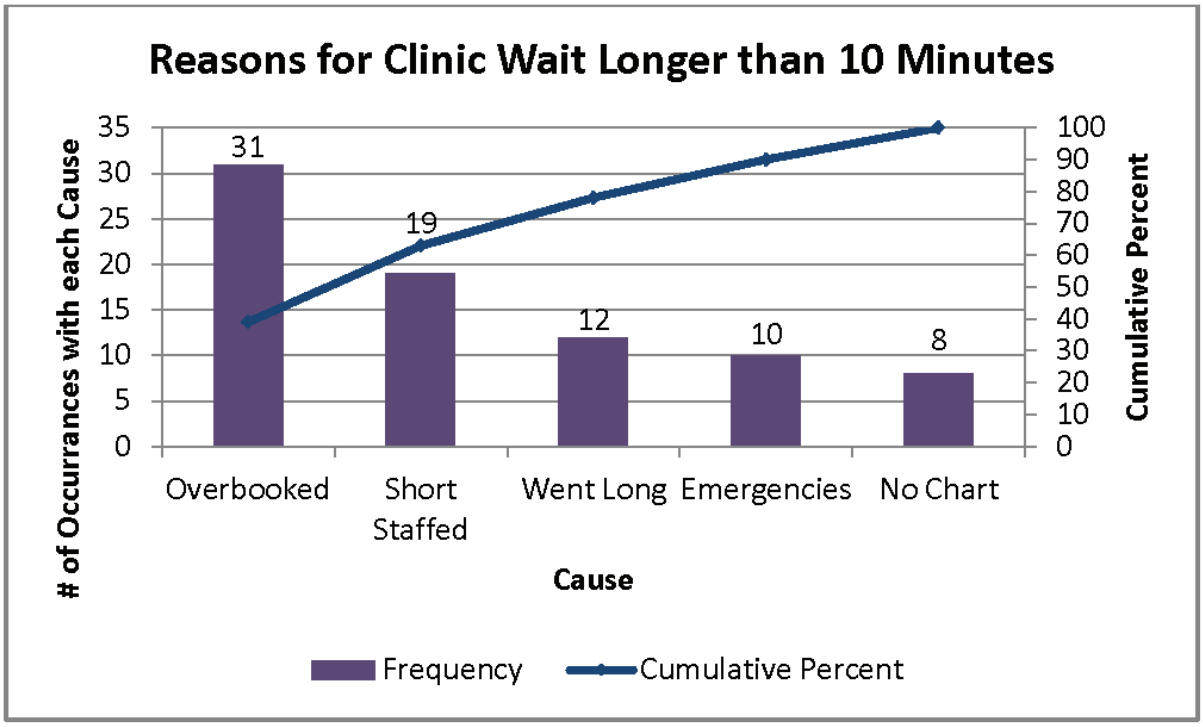
3. Count the number of times each potential cause leads to the problem. Each time the problem occurs, only attribute one cause to that event. If a specific instance of the problem has more than one cause, record the primary cause or create a category that combines the two causes.
   - For example, each time a client has a wait time of more than 10 minutes (the problem), record one primary cause. If a client has a long wait time because there was an emergency situation that resulted in their chart becoming buried under a pile of papers, record either 'emergencies' or 'no chart' as the primary cause, not both.

4. Once you have your data, count the number of times each cause occurred and order your results from the cause that occurred most frequently to the cause that occurred least frequently. Then calculate the percentage of incidents that fall in each category. The percentage is calculated by taking the number of times each cause occurred and dividing it by the total number of events that were documented. Also calculate the cumulative percent, starting with the most frequent cause.
   - For example, using the check sheet data above, prepare to construct a Pareto Chart by pulling the totals from the right hand column, ordering the causes, and calculating your percentages as follows:

Cause	Frequency	Percentage	Cumulative Percent
Overbooked	31	31/80 = 39%	39%
Short Staffed	19	19/80 = 24%	63%
Went long	12	12/80 = 15%	78%
Emergencies	10	10/80 = 12%	90%
No chart	8	8/80 = 10%	100%
Total	80	100%	100%

5. Display the data on a graph on the computer or on paper. The first bar should represent the most commonly occurring cause; the remaining causes should appear in order from most to least frequent. Include a line that represents the cumulative percent. The cumulative percent indicates what percentage of the total events have been explained by the top few causes.

6. Label everything so that someone totally unfamiliar with your project could understand what your chart is all about! The x-axis (horizontal) should list each cause, the left y-axis (vertical) should list the number of times the problem occurred, and the right y-axis should be labeled with the cumulative percent.
   - ♦ Check out the example Pareto Chart to see the top reasons for long wait times.



7. Make sense of the results by examining the data displayed on the graph. Think about the following questions when examining the data:
   - Are a few causes driving the problem?
   - Can this information help the team make decisions about a solution to try?
   - Does this information impact how the team wants to structure the aim statement or theory of change (if-then)?
   - Can the team use this information to measure results?

   - ♦ For Example, using the data above, Sunnyside Clinic staff might decide that overbooking, short staffed, and went long caused 80% of problem. Using these data, Sunnyside Clinic might decide to try altering scheduling practices to avoid these most frequent causes.

Hints and Tips

Remember: the team will only learn about causes it decides to investigate, so be inclusive when collecting data. Make sure that data collected are checked and double-checked—small errors can make a big difference! Keep in mind the results obtained through the Pareto Chart can typically be used in more than one way and used differently at different points in your project. Be sure to revisit the Pareto Chart(s) frequently as your project unfolds.

Pareto Chart Example:
Find a public health example of a Pareto chart in this case study in Appendix A:
- Mid-Michigan District Health Department

Tool #6: Run Charts—Performance Matters Too!

In order to know if a change was an improvement, you have to be able to measure how well your process is working. By tracking data on the results of your process over time, you can tell if your process usually produces the same results (i.e. your process is stable), and you can tell if a change in your process improves results. A Run Chart displays data on the results of a process over a specified period of time.

Run Charts are often used during PDSA Steps 1, 3, and 7 to:

- Display quantitative (numerical) data on a measure of the performance of a process over time
- Study the performance of a process
- Check to see if a process is stable
- Identify trends
- Measure change in performance following a change in process

Getting Started with Run Charts

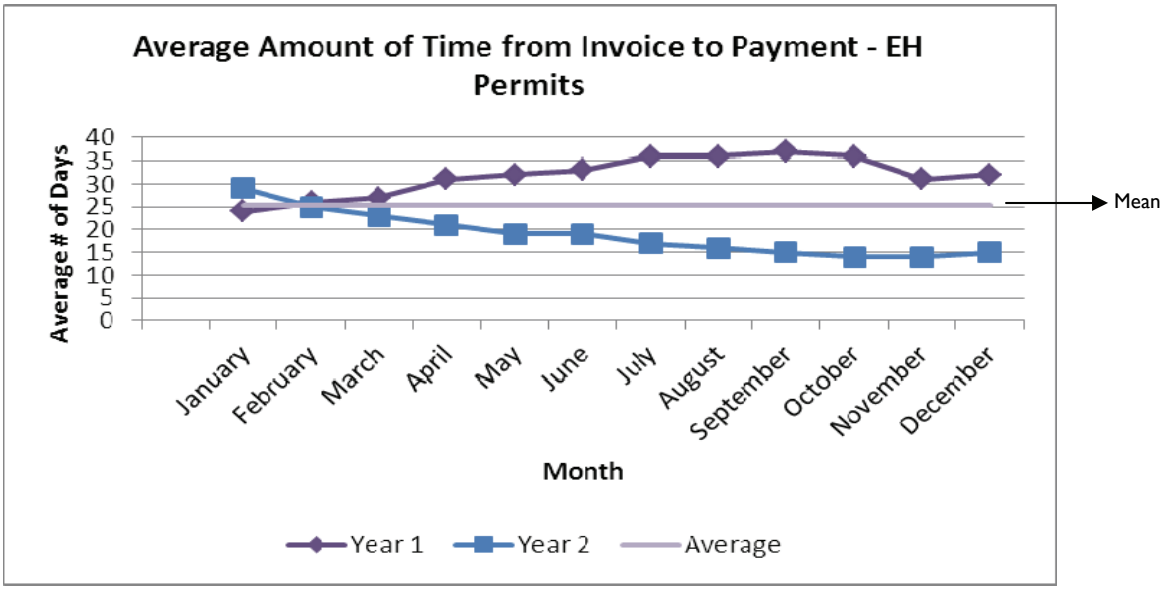
1. Decide what data are needed based on the identified problem or area of study. Determine whether the data needed are already tracked or whether you need to collect new data.
   - ♦ Let's look at an environmental health (EH) example, just to keep things interesting! Imagine Sunnyside Health Department has noticed that it takes far too long for well and septic permit fees to be received by the department. They decide to look at data from the past year on the average number of days it takes from the time a permit fee is invoiced to payment.

2. Determine the timeframe and number of data collection points. Determine whether data should be collected annually, quarterly, monthly, weekly, daily, or hourly. Try to gather data from at least twenty 'time points' to establish a trend. For example, if data will be collected on a monthly basis, then data should be collected over a period of two years in order to establish a trend. Collect data both leading up to and following the process change addressed by your project.
   - ♦ For example, the health department currently looks at EH well and septic permit data by month, so it makes sense to display these data by month on their run chart.

3. Gather your data. If data related to the desired measurements have already been tracked, compile the relevant data. If the needed data does not already exist, begin collecting data using a standardized format. This will most likely involve developing a data collection tool and training staff that will be responsible for collecting data.
   - ♦ For example, well and septic permit processing data are tracked in health department records. These data are pulled by month for the past 20 months and recorded on a spreadsheet.

4. Graph your data. To display data in a Run Chart format:
   - On the y-axis (vertical), set up a scale that corresponds with the measure.
   - On the x-axis (horizontal), set up a scale that corresponds with the measurement timeframe.
   - Plot the data on the chart placing a dot at each measurement point.
   - Draw a line through your dots.
   - Calculate the mean score and draw a line at the mean. A mean score is calculated by adding together all of the data points and dividing by the number of data points collected during the measurement timeframe.
   - If you made a process change at some point in time, note it on the graph.

   - ♦ Check out the example Run Chart on the next page examining the time it takes for well and septic permit fees to be received by Sunnyside Health Department.



5. Make sense of the results by examining the data.
   - Does the mean reflect an appropriate level of service or outcome of the process? If not, the QI team will need to reexamine the current process and identified root cause(s), make changes as appropriate, and collect additional data points to further examine the issue.
     - For example, the QI team decided that the length of time it's taking to receive payment on well and septic permits is unacceptable. They decide to implement a process change that streamlined the process for receiving payment for permit fees in January of Year 2. They collected data on the average number of days from invoice to payment following this process change.

   - Is there a trend that should be investigated?
     - For example, it appears that the average number of days it takes from invoice to payment is closer to the mean in winter months than other times of the year. This may be a trend that requires further investigation.

   - Is there shift in the data? Are there eight or more consecutive points on one side of the mean?
     - In the preceding graph, the average number of days from invoice to payment is below the mean for ten consecutive months (March-December of Year 2). Eight or more consecutive points on one side of the mean indicate that a special cause has influenced the process. In this case, the process change influenced the process.

   - Is there a trend in the data? Are there six consecutive jumps in the same direction (up or down)?
     - In the above graph, the average number of days from invoice to payment for well and septic permits increased for more than six consecutive months (January-July of Year 1). Six consecutive jumps in the same direction means that a special cause is acting on the process to cause a trend.

   - Is there a pattern in the data? Does a pattern recur eight or more times in a row?
     - In the above graph, a pattern exists between January and November of Year 2 when the average number of days from invoice to payment for well and septic permit fees decreased from month to month. A pattern recurring eight or more times in a row indicates that it is a good idea to look for a special cause.

Hints and Tips

When constructing a Run Chart, keep in mind that every process will have some variation (see the Chapter on Data for more information on variation). While variation from the average could have meaning, it could also be meaningless! Use the questions listed above to assess whether the variation you see is meaningful, and be sure to look at enough data points (over 20 is best!).

Run Chart Example:
Find a public health example of a run chart in this case study in Appendix A:
- Berrien County Health Department

Tool Selection Basics

First time users of PDSA may be unsure about when to use a particular QI tool when working with data. The following suggestions provide insight; they have been adapted from The Six Sigma Way: Team Fieldbook.[16] Consider them when choosing QI tools:

1. Have a clear objective when planning to use a tool. Avoid using a tool "just because." When pounding a nail, a hammer would be the tool of choice for most people rather than a screwdriver. Remember what you are trying to accomplish.

2. Consider your options. There are a variety of options and tools to choose from when collecting, analyzing, and displaying data. There are often several tools that will be compatible with your effort. Select the tool that seems to make the most sense.

3. Keep it simple by matching the detail and complexity of the tool with your situation. Use the basic tools described in this Guidebook most often.

4. Look for creative ways to analyze and display your data. It's okay to create your own variations as long as others understand them and your conclusions are sound.

5. If a tool is not working for you, stop using it. Every tool is a "trial." If it doesn't meet your need, try a different tool.

6. Remember GIGO: garbage in, garbage out! Work toward collecting meaningful or "good" data.

The next section provides assistance and additional information on the selection of tools.

Tool Selector Chart

Consider whether you will be working mostly with ideas or numbers when deciding which tool to use for a particular task. The following chart offers tool suggestions for typical improvement situations. Many tools serve multiple purposes. Each tool is labeled with a "B' or "E" denoting its general suitability for beginning or experienced QI practitioners. The chart also identifies where in the PDSA cycle you would most likely use the tool and provides a Guidebook page number for an example, where available.

QI Tool Selector Chart

				Task or Situation						
(B) = Beginning practitioners *(E) = Experienced practitioners*				Generate/Group Ideas	Make Decisions/ Prioritize	Clarify/Focus	Plan	Count	Measure	Gather Data/ Display Results
Working with Ideas/Concepts										
	PDSA Steps	**User Experience**	**Page #**							
Affinity	1,2,5,9	B		♦	♦	♦				♦
Brainstorming	1,2,3,4,5,9	B	133	♦		♦				
Fishbone/Cause & Effect	3	B	114	♦		♦				
Forcefield Analysis	1,3,4,5,8,9	B	139	♦	♦					
Gantt	5,6,8	B	81			♦	♦			♦
Logic Model	2,3,7	E	161			♦	♦			
Matrix	1,2,4,5,7,8	E			♦	♦				♦
Process Map	3	B	102	♦	♦	♦				
Story Board	9	B	41							♦
Working With Numbers										
	PDSA Steps	**User Experience**	**Page #**							
Check Sheet	1,3,4,6,7	B	145		♦			♦		♦
Control Chart	3,6,7	E			♦			♦	♦	♦
Histogram	1,3,7	E							♦	♦
Pareto	1,3,4,7	B	141		♦			♦		♦
Run Chart	1,3,7	B	106					♦	♦	♦
Scatter Diagram	1,3,4,7	E				♦		♦	♦	
Stratification	1,3,7	E				♦				♦

Final Thoughts on QI Tools

In closing, the preceding pages briefly highlighted some basic QI tools and discussed in greater depth those especially useful for public health staff having limited QI experience. Tool selection basics were covered and a tool selector chart provided. If your health department is in the early stages of using PDSA, try and master the use of basic tools before expanding your repertoire. The tools listed in the tool selector chart and labeled "E" for experienced QI practitioners may be found in resources exceeding the scope covered here, such as "Tool Time: Choosing and Implementing QI Tools"[2] and the Public Health Memory Jogger II: A Pocket Guide of Tools for Continuous Improvement and Effective Planning.[1] The Public Health Foundation (www.phf.org) is also an excellent source of information on QI tools and related resources for beginning and/or experienced QI practitioners.

CHAPTER 8: PDSA EXAMPLE

This chapter illustrates all the material covered in the previous sections of the Guidebook by providing a model public health example related to adult influenza immunization. This example illustrates an advanced application of the PDSA Cycle. If you are just beginning your QI journey and embarking on your first few QI projects, check out the case study narratives located in Appendix A of this Guidebook to see what an initial QI project looks like.

Background

The Sunnyside County Health Department (SCHD) has identified increasing adult influenza immunizations as a strategic priority based on two recent assessments.

SCHD recently completed a community health assessment, which identified influenza immunizations as a high concern for the community, particularly considering the following:

- The monitoring of the health indicator for annual influenza vaccinations among people 65 and older in the county showed that only 63% of age 65 and older adults received an influenza vaccine, well below the 90% Healthy People target.
- Most hospitalizations and deaths related to influenza came from the 65-and-over population, and vaccination could prevent many of these deaths.
- The local population 65 years and older has grown over 10% in the last decade.

In its most recent accreditation review, SCHD identified several improvement opportunities related to their immunization standards, such as:

- Strategies to assure adults within the community are vaccinated, including evidence of community based approaches
- Assessment of health department clients at every encounter to determine which vaccines are needed
- Working with practitioners to maximize vaccine administration

Step One: Getting Started

A team of staff from the department's planning, infectious disease, and outreach divisions jointly proposed the influenza QI project to the health department's QI team sponsor, who reviews and sponsors improvement projects on a quarterly basis.

As a result, the team sponsor recommended the department undertake an improvement project focused on increasing older adult (65+) influenza immunizations. The health official approved the recommendation, as well as a resource request for internal staff assistance to help with the project and external staff with QI expertise from a local university.

Step Two: Assemble the Team

Considering the community-wide nature of the issue, the department invited several community partners to join the QI team. These included representatives of the local hospital, a local primary care physician group, a nursing home, and a local superstore with a pharmacy. Among the team members from the health department were representatives from the three sponsoring divisions, a nursing supervisor, and a data analyst.

At its first team meeting in September, the team agreed to a 6 month project, appointed a team leader, and agreed to a SMART aim statement: to increase older adult (65+) influenza immunizations to achieve an 80% influenza immunization rate by the end of the next flu season. This is a stretch goal the team thought was challenging yet more realistic than the Healthy People target rate. The team then worked together to begin developing a QI team charter and aim.

Team Aim

What are we trying to accomplish?
Increase older adult (65+) influenza immunizations to achieve an 80% influenza immunization rate by the end of the next flu season

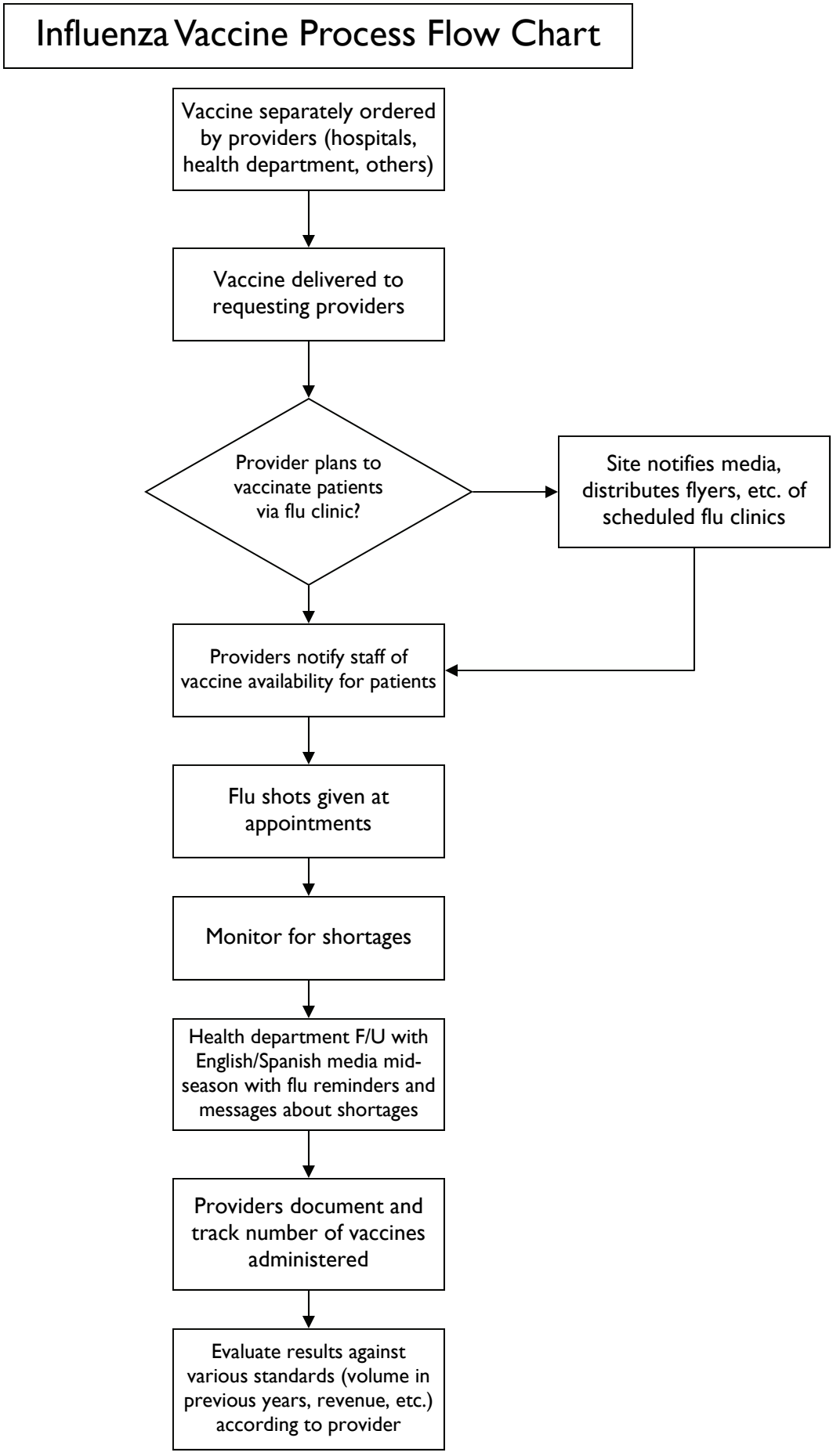
How will we know that a change is an improvement?
1. Increased percentage of eligible persons ages 65 and over who receive an annual influenza vaccine.
2. Increase in the percent of ordered vaccine that is administered.
3. Increase in the number of sites offering influenza vaccines to older adults.

The team **brainstormed** ideas regarding what they knew and did not know related to influenza vaccination of older adults in their community. A sample of the team's brainstorming ideas is included on the chart that follows. This helped them identify additional data that they could bring or might decide to collect later to help them further define the problem.

Annual Influenza Vaccination Among People 65 and Older	
KNOW	**DON'T KNOW**
How many people 65 and over live in the county	How many local primary care physicians routinely offer flu shots to all older patients or have reminder systems
CDC recommendations for flu shots among people 65 and older	How many specialists offer or refer patients for flu shots at visits during flu season
How many patients 65 and older are hospitalized due to flu each year	Patient acceptance rates when offered the flu in local physician offices
The estimated effectiveness of the flu shots	How many local hospital patients are offered flu shots during their stay or at discharge
How many community locations regularly offer flu vaccines	The most pressing reasons why people 65 and older choose not to get flu shots when they are available
How many total shots were given last year at the health department, pharmacy chain, and superstore clinics	Whether there is sufficient vaccine at all locations that offer flu shots
State regulations regarding offering flu shots in nursing homes	Sources of "real-time" data for flu shots billed to Medicare
Flu vaccination is an important concern to providers, based on assessment interviews	Which sites reach the most vulnerable patients (e.g., 85 and older, chronic disease)
Health department flu clinics have experienced delays but improved high-volume flow last year	Reasons for missed opportunities when older adults interact with health care providers
Immunization standards for state accreditation	Compliance rates among nursing home residents
The *Guide to Community Preventive Services* recommends the use of multiple strategies to raise immunization rates (vs. recall/ reminder systems or promotion alone)	How many older adults are home-bound and would not use health services during the flu season

Step Three: Examine the Current Approach

The team developed a high level **process map** of the major steps for the health department and community partners involved in annual influenza vaccinations, including steps such as ordering vaccine, scheduling clinics in the community, distributing reminders and bilingual promotional information (internal and external), responding to any shortages, and retrospectively evaluating the success of efforts.


Influenza Vaccine Process Flow Chart
Vaccine separately ordered by providers (hospitals, health department, others)
Vaccine delivered to requesting providers
Provider plans to vaccinate patients via flu clinic?
Site notifies media, distributes flyers, etc. of scheduled flu clinics
Providers notify staff of vaccine availability for patients
Flu shots given at appointments
Monitor for shortages
Health department F/U with English/Spanish media mid-season with flu reminders and messages about shortages
Providers document and track number of vaccines administered
Evaluate results against various standards (volume in previous years, revenue, etc.) according to provider

By creating a process map of the process for the entire community, the team made several useful observations.

- Almost all steps were carried out independently, without coordination among the various entities who deliver vaccinations.
- Some community-wide steps, like public information, were performed by the health department without input from other providers.
- No one was aware of any process to evaluate what strategies were effective across the community while the flu season was in progress.

There was no step in the current process to provide data or feedback to physicians, hospitals, health departments, or other sites about their patients' flu vaccination rates or the community's progress in getting seniors vaccinated.

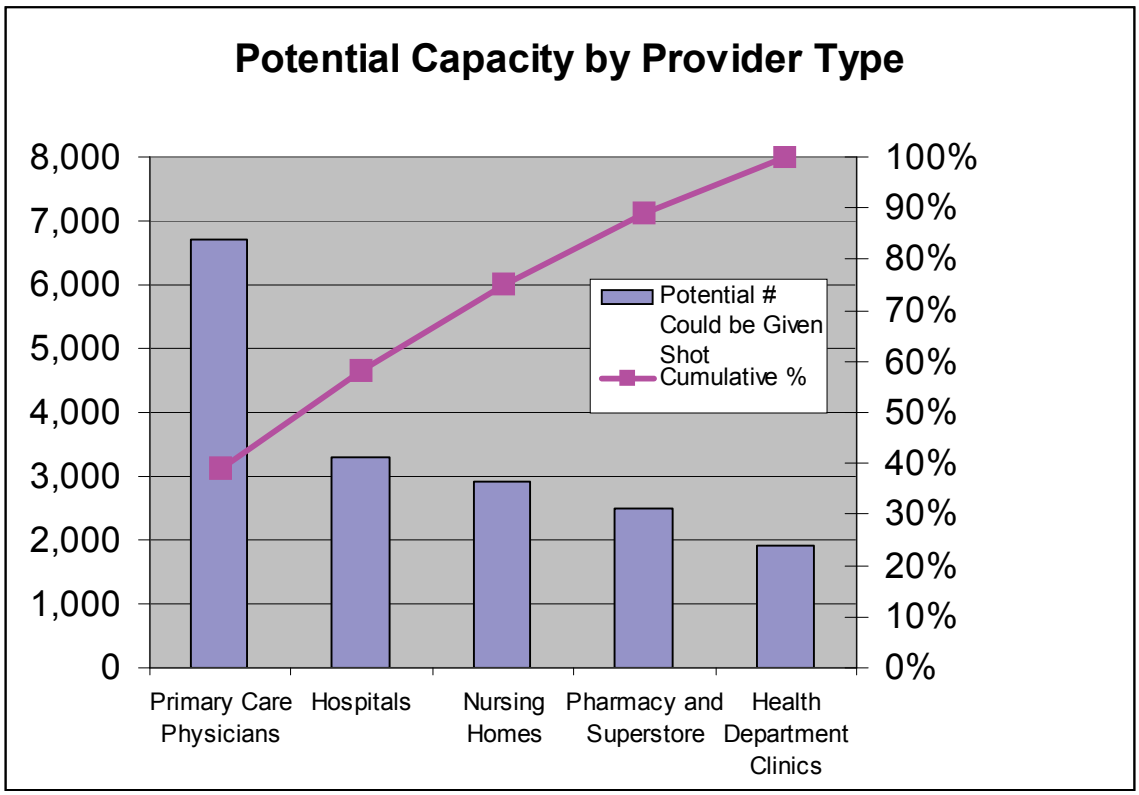
The team recognized that they needed some additional information from the healthcare organizations to verify what they understood about their current processes and capacities. The team particularly thought they had holes in their understanding of processes in primary care physicians' offices, which currently provide most flu shots to the target group. The physician group representative offered to gather additional input on processes and estimated capacities from primary care colleagues prior to the next QI team meeting. In addition, the team assigned the hospital and nursing home representatives the task of examining current processes to offer flu vaccinations to patients in contact with the healthcare system. With this information, the high-level process map was revised and additional process maps for certain settings were developed.

The team collected data and compared the current to the ideal capacity of various settings to identify which settings had the greatest opportunity for improvement if they followed all guidelines and used their patient interactions and resources optimally.

Annual Influenza Vaccination Delivery in Sunny County to Persons 65 and Older Total Estimated Eligible Population 65 & Older = 14,524				
	Estimated or Actual Vaccinations in Target Population Last Year, Using Current Processes		**Potential Capacity with Ideal Processes and With Available Resources**	
	# Patients Given Shot	% of Target Population	Potential # Could be Given Shot	Potential % of Target Population
Primary Care Physicians	3,000	21%	6,700	46%
Nursing Homes	2,300	16%	2,900	20%
Pharmacy and Superstore	1,800	12%	2,500	17%
Health Department Clinics	1,400	10%	1,900	13%
Hospitals	600	4%	3,300	23%
Other Settings	No data	--	Unsure	--
Total Estimated		63%		119%**

**Adds up to >100% because the potential capacity for patients exceeds the actual number of patients.

The team used the data in the table to create a **Pareto Chart** converting the potential capacity to 100% to identify the "vital few" provider sites that the improvement should target for their improvement actions. Using the chart on the next page, the team saw that their greatest opportunity for impact was in primary care and hospital settings. Nursing home vaccination rates were already fairly high due to state regulations. While health department clinics could be improved, their potential contribution to achieving the target community rates was not as great as other settings.



Based on this baseline data, the team refined its aim statement to focus on vaccinations in primary care settings and in the two local hospitals.

> Double (increase by 100%) the estimated number of eligible persons ages 65 and over who receive an annual influenza vaccination from their primary care physician or in the hospital in Sunny County, without decreasing vaccinations in other settings.

Step Four: Identify Potential Solutions

To help the team focus on key causes and the potential solutions for lower than acceptable flu vaccination rates in primary care physician and hospital settings, the team decided to create an **affinity diagram** of their ideas. First they listed possible factors on sticky notes, drawing on the process information, discussions, and data they already had. Then, they organized the information into categories. They prioritized three causes to tackle those that were within their influence:

- Physicians or hospital staff forget to offer
- Setting up patient reminder systems takes too much time from billable efforts
- Don't know performance / No feedback or data to track and motivate progress

The team brainstormed dozens of potential strategies that might help address these problems, including the following:

1. Providing technical assistance to help offices and hospital emergency departments set up reminder systems (an evidence-based practice).
2. Providing each primary care office and hospital with easy-to-use intake materials that offer and recommend the vaccine to patients.
3. Provide biweekly communications during flu season with updated information on the flu and report data on the community's estimated vaccination progress.

For each, the team considered potential costs, potential impact, and feasibility of success for the upcoming flu season. They decided to pursue #1 and #3 and refined the ideas to anticipate what might go wrong (see sample chart related to #3).

Strategy Idea #3 – Communications to Track & Motivate Progress	
WHAT CAN GO WRONG	**COUNTERMEASURE(S)**
Communications not read by physicians, office staff or hospital emergency department staff	• Cross-promote with Medical Society newsletter • Use health alerts as appropriate • Call attention with letter and phone call (for 10 largest offices) from health official • Explore offering CME for educational content
Data quality - Insufficient data on vaccination in individual practices, hard to get frequent updates, possibility that any PCP flu shot increase is due to shift from other settings	• Provide estimates for all primary care and hospital settings where data are unavailable • Show vaccination data from various settings (health dept., chain store, etc.) to underscore PCP and hospital contribution & track variables • Provide other content to motivate such as encouragement, tips, and mortality/ morbidity
Physician and hospital effort is so successful that office runs out of vaccine	• Include an easy-to-photocopy half-sheet listing of upcoming flu clinics in the community • Provide a hotline to the health department for coordination of excess vaccine

Step Five: Develop an Improvement Theory

The team made some simple **logic models** to clarify their hypotheses about how their strategies might lead to the target increase in primary care and hospital setting flu vaccinations. The logic models also gave them some ideas for preliminary steps that could be early measures to determine whether their strategies had the desired effect.

The team made two predictions that they thought they could test concurrently:

1. If physician offices and hospital emergency departments (EDs) were contacted to encourage them to put a flu vaccine patient reminder system in place and offered assistance, more primary care physician offices and hospital EDs would report that they have designated a person to put such a system in place 60 days before the flu season, compared to last year.

How to test strategy: Telephone data collection from sample of 20 randomly selected primary care physicians and the hospital ED
Early measure(s):
Immediate: Physician or manager response that office/ED is more/less likely to designate person by deadline, compared to last year
2-week measure: % sites have designated a person who confirms by phone or fax

Additional measures for implementation and patient response would be developed, if results are promising.

Who needs to be involved: Medical Society, health department, epidemiologist, and experts to provide requested assistance.

2. If physicians and hospitals received regular feedback on the contributions of primary care physicians to the community's overall flu vaccination rates, they would be more likely to offer and to vaccinate patients 65 and over in the flu season.

The team decided to test their strategy in two phases –

1) *Focus group for "proof of concept"* with volunteers at one Medical Society meeting and at one hospital staff meeting, who will be shown a sample of the proposed communication with feedback and data on local flu vaccinations. Participants would be given two pre- and post-questions to assess their intentions to make a change in their practice in response to the information. At the same time, the team can collect ideas to improve the concept for the communications.

2) *Pilot performance data/feedback process* using a 1-week sample from several offices' and the hospital ED using short patient exit logs that document whether patients in target age group were offered and received a flu shot.

Early measure(s):
Immediate: % sites collecting complete data for 1-week sample period
Post-feedback communications: % physicians that have taken at least one action (policy, staff education, etc.) to increase flu shots for older adults, based on feedback; and % sites with an increase over baseline for offered and accepted flu shots, as tracked in subsequent sample periods the first week of the month.
Complete a Gantt chart with tasks for each PDSA cycle and timeframes for completion. [See Gantt chart on the next page.]

To track these activities, the team used a **Gantt chart** that displays the strategies and monthly timeframes for the completion of each test of the strategy. The Gantt chart was reviewed at each of the team meetings and updated to show progress and to include revised actions or tasks as needed. The team also decided to begin collecting after action data to determine if changes made an improvement.

Gantt Chart
Project: Increase the Percent of Adults Receiving Influenza Vaccine

Cycle Number	Change Tested	Person Responsible	Month											
			1	2	3	4	5	6	7	8	9	10	11	12
Cycle 1	*Institute a reminder system*													
Plan	Phone call to determine if more of less likely		x	x										
Do	Distribute reminder forms and encourage use				x	x								
Study	Pilot test in September					x	x							
Act	Contact at 2 weeks and determine next steps						x	x						
Cycle 2	*Regular feedback to physician offices and hospitals*					x	x							
Plan	Design patient exit logs						x	x						
Do	Conduct patient surveys							x	x	x				
Study	Report results										x	x		
Act	Identify follow-up actions												x	x

Step Six: Test the Theory

The group established two sub-teams to perform a series of tests obtaining progressively more useful data as to whether the strategies were feasible and moving primary care practices and the hospital ED in the right direction on flu shots for older adult patients. Although the reminder system intervention test went largely as planned, they discovered that they needed to bring in subject matter experts on the "real-time" data feedback strategy to refine data collection in response to reported burdens and discontinuation by some sites selected to participate in data collection.

Step Seven: Study the Results

The team found that telephone calls regarding reminder systems:

- Prompted earlier assignment of staff and earlier implementation of systems if physician offices had a flu shot reminder system last year.
- Had limited effect on assignment of staff in sites that did not have a reminder system last year, unless assistance was requested.
- Only 2 test sites without a reminder system requested assistance. These sites were able to implement a system, but assistance was more time intensive than anticipated by the team.

The team found that the feedback system:

- Prompted over 60% of physicians to take new actions to offer more of their patients flu shots.
- Increased estimated flu shots given to older adults by 50% during the test period, compared to the same time last year.
- Early, real-time estimates additionally helped the department achieve repeat media coverage on the importance of flu shots and local providers.

Step Eight: Standardize the Improvement or Develop a New Theory

The team decided to modify their telephone calls regarding reminder systems before broader implementation based on what they learned, as follows:

- Tested two different call scripts targeted to sites that never used reminder systems, and selected one that led to more technical assistance requests.
- Trained and recruited 5 additional experts, including private sector database experts, to help provide assistance to offices on reminder systems.
- Downloaded and printed best practice materials on reminder systems to shorten the time for sites and consultants.

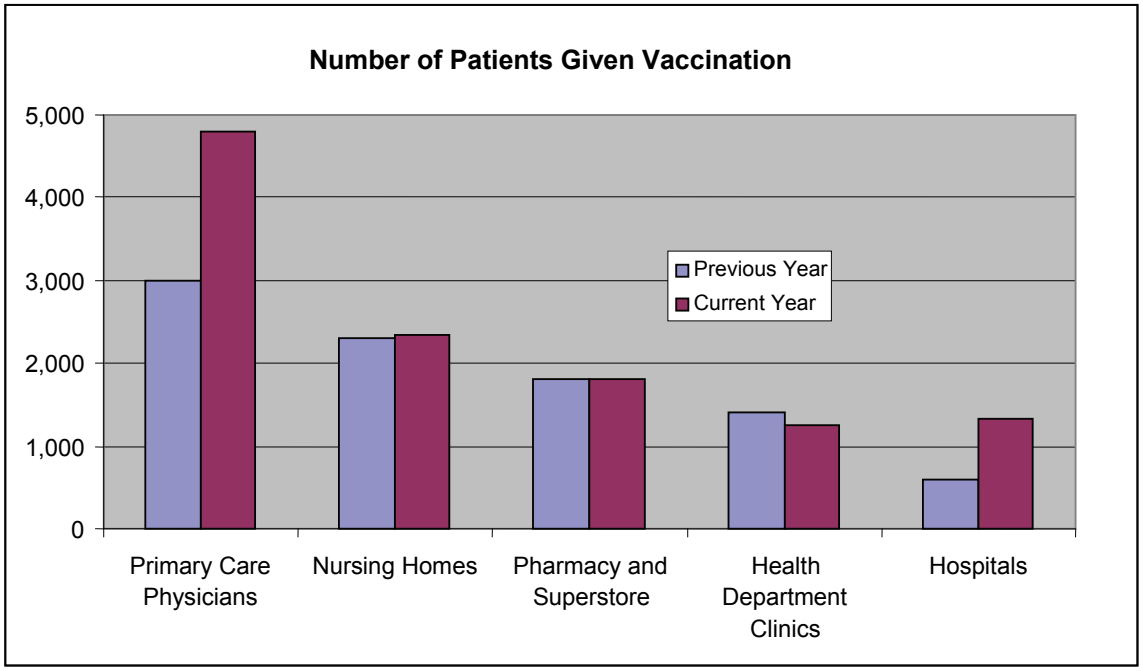
The team decided to expand their feedback system to involve the rest of the primary care physician practices based on what they learned.

Step Nine: Establish Future Plans

At the end of the flu season, the team celebrated its success with a luncheon catered by the superstore, and followed by a press conference. Overall, they estimated that 79% of adults 65 and over had received a flu shot, compared to about 63% the year before. They increased by 75% the estimated number of eligible persons 65 and over who received an annual flu shot from their primary care physician. The two local hospitals also implemented policies to offer flu shots to all eligible older patients before discharge and reported over 1,300 doses given. (See following table) In other settings, vaccinations were similar to previous years except for the health department clinics, which experienced a 10% decrease.

Annual Influenza Vaccination Delivery in Sunny County to Persons 65 and Older Total Estimated Eligible Population 65 & Older = 14,524				
	Previous Year		Current Year	
	# Patients Given Shot	% of Target Population	# Patients Given Shot	% of Target Population
Primary Care Physicians	3,000	21%	4,800	33%
Nursing Homes	2,300	16%	2,350	16%
Pharmacy and Superstore	1,800	12%	1,800	12%
Health Department Clinics	1,400	10%	1,250	9%
Hospitals	600	4%	1,320	9%
Other Settings	No data	--	No data	--
Total Estimated		63%		79%

The chart below shows the number of patients given shots for the previous year and for the current year, after the interventions of the QI team. The improvement in the primary care offices and in the two hospitals is clearly evident.



Although they had not achieved their overall 80% vaccination goal in the target population, they had made great progress. Most importantly, influenza-related deaths and hospitalizations had declined 16% and 19% from the previous year, respectively, while neighboring counties experienced slight increases.

The team agreed to expand their efforts next year to be sure they met or exceeded the 90% Healthy People target community-wide. They immediately planned to gather more data on the reasons some primary care physician offices did not have reminder systems or routinely offer flu shots, so they could better target their primary care physician interventions and test additional strategies. In addition, they planned to apply for a grant from a local foundation and partner with the state health department to develop more rigorous and sustainable tracking and estimation methods.

CHAPTER 9: BUILDING A CULTURE OF QUALITY—IN PUBLIC HEALTH

Vision for Public Health Quality:
Building better systems to give all people what they need to reach their full potential for health.

Howard K. Koh, MD, MPH, Assistant Secretary for Health
Excerpt from Priority Areas for Improvement of Quality in Public Health, US. Department of Health and Human Services

Introduction

Much has been written about building a culture of quality in generic terms—applicable to any field or organization, public or private. However, specific information on building a culture of quality in public health is relatively new, a little more difficult to find, but a growing priority. It's not surprising that evaluation of the first edition of this Guidebook revealed a strong interest by users in learning more about building an organizational culture of quality in public health, sustaining quality improvement (QI) efforts, and developing QI plans and policies. This new chapter of the Guidebook discusses these topics in public health terms, provides examples, and offers suggestions for further reading and learning.

As you read this chapter, keep in mind that providing comprehensive information about building a culture of quality would go well beyond the intent of this Guidebook. What you'll find here are key ideas related to how QI fits with the pursuit of quality in public health more broadly, as well as strategies for nurturing a culture of quality in your health department. This chapter will get you started, but many of the ideas introduced here are widely and easily available from other sources.

As you sort through the concepts and approaches included below, remember that building a culture of quality starts with small steps in the desired direction that add up to real changes in how an organization operates. One QI project, one passionate staff person, one small success can be the catalyst. Changes in your culture will not occur as quickly or as neatly as you'd like. Begin with small steps that make sense for your health department, continue learning during the journey, and remember to celebrate your milestones as they occur!

Culture of Quality: How Does the Fabric Look?

Think about the words of Philip Crosby, a management and quality guru known for "doing work right the first time." He describes a culture of quality this way: **"Quality is the result of a carefully constructed cultural environment. It has to be the fabric of the organization, not part of the fabric. If quality isn't ingrained in the organization, it will never happen."**[1] Quality is a state or an ideal that is somewhat difficult to define. Sometimes you just know it when you see it. The same holds true for defining a culture of quality; it is a bit elusive. However, when you see an organizational environment where quality is "the fabric," you find a number of common threads. This chapter of the Guidebook identifies these common threads and relates them to the public health environment.

Organizational culture is the collection of shared beliefs, values, rituals, stories, myths, and specialized language present in an organization. Organizational culture may be thought of as the visible and invisible filaments that bind your health department employees together to achieve your mission. Developing and implementing your health department's vision for a culture of quality will foster a sense of identity and feeling of community within your agency. These are two essential components for constructing your quality fabric.

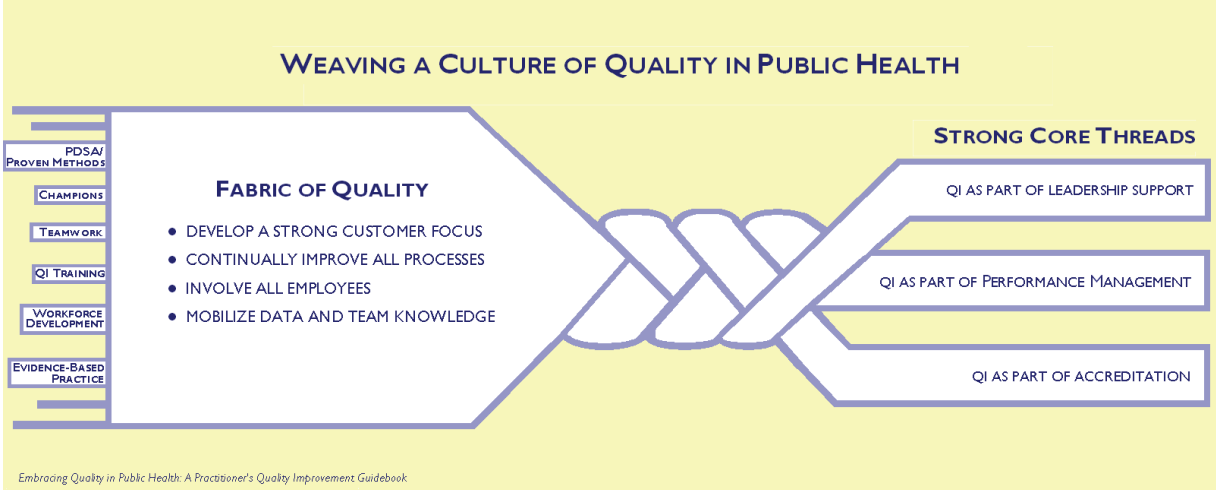
So, for public health, what might a quality fabric look like? For starters, to achieve a systematic, organization-wide approach to quality, The Public Health Memory Jogger II [2] suggests sticking to four basic principles:

- Develop a strong customer focus
- Continually improve all processes
- Involve employees
- Mobilize both data *and* team knowledge to improve decision making

Details about these four principles are provided in the Quality Fundamentals Chapter of this Guidebook. In broader terms, your health department's culture of quality would include staff doing the right things, in the right way, at the right time, using the right tools, and achieving the right outcomes. Additionally, a work environment rooted in a culture of quality "routinely uses data to examine process and product to enhance all aspects of operations. Curiosity and experimentation are accepted as well as expected characteristics of organizational and staff attitudes, values, goals, and practices." [3] So it's doing things right and always looking to improve. Commitment to quality is evident on a day-to-day basis, including an ongoing emphasis on customer service and satisfaction.

Keeping the four basic principles and supporting ideas in mind, what might be a public health framework for applying them? What additional approaches and activities can health departments take to build a culture of quality? To get started, the next section offers ideas and descriptions related to:

- Leadership Support
- Performance Management
- National Accreditation for Public Health Departments



Constructing Your Quality Fabric: Strong Core Threads Needed

When examining the topic of creating or changing an organizational culture, there is an abundance of information pointing to the need for strong leadership support. In examining current information relating to quality in public health, there are growing emphases on performance management and national accreditation for public health departments. In light of this information, and in keeping with Crosby's assertion that quality must BE your fabric, this section of the Guidebook poses that leadership support, performance management, and accreditation are three strong core public-health-based threads, which if woven together, can create a foundation for quality becoming the fabric of your health department's culture. It's important to note that these are not the only threads that can be used and you can still achieve a quality culture with a different mix of threads. However, these threads were selected based on their relevance in a public health context.

The first core thread we'll discuss is strong leadership support—which is essential and makes it possible to begin weaving a culture of quality. The second core thread for your consideration is performance management—a positive strategy for using strategic planning, data driven decision-making, and continuous improvement to move toward creating robust health departments and a healthier population. The third core thread for you to think about is accreditation—which offers health departments a set of standards and the opportunity to receive external peer feedback on performance. Let's look at each of these core threads in turn.

Core Thread #1: Leadership Support—Threading the Needle Starts at the Top!

There are a number of methods for promoting a culture of quality, but they all start at the top with leadership "embracing the promotion of quality through the articulation of the organization's mission and vision, engagement of people throughout the organization in quality, and attention to learning."[4] This concept won't surprise public heath practitioners; you've experienced this in your health department or in other organizations. You've seen firsthand, that which your governing entity, health officer, or other executive level leadership embraces, receives high priority. Leadership and support from these entities is essential to creating a culture where quality becomes embedded in the "way your whole health department does business" each day—where quality is not just part of the fabric, but *is* the fabric.

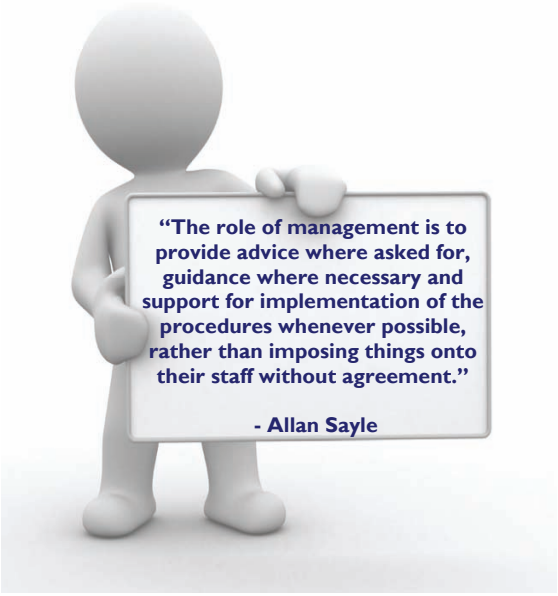
What steps can executive level leaders take to establish an environment conducive to improvement? *The Improvement Guide: A Practical Approach to Enhancing Organizational Performance,*[15] asserts that leaders must put in place some basics for staff to be successful in making changes that lead to improvement. Those basics are:

- Create the desire for continuous improvement
- Create an environment that nurtures mutual respect among people
- Provide encouragement
- Promote cooperation

What else can these leaders do? John Woods offers insights with his six (self-explanatory) values of a quality culture.[16] He asserts that values should include emphases on the following:

1. We're all in this together (including customers)
2. No subordinates or superiors are allowed
3. Open, honest communication is vital
4. Everyone has access to all information on all operations
5. Focus is on processes
6. There are no successes or failures, just learning experiences

Operating with these types of organizational basics or values in place may include radically changing or just slightly modifying the existing work culture. On a large scale, it may require transformational change—a complete rethinking by leadership of how the organization is structured or managed. In this case, leaders will need to deliberately manage all aspects of the change process, including staff resistance. They will also need to begin living these values every day, not just posting them in the health department's hallways. There are many excellent resources available on transformational change and/or change management models; several are listed in the Resources Section of this Guidebook. On a much smaller scale, where a conducive environment currently exists, leaders can focus on providing direction, encouragement, and support for QI. This includes setting the tone for and empowering a staff-driven bottom-up approach. In all cases, leadership drives the process, manages the human aspects of change, and provides open, frequent, and genuine communication about the value and importance of QI. Providing appropriate staffing levels, training and workforce development opportunities, and financial resources are essential too!



While executive leadership support starts at the top, it's important to note that leaders throughout the health department must also be identified, recognized, and cultivated. This includes obtaining buy-in and participation from middle managers and from staff at all levels without regard to specific job title. Leaders throughout your health department need skills to influence peers, carry out change, and build your culture of quality. In a nutshell, to be successful, executive leadership provides the vision and the inspiration and also enlists leaders across the health department to create an environment where a quality mindset is the way public health is carried out by all staff each day!

Core Thread #2: Performance Management

You may know that many organizations—both public and private—rely on performance management (PM) systems to drive improvement by measuring and monitoring progress toward organizational goals. This is becoming an area of increased emphasis for public health departments. PM is the practice of actively using performance data to improve the public's health. The practice involves strategic use of performance measures and standards to establish performance targets and goals.[5] PM is what you do with the data and other information you've gathered from measuring performance. PM can help you prioritize and allocate resources, adjust policy or program direction to meet goals, and improve overall quality of public health practice. PM fosters accountability, helps you make better decisions, assists in reviewing programs and services, and identifies where performance gaps are. All this, and, it serves as a framework or springboard for QI activities! PM is part of the fabric of a culture of quality because it will help your health department develop strategies for moving toward its big goals – a strong public health system and a healthier population.

In building your culture of quality, the Turning Point Performance Management[7] model may be helpful. It comprises four components that work together to create the framework for a PM system:

- Performance Standards,
- Performance Measurement,
- Reporting of Progress, and a
- QI Process.

A robust PM system includes all four components and requires integration across your entire health department. The model uses a systematic approach to change and provides an approach that can augment the concepts discussed throughout the Guidebook. Let's briefly look at each component.

Performance standards establish a level of performance that is desired or expected; standards can be numeric or descriptive. A sample numeric standard is "75 % of all children in the jurisdiction will be appropriately immunized by age five." A sample descriptive standard is "the health department shall immunize children." Standards may be set based on national, state, local, scientific, or other guidelines. Setting performance standards includes the establishment of organizational or system performance standards and goals along with relevant indicators to improve public health practice. The National Public Health Performance Standards Program available at www.cdc.gov.nphpsp/index.html is a good resource.

Performance measures are quantitative indicators of public health activities. They can that let you know if a goal, target, or standard is met. Performance measures relate to capacities, processes, or outcomes. A sample performance measure is "the percentage of children by age two with age-appropriate immunizations." Performance measurement is the regular collection and reporting of your data in order to track the work you've accomplished; it answers the question, "Are we making progress toward our goals?" The Essential Public Health Services available at www.cdc.gov/nphpsp/essentialservices.html and/or national public health department accreditation available at www.phaboard.org are good places to look for public health performance measures. Additionally, the Healthy People 2020 national health objectives available at www.healthypeople.gov offer your health department a set of performance measures and more.

Reporting of progress pertains to the documentation, reports, and briefs relating to meeting goals, targets, or standards. Reporting of progress includes the dissemination and sharing of this information in your health department and beyond. It includes analyzing data, providing feedback to governing entities, staff, managers, policy makers, clients and constituents. It also includes publishing progress reports.

A QI process pertains to the establishment of a program or process to manage change toward improving policies, programs, infrastructure, or outcomes based on your standards, measures, and reports. It includes using data for decision-making and the emphasis is on learning. As stated in the Quality Fundamentals Chapter of this Guidebook, QI in public health is the *use of a deliberate and defined improvement process, such as Plan-Do-Study-Act, which is focused on activities that are responsive to community needs and improving population health. It refers to a continuous and ongoing effort to achieve measurable improvements in the efficiency, effectiveness, performance, accountability, outcomes, and other indicators of quality in services or processes which achieve equity and improve the health of the community.*

If your health department is just beginning with PM, a helpful step is selecting QI efforts strategically by linking them to health department performance and strategic direction. For example, your health department's PM system should align with your community health assessment, health improvement plan, and health department strategic plan. Why? Because your performance measures, standards, and data will, in part, have their bases in the results and content of your health assessment, improvement plan, and strategic plan. Brief descriptions of these compiled from a variety of sources follow:

Community health assessment, a core function of public health, uses a systematic process to collect, analyze, and use data to educate and mobilize communities, develop priorities, garner resources, and plan actions to improve the public's health. It's conducted with other community organizations and includes collecting data on health status, health needs, community assets, resources, and other determinants of health status. Community collaboration and partnership are essential. Health assessment data are used to identify opportunities for improvement.

A community health improvement plan is a long-term systematic effort to address issues identified through the community health assessment process. It is broader than the health department and includes significant participation of numerous partners. The planning and implementation process is community-driven and the plan describes how the health department and the community it serves will work together to improve the health of the population of the jurisdiction. The plan builds upon the work accomplished, partnerships formed, and data gathered through the health assessment and can be used by all partners to prioritize activities, set priorities, and measure success.

Your ***health department strategic plan*** is specific to your agency. It shapes and guides what your agency does and why. It also describes your vision, mission, guiding principles, values, and strategic priorities—and contains measurable and time-specific goals and objectives. The plan includes actions and assigns responsibility to implement pieces of the community health improvement plan and comprises other health-department-specific strategic issues. It may align with national initiatives such as Healthy People 2020.

The national public health department accreditation program operated by the Public Health Accreditation Board (PHAB) described in the next section requires that health departments complete a community health assessment, health improvement plan, and strategic plan as prerequisites to application for accreditation. National public health department accreditation also includes specific standards on the implementation of PM (i.e., PHAB requires use of a PM system to monitor achievement of organizational objectives).[6] The PM activities you are already doing in your health department will be critical to meeting PHAB PM standards.

In summary, a fully functioning PM system that is integrated into a health department's daily practice includes setting organizational objectives across the health department, identifying indicators to measure progress, monitoring progress and reporting, and identifying areas where achieving objectives requires the use of QI processes.[7] Your PM system relates to your health assessment, health improvement plan, and strategic plan. This means that PM is a core thread in building your culture of quality because it relates to much that you do in your health department—and it provides a purposeful and structured means for achieving quality in public health processes, programs, and interventions. A good public health resource on the Turning Point Performance Management Project, including other tools, training, and webinars is the Public Health Foundation website available at www.phf.org.

Core Thread #3: Accreditation

In recent years, you may have directly experienced some form of accreditation or perhaps have followed the development of the national public health department accreditation program. Accreditation has brought about significant changes in the fields of manufacturing, education, law enforcement and health care—and those important lessons are now being applied broadly to public health. Schools, hospitals, police departments and other publicly funded entities all have standard processes to assure quality and achievement of their governmental missions. This too is true and becoming the norm for public health. Accreditation for public health is a means to an end, not an end in and of itself; it gives residents in your jurisdiction a sense of what to expect from your health department.

Accreditation establishes standards and benchmarks for the provision of public health services, engages health departments in ongoing QI, and validates that communities are served by governmental health departments that meet standards.[8] Accreditation includes an on-site review by external peer evaluators to provide feedback and assure standards are met. It is also a mechanism to hold health departments accountable to the communities they serve, as well as their governing entities and policy makers. **Even if pursuit of accreditation is not in the near future for your health department, you can still help establish a culture of quality by working toward meeting accreditation standards. Remember, it's okay to start small, but just start!**

With the emergence of a national public health department accreditation program, QI has moved to the forefront of discussions occurring at the local, state, tribal, and national levels. The following questions and answers relate to national accreditation, were excerpted from the RWJF website, align with information available from the PHAB and CDC, and have been adapted for this section of the Guidebook.[9]

1. What is the voluntary national public health accreditation program?

The goal of national public health accreditation is to improve and protect the health of the public by advancing the quality and performance of all public health departments across the country. With broad input from public health practitioners, the accreditation program developed standards that state, local, tribal and territorial health departments can implement to ensure they are providing the best services to keep their communities safe and healthy and to demonstrate accountability.

2. Which organizations are involved in the public health accreditation program?

The Public Health Accreditation Board (PHAB) is a non-profit organization created to develop the national accreditation program. With funding from the RWJF and the CDC, PHAB was incorporated in 2007, after public health leaders explored feasibility. Accreditation is supported by leading public health organizations, including the American Public Health Association (APHA), Association of State and Territorial Health Officials (ASTHO), National Association of County and City Health Officials (NACCHO), National Association of Local Boards of Health (NALBOH), National Indian Health Board (NIHB), National Network of Public Health Institutes (NNPHI), and Public Health Foundation (PHF), as well as several state health departments.

3. Why is accreditation important?

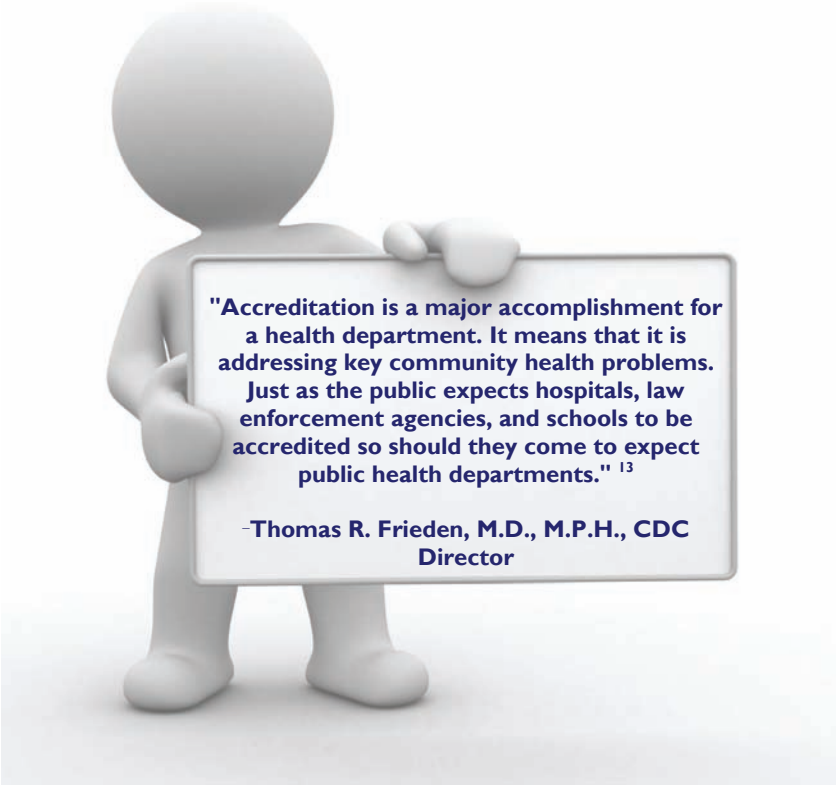
Accreditation signifies that the best possible services are being offered to keep a community healthy. It drives health departments to continuously improve the quality of their services. With accreditation status, health departments are able to demonstrate increased accountability and credibility to the public, funders, elected officials and others. Also, the accreditation process provides valuable feedback about strengths and areas for improvement to better protect, promote, and preserve the community's health. National public health accreditation means that people across the country can expect the same quality of public health programs and services no matter where they live. The expectation is that accreditation will strengthen health departments and the services they provide, which contributes to improved health outcomes. Accreditation will allow all public health departments to demonstrate the value and importance of their work, and the critical impact that health departments have on health and quality of life.

4. How were the accreditation standards developed?
An Exploring Accreditation Report[1] was the foundational document for developing a voluntary national accreditation program and its standards. The draft standards were developed by a nation-wide workgroup through review of 15 sets of state and national standards, including NACCHO's Operational Definition (including metrics), NPHPSP state and local, Project Public Health Ready, and results of ASTHO's State Public Health Survey. The first version of the proposed PHAB standards was reviewed through an alpha test with two state agencies and six local health departments. The revised proposed standards were reviewed through an extensive, formal vetting process that resulted in more than 3,700 comments from all parts of public health throughout the U.S., including tribal communities. After reviewing every comment, the workgroup revised the materials for use in a beta test. Further revisions were made based on beta test results.

To participate in the national public health department accreditation program, health departments must complete three essential prerequisites—community health assessment, health improvement plan, and strategic plan.[8] These prerequisites were described in the preceding section in the context of PM and are the fundamental first steps in becoming accredited. They also relate directly to building a public health culture of quality based on their use of data to drive decision-making and emphasis on measurable improvement.

Accreditation may be thought of as a core thread that's woven into your health department's culture of quality. Accreditation provides a set of standards that are common to all public health departments, and it offers health departments the opportunity to see how they stack up against those standards. Also, having an expert public health peer review your processes and programs helps you identify opportunities for improvement and assures you are delivering programs and services that improve health in your community. **If, however, your health department is unable to pursue accreditation, it can work toward building a culture of quality by using standards and implementing the other strategies identified in this chapter. Remember, it is okay to start small, and build as you go.**

We've discussed leadership, PM, and accreditation as three core threads that when woven together, may contribute to the formation of your health department's quality culture. Now we're ready to look at how QI strengthens and can be used to connect all three of these core threads.



QI: The Essential Fiber of Each Core Thread

Results and quality are undeniably important to every health department. In public health, each day brings opportunities to make measurable differences in people's lives by tackling some of society's toughest problems—health disparities, inadequate access to health care, obesity, infant mortality, unsafe food, contaminated water, and many more. You are challenged to demonstrate that what you do achieves results and that what you did today is better than what you did yesterday. To rise to these challenges, public health departments must be proactive and strong—and actions customer-focused, data-driven, and results-oriented. QI in public health "is the use of a deliberate and defined improvement process, such as Plan-Do-Study-Act, which is focused on activities that are responsive to community needs and improving population health. It refers to continuous and ongoing efforts to achieve measurable improvements in the efficiency, effectiveness, performance, accountability, outcomes, and other indicators of quality in services or processes which achieve equity and improve the health of the community." [10] In other words, QI is a strategy for rising to the challenge of effectively improving population health as efficiently as possible. QI has become essential for all health departments. Let's see how it specifically relates to the core threads we've discussed.

QI as Part of Leadership

Health department leadership, including staff leaders and governance leaders, are responsible for creating the environment where quality efforts can thrive and flourish. This begins by articulating an appealing vision for QI, explaining where QI fits in, leading by example, talking with and expressing confidence in staff, and providing opportunities for early success. Leaders are in the spotlight and pave the way for staff commitment. QI as part of leadership requires genuine enthusiasm and the willingness to roll up sleeves and work with and alongside health department staff. Some practical approaches include providing QI resources, sponsoring QI projects, discussing QI in person with managers and staff, encouraging staff training and development, and frequently recognizing QI team achievement. Remember to involve boards of health, elected officials, the public, and public health system partners in your QI work.

QI as Part of PM

At this point, you may be seeking more information on how QI and PM relate. The Public Health QI Handbook indicates QI approaches are used to strengthen performance within a program or process—this is sometimes called "little qi." When there is a systematic effort to improve performance, using QI methods across an entire organization in numerous programs and processes, it is termed PM—sometimes called "big QI."[11] This means that PM, as a strategy to improve the results of health departments, includes the use of QI methods, tools, and approaches. PM can serve as the impetus for QI efforts. By implementing PM activities, you can make sure your QI efforts are connected to your organization's performance goals. In summary, QI includes improving processes and programs, and PM includes using QI methods across your entire health department. Both are essential for building a culture of quality.

QI as Part of Accreditation

A greater emphasis on QI and PM comes with the national public health department accreditation program.[8] How does accreditation relate to the QI activities health departments are already doing?

Accreditation, as a strategy to improve the performance of public health departments, relies on the use of QI plans, methods, tools, and approaches. PHAB accreditation includes specific standards on the implementation of QI. For example, it requires the development and implementation of QI processes integrated into organizational practice, programs, processes, and interventions.[6] The QI activities health departments are already doing will be critical to meeting PHAB QI standards. Achievement of accreditation provides a mechanism for recognizing high-performing health departments that, despite the demands of normal daily work, take a step back and seek ways to incorporate the concepts of PM and QI to perform more efficiently and effectively.[12]

In addition, accreditation, like PM, can serve as the impetus for QI efforts. By implementing QI activities in order to achieve accreditation standards, health departments can improve their performance and ultimately the programs and services they deliver to the community. Because accreditation uses an external peer review process to identify where performance gaps are, it identifies opportunities for QI activities from the vantage point of someone with fresh eyes and a new perspective. Simply stated, accreditation identifies opportunities for improvement and relies on QI plans and methods to carry out improvement.

QI as an "Everyday" Practice

As important as leadership, PM and accreditation are to a culture of quality, it's the ongoing everyday practice of QI that weaves these threads into fabric. As QI becomes engrained into the way public health is practiced, it changes the way you think about your work, the way you solve everyday problems, and the way you interact with your colleagues. This transformation is what a culture of quality is all about. How can QI become woven into everyday practice in your health department? One thread at a time! Let's take a look.

Is a Proven QI Method like PDSA Required?

You've no doubt noticed that PDSA is the method of choice used throughout this Guidebook—and for good reason. It works! It has worked in public health and works in other fields. However, there are other proven QI methods and approaches in use and available to public health practitioners, including Baldrige, Six Sigma, and Lean. The "take away" here is that to build your culture of quality, it's best to identify a proven method or approach—an approach that develops a strong customer focus, continually improves processes, involves employees, and uses data to improve decision making. Use your method, along with QI tools and techniques repeatedly and consistently across your health department until they are your 'go to' resource every day or when you're faced with a challenge.

Champions, Mentors, and Coaches—Who Needs 'Em?

Champions, mentors, and coaches play important roles when shifting to a culture where using formal QI becomes the norm. These roles can be distinct or blended, but they share a common purpose in providing encouragement and support for QI work in your health department. Certainly, the leaders in your health department (department, division, or program area directors) could serve as champions, mentors, or coaches, but for practical reasons, you may want to designate and train an additional staff person to serve as a champion, mentor, or coach. That person could serve in a key role such as a performance improvement manager, QI coordinator, QI team leader, or quality committee chairperson. Regardless of how you incorporate the role, knowledgeable and engaged managerial staff can effectively steer QI activities, remove barriers, solve problems, provide training and guidance, and generate overall enthusiasm for QI efforts. A word of caution here, for these individuals to be successful in their roles, they need visible support of leadership, authority within the organization, and genuine enthusiasm for the role. Remember that support from your governing entity is also vital to championing your work. In addition to what may be described as these internal champions, you may want to consider external champions, such as hospitals, healthcare providers, or businesses that have a commitment to or expertise in QI and share common goals with your health department. They may be willing to champion your efforts and/or serve as mentors or coaches. Consultants may also be used to supply needed encouragement and expertise.

Teamwork—Does it Drive Improvement?

Many public health practitioners have worked as part of teams during their careers. You know that this can be rewarding—and challenging. However, teamwork is fundamental to creating a culture of QI. Teams have the ability to generate change in organizations. Well-functioning teams learn from one another, generate a deeper understanding of organizational processes and their outcomes, and come up with innovative ideas and solutions. Given that most organizational processes involve more than one person, improvements often must happen through team learning and organizational change.[14] Encouraging teams through training, support, and celebration will help you involve all employees—a basic principle in pursuing a culture of quality.[2] Teams are useful, essential, and will drive improvement in your health department. Additional information about teamwork is provided in the Organizing a QI Project section of this Guidebook.

Is QI Training and Workforce Development Necessary?

You may wonder whether staff at your health department should receive training in QI methods. Is workforce development required? The short answer is YES! Most staff in your health department have received no formal education or training related to QI. Yet, many staff believe they are already doing QI. However, they are most likely just making changes—changes that may not have the desired results, are not based on good data, can't be measured, and may not actually lead to positive outcomes. Formal training in using proven QI methods, such as PDSA, is critical. Via training and development, staff will learn to make data-driven decisions leading to true improvement. If QI is to become the way work in your health department gets accomplished every day, staff must know what QI is and how to use it effectively. Training and workforce development are absolutely essential in building QI capacity—and, if you want quality to be the fabric of your organization, your organization must have the capacity to use proven QI methods.

Is Evidence-Based Practice or Practice-Based Evidence Important?

You already know the answer to this, right? Using evidence-based or best practices really are important parts of creating a culture of quality. They increase your ability to get results and avoid wasting resources on strategies or interventions not likely to succeed. They encourage you to be intentional and strategic about the approaches you opt to use to tackle public health problems. The CDC Guide to Community Preventive Services (sometimes just called the Community Guide) available at http://www.thecommunityguide.org/index.html is a place to look for approaches that work. The Community Guide is a place to find evidence-based recommendations and findings of the Task Force on Community Preventive Services. The Community Guide uses a science-based approach that covers many health topics and types of interventions for behavior change, disease prevention, and environmental change. It identifies where more research is needed and complements other decision support tools, such as Healthy People 2020. Users of the Community Guide will find answers to these types of questions:

- Which program and policy interventions have been proven effective?
- Are there effective interventions that are right for my community?
- What might effective interventions cost; what is the likely return on investment?

Additionally, practice-based evidence is useful in building your culture of quality. Practice-based evidence includes public health programs, interventions, and policies that have been evaluated in real world settings, shown to be promising, and have the potential to be adapted and transformed by others working in the same field. The Model Practice Database (developed by the National Association of County and City Health Officials) available at http://naccho.org/topics/modelpractices/database/ is a collection of projects from around the United States highlighting successful public health projects. The Promising Practices Network (developed by the RAND Corporation) is available at http://www.promisingpractices.net/default.asp and provides a collection of summaries of successful projects, programs and practices addressing the needs of children and youth. Also, check out the University of Wisconsin Population Health Institute's County Health Rankings website available at www.countyhealthrankings.org to find programs and policies that work. You may have other sources with which you are familiar. Remember to use them in building your quality culture!

Do Small Stitches Count?

Remember, a culture of quality is about incorporating QI methods and tools into everyday health department work. This won't happen overnight—building a culture of quality takes time. However, even if you don't have leadership commitment, a PM system, and accreditation in place, and culture change has not yet occurred, you have the ability to move your department toward a culture of quality by incorporating QI methods into your daily work. The pay-off can be very rewarding in terms of increased efficiency and job satisfaction. A single QI project is a good way to begin the journey. Use the PDSA approach as discussed throughout this Guidebook and identify an opportunity for improvement. Begin with something doable—something you can accomplish within a short time period. Pick something within your sphere of influence that is likely to succeed. As you become proficient with QI methods and tools, increase the complexity and scope of your improvement efforts. Share what you learn, involve a team, keep leadership informed, document your work—each of these small stitches will take your organization one step closer to a culture of quality. Then communicate and celebrate your success; you may just light a QI fire among your colleagues!

Sustaining a Culture of Quality: Keeping the Threads from Unraveling

So once you've made progress in your health department in weaving a culture of quality, how do you sustain those gains? How do you institutionalize QI? Are there strategies that work in public health? What simple steps can you take? The following strategies may help you sustain the gains you made in creating a culture of quality in your health department.

Engage Your Governing Entity and Elected Officials!

As you know, support from the top is essential. That includes your health department's top official's boss. Routine engagement of your health department's board of health or other governing entity in setting policy and providing direction will assure you don't slide backward in your QI journey. If you've not yet engaged your elected officials in terms creating awareness or setting policy, now is the time to start.

Involve Everybody!

Sustaining QI is not the job of one or two staff. It requires involvement and buy-in from everybody in your health department. It helps to remember that staff closest to a process know best how to improve that process—so look to frontline staff for improvement ideas and then build your teams upward and outward from there. A culture of quality includes a top-down and a bottom-up approach!

Maintain a Customer, Client, and Stakeholder Focus!

Customer, client, and stakeholder needs are a focus in "quality organizations." Input and feedback from these entities can tell you how you're doing and provide ongoing opportunities for improvement—keep internal and external customers involved and engaged in your improvement efforts. The Guidebook chapter on Customers, Clients, and Stakeholders provides practical suggestions.

Develop a Strong QI Infrastructure: Policies, Plans, Competencies, & More!

To sustain your QI culture, a sound QI infrastructure is key. A clear QI policy and actionable QI plan will help keep QI alive in your health department—provided they are useful and actually used. Engage staff in the development of these items and refer to them often. Your QI policy will set the stage and the tone. Your QI plan will be guided by your heath department's strategic direction and health improvement plan—it will include timelines and specific, measurable activities. Incorporate QI language in agency job descriptions and in annual employee performance appraisals. Employee selection and career development should be based, in part, on QI expertise and competency. Together these approaches and documents will define quality for your organization and assist in integrating QI into all health department operations. There are a number of very useful public health resources to guide you in this regard. The PHAB website available at www.phaboard.org contains guidance in various domains when discussing standards and measures. Additionally, the Michigan Local Public Health Accreditation Program provides QI resources, including policy and plan examples available at www.accreditation.localhealth.net/QI%20Resources.html. For additional state-specific resources on QI policies and plans use the National Network of Public Health Institute's (NNPHI) Performance Improvement Toolkit available at www.nnphi.org/tools/public-health-performance-improvementptoolkit-2 or view the MLC Topical Brief on Key Factors Influencing the Spread of QI in Public Health also available at the NNPHI site.

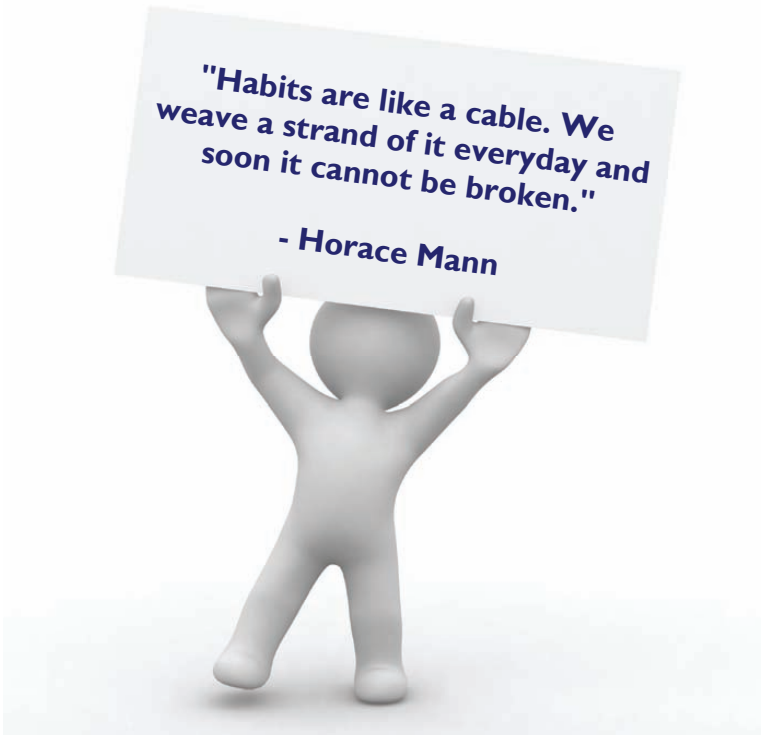
Communicate & Celebrate—Make it Open, Often, and Public!
Growing and sustaining your QI culture requires top-down and bottom-up participation and dialogue. Open communication about the importance and value of QI should occur on a regular, recurring basis. This communication generates enthusiasm and reinforces a department-wide commitment to quality and includes discussing QI during health department meetings and placing QI as a priority on every meeting agenda. Create a QI page on your agency website, write about QI in newsletters, display QI projects on storyboards and in presentations, and tell stories internally and externally about your QI results. Don't forget to recognize staff accomplishments, include your governing entity, and celebrate your achievements.

Make Long Term Plans
Developing long-term plans and strategies will help institutionalize a culture of quality and help you get to improved health outcomes. This also helps staff realize that QI is not a fad or short-term undertaking in your health department. It will also help with keeping QI alive as staff transition in and out of your agency. Examples include incorporating QI in health improvement plans, strategic plans, program plans, and health department policies. It can also include strategies like creating an agency-wide QI plan, designating a QI coordinator or placing QI as a standing agenda item during meetings with your governing entity. The goal is to take steps to assure that QI is not here today, but gone tomorrow!

Use On-going Training, Technical Assistance, & QI Tools
Keep staff skills current or expand them through ongoing training and offer technical assistance in-house. Continuous staff development will help keep QI fresh and doable. Use QI tools in common public health situations, like disease outbreaks, everyday occurrences like customer interfaces with health department employees, or during public health crises. Be sure that ongoing QI training is available for all staff and that quality tools are used organization-wide.

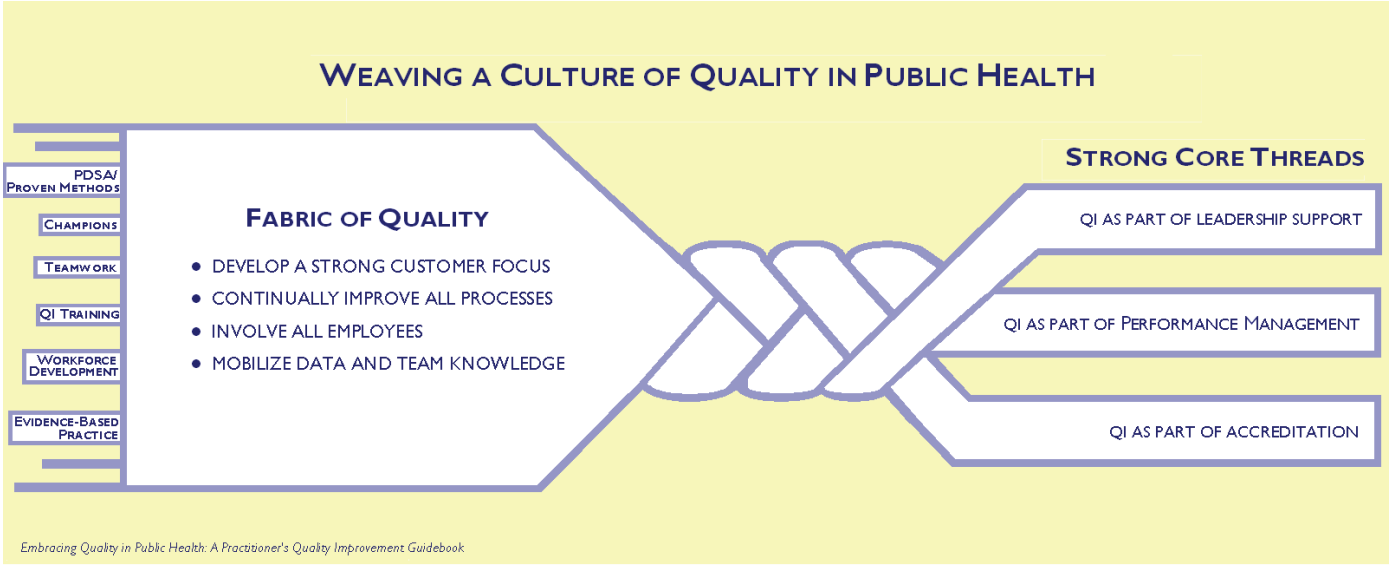
Culture of Quality: Weaving it All Together—Fibers, Threads, & Strands

Your health department's organizational culture can make or break your QI efforts! Quality must become the fabric of the organization, not just a small piece of the fabric. Achieving a work environment rooted in a culture of quality requires the routine use of data to examine processes to enhance all aspects of operations. Curiosity and experimentation are accepted and expected. Building a culture that supports QI includes leadership and governing entity commitment, a proven QI method, champions, teamwork, training and workforce development, evidenced-based practices, learning, willingness to change, a positive organizational climate, and deliberate actions to sustain your QI efforts. You also know that the national public health department accreditation program relies heavily on QI as its cornerstone AND requires a robust PM system. It's clear PM, Accreditation, and QI are good strategies for public health improvement and accountability. Together, these characteristics, concepts, and approaches contribute to the development of organizational behaviors, skills, and structures that build a robust, living, and institutionalized culture of quality—one which is the very essence of your health department!



Accreditation and PM serve as an impetus for QI, but they're not the only impetus. For a variety of reasons, health departments will have improvement needs that fall outside of the scope of the PM system or accreditation process. QI methods will enable your health department to nimbly respond to emerging challenges and deliver results in important areas unique to your agency. This means that QI, PM, and accreditation, individually and/or together are good for public health and have undeniable potential for measurable improvement in health outcomes!

For more information about accreditation, or standards and guidance related to performance management, and QI, visit the PHAB website at www.phaboard.org or the Robert Wood Johnson Foundation (RWJF) available at www.rwjf.org/publichealth/focusareas.jsp. Information on these topics pertaining specifically to local health departments and governing entities may be obtained from the NACCHO Web site at www.naccho.org or via NALBOH at www.nalboh.org. Information related to state health departments, is available via the ASTHO Web site at www.astho.org. Tribal health departments are encouraged to visit the National Indian Health Board (NIHB) website at www.nihb.org and the NACCHO and ASTHO websites. The National Network of Public Health Institutes (NNPHI) available at www.nnphi.org and www.nnphi.org.tools/public-health-performance-improvement-toolkit-2 and the Public Health Foundation available at www.phf.org also provide valuable information on accreditation, performance management, and QI. The CDC Office for State, Tribal, Local, and Territorial Support (OSTLTS) available at www.cdc.gov/ostlts/performance/Resources.html provides additional resources, as does the resource section (Appendix C) of this Guidebook. If you are seeking additional information on building a culture of quality take a look at the NACCHO Roadmap to a Culture of Quality Improvement available at www.naccho.org/topics/infrastructure/accreditation/qi-culture.cfm. Additionally, the Journal of Public Health Management and Practice special editions on performance management and quality improvement contain a variety of useful information on the topics discussed in this chapter, as does The Public Health Quality Improvement Handbook available through the Public Health Foundation or the American Society for Quality at www.asq.org.



CONCLUSION

Embracing Quality in Public Health: A Practitioner's Quality Improvement Guidebook was designed specifically as a practical resource for public health professionals. The Guidebook covered a range of topics—from fundamentals, methods, and tools . . . . to building a culture of quality. To increase utility, public health examples were integrated throughout. When feasible, worksheets, templates, guides, and charts were incorporated to facilitate learning and application. It's the authors' and sponsors' intent that you use this QI resource in your health department to purposefully improve your public health processes and programs as steps toward improving health outcomes.

To advance your QI learning, this Guidebook also contains appendices that provide practical information. Appendix A includes cases studies from health departments across the country. Each case study describes a QI project that used PDSA and illustrates the teachable moments referenced in earlier chapters. Appendix B will help you conduct a basic evaluation, Appendix C contains additional QI resources, and Appendix D provides a glossary.

The PDSA cycle works in public health and provides a model with a repeatable set of steps that any public health team or individual can learn and follow. If you are just beginning your QI journey by becoming familiar with PDSA, remember to select a realistic, SMART aim. Connect that aim to a theory of improvement, put that theory through a test, and use that test to come to a conclusion that tells if you achieved your aim. Remember to use your data throughout the PDSA cycle and repeat the cycle for greater results. Simply stated, the PDSA cycle is the primary means for turning ideas into action and for connecting that action to learning. Using PDSA for conducting QI will expand your organizational capacity and put you on the path to improved health outcomes.

Remember, achieving a culture of quality in your health department will take time. Begin by applying these four basic QI principles:

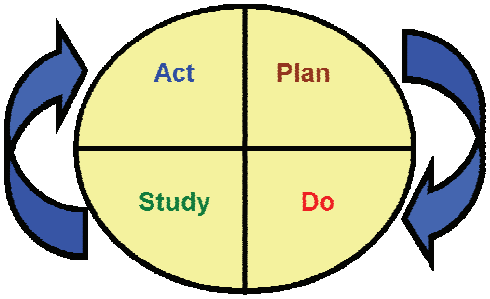
- Develop a strong customer focus
- Continually improve all processes
- Involve employees
- Mobilize both data *and* team knowledge to improve decision making

And don't forget to ask the three fundamental questions when applying PDSA:

1. What are we trying to accomplish?
2. How will we know that a change is an improvement?
3. What changes can we make that will result in improvement?

Using these four principles and three key questions as guideposts for your public health QI work will assure success! But you don't have to take our word for it! The best way to **LEARN QI** is to **DO QI**, so…

Start now.
Start today.
Just start.



Public health will be better because you did.
Best wishes on your quality journey!

APPENDIX A: CASE STUDIES

The first edition of the Guidebook contained case studies of the four quality improvement (QI) projects completed by Michigan Health Departments during the second Multi-State Learning Collaborative. The practice of QI in public health has expanded greatly in the years since those first projects occurred, and new case studies from around the country are included in this Guidebook to reflect that increased experience. The health departments included here conducted their QI projects during the third Multi-State Learning Collaborative, the PHAB Beta Test, or through other grant programs focused on improving the practice of public health.

To provide varied learning opportunities for Guidebook users, QI examples from public health departments across the country were identified, reviewed, and chosen based on selection criteria. You will find that projects vary by geographic area, population served, topic area addressed, QI tools used, and lessons learned. As a result of the greater range of case study content, a case study selector matrix was developed to aid in your selection and review of case studies. Each selected health department produced a narrative case study based on their actual experiences in using PDSA within their health department. The case studies highlight the steps taken to improve quality within the health department, as well as the QI tools used, lessons learned during the project, and future plans for advancing QI activities. The intention of the case studies is to share QI stories, advance your understanding and application of PDSA—a proven QI method, and provide real examples of QI work occurring across the country in health departments like yours. We encourage you to peruse these informative stories as a strategy to learn with and from your public health colleagues across the country.

Case Study Selector Chart

Health Dept. Name	Location	Population Size	Page #	QI Tools										Teachable Moments										
				Brainstorming	Process Map	Fishbone Diagram	Check Sheet	Pareto Chart	Run Chart	Interrelationship Diagraph	Nominal Group Technique	Prioritization Matrix	Force Field Analysis	Continous Nature of PDSA	Good External Customer Involvement & Communciation	Use of Data	Good InternalCommunication	Celebration of Success & Team Recgnition	Did not achieve AIM	Unstable Process	SMART Measures	Good Development of Improvement Theory	Clear, Straightforward, Simple
Berrien County Health Department	Benton Harbor, MI	162,453	101	♦	♦				♦					♦		♦					♦		
Caring Community Network of the Twin Rivers	Franklin, NH	34,000	108		♦	♦									♦					♦			
Comanche County Health Department	Lawton, OK	124,000	112	♦	♦	♦						♦			♦		♦				♦	♦	♦
Eastern Montana Collaborative	3 counties in eastern Montana	25,000 (combined)	119	♦		♦														♦			
Grand Traverse County Health Department	Traverse City, MI	86,000	124	♦	♦	♦				♦	♦				♦	♦	♦		♦		♦	♦	
Hennepin County Human Services and Public Health Department	Minneapolis, MN	1.1 million	132			♦					♦			♦					♦				
Mahoning County District Board of Health	Youngstown, OH	172,000	137		♦								♦	♦	♦	♦					♦		♦
Mid-Michigan District Health Department	Stanton, MI	174,574	141		♦	♦	♦	♦						♦	♦	♦	♦	♦			♦	♦	
Norton County Health Department	Norton, KS	5,500	149	♦	♦	♦				♦				♦						♦			
Tooele County Health Department	Tooele, UT	58,000	154	♦	♦	♦					♦			♦			♦	♦			♦	♦	

Case Summary Narrative– Berrien County Health Department

Agency:
Berrien County Health Department
Benton Harbor, MI

Quality Improvement Project Title:
Improving Efficiency of the Berrien County Health Department using Quality Improvement

Size of Jurisdiction Served:
156,813

Contact Name and Email Address:
Vita Benson, vbenson@bchdmi.org

Introduction
In collaboration with Robert Wood Johnson Foundation, the Berrien County Health Department (BCHD) completed an eighteen month initiative to explore whether purposeful continuous quality improvement (QI) would increase efficiency and quality in public health delivery. Specific focus areas were the Children Special Health Care Services (CSHCS) and Environmental Health Food Inspections Service.

BCHD employed the Institute for Healthcare Improvement's Model for Improvement as the framework for the QI intervention. The evaluation assessed both processes and outcomes using static analysis including comparison measures but also dynamic analysis including trend lines and run charts to examine process variation. Substantial improvements were achieved.

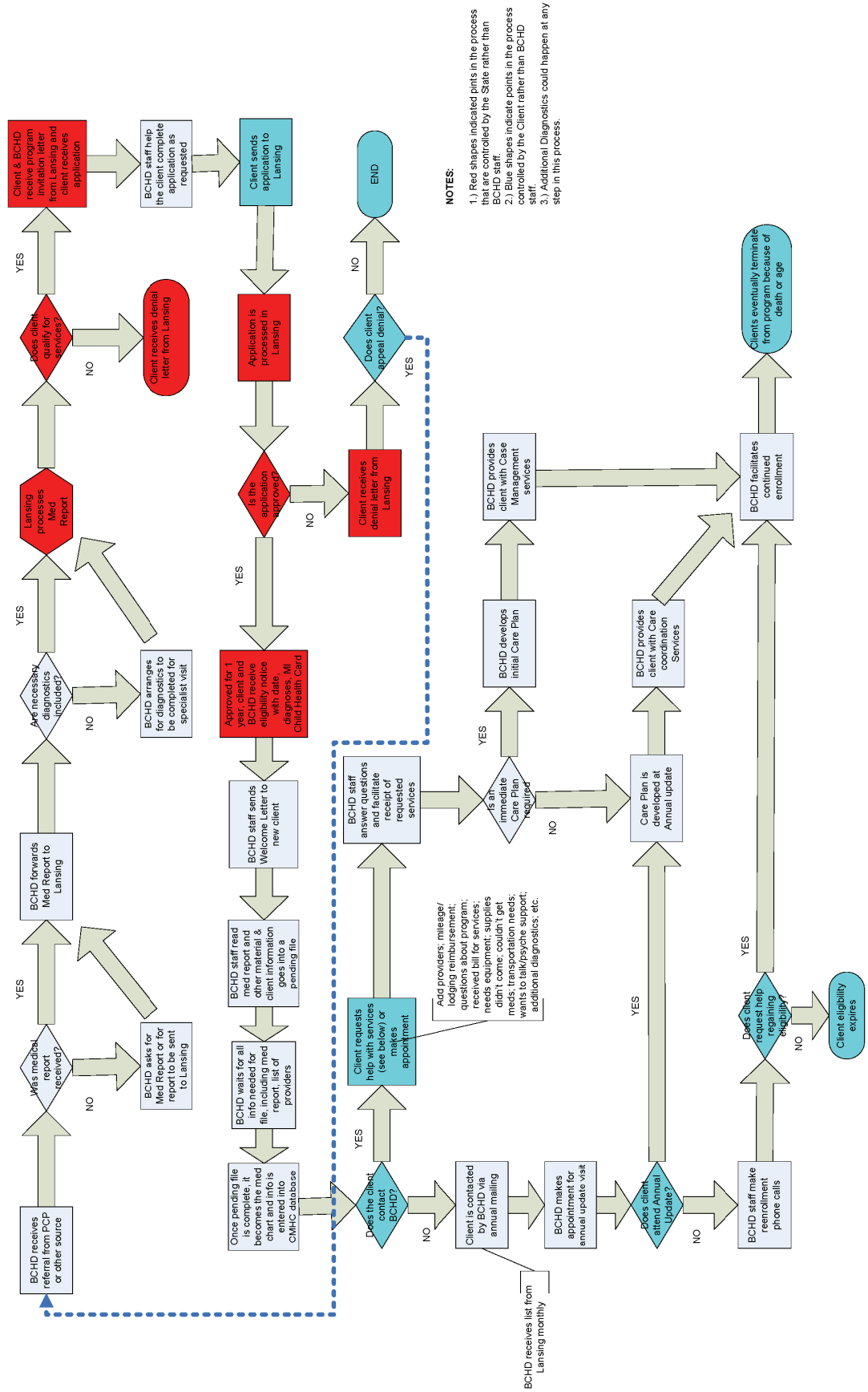
PDSA Steps

Step One: Getting Started
BCHD had service areas struggling with inefficiency of services, decreased cost effectiveness in providing services, and diminished customer satisfaction. Two specific areas of particular concern were CSHCS and Restaurant Inspections. Both of these programs were experiencing lagging response times to return client calls and/or return for follow-up services, and both believe that the difficulties stemmed from inefficient tracking systems and procedures.

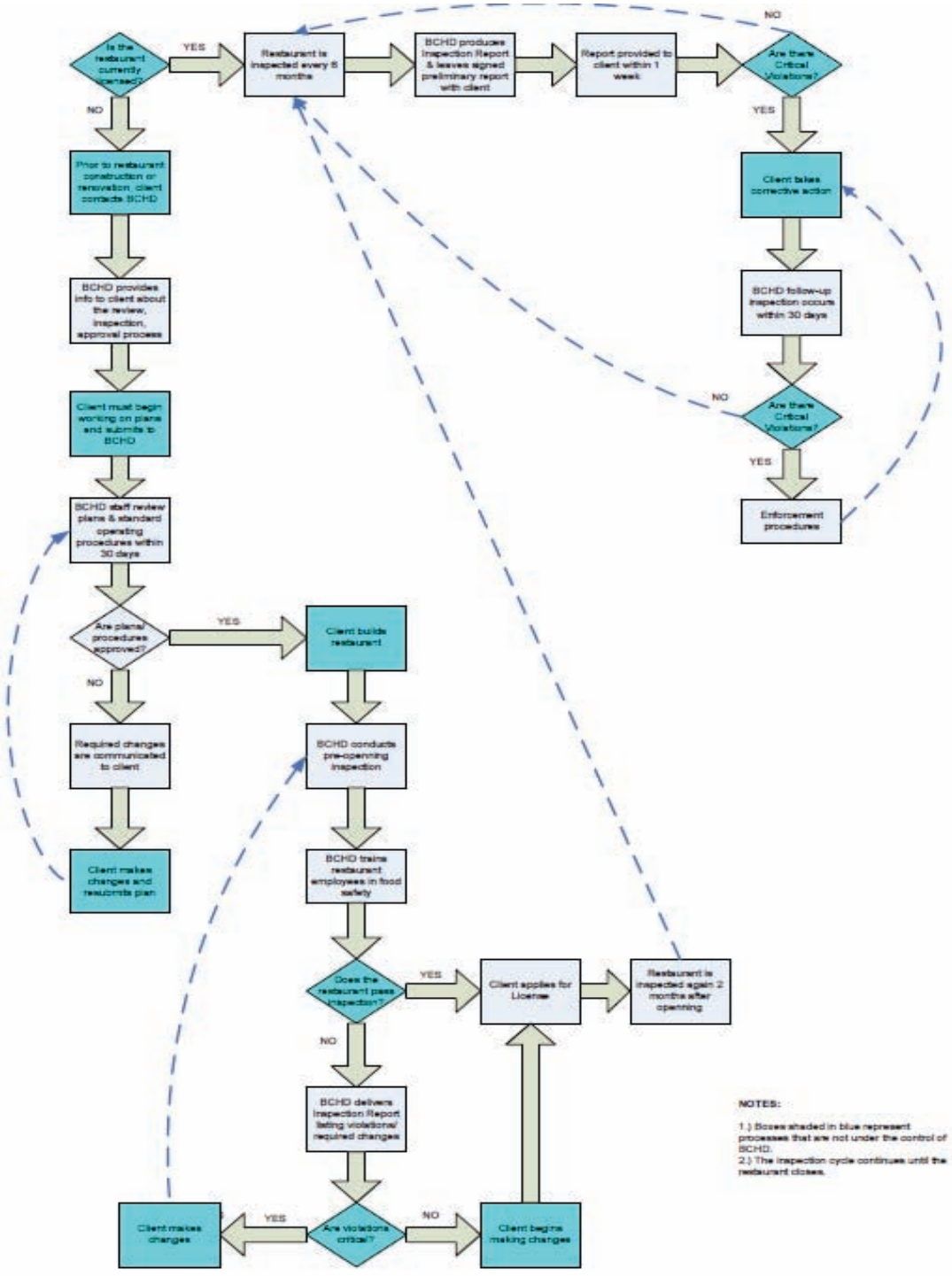
These areas were identified by the service managers in response to a grant opportunity. Benchmark data at this point were based on manager perception, complaint calls, and accreditation insufficiencies.

Step Two: Assemble the Team
Two health department service areas were targeted for the CQI intervention, and during November and December 2009 service teams from each established an aim statement and specific goals to address identified problems. Teams included all service staff and the supervisor/manager. In addition, with the help of an external evaluator, benchmarks and measurement tools were established and **process maps** were created in each service area.

CSHCS Process Map



EH Restaurant Inspections Process Map



In the CSHCS service area, problems included slow response to client calls, slow resolution of client problems, overwhelmed staff, charting back-log, and diminishing revenues. The team targeted several processes in this service area, initially concentrating on the process that starts when a client calls with a specific request, and ends when the client's request is met. Later in the intervention, the process focus broadened to include increasing number of clients and increasing services provided. CHSCS aim statement:

Increase the number of CSHCS (billable) client encounters by 20% while improving the level of current customer satisfaction by March 31, 2011

In the food inspection environmental health service area (EH), identified problems included delayed time to re-inspect restaurants with critical violations, too many restaurants with critical violations, inconsistencies in reporting violations among EH inspectors, and some restaurants needing to be re-inspected several times before being compliant. The team primarily concentrated on the process that starts when a restaurant receives a critical violation during a routine inspection, and ends when that restaurant is free of all critical violations as determined by a sanitarian's repeat inspection. EH aim statement:

Decrease the occurrence of fixed restaurants with critical violations (total number and duration) in any given month by 20% by March 31, 2011 without increasing staff time or expense.

Each team decided to discuss QI interventions monthly at their regularly scheduled team meetings.

Step Three: Examine the Current Approach

Process flow diagrams helped to examine the current approach and to develop aim statements. The teams established measures of success based on the developed aim statements. With each measure, a measurement tool and process was developed. For CSHCS it was important to assess customer satisfaction, so a customer satisfaction survey was developed and distributed to the current client base. In addition, the team needed to begin to track response times, so a new billing slip was created that recorded time of initial request and time until response. Data processers within the health department were incorporated into the project and asked to track time for each response as well as number of encounters and revenue for this service area.

For EH, similar data collection issues were resolved. The team needed to track the number of restaurant inspections with critical violations each month as well as the time needed to respond and then to resolve those violations. Tracking tools were developed and data processors were incorporated for time tracking. Baseline data were established over a few months for each service area.

Step Four: Identify Potential Solutions

Baseline data were presented to the team members, especially front-line staff, for their input and response. Frontline staff developed solutions through **brainstorming** and discussion during the monthly meetings. In general, both teams determined that to improve efficiency without decreasing customer satisfaction, services need to be performed more consistently and in a more timely manner. The best solution identified for each service area was to decrease response time. How that should be accomplished is something that the team did not know at the start of the project. Team members identified the problem, set a goal, and developed a data tracking plan to monitor progress. The team then started with small interventions through Rapid Cycle Improvements (RCI) to test where improvements could be seen.

Step Five: Develop an Improvement Theory

The team's improvement theories included:

For Children's Special Health Care Services, it was determined that:
If frontline staff were consistently tracking client inquiries by the same method, then better data on responses and encounter hours would be available. In addition, the team assumed that better tracking should lead to increased productivity and client satisfaction.

For Environmental Health, food services, it was postulated that:
Increased consistency and accountability among sanitarians would lead to faster re-inspections, therefore healthier restaurants; and that increased education and information, as well as stronger consequences for offenders, would lead to less overall critical violations.

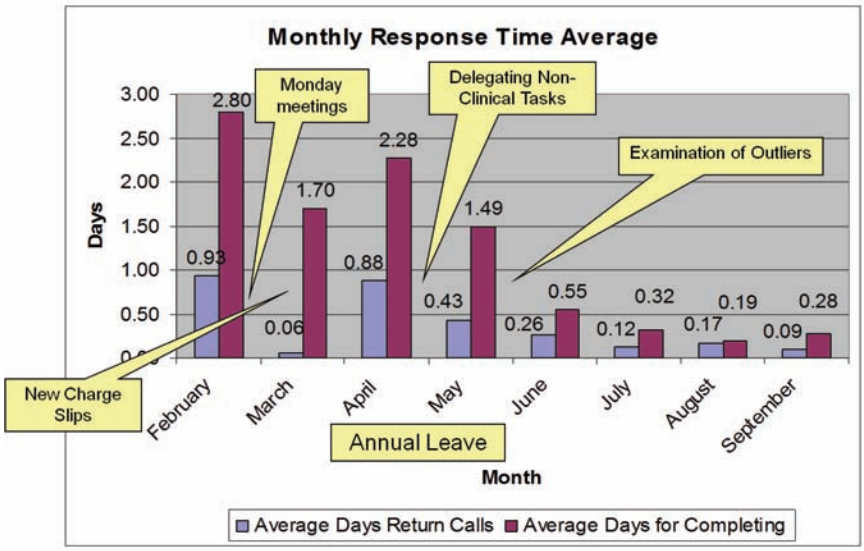
Step Six: Test the Theory
Several PDSA cycles were completed on about a monthly basis. Each month, during the team's monthly meeting, data were presented to see how the improvements were tracking. The team members commented on the data and suggested additional RCI interventions. Each potential intervention was discussed and agreed upon by the frontline staff – it is important that managers do not dictate the interventions, rather the frontline staff discover what works best for them. RCIs included:

For CSHCS:
- Began meeting each week for 1 hour to coordinate efforts rather than meeting once a month for 4 hours
- Implemented a new billing charge slip that standardized tracking, billing, and response (this took several PDSA iterations)
- Delegated billing and tracking duties to non-frontline staff to free clinical personnel
- More effectively batch non-billable to billable
- Changed phone message and maintained accurate in-house data base
- Improved membership renewal process

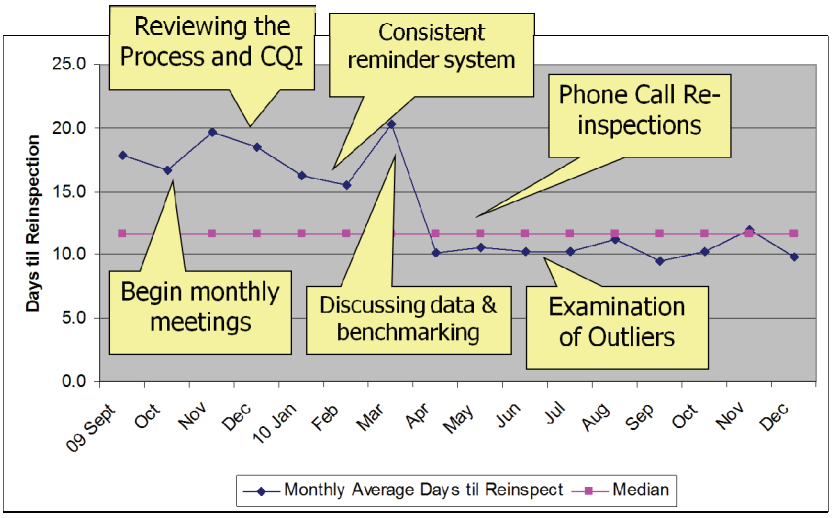
For EH Food Services:
- Initiated monthly meetings of food staff to compare sanitarian results against benchmark data
- Consistent reminder system for re-inspections initiated using administrative assistant to track rather than manager
- Implemented call backs for re-inspection rather than a required face-to-face visit
- Examined and corrected outliers through 5 whys
- Developed a newsletter to educate restaurants and to potentially decrease the number of critical violations
- Promoted standardized inspections with team leaders

Step Seven: Study the Results
At each monthly team meeting, team members reviewed the results of the previous month's RCI. Prior to each meeting, the QI coordinator organized the data in a way that was easy and clear for frontline staff to understand. Data were presented in a way that also tracked RCI improvements so data changes could be tied to specific interventions. In the charts that follow, the changes are noted in the callout boxes. If an intervention (RCI) caused an improvement, then it was continued throughout the project time so the changes that occurred in the later months were due to a cumulative effect of all the RCI's small incremental changes.

CSHCS Example:



EH Example:



In addition to the data presentation, a qualitative assessment was completed. Notes were taken at each meeting to record personal experiences and revelations.

Improvements far surpassed team expectations in CSHCS and included:

- Average client encounters increased by 312%, nearly doubling revenue for the service area
- Demonstrated efficiency improvements included:
  - Collected $15,694.16 over baseline
  - Clerical and billing duties shifted from nurse to administrative assistant: 5 hours/week x 52 weeks x $14.03 difference = $3,647.80
  - Audit difference from 3 days to 3 hours –staff time supervisor difference and representative = $509.83 per incident
- Monthly average time it took clinic staff to complete a customer requested task decreased significantly from 2.80 ± 3.02 days prior to the QI intervention to 0.28 ± 0.50 days within seven months, showing a substantial decrease in variance over time
- Client satisfaction also improved – clients reported increased satisfaction with response to phone messages, timely appointments, and staff that met their needs

For food inspections, the time between discovery of a critical violation to re-inspection after restaurant improvement decreased by 5.17 days, indicating a significant special cause trend. Now, 90% of re-inspections occur within fourteen days after discovery. In addition, variation among food service inspectors has decreased substantially.

Step Eight: Standardize the Improvement or Develop a New Theory

As improvements were noted, they were fine-tuned or intensified in the next month's RCIs. With CSHCS some maximum improvements were noted within six months so consistently that the data were no longer tracked or examined. Data were checked every six months to assure that improvements were long-term. If data showed that the intervention did not result in an improvement, the team decided if the intervention was worth trying again, or if the intervention was truly unsuccessful and the team responded accordingly within the following month. Both CSHCS and EH continued to meet monthly to discuss service improvements. A two year spot check of the data confirmed that changes with this QI project were indeed sustained.

Study results indicated that initiating continuous QI activities using the Model for Improvement framework and PDSA yielded significant improvements in the efficiency of service delivery, provided cost savings and improved quality in two unique service areas. Through QI efforts, health departments are better equipped to serve their clients, and to keep people safe from health threats thus improving the health of a community.

Step Nine: Establish Future Plans

BCHD's service specific QI interventions were incredibly successful and the department has decided to expand QI throughout the department. BDHD's strategic planning process is now based on QI and has a department-wide QI policy. Each service area must establish QI goals for their program and data are tracked monthly with the Health Officer and Director of Program Operations. QI interventions in the future will be determined by upgraded billing and data systems, through the analysis of pre-determined dashboard indicators.

Closing Commentary:

Public health is moving towards a system of national accreditation which represents quality assurance for the public. This project contributes to the body of evidence showing the significant improvements toward accreditation standards that can be gained from implementing QI.

Case Summary Narrative– Caring Community Network of the Twin Rivers

Agency:
Caring Community Network of the Twin Rivers (CCNTR)
Franklin, New Hampshire

Quality Improvement Project Title:
Pediatric Weight-Related Health in Primary Care

Size of Jurisdiction Served:
34,000

Contact Name and Email Address:
Michael Loomis, Michael.loomis@nh.gov

Introduction
The Caring Community Network of the Twin Rivers (CCNTR) sought to address the childhood obesity rate in the Twin Rivers—one of the highest in the state—as part of the Multi-state Learning Collaborative through quality improvement (QI) processes in four local primary care practices. CCNTR conducted interviews with local childhood health stakeholders including health care providers, school nurses, and public health officials to determine potential root causes. Among these stakeholders, the Franklin School District Health Coordinator discussed how parents react negatively to body-mass index (BMI) screenings at school-based health screenings. Parents respond with hostility and disbelief to school nurse correspondence about their child's unhealthy weight, claiming that their child's primary care provider had never mentioned weight as a problem in previous well-child visits and interpreted this as not an important health concern.

PDSA Steps

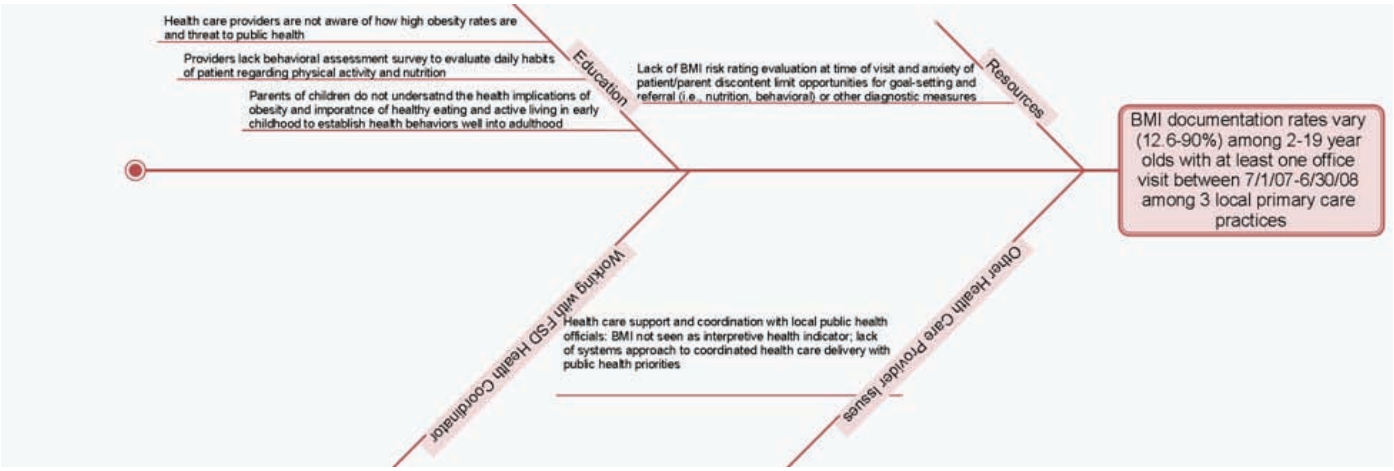
Step One: Getting Started
CCNTR began by evaluating the rates at which primary care practitioners measured children's BMI at four selected primary care practices in the region. Additionally, the QI team observed practice patterns using Electronic Medical Record (EMR) protocols and workflow to document BMI at well-child visits and evaluate methods to diagnose or treat weight related health behaviors.

Step Two: Assemble the Team
The CCNTR QI team was assembled with top-down management from participating local primary care practices and consisted of CCNTR Community Program Specialist, Federally Qualified Health Center (FQHC) Executive Director, FQHC Practice Manager, FQHC Provider Wellness Champion, LRGHealthcare (hospital system) Director of Practice Development, LRGHealthcare Director of Community Health Education, and LRGHealthcare Community Health Educator.

The team determined that the importance of maintaining a healthy weight through healthy eating and active living is not routinely discussed in the primary care well-child visits due to the lack of clinical operations and resources.

Upon creation and analysis of a **fishbone diagram**, the team decided to focus on improving health care provider access to timely BMI risk rating analysis through redesign of clinical flow to assess behavior, provide effective communication strategies and referrals, and interpret weight related health into diagnosis and treatment.

Fishbone Diagram



Step Three: Examine the Current Approach

In examining the current approach, the QI team determined that no uniform office flow for documentation of weight related health or self-management goal setting health behaviors for obesity prevention at well-child visits existed. This information was derived from the Practice Management Interviews the QI team conducted with the four participating primary care practices in the region. Additionally, BMI documentation among the four local primary care practices in the EMRs for youth ages 2-19 with a well-child visit between 7/1/07-6/30/08 ranged from 12.6% - 90%. This information was obtained from the EMR Aggregate Reports. Moreover, the QI team determined that health care providers lack the EMR capability to efficiently screen, document, and educate children and their parents on weight related health risks during a well-child visit. This information was again derived from the Practice Management Interviews the QI team conducted.

Based on the information the QI team examined, an aim statement was developed:

CCNTR will work to improve documentation of BMI in EMRs among youth ages 2-19 in four local primary care practices to at least 65% between 2008 (7/1/07-6/30/08) and 2009 (7/1/08-6/30/09).

Step Four: Identify Potential Solutions

The QI team decided to focus QI efforts on two FQHC practices with the lowest BMI documentation and share tools and resources with the two LRGHealthcare practices with higher documentation. The team updated medical staff at all four practices on clinical evidence-based recommendations and research identifying obesity as a health indicator for chronic disease risk. Moreover, the QI team determined that the EMR would be used to prompt providers to discuss the importance of healthy eating and physical activity at well-child visits, as appropriate, which would strengthen provider's motivational interview techniques with patients and parents. Additionally, as an order for pediatric wellness and disease prevention, primary care providers would be required to refer youth to education, treatment, and consultation resources regarding nutrition and physical activity available in their community. The team decided that the chronic care model would be used to coordinate effective weight-related health for youth.

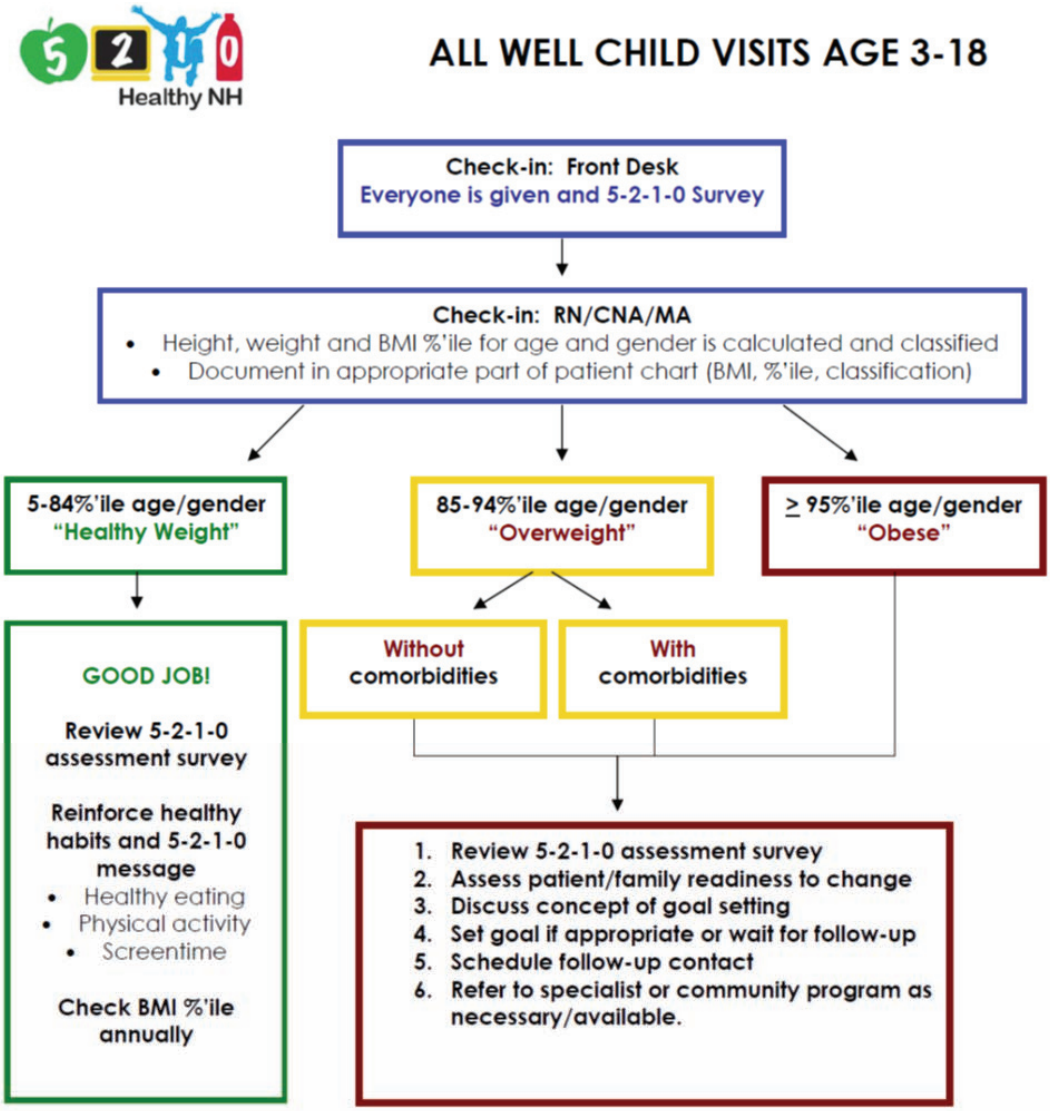
Step Five: Develop an Improvement Theory

The QI team developed the following improvement theories:

- If weight related health analysis and health coaching tools are integrated into the clinical flow at every well-child visit, then providers will facilitate counseling and behavioral interventions to assist patients in improving dietary choices and physical activity behaviors.
- If a provider Wellness Champion within the FQHC will adopt standards of practice that include routine screening of BMI and counseling and behavioral interventions for patients using the "5-2-1-0 Healthy NH" pediatric primary care campaign, then patients will maintain a healthier lifestyle.

Step Six: Test the Theory

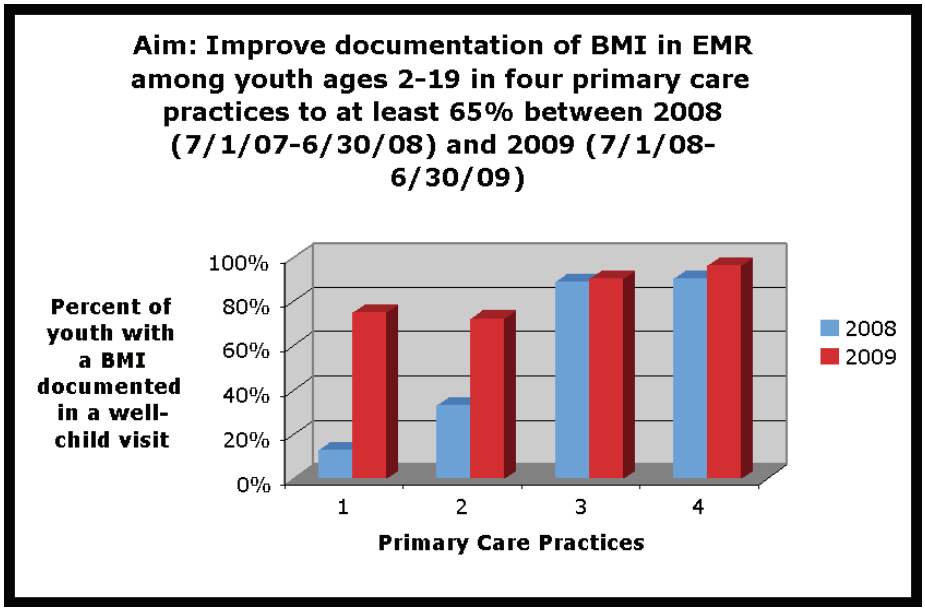
In order to test the improvement theories, the QI team integrated a BMI risk rating calculator into the EMR system for evaluation at all well child visits for youth ages 2-19. Additionally, clinical staff were educated on how to document clinical office flow using the "5-2-1-0 Healthy NH" pediatric primary care campaign. As such, the "5-2-1-0 Healthy NH" well-child EMR risk rating application was uploaded to the EMR system. Moreover, providers were educated on local resources for healthy eating and active living to which they could refer patients. Finally, the QI team identified locations suitable for outreach activities to distribute printed materials to health care clinics, schools, and childcare facilities on "5-2-1-0 Healthy NH" to educate parents about BMI and weight related health risks in children.



Adapted from the Maine Center for Public Health *Keep ME Healthy* project

Step Seven: Study the Results

Upon completion of first full year of the QI project, BMI documentation rates among the four participating local primary care practices for youth ages 2-19 with a well-child visit between 7/1/08-6/30/09 increased. The graph below displays the BMI documentation rates for each of the four participating primary care practices at the beginning of the QI project and one year later.



Step Eight: Standardize the Improvement or Develop a New Theory

Based on the success of the QI project, the CCNTR QI team elected to adopt the improvements and implement them on a broader scale.

CCNTR will continue to promote routine documentation of BMI risk rating at each clinical encounter by continuing to encourage health care providers to discuss weight-related health with patients between the ages of 2-19 in order to prevent chronic disease. CCNTR will use this QI project as an example and begin focusing on other health indicators in the region relative to weight-related health in order to develop additional "5-2-1-0 Healthy NH" QI projects. Moreover, CCNTR will continue to educate and promote the "5-2-1-0 Healthy NH" pediatric primary care campaign and work to foster collaboration between CCNTR and local primary care practices around referral and awareness to local "5-2-1-0 Healthy NH" resources.

Step Nine: Establish Future Plans

CCNTR plans to continue familiarizing partner organizations with QI concepts, tools, and methods with particular emphasis on evidence-based activities and strategies in order to continue to build capacity for QI among staff and promote a culture of quality throughout the department. CCNTR will also communicate with local school wellness committees about increased adherence addressing BMI and weight related health behaviors in the primary care setting. Finally, CCNTR will work to gain support and funding to continue QI efforts on individuals and families through a multi-sector approach targeting weight-related health through the Healthy Eating Active Living NH Community Grant Program.

Closing Commentary:

CCNTR wanted to ensure that the benefits of this QI project would continue after the project concluded. The department recognizes that sustainability is critical to achieving long-term, life-changing results for New Hampshire's children. When a statewide initiative called for community-based solutions to the problem of childhood obesity, CCNTR was able to use the successes achieved through this QI project in order to secure additional funding of $150,000 to continue work at fighting obesity in the Twin Rivers area. CCNTR's dedication to the QI accomplishments gained through this project provided a foundation for CCNTR's continued QI work and prepared the department for additional QI projects involving schools, food outlets, and community initiatives aimed at advancing healthy eating and active living behaviors among the population.

Case Summary Narrative– Comanche County Health Department

Agency:
Comanche County Health Department
Lawton, Oklahoma

Quality Improvement Project Title:
Improving Community Engagement

Size of Jurisdiction Served:
124,000

Contact Name and Email Address:
Keith Reed, RN, MPH, CPH, KeithR@health.ok.gov

Introduction
The Comanche County Health Department (CCHD) is located in southwest Oklahoma and serves approximately 124,000 residents. Using the Public Health Accreditation Board (PHAB) Self-Assessment and a quality improvement (QI) project, the CCHD assessed community engagement in an effort to improve community sector participation in the community health assessment process. As a result, sector participation improved as did overall meeting effectiveness. Both of these improved outcomes have resulted in an enhanced community health assessment process.

PDSA Steps
Step One: Getting Started
While CCHD is involved in an active community coalition, the coalition partners have not taken the time or effort to stop and develop a Community Health Improvement Plan (CHIP). Through **brainstorming** and collaboration with the State Health Department (SHD), CCHD began to look at the essential prerequisites to developing a CHIP; broad community engagement, assessments at multiple levels, and community health data. Following a brainstorming session, the team met and determined that a **Prioritization Matrix** would help the team narrow the identified "problem" areas that were inhibiting CCHD from developing a CHIP. The team identified the following areas of need: improvement in available data, improving community engagement, and community assessment. Each team member scored each area of need against the others. The scoring was as follows: Equally Important (1), More Important (5), Much More Important (10), Less Important (1/5), and Much Less Important (1/10). The area with the highest score was the area the team would focus on. The team easily identified Improving Community Engagement with a score of 15 as the area the QI team should direct focus.

Prioritization Matrix: Areas of Improvement to Develop a CHIP

	Improvement in Available Data	Improving Community Engagement	Community Assessment	Row Total
Improvement in Available Data		1	1	**2**
Improving Community Engagement	10		5	**15**
Community Assessment	1	5		**6**

Step Two: Assemble the Team

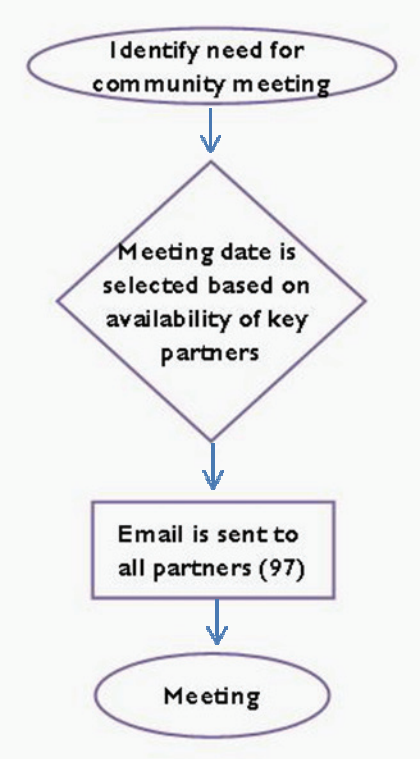
The CCHD administrator recruited QI team members based on the subject matter of the project, interest in QI, and current involvement in community-based initiatives. While the QI team members remained consistent throughout the project, CCHD recognizes a potential value in including additional disciplines. This addition would not necessarily add to the direct success of this project, but instead, would add to the organizational experience gained through its success. Specifically, the wealth of knowledge gained through the QI training and project implementation would easily translate to any area of public health service, and as such, additional disciplines would greatly benefit from the experience. Fortunately, as a centralized system CCHD has the ability to continually look to the SHD for training and guidance on future QI projects. The team's initial aim statement was:

By December 2010, the Comanche County Health Department will improve community engagement as evidenced by: 60% of invited partners will attend meetings; an average score of 4 on the Meeting Effectiveness Survey; completion of all four assessments of the MAPP process demonstrating progress toward a CHIP; and completion of a local strategic plan.

Step Three: Examine the Current Approach

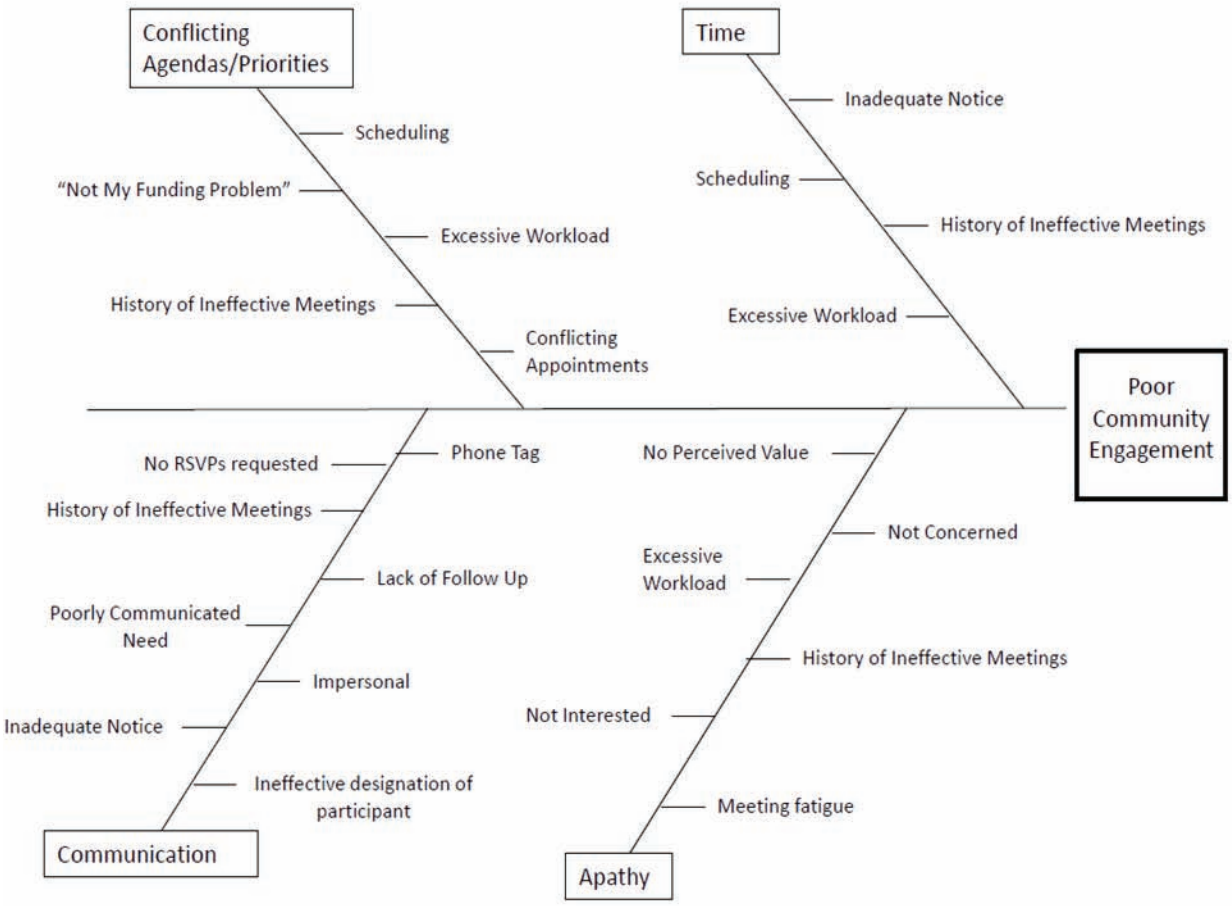
The QI team met and documented the actual sequence of events that takes place when planning for a community meeting. The sequence of events is depicted in a **Flowchart**. While simple is good, it became very evident from the flowchart that CCHD's process for engaging community partners was limiting and not all that "engaging." CCHD simply set a meeting date, sent it out, and hoped community partners were motivated enough to attend.

Flowchart: Existing Community Engagement Process



Through a **Fishbone Diagram** the QI team began to take a closer look at possible reasons the community partners were not as engaged as needed. The reasons quickly fell into four categories; conflicting agendas/ priorities, time, apathy, and communication. These four categories led the team to develop strategies to counter the reasons identified for poor community engagement. The improvement theory reasoned that if the CCHD demonstrates respect for partner's time and participation the number of community sectors represented at meetings will increase and meeting effectiveness will increase.

Fishbone Diagram



CCHD's final aim statement was scaled back on September 10, 2010, in order to more appropriately focus efforts, and reads as follows:

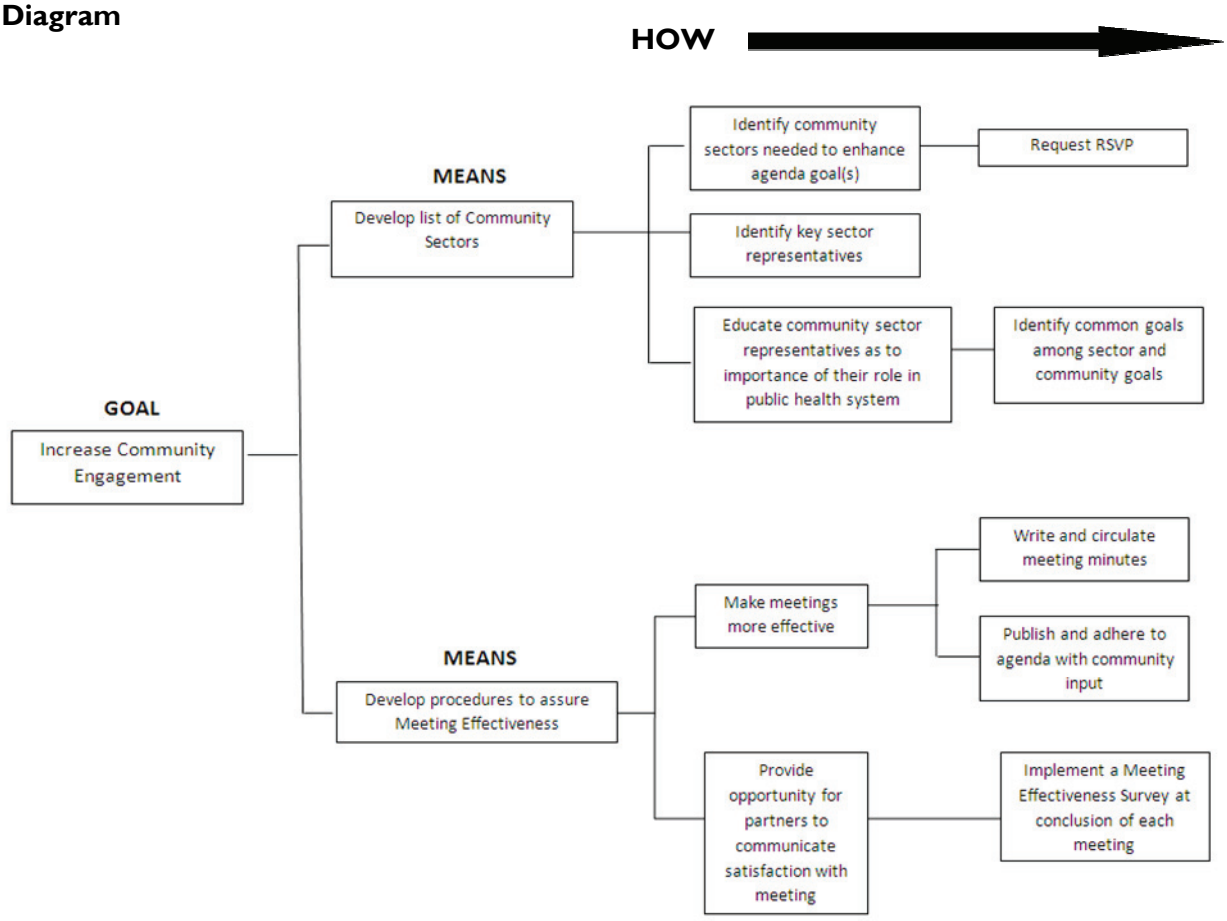
By December 2010, the Comanche County Health Department will improve community engagement as evidenced by: 60% of community sectors will be represented at meetings, with an average score of 4 on the Meeting Effectiveness Survey.

Step Four: Identify Potential Solutions

A **Tree Diagram** was developed to break down the theory into greater detail, including realistic action steps. The QI team believed that CCHD could improve community engagement by implementing the following strategies:

a. In order to show proper respect for community partner schedules, every effort will be made to ensure clear and concise meeting agendas are prepared, with relevant objectives.
b. An RSVP will be added to all meeting invitations. This will allow CCHD to see the level of engagement and to identify missing partners/sectors.
c. In response to the RSVP, CCHD will make a concerted effort to engage missing and key partners/sectors through personal contact via a phone call, or face to face visit.
d. Draft agendas will be sent out at least four weeks in advance providing partners/sectors an opportunity to provide input.
e. Meeting requests will have a clear, concise goal with beginning and end times.
f. Each meeting will conclude with a meeting effectiveness survey.
g. Meeting minutes will be taken and circulated in a timely manner.
h. Adjustments will be made based on survey results and partner input.

Tree Diagram

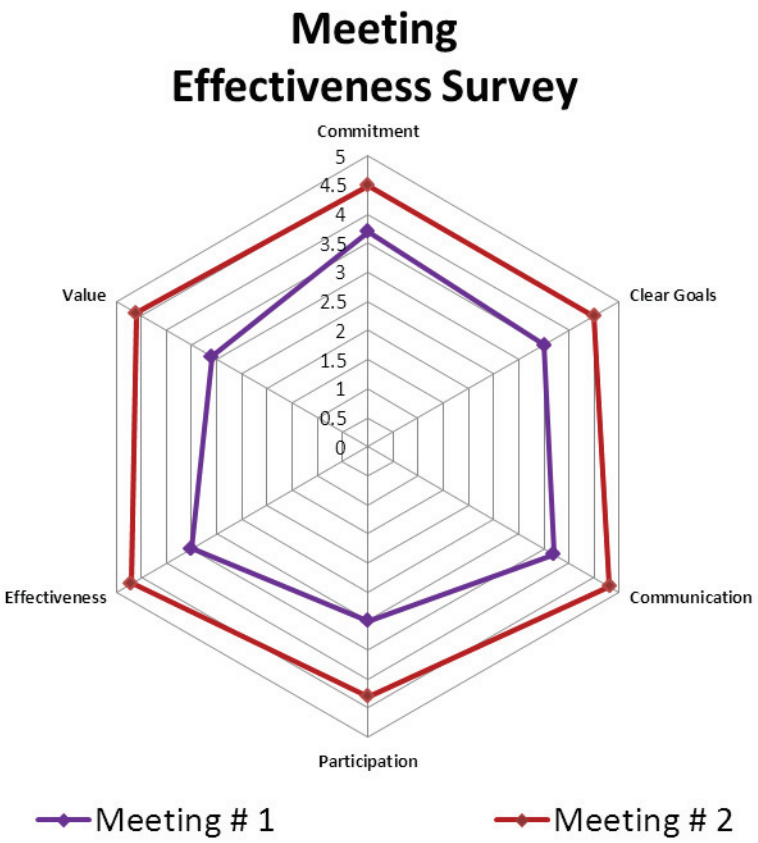


Step Five: Develop an Improvement Theory

The improvement theory reasoned that if the CCHD demonstrates respect for partners time and participation by: providing draft agendas in advance, offering clear and concise goals with beginning and ending meeting times, requesting RSVPs for meeting participation, and offering feedback via meeting minutes, CCHD will increase the number of community sectors represented at meetings and increase meeting effectiveness as evidenced by an increased score on the Meeting Effectiveness Survey.

Step Six: Test the Theory

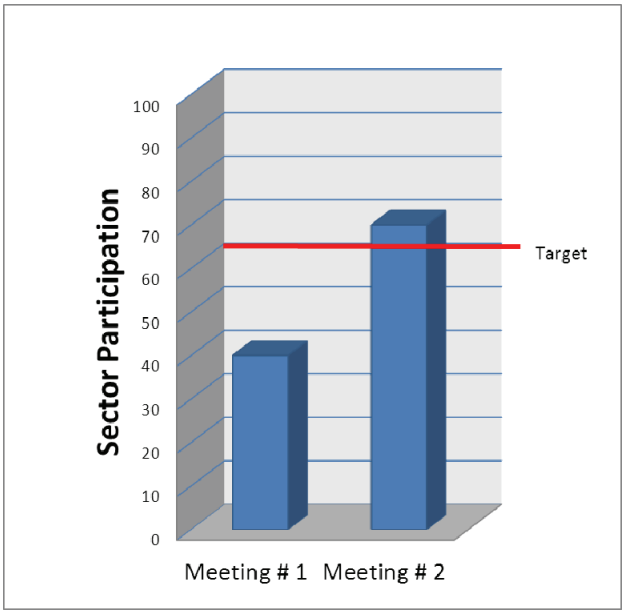
The CCHD QI team hosted two community based meetings, one using the department's traditional approach, then applying the improvement theory and interventions to the second. Participants were identified as to which sectors they represented, and were asked to complete a 'meeting effectiveness survey' at the end of each meeting to measure the effectiveness in both scenarios. Improvements over baseline in meeting effectiveness and sector representation were documented on a **radar chart** and bar graph respectively. As expected, the second meeting showed significant improvements in both areas.



Step Seven: Study the Results

The QI Team collected information from the invitation list vs. actual attendance. The team evaluated the sectors input on the Meeting Effectiveness Survey to gauge meeting quality with the anticipation that if partners are satisfied with the effectiveness of the meetings they will continue to be engaged. The results of the meeting effectiveness survey went from an average of 3.4 to 4.6 as demonstrated on a radar chart. A simple bar graph shows an increase in sector representation from 40 to 70 percent with CCHD's goal being 60 percent.

Average Participation by Sectors



The data clearly indicated that the improvement was effective. In fact, the improvement yielded an increase beyond the team's expectations. The QI team had set a goal of achieving a 4 on the Meeting Effectiveness Survey, and ended up with a 4.6. Additionally, the team had set a goal for 6 out of 10 sectors to participate, and 7 were represented. No unexpected data were revealed.

Step Eight: Standardize the Improvement or Develop a New Theory
With the success of the initial test, the improvements were standardized with one minor adjustment. The four week advance agenda was deemed to be logistically impractical in all cases. Instead, the initial meeting requests, at approximately four weeks out, include a clear narrative of the meeting purpose and objectives. Within 1-2 weeks of the actual meeting, a draft agenda is sent out to provide partners with an opportunity to provide input.

Step Nine: Establish Future Plans
Considering the success that the data identified, CCHD decided to adopt the improvement.

Having exceeded the QI team's original goals, it is clear that the improvement efforts were successful. As such, the team must follow the course the data indicates is most effective.

For purposes of the QI project, the improvements were focused on one particular area of community engagement. In this case, CCHD's efforts to improve engagement in pursuit of a community health assessment and ultimately, a CHIP. The success experienced in this endeavor will now be applied in all areas of community engagement. As such, CCHD will plan community meetings in such a way as to incorporate these lessons. CCHD will plan meetings more mindful of partners' needs and motivations, as opposed to planning meetings simply to meet CCHDs needs and motivations.

Members within the organization were very accepting of the improvements for this project. It will, however, be interesting to see how these improvements are carried forward in all community engagements. CCHD is effectively committed to taking more time and effort in the planning phases of community interactions, which requires a consistent commitment from staff. Busy schedules and competing priorities will be a constant obstacle to maintaining these improvements.

CCHD will continue to track sector participation for each meeting through sign in sheets with organizational/ demographic data incorporated. Additionally, CCHD will track meeting effectiveness using the Meeting Effectiveness Survey for subsequent meetings. The department will periodically review data always comparing to baseline and the successes that were achieved through this process.

Closing Commentary:
This project represents CCHD's first formal efforts at QI. As such, CCHD began with a training process that has revealed distinct deficiencies in what the department had once perceived to be a robust QI program. In reality, CCHD had successfully engaged in quality evaluation and control, but lacked the continuous and organized process that leads to lasting improvement. Additionally, CCHD has learned that the department must apply QI principles to all areas of public health practice, including the most vulnerable areas of practice, where CCHD engages community partners.

Using CCHD's new found skills in QI, the department is more effectively engaging community partners and has completed a community health assessment and CHIP, both prerequisite items for national accreditation. Using what CCHD learned from the QI project, the department has strengthened relationships with existing community partners, as well as developed new partnerships among diverse community sectors. As such, CCHD has benefited from excellent community engagement in the health improvement process. Internally, CCHD has begun to build a culture of quality by exposing additional staff to formal QI training.

Overall, CCHD has learned many lessons from this process. However, the most valuable of all the lessons was also the most basic. CCHD learned just how important organizational self-awareness is to developing a quality public health organization. As self-awareness can stir an awakening in an individual, the organizational self-awareness gained by this experience has stirred an awakening in CCHD. CCHD went into the process hoping to see many successes, but prepared to accept deficiencies. That acceptance has provided a framework for comprehensive improvement, and will undoubtedly result in local public health excellence.

Case Summary Narrative– Eastern Montana Collaborative

Agency:
Eastern Montana Collaborative

Quality Improvement Project Title:
Implementing a Standard Process for Documenting Childhood Immunization

Size of Jurisdiction Served:
Collaborative includes 3 Local Health Departments serving small populations of 5,000 - 9,999 each. Total population of approximately 25,000.

Contact Name and Email Address:
Judith LaPan, MS, MBA, jlapan@richland.org

Introduction
Impacting immunization rates requires a collaborative effort between counties. The immunization process must be addressed through a systems approach, which when operating in a decentralized state, like Montana, requires cooperation across county lines. The quality improvement (QI) process helped not only impact immunization rates, but also built a process whereby individual counties could discuss and develop policy across jurisdictional lines. By focusing on the process and measuring the impact, counties were more likely to make changes. The process minimized the barriers to creating a more standardized system between "home rule" counties where there is no incentive to work together.

PDSA Steps

Step One: Getting Started
The Eastern Learning Collaborative comprises Lead Public Health Officials from three counties in eastern Montana with small populations. The three counties assembled a larger regional team consisting of Lead Public Health Officials from 16 counties in eastern Montana (referred to throughout as the Eastern Region). The region consists of small counties with populations of anywhere between 500 and 12,000, encompasses two reservations, and covers an area that is larger than many states.

The three eastern Montana counties involved in the collaborative jointly proposed the need to improve immunization rates in Montana, specifically in the Eastern Region. As a result, the Eastern Region decided to determine what part the region as a whole played in the low immunization rates throughout Montana. The entire region agreed to support the work of the three selected counties by providing input, implementing suggested solutions in their individual county, and offering feedback on the proposed solution after its implementation.

Baseline immunization data from the three collaborative counties were pulled and is provided in the following tables. Both tables represent the percentage of children 19-38 months of age who have received all of the following immunizations: 4PCV, 4DTaP, 3Polio, 3Hep BV, 1MMR, 4HIB, and 1Var. The first table reflects children who reside in the county of service. The second table reflects both children who reside in the county of service and those who do not reside in the county of service.

Table 1: Children (19-38 months) who reside in county of service

County of Residence	**Full Series**	**4th DTaP**	**Varicella**	**Input < 30 days**	**Input < 6 days**
Dawson	36%	57%	65%	78%	69%
Richland	41%	70%	67%	66%	52%
Rosebud	65%	74%	73%	60%	32%

Table 2: Children (19-38 months) who reside and do not reside in the county of service

County of Service	**Full Series**	**4th DTaP**	**Varicella**	**Input < 30 days**	**Input < 6 days**
Dawson	33%	57%	64%	86%	80%
Richland	39%	67%	64%	66%	52%
Rosebud	52%	60%	66%	72%	42%

Step Two: Assemble the Team

Considering the multi-county and multi-disciplinary nature of the immunization issue, as well as the vast distance covered by the local health departments, the team consisted of three lead counties that were selected because of their involvement in the Multi-state Learning Collaborative. To participate in the Multi-state Learning Collaborative the three counties had to respond to a state RFP. The requirement was that more than one county apply; therefore, the collaborative was funded rather than just one local health department. In eastern Montana, Richland County was the lead agency and applied with Dawson and Rosebud Counties. Richland received the funds and assured that the reports were completed and submitted as required by the grant. The counties that formed the collaborative were seen as the leaders in eastern Montana mostly because the lead public health officials in those counties were involved in state-wide public health system improvement efforts. The three counties met monthly to plan bigger regional meetings, provide QI trainings, and facilitate QI discussions. There were 13 additional counties in the Eastern Region that worked with the lead counties to provide input and convene meetings within their counties. The three lead counties met with their local providers, communities, and department staff as they gathered information and developed the QI project. The team determined a project timeline that ran for 6 months.

Step Three: Examine the Current Approach

The region determined that The Montana Immunization Registry (IZ registry) data contained duplicate immunization records and inaccurate information. If the registry data is not reliable, the true immunization rates are difficult to determine. The Eastern Region counties identified the need for common standard operating procedures for data entry to be used throughout the region, and eventually the state. The standard operating procedures were developed for all immunization data entry even though they would be tested in this PDSA cycle for childhood immunizations only. The collaborative believed this would improve the quality of information in the IZ registry so that data are accurate.

At the outset of the project there were no standard operating procedures for entering immunization data into the IZ registry. The state of Montana sent a report to the counties that showed a list of incomplete records and the team completed a spot check of the data and found that in many cases one client was entered into the IZ registry several times with different names. The differences in the names were either spelling errors, nicknames vs. legal names, and changes in names due to changes in marital status. In most cases, the error could be resolved by using the date of birth and other health department records. The team attempted to run a report of duplicate records. These duplicate records were due to a variety of issues, but mostly due to multiple names for one individual.

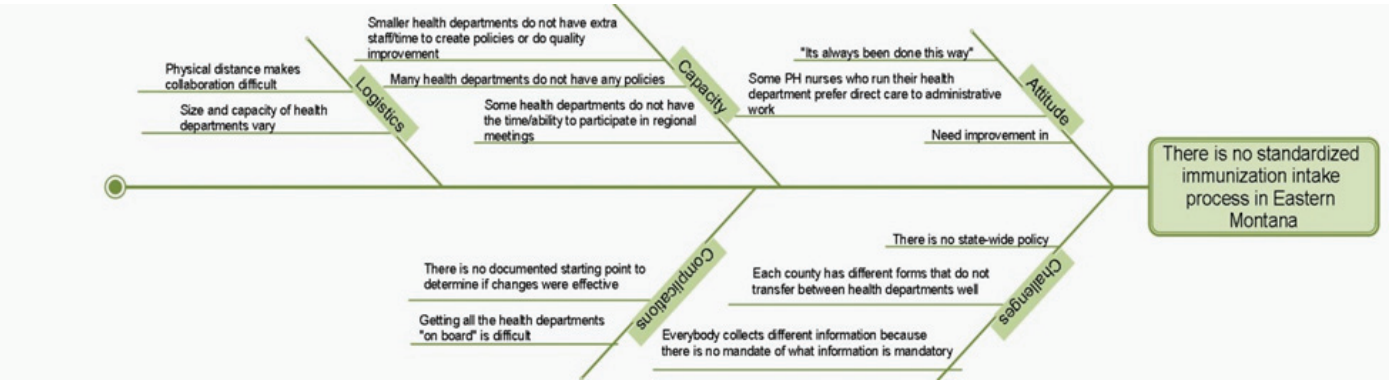
For various reasons, the team could not get a report that could be used to measure the number of duplicate records as a baseline so the team decided that an improvement in the immunization rates would serve as an indicator of improved data entry.

The team developed the following aim statement:

The Eastern Region will develop common standard operating procedures for required data entry to improve the quality of the information in the IZ registry by February 15, 2011.

Step Four: Identify Potential Solutions

The Eastern Region used a **fishbone diagram** to conduct root cause analysis in order to identify what the collaborative thought were the five major areas in need of improvement. The following is the fishbone diagram the team constructed:



After the fishbone diagram was completed there were five root causes identified that related to immunization data and the lack of consistent policies and procedures related to immunization data input, correction of errors, and its use for QI efforts.

The list included:

1. Inconsistent method used to search IZ registry data
2. No clearly defined process for correcting duplicate records
3. Data entry protocol is inconsistent
4. Data are incomplete
5. Inconsistent knowledge and utilization of immunization data for QI

Step Five: Develop an Improvement Theory

The Eastern Region as a whole reviewed the identified root causes for immunization data issues that the team believed led to low immunization rates. Each root cause was reviewed based on its impact on the immunization rates, the ability of the group to measure the impact, and the relative ease of the group to make required change. The QI team used the consensus method to decide on the following improvement theory:

- If the collaborative creates standard operating procedures that address how data are entered into the IZ registry, then there will be more complete and accurate data.

By implementing this improvement theory the QI team believed the integrity of the IZ registry would improve. Improving the integrity of the IZ registry would create more complete data, decrease duplicates, and ultimately create useful reports that would improve the ability of local health departments to assess the status of immunizations in their community.

Step Six: Test the Theory

Once the standard operating procedures were developed with input from the team, the Eastern Region tested the procedures by:

A. The number of local health departments that implemented the standard operating procedures
   Measure of Success: 50% of counties using the same standard operating procedures or practices
B. The number of Eastern Region participants who report efforts to reduce duplicate records
C. 50% of the Eastern Region will use IZ registry reports to guide QI activities

The following chart was developed to provide a clear outline of the improvement plan. It includes what was to be accomplished, by whom, and when. It also describes the expected outcome for each step of the process.

What	Who	When	Outcome
Survey Current Approach	Lead Public Health Official (LPHO) of Rosebud County will develop a survey on "survey Monkey" and send to all 17 counties in eastern Montana	10/31/10	At least 13 counties will respond to the survey to create a list of current approaches
Review the areas of improvement at the regional meeting	Richland County LPHO will review the survey results	11/18/10	A list of potential areas of improvement
Create some draft standard operating procedures for: -IZ record search -Data entry	Dawson County LPHO	12/15/10	All eastern Montana health departments will adopt common policies for IZ record search and data entry.
An algorithm will be developed for each standard operating procedure	McCone County LPHO	11/29/10	The same algorithm will be adopted by all health departments in eastern Montana.
Send out a post survey to determine how many health departments implemented the standard operating procedures	The three participating Eastern Montana counties	1/31/11	Survey results to determine the change from the time the first survey was completed in October 2010.
Review results	The three participating Eastern Montana counties	2/28/11	All participating counties will implement a data entry policy and procedure.

Step Seven: Study the Results

Results of the test indicated that:

- 57% of the Eastern Region made changes to standardize their data entry protocol as a result of the QI process
- 28% of the Eastern Region participants reported efforts to reduce duplications, as a result of using the standard operating procedures
- 35% of the participants reported using the IZ registry reports to guide QI activities

Through meeting the collaborative's aim by cleaning up the data in the IZ registry and entering new data according to the standard operating procedures, the lead counties increased calculated immunization rates by an average of over 10%.

Step Eight: Standardize the Improvement or Develop a New Theory

The improvements to the immunization registry data and resulting rates are still on-going. However, the standard operating procedures for immunization data entry are in place in all 16 counties within the Eastern Region. The Standard Operating Procedures are posted on the State Training Site for other counties to review and adopt.

The Eastern Region has agreed to utilize the QI process to tackle other identified root causes of immunization rate issues and other public health issues that arise.

Step Nine: Establish Future Plans

The three lead counties shared their QI project story board with other regions in the state through monthly meetings and a final report to Montana Public Health Systems Improvement Task Force. The State Immunization Program was also involved in the monthly meetings to encourage a statewide acceptance of the standard operating procedures.

An Outcome Form was developed to be used as a tool to assure that the PDSA cycle is utilized to improve the quality of public health services, such as immunization rates. Additionally, the Eastern Region has discussed a regional charter that will formalize the relationship between counties when addressing QI issues.

Closing Commentary:

The Eastern Montana Collaborative views this QI project as a success both regionally and within each of the collaborative's departments. The collaborative gained knowledge of several QI tools which are now being used within the departments on a regular basis. An unanticipated gain of increased immunization rates occurred when each county took a closer look at their individual immunization input process and made improvements. Moreover, the QI process increased the organizational capacity of the individual counties to use a QI process to improve public health in eastern Montana. Staff who had worked in their current position for years realized through this process that there may be a better and more effective way of doing things.

The collaborative learned a few lessons through this process. First of all, it is important to break the problem down into small parts. At the onset of the project the team tried to take on too much and ended up feeling frustrated. Additionally, communicating on a regular basis is important. In eastern Montana it is very difficult to meet in-person, thus the collaborative needs to embrace and utilize technology more often because it allows for more cost-effective, regular collaboration.

Montana's Eastern Region plans to use the QI knowledge and lessons learned through this project to increase the capacity of both the region as a whole and individual counties in the region to continuously improve the quality of public health in the region.

Case Summary Narrative– Grand Traverse County Health Department

Agency:
Grand Traverse County Health Department

Quality Improvement Project Title:
Improving Food Safety Knowledge for All

Size of Jurisdiction Served:
86,000 (95,000 during the summer months)

Contact Name and Email Address:
Daniel R. Thorell, Jr. (dthorell@gtchd.org)

Introduction
Grand Traverse County Health Department's (GTCHD) quality improvement (QI) team selected food safety training disparities among Chinese restaurant workers as an improvement project. Food safety training exam scores were disproportionately low among Chinese food service workers in Grand Traverse County. The goal of the project was to use QI techniques and tools to determine why such a learning disparity existed among Chinese food service workers and develop an improvement theory to address the problem. The strategy involved including Chinese restaurant owners/managers/workers in the process to accurately identify the needs of the workers regarding food safety training. Once the needs assessment was done and potential root causes identified, an improvement theory was developed to improve food safety knowledge.

Step One: Getting Started
Historically, GTCHD Sanitarians have been challenged when training food service workers from Chinese restaurants. Only five of the twelve workers from Chinese restaurants who attended National Restaurant Association (NRA) ServSafe® food safety courses in 2009 actually passed the exam to become certified. This failure rate of 58% is well above the failure rate of 4% observed in the cohort of remaining students in 2009. GTCHD Environmental Health (EH) staff recognized that food safety training for Chinese food service workers was failing. The QI team identified the low ServSafe passing rate among Chinese food service workers as a suitable candidate for a QI project. GTCHD administration approved the use of staff time and resources to pursue project funding. Once funding was secured, GTCHD was fully committed to provide additional resources to complete the project.

Step Two: Assemble the Team
The GTCHD QI team was assembled to access a diverse group of individuals within the organization. An EH Sanitarian was selected as the team leader, the EH Director and Personal Health Director represented administration, and the Community Outreach Coordinator provided insight with experience in communication and graphic design.

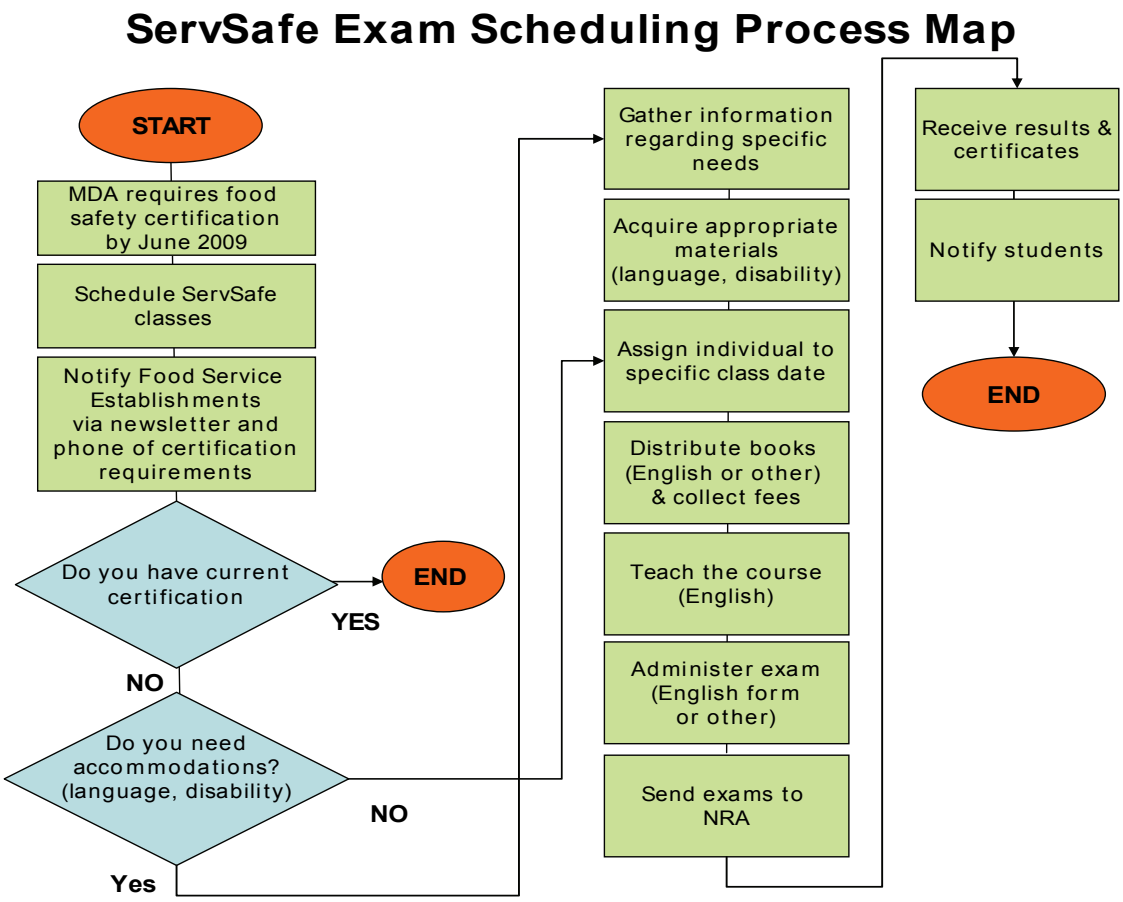
The first task of the QI team was to develop a work plan to guide the team including a schedule of all the team meetings and other project related meetings and webinars. Initially, the QI Team decided to meet weekly every Wednesday for two hours. Gradually, the QI team began to meet less frequently for two reasons: first, most of the hard work had been completed and second, the team lost two of its members. Due to the complexity and progression of the project, the team leader decided not to replace the two lost team members. The QI team developed its initial aim statement during one of the first meetings:

By January 15, 2011, food service workers from Chinese restaurants will demonstrate a 20% increase in the ServSafe exam passing rate after receiving culturally appropriate training and educational materials provided by GTCHD EH program staff.

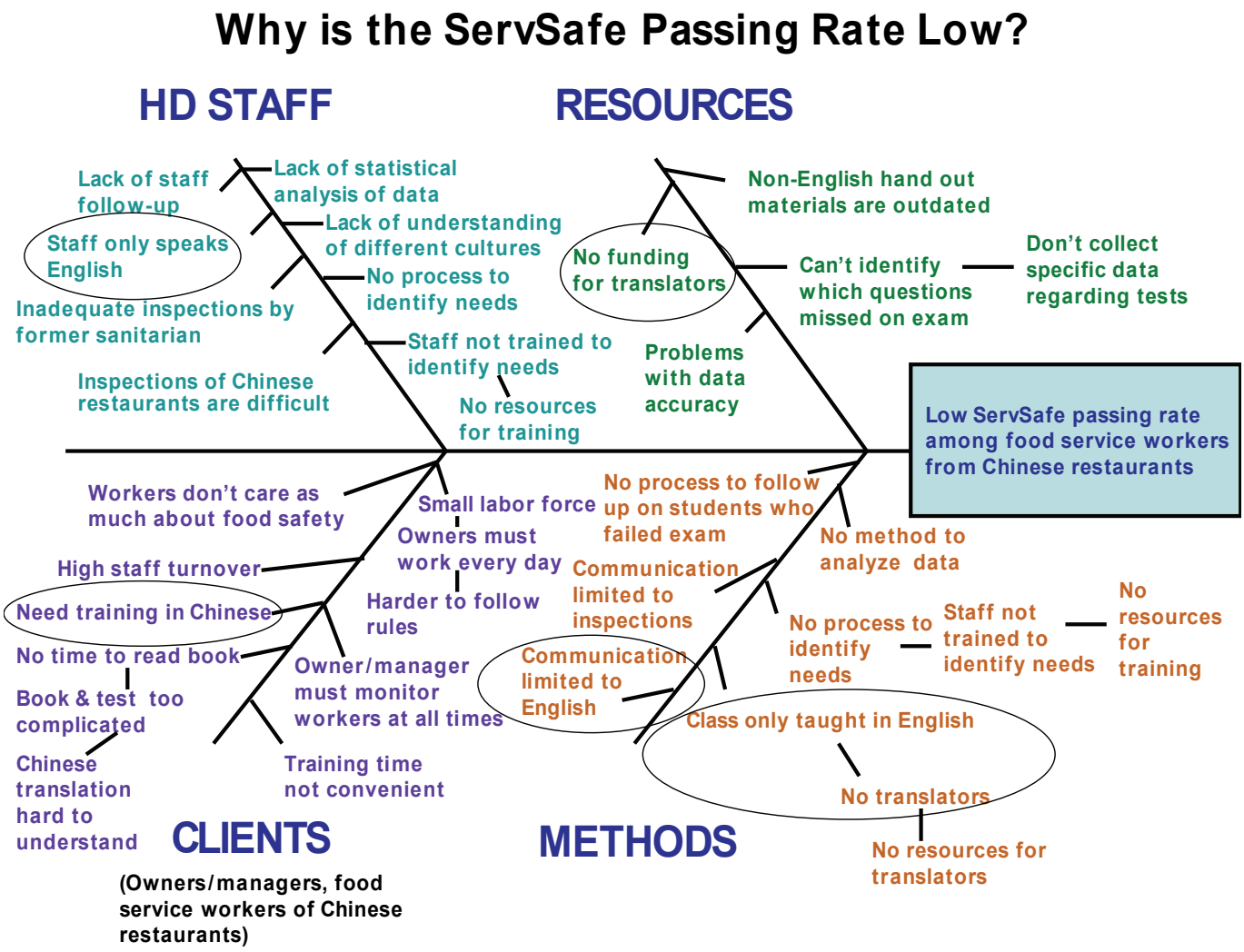
Step Three: Examine the Current Approach

GTCHD decided to employ a **process map** to examine the current system for scheduling and teaching the ServSafe food safety certification course. The following problem areas were identified:

- There is no standard policy for identifying specific needs regarding language or disability
- Even though students may request a non-English book and exam, the course is only offered in English
- No translator available for Chinese food service workers to ask ServSafe instructor questions from textbook
- No follow-up survey for students to measure course and exam quality (no quality assurance)
- Little follow-up for students who failed exam to determine root cause (no follow-up for Chinese students)



In order to further study the problems, a **fishbone diagram** was employed to determine possible causes of the low ServSafe exam passing rate. The most significant factor identified was communication problems between GTCHD staff and Chinese restaurant staff due to language barriers.



In order to learn from our client's viewpoint, GTCHD QI team held a **focus group** meeting for owners/operators of Chinese restaurants on June 22, 2010. The QI team presented the current status of food safety training for Chinese restaurants including the low ServSafe passing rate among Chinese students. One of the restaurant owners speaks English fluently and was the interpreter for the QI team.

The QI team presented the focus group with an exercise known as **Nominal Group Technique (NGT)** which is used to prioritize and generate a course of action. The NGT exercise started with posing a question pertaining to problems that exist regarding food safety training for Chinese food service workers. Each focus group member was polled to answer the question and then the answers were listed. Each group member was asked to prioritize each of the answers using a ranking system.

Focus Group Data

Nominal Group Technique

QUESTION:

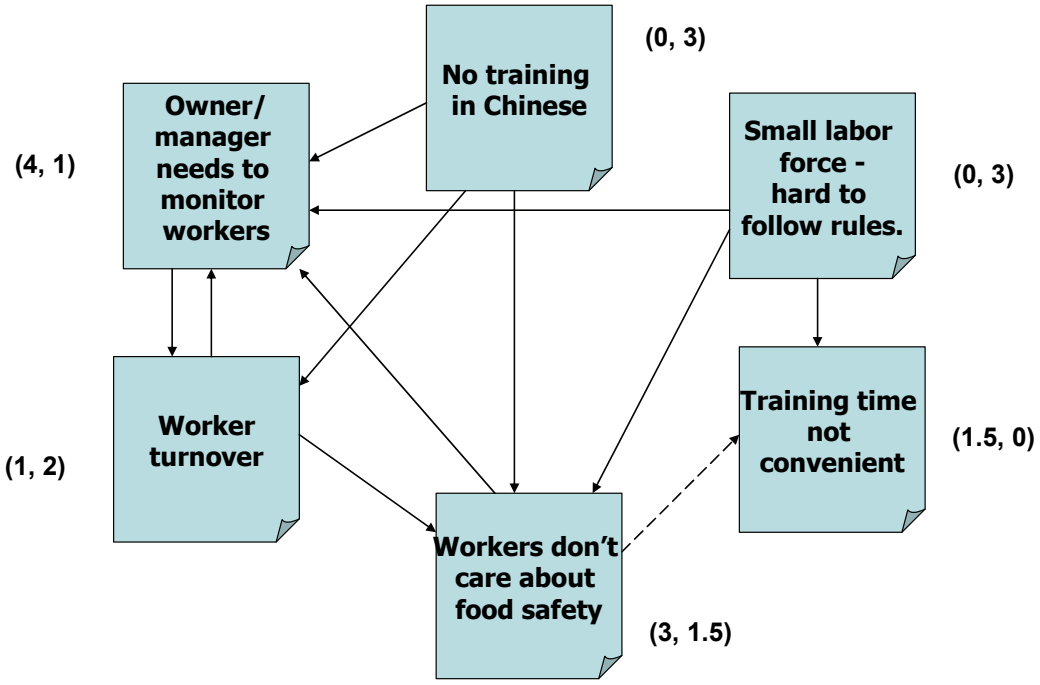
What potential problems exist that limit the Health Department from communicating food safety information to workers at Chinese restaurants?

ANSWERS	ANSWERS PRIORITIZED
1. No training in Chinese	1. No training in Chinese
2. Small labor force; less workers to do jobs; harder to follow rules	2. Owner/manager needs to continually reinforce food safety concepts to workers
3. Training time not convenient – would be better during slow times (mon & tues 1-5pm each day)	3. Workers don't care as much about food safety
4. Workers don't care as much about food safety	4. Training time not convenient – would be better during slow times (mon & tues 1-5pm each day)
5. Worker turnover	5. Worker Turnover
6. Owner/manager needs to continually reinforce food safety concepts to workers	6. Small labor force; less workers to do jobs; harder to follow rules

In order to further identify the root cause, an **Interrelationship Diagraph** was used to study the cause and effect relationship between prioritized answers from the NGT exercise. The answers from the NGT exercise were arranged in a circle and then a line was drawn between answers if a relationship exists.

Interrelationship Diagraph

Causes from Nominal Group Technique Exercise



Next, an arrow was drawn on the line pointed to the item that is most affected by the other. The number of arrows going in and the number of arrows stemming from each cause were counted. The factor or cause with the most outgoing arrows is ranked the highest. In this case, the cause "No Training in Chinese," was ranked the highest and correlates with results of the other tools used to identify the root cause of the low ServSafe passing rate. "Small Labor Force," was also identified as a significant cause. However, the problem of a small labor force is not a factor that can be controlled by GTCHD and therefore the QI team focused on the issue of "No Training in Chinese." At this point in time, the QI team decided to revise the initial aim statement:

By January 15, 2011, food service workers from Chinese restaurants will demonstrate a 20% increase in the ServSafe exam passing rate.

Step Four: Identify Potential Solutions

GTCHD QI team identified potential solutions based on root cause analyses and focus group data which identified the language barrier as the root cause for the low ServSafe passing rate among Chinese food service workers. One potential solution was evident in order to meet the requirements of the aim statement: Structure a ServSafe course specifically for Chinese food service workers. Key components of the improvement would include teaching the course in Simplified Chinese using a bilingual instructor or interpreter, structuring the course to fit with student's busy schedules, and providing the course free of charge to encourage participation.

Step Five: Develop an Improvement Theory

GTCHD QI team developed improvement theories to increase food safety knowledge among Chinese food service workers.

- If GTCHD provides a ServSafe course which is taught using the Simplified Chinese by means of a Chinese instructor/interpreter, Chinese text books, and Chinese exam forms, then Chinese food service workers will demonstrate a 20% increase in the ServSafe exam passing rate.
- If GTCHD schedules the Chinese ServSafe course on a Monday and Tuesday which are slow days for Chinese restaurants, then the number of potential students will be maximized.
- If GTCHD offers the Chinese ServSafe course free of charge, then Chinese restaurant owners will be more likely to send kitchen staff to the training.

Step Six: Test the Theory

GTCHD planned a Chinese ServSafe course and exam.

- GTCHD contacted an Epidemiologist from Public Health Muskegon County who speaks Chinese and English fluently to assist with GTCHD's class.
- GTCHD collaborated with the Genesee County Health Department who provided GTCHD with a professionally produced DVD of a Chinese ServSafe course.
- GTCHD QI team scheduled a special two-day Chinese ServSafe Course for Monday, August 30th and Tuesday, August 31st, 2010.
- GTCHD developed a flyer advertising the Chinese ServSafe Course and had it translated into Simplified Chinese. The flyer was hand delivered to all the Chinese restaurants in Grand Traverse County six weeks prior to the course.
- Despite the advertisement and follow-up visits and phone calls to area Chinese restaurants, only eight students signed up for the class.
- The Chinese ServSafe course was a combination of the Chinese ServSafe video presentation and discussion and review. Also, the GTCHD ServSafe instructor interacted with the students using the Epidemiologist as the interpreter.

Step Seven: Study the Results

Three out of eight students passed the Chinese ServSafe exam which yielded a 37.5% passing rate. The course results did not meet the GTCHD QI team aim statement requirement of a 62% passing rate or higher. Some of the problems observed during the ServSafe Course:

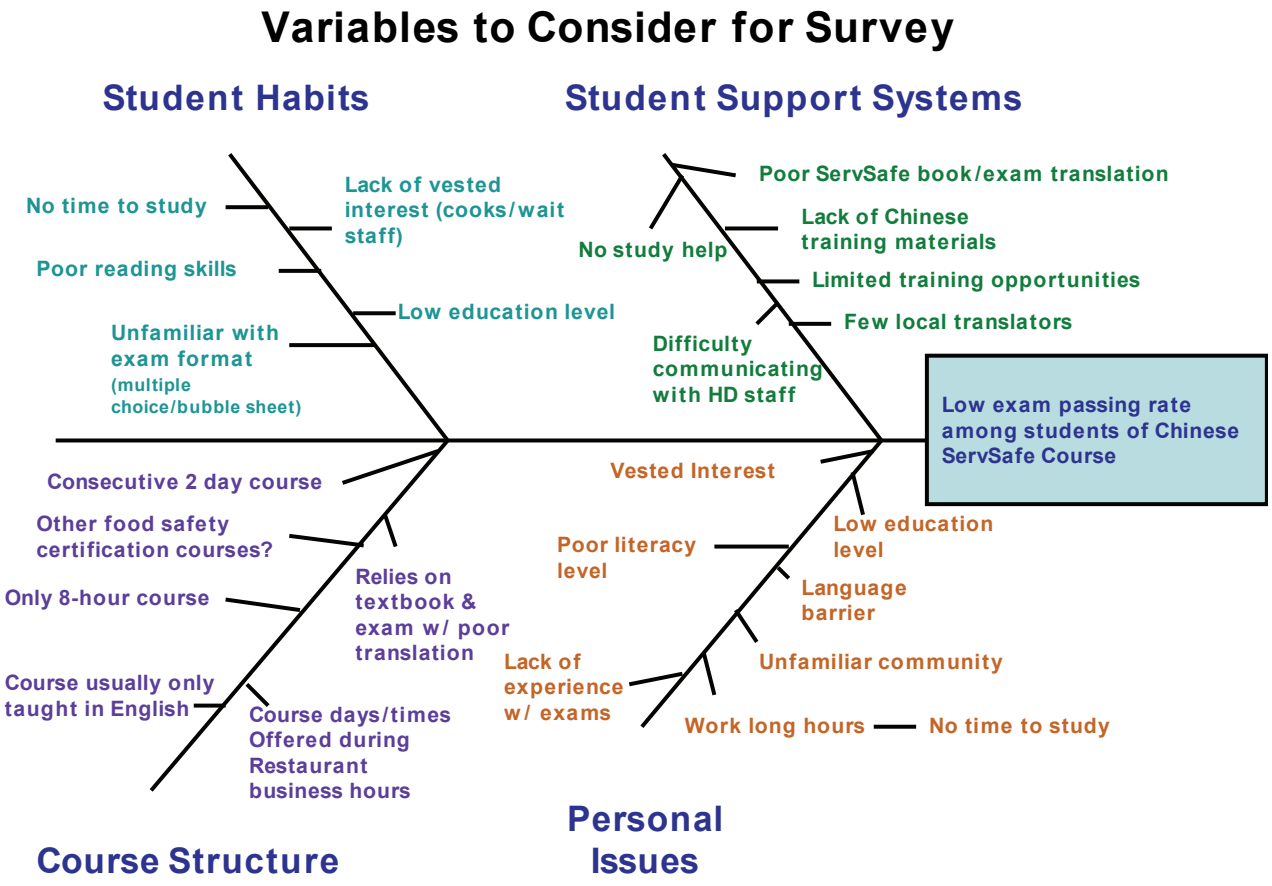
- Two of the students only attended the second day of the course missing the bulk of instruction.
- One of the students was a last minute substitution for a student and did not have an opportunity to study the textbook in advance.

- Most of the students had a difficult time understanding and completing the exam "bubble sheet." They simply had never encountered this type of answer sheet for an exam.
- The exam results indicated that one student received zero points. This confirmed the existence of the "bubble sheet" confusion.
- The small class size magnified any variation and therefore the statistical significance of the theory test is questionable. However, the mitigating factors must be explored.

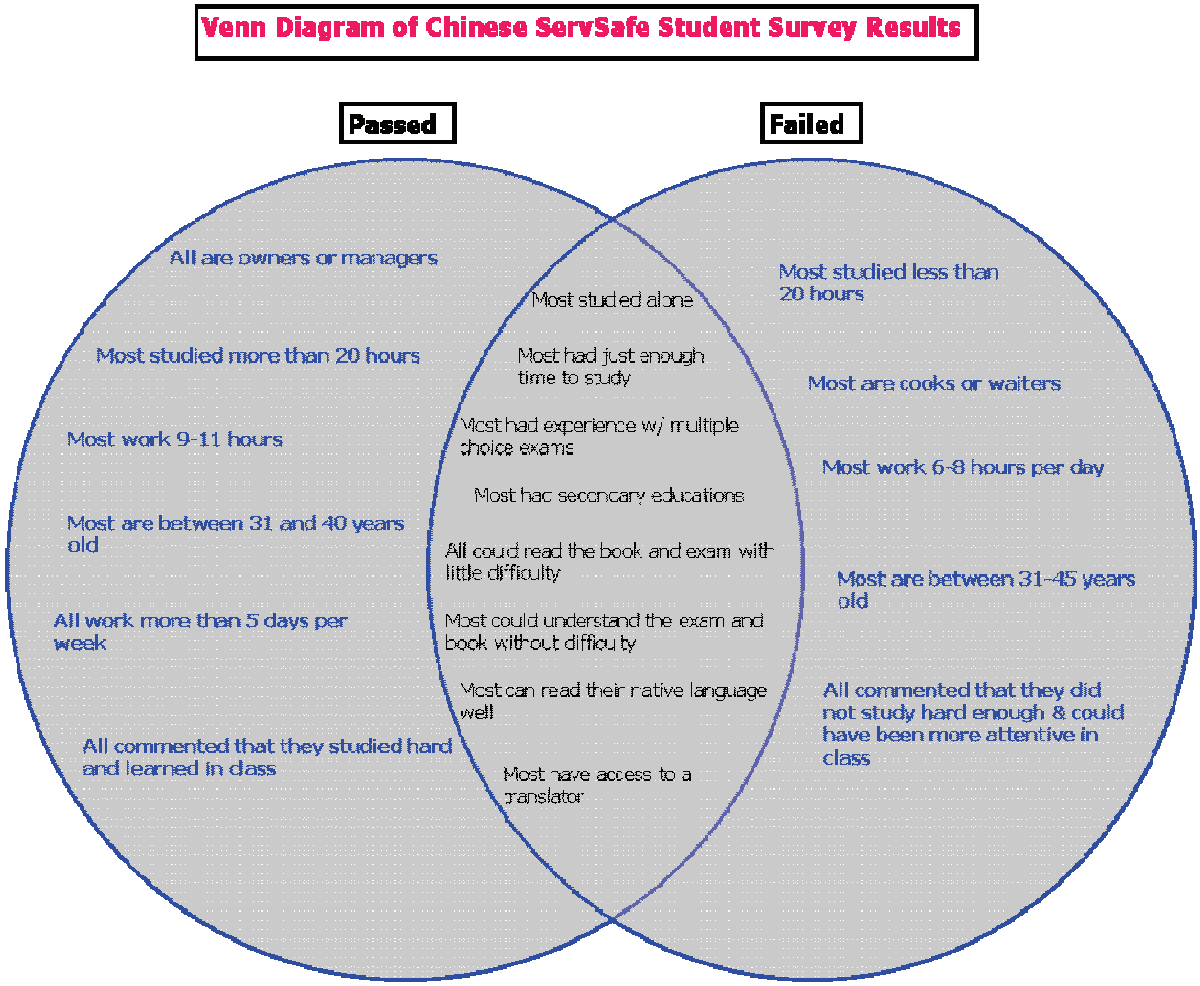
Step Eight: Standardize the Improvement or Develop a New Theory

After the results were studied and proved the original aim statement had not been met, it was evident the root cause of the problem was still lingering. The QI team did recognize that there were some great achievements. A positive rapport was developed between GTCHD and owners/mangers/food service workers from Chinese restaurants. However, as highlighted by the poor exam results, there are obviously other variables that are contributing to the low ServSafe passing rate. The QI team decided to develop a survey to distribute to all of the ServSafe students from Chinese restaurants that had taken past courses taught in English and this special course taught in Chinese.

The QI team used a **fishbone diagram** to develop the survey and it was then translated into Chinese.



The surveys were hand delivered to each student and then collected two days later with a 94% return rate. In an effort to find common factors, a **Venn diagram** was constructed to compare those who passed the exam and those who failed.



An examination of the Venn diagram outlined similarities and differences between the two groups. The QI team focused on the unique differences highlighted by the diagram. The fact that all those who passed were owners or managers indicates that "vested interest" may be a significant factor. Cultural differences or social class may be issues that are not apparent on the surface. Anecdotal information obtained from informal discussions with restaurant owners and discussions during the focus group indicated that many of the Chinese food service workers come from poor rural areas of China with minimal educational opportunities. In fact, the QI team interpreter revealed that handwriting and grammar skills of those students who failed the ServSafe exam were generally more basic and elementary than those who passed the exam. These observations are anecdotal, but the combination of low education level and low vested interest may be a root cause of the low ServSafe passing rate. Vested interest may be a more significant variable than low education level. Some States require a "food handler's card," which is obtained after passing an approved training program. Workers have a vested interest in passing the training course which may lead them to take extra measures to pass the course, i.e. seek a tutor, study harder, form study groups, etc. In Michigan, the food code only requires the person in charge to be certified. In order to effectively increase vested interest among Chinese food service workers, an incentive may be needed to perform well.

Step Nine: Establish Future Plans

Initially, the effort to increase the ServSafe exam passing rate among Chinese food service workers seemed like it was going to be black and white. Provide training in the student's native language and they will be more likely to pass the exam. In reality, this QI project has uncovered the complexity of the potential root causes and their interrelationships. The lessons learned during this QI project were used to inform future actions which are outlined below:

- Structure a basic food safety training course for the Chinese food service workers
- Determine possible incentives for Chinese food service workers to participate in food safety training (i.e. increase vested interest)
- Establish an aim statement for new PDSA cycle

Closing Commentary:
Initially, GTCHD QI team was extremely disappointed not to meet the aim statement and have an "unsuccessful" QI project. However, after further study, there was a realization of positive accomplishments and potential for real improvement. The QI team did succeed in improving the relationship between the health department and the owners/mangers/food service workers from Chinese restaurants. The GTCHD's clients were genuinely pleased with the efforts to help them succeed. Also, a foundation of knowledge has been built regarding the cultural differences and complex relationships within Chinese restaurants. Truly, the needs of food service workers from Chinese restaurants are better understood now more than ever. Obviously, there is still much work to be done to achieve the ultimate goal of improving food safety in Chinese restaurants. Great potential exists to build on the accomplishments and make some real improvements in the future to turn this experience into a true "success."

One of the most significant outcomes of this project is the paradigm shift that has occurred within the QI team. Team members can no longer simply speculate or assume the origin of problems within their respective public health programs. Everything is now viewed through the lens of QI. Involvement in the MLC-3 project has already changed the way things are being done within GTCHD. However, the new challenge is to maintain momentum in these times of tight budgets and increasing responsibilities. The QI team identified three steps to insure that QI continues and grows within the organization:

1. Establish a committee within the administrative team to develop a department policy regarding QI.
2. Establish a work plan to train supervisors, coordinators, and professional staff within specific programs.
3. Develop and prioritize future QI projects within the GTCHD. Mentor the staff involved.

Case Summary Narrative– Hennepin County Human Services and Public Health Department

Agency:
Hennepin County Human Services and Public Health Department
Minneapolis, Minnesota

Quality Improvement Project Title:
Increase Health Care for the Homeless Clinic Visits and Encounters at the People Serving People Shelter

Size of Jurisdiction Served:
Hennepin County, the largest county in Minnesota, is located within the Minneapolis/St. Paul Metropolitan Area. Minneapolis, the most populous city in Minnesota, is one of 46 municipalities within the county. The county encompasses 611 square miles with an estimated population of 1.1 million.

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Introduction
Hennepin County Human Services and Public Health Department (HSPHD) served as a Public Health Accreditation Board (PHAB) Beta Test site. HSPHD's self-assessment process illuminated a number of issues needing attention within the health department. One of the assessment measures rated partially demonstrated was in Domain 7: identify and implement strategies to improve access to health care services. Hennepin County choose to use the PDSA cycle to address a growing concern that while the number of homeless individuals using homeless shelters in Hennepin County has increased, the number of clinic visits at HSPHD's Health Care for the Homeless Project (HCHP) clinics operated in eleven homeless shelters has decreased.

PDSA Steps

Step One: Getting Started
Feedback from HSPHD's accreditation site visit showed that identifying and implementing strategies to improve access to healthcare services was an area of weakness for HSPHD. At the local level, assessments showed an increase in homeless shelter usage in Hennepin County but a decrease in medical appointments within the HCHP operated by HSPHD. County leadership felt that PHAB standard 7.2.3- lead or collaborate in culturally competent initiatives to increase healthcare access for underserved and at risk populations, would be ideal to address through a formal quality improvement (QI) project. The HSPHD executive committee provided full support for this and future efforts.

Step Two: Assemble the Team
QI team members were identified and chosen based on their knowledge and role with the HCHP. HSPHD also selected staff that had experience working at the project's clinic, the People Serving People (PSP) homeless shelter in Minneapolis. Ultimately, the team included not only the full spectrum of operational, clinical, and managerial perspectives, but it included seasoned as well as new staff. HSPHD's goal was to create an interdisciplinary team to develop a broad base of support and ensure that regularly scheduled QI meetings were efficient and roadblocks were identified early and addressed proactively.

As stated previously, HSPHD decided to focus on a significant problem the department was facing in the HCHP. While the number of homeless persons accessing shelter services is increasing, the number of reported visits and encounters at the PSP shelter HCHP clinic is decreasing.

Step Three: Examine the Current Approach

The QI team used **brainstorming** to develop a list of potential problems that might be driving this reduction in clinic encounters and visits at PSP. The brainstorming process was a useful part of the overall project, not only because it gave the team an opportunity to identify a wide range of potential problems, but because it also provided a forum for everyone to share their individual views across a number of issues.

The following ideas were generated as a result of the brainstorming session:

- Decreasing the no-show rate is important
- Increasing the number of new people served needs to be considered
- Orientation – how is this effort captured?
- Time directed at providing shot records and immunization records. Is there a way to do this more efficiently?
- Other service providers experience no-shows at PSP. Is there something the team can learn from them?
- How can HSPHD reflect community outreach better?
- Is all the work currently being carried out effectively documented?
- What can the team learn from other HCHP sites about no-shows?
- Need to track services that are provided, but not counted. In the pre-EPIC days all family members at that appointment were counted. Now, these numbers are not collected and do not appear on reports. What are some other data collection issues that can be addressed to increase numbers?

The brainstorming process was the beginning of the team exploring the connection between the mid-2009 implementation of EPIC, the department's electronic health record (EHR), and a corresponding decrease in the number of visits and encounters being reported at PSP. One likely explanation the QI team considered was that while HCHP had historically operated on a walk-in basis, an appointment-based system was implemented in tandem with EPIC. What happened in this transition? Was this new service delivery model responsible for the reduction in numbers? To explore this possibility, the team developed the first iteration of an aim statement:

By December 4, 2010, increase by 10% the number of encounters from (number)/month to (number)/month; and the number of clinic visits from (number)/month to (number)/month at PSP.

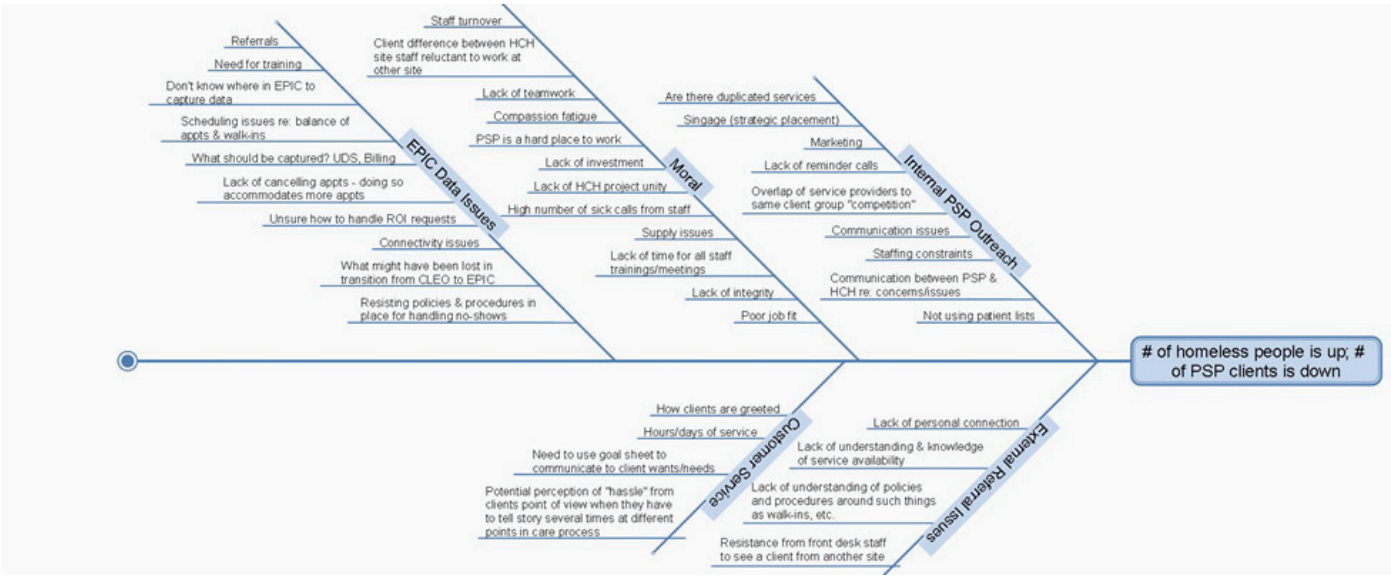
The QI team examined the current approach by developing a survey comprising four questions:

1. How do clients come to you (e.g. walk-in appointment requests, referral from shelter team, outreach, etc.)?
2. What do you record in EPIC (e.g. medical appointment information, demographics, helping with transportation, lab results, etc.)?
3. What types of follow up do you do with clients (e.g. making future appointments and referrals, providing immunization data, obtaining medical records from other providers, etc.)?
4. What ideas do you have to better reflect in EPIC the volume of work that you do?

The survey was distributed and completed by eight staff persons, all of whom played key roles in clinic operations. Survey results were compiled and the results were used to inform root cause analysis.

A **fishbone diagram** was used to conduct root cause analysis. Much like the original brainstorming session that was used to generate the list of potential problems, the root cause analysis netted many benefits including overall buy-in to the project, mutual understanding of the problem, and a realization of how one operational process impacts another. It became clear that one error would be expansive and increasingly problematic as it moved through the system.

The results of root cause analysis identified a number of key issues. The fishbone diagram went through a second draft process where issues were added and 'bones' were re-categorized.



From this, the team went through a **nominal group process** where issues were ranked and prioritized. The number one improvement to be tested was in the area of EPIC data issues, specifically clinic no-show rates. Based on currently tracked data, the team determined that provider productivity was the best method to measure changes in the clinic's no-show rate. The baseline data consists of provider encounters per clinic hour averaged for the two month time period of August and September, 2010. This analysis demonstrated a baseline encounter of .79 encounters per provider per clinic hour.

After further consideration the team determined that the original aim statement did not accurately measure changes in the clinic's no-show rate. Rather than the number of encounters, provider productivity was selected as a better measure because the PSP clinic schedule is flexible and inconsistent. Measuring provider productivity controls for this inconsistency serves as a better measure to reflect changes in no-show rates. The original aim statement was revised to reflect this new approach: By December 4, 2010, increase by 50% the number of provider and public health nurse encounters per clinic hour from <1 per hour/per provider to 1.5 per hour/per provider.

Step Four: Identify Potential Solutions

Once the QI team began to discuss potential improvements, it was clear there were many options for resolving the issue. Some of the potential improvements discussed, but not selected included:

- Morale - while a definite concern at the PSP site, the topic is too broad, difficult to measure, and does not lend itself well to the time-limited nature of this QI project.
- Internal PSP Outreach - there is general agreement on what improvements can be made to improve internal PSP outreach, and these improvements can be made outside the scope of this project.
- Customer Service - an important issue that spans the entire HCHP and in particular, the PSP site. However, improvements here require collaboration and problem solving beyond the scope of this project.
- External Referral Issues - An issue across all programs in the HSPHD that would require extensive exploration and remedy beyond the scope of this project.

The solution selected centered on EPIC data issues. At the time of EPIC implementation, PSP clinic flow was modified to accommodate the lengthy registration and scheduling process required by the new system. PSP staff did not have the skills to operate a clinic schedule on a walk-in basis and in response clinic flow was modified to an appointment-based model. The QI team believed that the appointment-based system that was implemented was cumbersome and created barriers to efficiently seeing clients. It added a level of complexity to clinic flow that distracted and overwhelmed clinicians, and created barriers in communication between registration staff and provider staff, which led to further confusion and frustration. Additionally, by focusing on EPIC data issues the team believed they would have the potential to positively impact the other problems that were identified, but not selected.

Step Five: Develop an Improvement Theory

HSPHD developed the following improvement theories:

- If HCHP reverted to a primarily walk-in service delivery system, then the number of reported encounters at the HCHP PSP clinic would increase.
- If barriers are removed that the EPIC appointment scheduling system created, then clinic no-show rates will decrease, providers will be more productive, and more clients will be seen.

A policy was drafted for the walk-in service model and shared with a small group comprising EPIC system experts that provided training to HCHP staff. Feedback was gathered from EPIC experts then incorporated into a second draft, which was approved at a QI Team meeting. All HCHP PSP staff were trained in the new policy.

The policy began in mid-October 2010. The team's original plan was that data would be collected at the end of October 2010, and again at the end of November 2010, for the purposes of the Beta Test project. However, because of the short timeline of the QI project and issues uncovered during the Study stage, data were collected through March 2011.

The QI team's original plan for data collection included three main sources:

- EPIC: total provider encounters
- Time cards and staff schedules: Nurse Practitioner (NP) and Licensed Practical Nurse (LPN) time
- HCHP clinic schedule: available clinic hours

Step Six: Test the Theory

HSPHD's improvement process did not proceed as planned. Although the walk-in policy was developed by staff persons responsible for its implementation and communicated to all individuals involved, the team discovered at a check-in meeting one month into the Do stage that the policy was not implemented. The QI team was surprised to learn this, and discovered there were two central issues: 1) a breakdown in communication about how and when the policy was to be implemented, and 2) a roadblock in the registration/scheduling process with how walk-in client arrival data were entered. Client arrival data are entered on all clients as they come into the clinic. It appears there were issues with how walk-in arrivals were managed in the EPIC system including confusion around how clients were checked in as part of the arrival process. As a result, a tip sheet was developed and is now being utilized to remedy these issues.

Step Seven: Study the Results

Unfortunately, since the policy was not implemented as planned, there was little to measure, and the team was unable to determine if the QI process had the intended effect. As a result, the QI Team regrouped and worked to develop a new improvement theory that provided more coaching and support to staff to ensure the walk-in service policy was correctly and effectively implemented. The improved implementation strategy was implemented in January 2011 and new measurement data were collected through June 2011.

Health Care for the Homeless People Serving People NP/MD Visits

	Month	Medical Providers	Clinic Hours	Visit/Clinic Hour
Pre-QI	August 2010	115	136	0.85
	Sept	99	136	0.73
	Oct	144	136	1.06
	Nov	113	113	1.00
Post-QI	Jan 2011	79	118	0.67
	Feb	158	102.5	1.54
	Mar	171	115	1.49
	Apr	128	102	1.25
	May	108	82.5	1.31
	June	146	91	1.60

Step 8: Standardize the Improvement or Develop a New Theory

Five months of data showed an increase in the number of nurse practitioner clinic visits per hour. Based on this data, HCHP leadership implemented a walk-in service policy at all HCHP clinical location.

Step 9: Establish Future Plans

HSPHD's data collection process went relatively well and the team was easily able to collect the data needed on appointments, client specific scheduling histories, completed encounters per clinic hour, and nurse practitioner hours. However, one issue was discovered in the Do stage; the team learned that public health nurse data are difficult to capture and analyze because of how and when public health nurses document their time. Consequently, results only reflected nurse practitioner time. Undertaking this QI project brought this issue to light. Efforts are now underway to determine an efficient method of tracking non-nurse practitioner provider time.

Closing Commentary:

The QI project provided HSPHD with an opportunity to explore a problem the department may otherwise have overlooked. Using the PDSA QI framework helped HSPHD shape a meaningful intervention within a defined time period. The QI team found it helpful to have a variety of tools from which to choose from, and appreciated the simplicity of the QI reporting process.

Overall, HSPHD views this QI project a success as the QI team was able to increase healthcare access for an underserved and at risk population. Since the time of this QI project, HSPHD has developed a public health specific strategic plan that sets organizational objectives at all levels of the service area, defines indicators to measure progress toward achieving objectives, and identifies areas which require focused QI using the PDSA cycle.

Case Summary Narrative– Mahoning County District Board of Health

Agency:
Mahoning County District Board of Health, Youngstown, Ohio

Quality Improvement Project Title:
Time Reduction in Conducting Point of Sale Real Estate Septic and Well Inspections

Size of Jurisdiction Served:
172,000

Contact Name and Email Address:
Mary Helen Smith, Director of Environmental Health, mhsmith@mahoninghealth.org
Matthew Stefanak, Health Commissioner, mstefanak@mahoninghealth.org
Nicholas Cascarelli, Carroll County Health Commissioner, NCascarelli@carroll-lhd.org

Introduction
The Mahoning County District Board of Health enacted a regulation in 1997 requiring the inspection of septic systems prior to the sale or transfer of residential properties. At the time, the Health Commissioner committed to realtors who are required to comply with this regulation that these inspections would be completed in a timely manner—in most cases within two weeks. Although the Board of Health received few complaints from realtors about the timeliness of these inspections over the years since then, the Health Commissioner asked for more information about how adherent to this promised turnaround time the Board of Health had been. Through this QI project, the Board of Health saw opportunities to benchmark and improve its performance in meeting a commitment to timely inspections and more closely engage the realtor community.

PDSA Steps

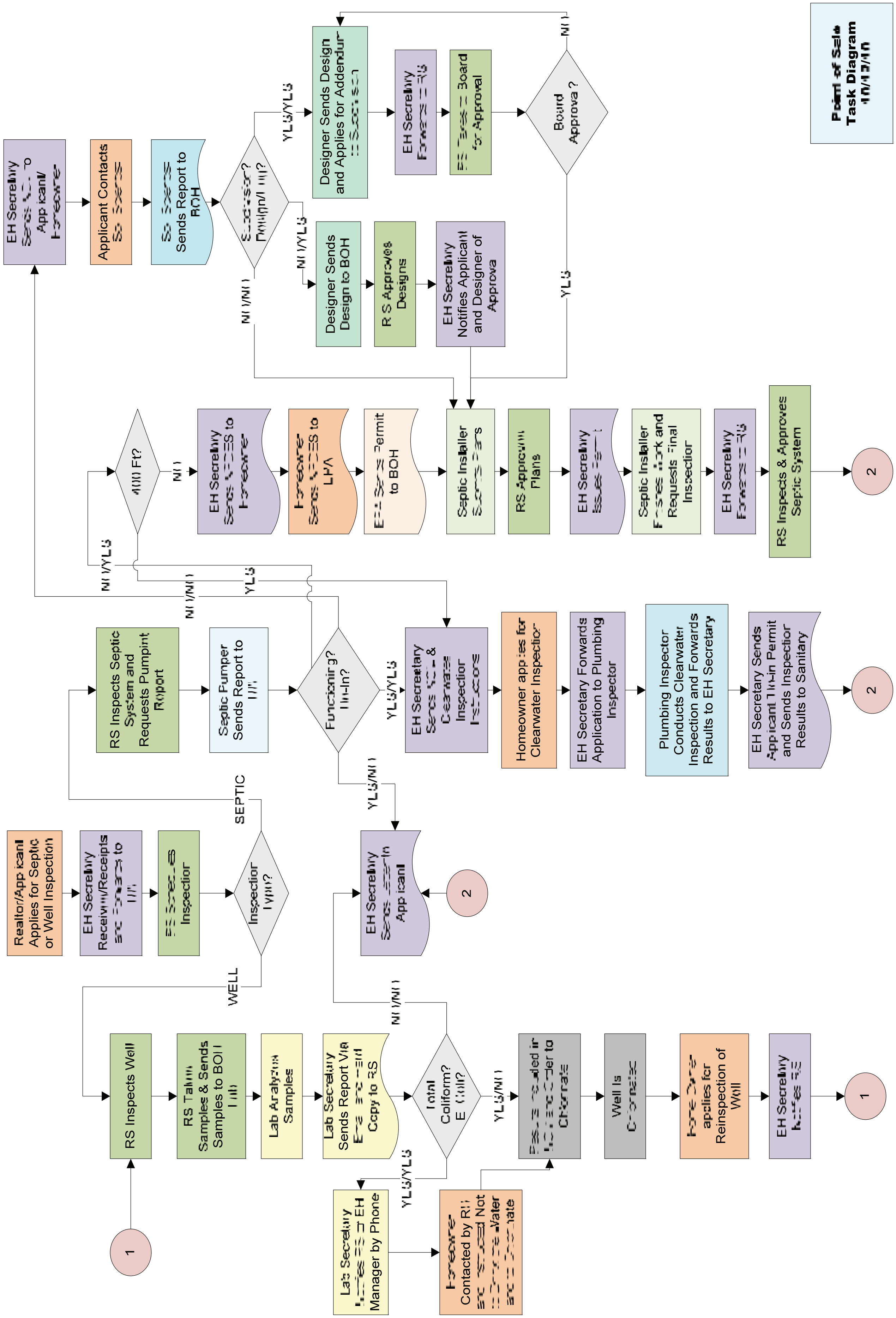
Step One: Getting Started
The Mahoning County District Board of Health (MCDBOH) has a longstanding commitment to local realtors to respond promptly to requests for inspections of residential septic and well systems when properties are listed for sale. The health department decided to examine the current performance to determine if these inspections were being completed in a timely manner.

Step Two: Assemble the Team
The team members who were Board of Health employees were chosen because they specifically work in the Septic and Well Inspection Program. The team facilitator serves as the Accreditation Coordinator for the department and has experience facilitating quality improvement (QI) teams. The MCDBOH also wanted to involve some realtors as they are key external stakeholders to this process. As a result, the QI team invited members from the local realtors association.

The QI team encountered some difficulty with getting members of the realtors association to attend regular team meetings due to scheduling conflicts. The team overcame this barrier by meeting at the realtors association early in the process to engage them and express the value of their input in the process. The QI team also reduced the requirement to attend all meetings.

Step Three: Examine the Current Approach
The QI team first used business process analysis tools to create a **process map** to represent the current process for septic and well inspections for real estate transactions. Each inspector is assigned a geographically contiguous cluster of townships within the county to control travel time and costs.

Process Map


Realtor/Applicant Applies for Septic or Well Inspection
Inspection Type?
SEPTIC
WELL
RS Inspects Septic System and Requests Pumpint Report
Septic Pumper Sends Report to
Functioning? Tie-In?
RS Inspects Well
Lab Analyzes Samples
Total Coliform? E Coli?
Homeowner applies for Clearwater Inspection
EH Secretary Forwards Application to Plumbing Inspector
Plumbing Inspector Conducts Clearwater Inspection and Forwards Results to EH Secretary
Applicant Contacts
Sends Report to BOH
Designer Sends Design to BOH
RS Approves Designs
EH Secretary Notifies Applicant and Designer of Approval
Board Approval?
RS Approves Plans
RS Inspects & Approves Septic System
Lab Secretary
Manager by Phone
Point of Sale Task Diagram

Next, the QI team worked through a **force field analysis** to look at where the process tends to slow down and may cause the process to unnecessarily take longer. The team used the force field analysis to **brainstorm** potential reasons that point of sale inspections might be taking longer than needed. Force field analysis is a QI tool that is used to look at forces or factors in support of or working against a problem. It analyzes the balance in a system by identifying the stakeholders, target audience, barriers, and driving forces that can impede a process (restraining forces) or promote change (driving forces) for QI. From the QI team's analysis it was decided that unequal distribution of labor was the strongest force against reducing the department's turnaround time for inspections.

Below is a list of the restraining forces identified through the force field analysis:

- The step in the process whereby the lab secretary is supposed to notify the inspector of the results of the well test sometimes takes longer than expected
- Time it takes for the inspector to schedule the inspection
- Time it takes for the septic pumper to send the report to the Board of Health
- No system in place to follow-up on the Clearwater Inspection Report for those properties who are required to tie into the sanitary sewer and cease using their septic system
- Realtors wait too long to apply for inspections
- Waiting on external parties when the case dictates - the involvement of the EPA, a soil scientist, Board of Health approval, or engineers
- Lack of follow-through on part of the homeowner
- Inspector forwards hand written notes to be typed by secretary
- Each inspector may do this process a little differently
- MCDBOH requires the septic system pumped even if it is functioning properly
- Variance in inspector workloads

Step Four: Identify Potential Solutions

We evaluated whether or not some of the items indicated as restraining forces were within our control and could be changed in a short timeframe so that they could be tested. The team decided by consensus the change to test using this criterion. In examining the baseline data that follows, the department will test a more equitable redistribution of the workload among the three inspectors to reduce the time it takes to conduct the inspection.

The QI team looked at two sets of baseline data. The first set of data involved collecting the time it took to complete various critical points in the process from the time the applicant applied for the septic and well inspection to the time the process was complete. The team collected baseline data on 55 properties during three particular time frames beginning at the end of July through the beginning of October. They found:

- The average time it took from application to scheduling was 7.4 days
- The average time it took from application to inspection was 11.8 days
- The average time it took from application to process completion was 22.3 days

The second set of baseline data examined workload. One observation from the data was that inspections in townships farthest from the health department took longer to complete. The QI team then analyzed the workload data of the three inspectors who worked in that program. Many of these inspections were conducted by the same inspector and when looking at the total workload (this includes other types of inspections beyond this process), this inspector had completed more inspections than any other in the program.

- Inspector 1 conducted 41% of inspection activities
- Inspector 2 conducted 29.5% of inspection activities
- Inspector 3 conducted 29.5% of inspection activities

Through a more equitable distribution of the workload, the QI team believes the mean time it takes from when the realtor or homeowner applies for an inspection to when the inspection is conducted can be reduced from 11.8 to 10 days.

Step Five: Develop an Improvement Theory

The QI team developed this theory:

If the workload is redistributed among the inspectors more equitably, then MCDBOH can reduce the average time it takes to conduct the septic and well inspection from 11.8 to 10 days. The mean time it takes to both schedule and conduct all septic and well inspections as a result of real estate transaction was calculated to determine if the redistribution of workload had the desired effect. The team's aim statement was:

Between October 18 and November 30, 2010, MCDBOH will reduce the average time it takes to conduct septic and well inspections for real estate transactions by 15% (from 11.8 to 10 calendar days).

Step Six: Test the Theory

The improvements were run according to plan. The redistribution of the workload began on October 18, 2010 as proposed in the plan stage. The team collected the dates of various critical incidents in the process, including the date the applicant applied for a septic and well inspection, the date they were contacted by an inspector to schedule the inspection, the date the initial inspection was conducted, and the date the approval/disapproval letter was mailed out to the applicant. Program support staff maintained these data in a spreadsheet that was periodically reviewed by the program manager and inspectors.

Step Seven: Study the Results

The data collected were sufficient to conclude that the improvement tested was effective. The QI team was able to collect all the information needed on 24 properties in the six week time frame after the improvement was put into place. The time it took from application for a septic and well real estate evaluation to when the inspection was conducted was reduced from 11.8 to 7.1 calendar days, a 40% decrease in time. This far exceeded the team's final aim statement goal of 10.0 days or a 15% decrease. Below is a summary of post-test data.

- The average time it took from application to scheduling was 2.7 days
- The average time it took from application to inspection was 7.1 days
- The average time it took from application to process completion was 13.8 days

Step Eight: Standardize the Improvement or Develop a New Theory

As a result of the success with distributing the workload, it was appropriate to adopt the workload changes among staff during the test of the improvement theory. There were no major challenges or obstacles with the change because the redistribution was actually decided and agreed upon among the three inspectors doing the work. MCDBOH continued to monitor the impact of these changes on turn-around time on point of sale inspection requests because the QI team was concerned about the effect of seasonal variation in demand for inspections on turn-around time.

Step Nine: Establish Future Plans

The QI team presented its results at the closing meeting of Public Health Accreditation Board Beta Test sites and to the members of the local association of realtors. MCDBOH continued to monitor this improvement because home sales in this part of the country tend to reach a seasonal peak in the warmer months. Demand for point of sale inspections did indeed increase during the summer of 2010. However, the improvements in turn-around time for point of sale inspections were sustained during this period.

Closing Commentary:

This QI project exceeded expectations for reducing turn-around time for point-of-sale home inspections by the health department. A recent review of program performance data suggests that these turn-around times were sustained during the 2011 peak summer season for home sales. Data collection for this QI project was completed through a "chart audit" of point-of-sale inspection requests. Since the project was completed, the health department has created an application to monitor inspection turn-around times enabling ongoing performance measurement for this program. A key lesson learned through this project is that involving external stakeholders (customers and suppliers) - in this case realtors and the testing laboratory—can increase opportunities for buy-in if process changes are necessary to improve performance. The MCDBOH currently has three QI projects underway. One is to increase utilization of the health department's health alert information by social media partners in the community; others are to measure and improve the health department's response to outbreaks of foodborne illness and nuisance complaints.

Case Summary Narrative– Mid-Michigan District Health Department

Agency:
Mid-Michigan District Health Department
Stanton, Michigan

Quality Improvement Project Title:
Improving Customer Satisfaction with the Automated Telephone System

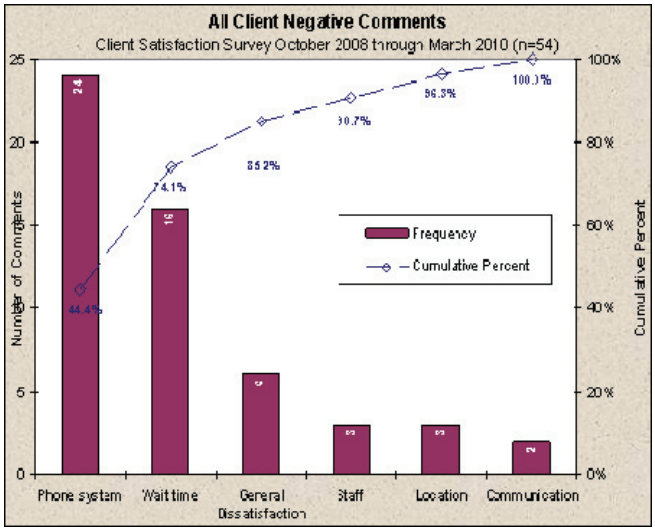
Size of Jurisdiction Served:
Three-county jurisdiction (Clinton, Gratiot, Montcalm) population: 174,574

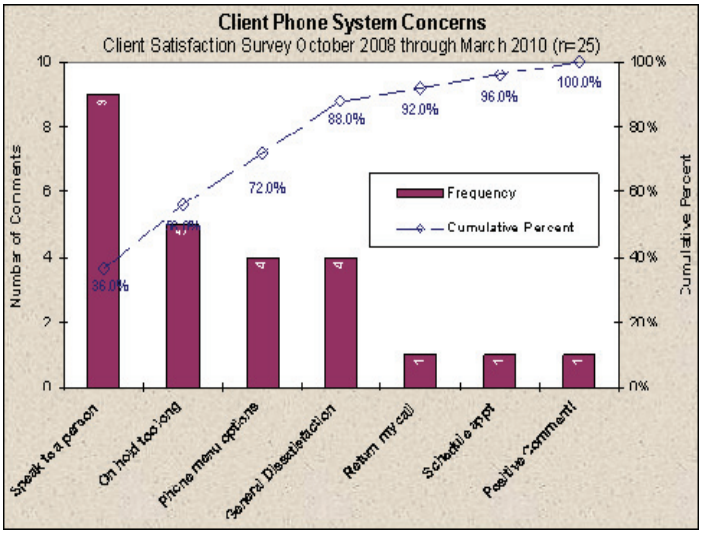
Contact Name and Email Address:
Rex Hoyt, Administrative Services, rhoyt@mmdhd.org

Introduction
Seeking cost-savings and efficiencies through new technology, Mid-Michigan District Health Department (MMDHD) implemented an automated telephone system in 2002 to receive and route incoming customer calls for its three district offices. For many customers, their initial contact with the local health department involves navigating the automated phone system. As such, the automated phone system acts as a gatekeeper to department services and plays an influential role in customer perception of service accessibility and quality. Results from MMDHD's client satisfaction survey indicated the automated phone system represented nearly 55% of all customer complaints logged in the survey during the period 2004-09 and accounted for the lowest client satisfaction scores concerning agency service delivery.

PDSA Steps

Step One: Getting Started
MMDHD identified 'customer service' as an area for improvement. In recent years, the agency had become aware that customers were increasingly dissatisfied with the ability to efficiently reach staff when calling. Through the use of **Pareto charts**, MMDHD was able to determine that over half of the negative comments recorded in the client satisfaction survey dealt with issues concerning the phone system. The QI team felt that it could improve overall customer service by targeting the health department's most frequent complaint—dissatisfaction with the automated phone system.





The resources required, as it pertained to staff time, varied depending on the tasks assigned to each QI team member, but all team members committed a minimum of two hours a week for the duration of the project to meet together, discuss, and exchange information on the progress of the QI project. The QI team involved front-line staff, data specialists, management information system specialists, and program supervisors. All team members were essential to getting the project off the ground and maintaining a sustained effort due to the fact that this problem affected the entire health department and it needed committed team members in order to effectively assess the problem and work toward a solution.

Step Two: Assemble the Team

MMDHD assembled its QI team with the understanding that members should have diverse experiences with the automated phone system and offer unique insight as to how to address the problem from both a customer service and technical point of view. The team included the Agency Health Officer (team advisor), Community Health and Education Supervisor (team leader), Data Specialist (data support), Management Information Systems Specialist (telephone system support), Public Health Representative (staff input), and Finance Department Billing Specialist (team scribe and staff input). The team members agreed to meet on a weekly basis to discuss the project and undertake the activities that developed through the process of group discussion.

After the QI team attended a two-day MLC-3 training, members began work on developing an aim statement from the available data. It became evident fairly quickly (after viewing inconclusive phone log data) that all team members needed a better understanding of the technical workings of the phone system and how phone calls were processed before attempting to identify problems or potential solutions. Therefore, the QI team's three primary objectives early in the process were 1) develop an understanding of a complex technical process (multiple county automated phone system), 2) identify where/why in this process customer dissatisfaction develops, and 3) determine if there are steps or decision points along this process that can be improved.

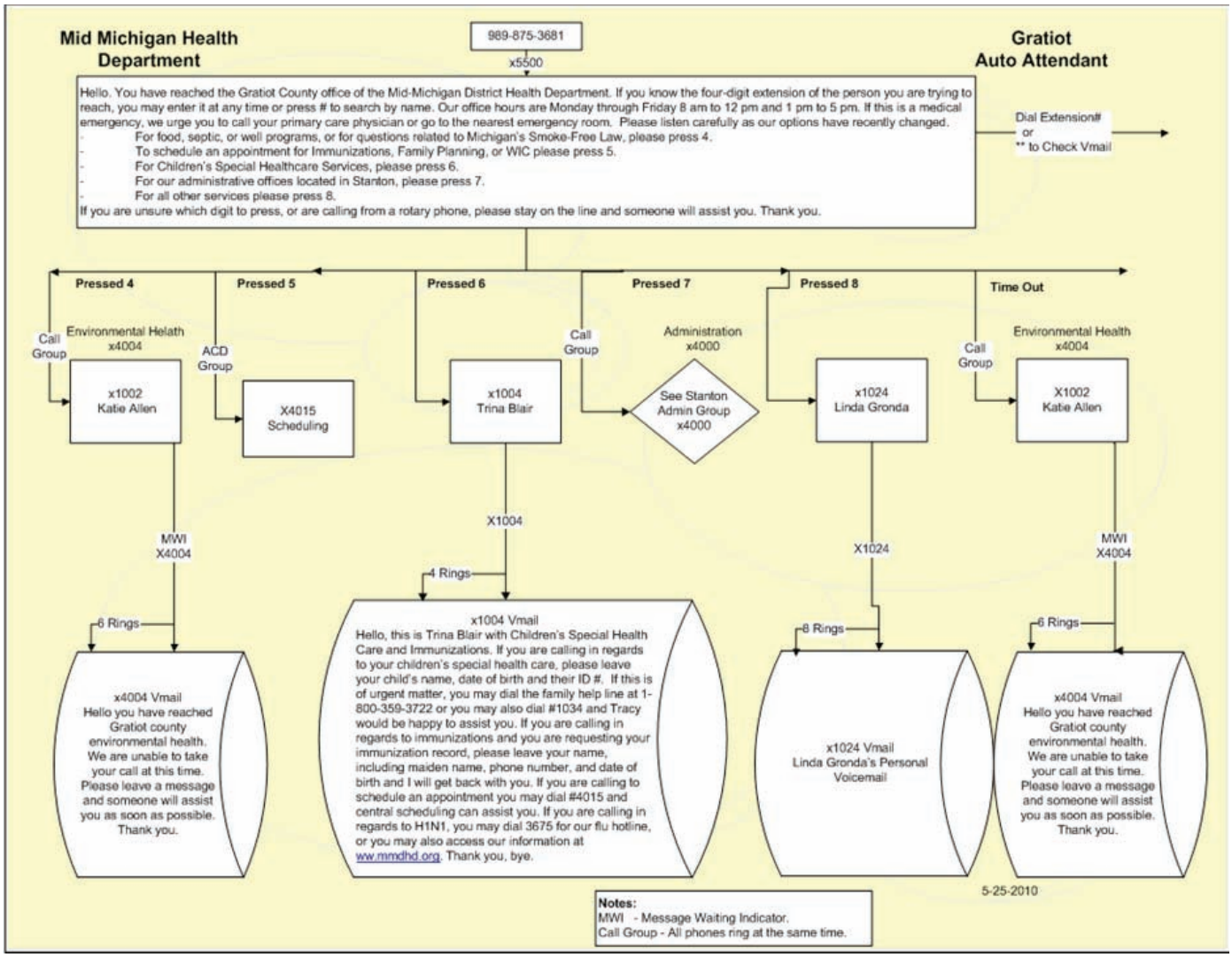
Team members developed the initial aim statement knowing the team hadn't yet identified the type of information (data) that would allow progress to be tracked; but it was none-the-less important to transfer the general concept to paper and refine the statement as more was learned about the process. The initial aim statement follows:

In order to improve customer satisfaction with the ease and effectiveness of contacting the health department via the telephone, MMDHD will reduce abandoned calls by 25% and wait times by 50%, as well as reduce customer negative responses identified in the Customer Satisfaction Survey by 50%.

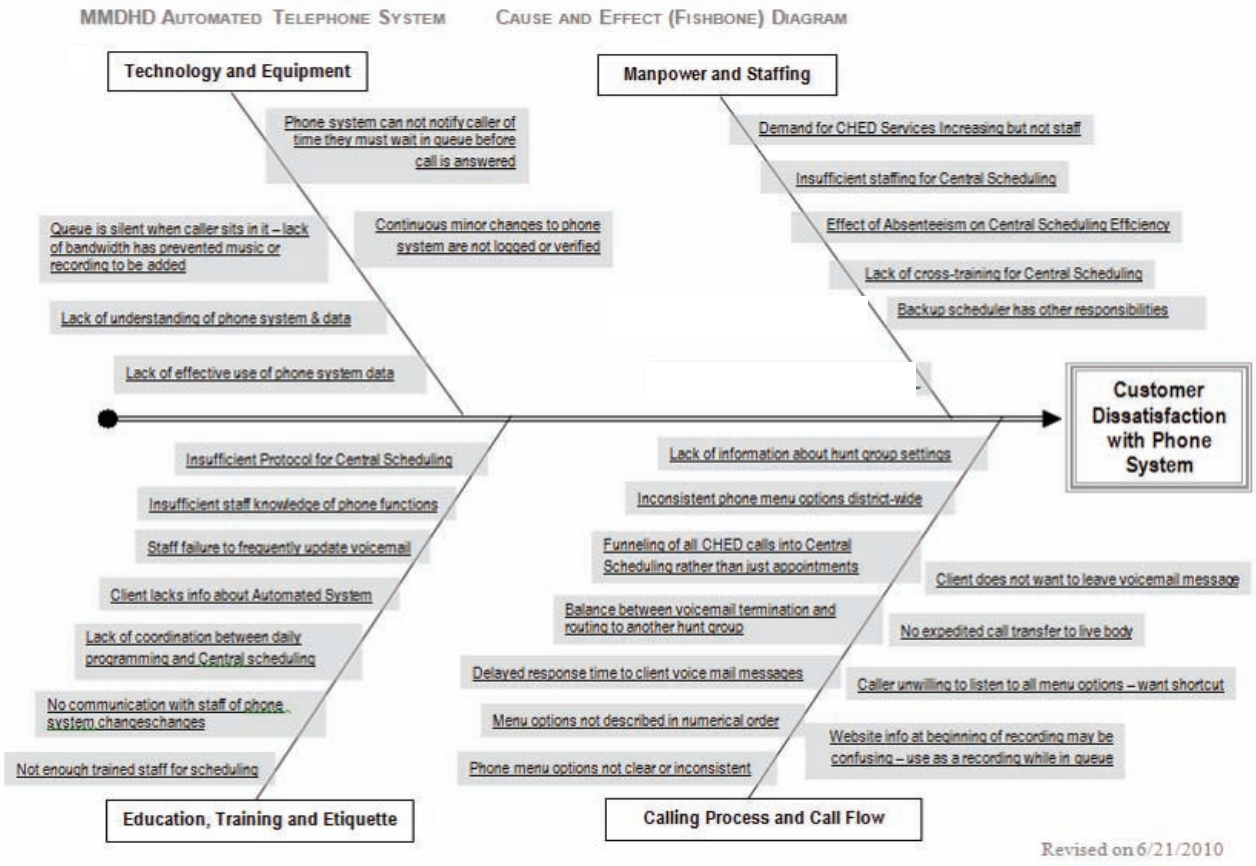
Step Three: Examine the Current Approach

MMDHD examined its current automated attendant system that presents to the caller a menu of options to reach various health department programs or to schedule an appointment. Customer feedback via a client satisfaction survey indicated that customers found the phone menu options inadequate for their needs, they had difficulty speaking to a staff person directly when calling, and they were often placed on "hold" too long.

In order to understand how the automated phone system worked, MMDHD developed call **flow diagrams** that depicted how incoming calls were processed. This allowed team members to see how the calls were routed throughout all three branch office locations and the wording of the instructions used to direct the customer to the person or service they were intending to reach. After studying these call flow diagrams, the QI team was able to visually comprehend the internal routing of calls and the specific aspects of the system that were capable of being altered to improve performance.



Although phone logs generated by the phone system provided a wealth of data about the length, time, and number of calls, this data did not suit the project's needs, as it did not provide insight about the possible causes for client dissatisfaction. Through the process of implementing additional QI tools (Pareto charts, **Fishbone diagram**, **5 Whys**), MMDHD determined that limitations in the telephone menu options and inadequate call routing were the primary drivers of customer dissatisfaction. The QI team's theory held that a client would reach the automated telephone system during a call, hear the automated attendant and a) not hear the program/service they wanted in the menu options, b) find that the menu options did not adequately address their needs, or c) not have the ability to easily access a person when they found the menu options limited or confusing.



Five Whys

Problem: I can't reach a person when I use the automated telephone system

Why 1: Someone not in the office or at their desk
Why 1: Caller doesn't know who they want to talk with
Why 1: Health department operations are complex
Why 1: Caller is telephoning outside of regular business hours
Why 1: If intended recipient is on phone, caller gets their voice mail
Why 1: Caller operator error within automated system
Why 1: **Menu options are unclear or don't fit the callers' need**
- Why 2: Choices are too specific
- Why 2: Choices are too narrow
- Why 2: Choices are spoken too rapidly
- Why 2: Caller missed options while listening
- Why 2: Choices are too vague; script is too
- Why 2: Caller doesn't like "sub menu's" (branches from the main options)

Why1: **There is no menu option to allow caller to speak to a "real person"**
- Why 2: There is no single designated person for them to talk to
- Why 2: Caller may still get a voice mail, even with dedicated "operator", if line is busy
- Why 2: Is there is a single designated person for callers to speak with, they may be deluged w/calls
- Why 2: If there is an option to speak to a "real person", callers will discontinue using the other options.

Why 1: **Automated system is set up to loop back to the beginning of the menu**
- Why 2: No termination point within auto attendant
- Why 2: Design flaw within the system
- Why 2: **Caller doesn't want to leave a voice mail, so they get back into the system**
  - Why 3: The call is urgent
  - Why 3: Caller needs a timely response
  - Why 3: Caller afraid they won't get a return call

Why 3: Call is of a personal nature or content
Why 3: Caller does not have a telephone for a return call (borrowing phone)
Why 3: The call relates to an appointment scheduled for that day
Why 3: Unclear voice mail message, caller thinks they have wrong recipient
Why 3: Some people are uncomfortable with recording messages/technology

In order to confirm this theory, the QI team developed a **Checksheet**, with the assistance of the Public Health Representatives (PHR's) who receive most of the customer calls. The goal of the Checksheet was to gather information directly from the client while they were on the telephone with a staff person and, in particular, determine what proportion of callers were having difficulty reaching their intended program of need, how they were getting routed to the wrong program, and if there were specific programs that were affected. With the assistance of MMDHD's PHR's, the QI team captured necessary baseline data from over 500 customer calls during a period of two weeks. Data gathered at the beginning of the project indicated that 30% of all incoming customer calls were misrouted to the wrong program or service.

MMDHD determined, through the results from the Checksheet, that the best option for improving customer service was to focus on decreasing misrouted calls. This, in turn, would decrease the frequency of abandoned calls, unnecessary call transfers, and dissatisfaction with the phone system. The modified version of the aim statement reads:

In order to optimize the performance of the automated telephone system for clients calling the health department, MMDHD will reduce misrouted calls originating from the auto attendant by 25% by February of 2011.

TELEPHONE CHECKSHEET

PHR's NAME:_____ **CALL GROUP EXT:** _____

*__Statement:__ We are trying to improve our phone system and would like to ask you a few questions-is that okay?

*Do not code multiple days on the same sheet DATE:_____

*Please give completed forms to Jamie Sorgenfrei directly or by inter-office mail, by 8/16/10

Thanks, MLC3 Quality Improvement Team

Was this call intended for you or your call group? (Y or N) *you determine	Time	What number did the caller dial (County)?	What program or service were you trying to reach?		What option did you select from the telephone menu, or for what reason did you choose not to pick an option?										Did you resolve their issue? (Y or N) *you determine
		CBO, GBO, MBO	WIC, FP, IMMS, CSHCS, EH, Finance, Admin, etc.	OTHER (DESCRIBE) non-health dept.	Wanted a person	Didn't hear options	Stayed on line	Pushed wrong button	Options didn't apply	spell by name option	Dialed this # directly	Call was transferred here	Dialed auto option #__	OTHER (DESCRIBE)	
N	8:00	CBO	WIC	late for appt.					X				7		N
N	10:30	MBO		wanted # for DHS			X		X						Y
Y	11:45														

Step Four: Identify Potential Solutions

By reviewing the results of the Checksheet data, MMDHD was able to determine specific weaknesses in its call menu system and routing practices that could be targeted for improvement using the rapid cycle improvement (RCI) method. The QI Team gathered input from its PHR's during **focus group** meetings as to what they saw as weaknesses in the phone system and suggestions for improvement. Team members also studied available reports concerning standards for operating an automated phone system.

With the baseline data gathered through the Checksheets and input from the PHR's, MMDHD identified five target areas to improve its telecommunications including:

- Clarifying existing phone menu scripts
- Expanding the phone menu options to additional programs/services
- Expanding staff call groups to answer incoming calls
- Standardization of phone system processes throughout the district
- Staff education/training regarding phone system capabilities and etiquette

Step Five: Develop an Improvement Theory

The QI team developed improvement theories based on the information gathered.

1. If MMDHD expands the phone menu options for the Family Planning/WIC/Immunization programs by separating callers who want to schedule an appointment from those callers who simply want ask a question, then a) this will remove unnecessary calls from the central scheduling queue that were not intended to go there, and b) provide the caller with a more direct route to the program/service they need, rather than being inefficiently routed via an internal call transfer to the Community Health and Education (CHED) reception desk.
2. If MMDHD enlarges the call group size in each county office by routing the "timed-out" calls and the "all other" calls to a single call group where two people are available to take calls (rather than one person for each), then the larger single call group should enhance coverage, particularly when one person is away from the phone or already taking a call (thereby reducing calls going to voicemail).
3. If MMDHD increases the number of times the phone menu options cycle (from once to twice) before the caller is timed-out, then the caller will have sufficient opportunity to hear the menu options and correctly make a selection before being timed-out and forwarded to administration.
4. If MMDHD clarifies the Environmental Health (EH) menu script to more clearly identify EH-specific programs, then callers wanting EH-related services are more likely to select this menu option and fewer non-EH callers will mistakenly select this menu option.
5. If MMDHD adds to the phone menu the Mid-Michigan Health Plan as a menu option, then callers in need of this service will have a means of reaching the program staff directly rather than being timed-out or transferred to the wrong service.

Step Six: Test the Theory

The QI team chose to test its theories using two separate RCI rounds to ensure that changes could be directly linked to each of the five specific improvement actions. Improvement actions were implemented on a small scale affecting only one county so as to not disrupt the entire three-county phone system during the testing phase.

In the first RCI round of testing, MMDHD expanded the CHED call menu option to a two-tier system, with the first tier consisting of the main phone menu options, and the new second tier consisting of a "scheduling" option to setup or cancel an appointment and an "information" option for questions concerning WIC, Family Planning, or Immunizations. The QI team also created a new call group to capture clients calling who were unsure of the person or service they needed. Both of these changes showed improvement in the correct routing of calls for MMDHD's most frequently used services. The QI team was able to monitor these changes over a two-week period by calling upon the PHR's to record the outcome of each phone call.

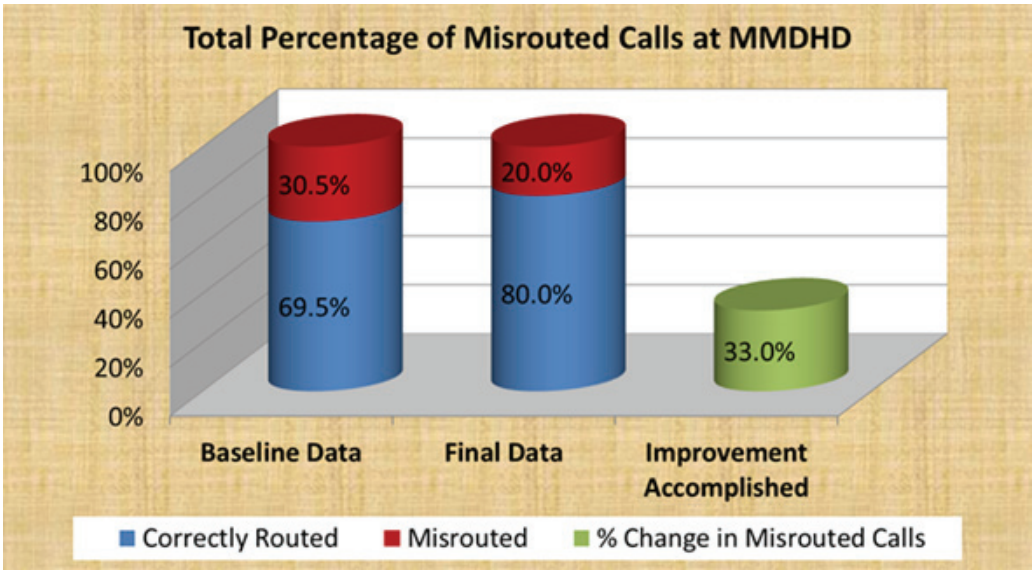
After data were gathered from the first round of RCI testing and time allowed for staff to become acclimated to the changes, a second round of RCIs were implemented over a two-week period. MMDHD refined the EH call menu scripts that customers heard, added the Mid-Michigan Health Plan option to the main menu option, and allowed the main menu script to cycle twice (rather than just once) before the call was timed-out. Each of these changes also showed improvement in the correct routing of calls during the data collection period.

Step Seven: Study the Results

Limited staffing has required customers to navigate an automated telephone attendant that directs the caller to their call destination. MMDHD has tried in the past to manage this automated phone system by balancing simplicity of use with sufficiency of information. Data gathered during this project indicates that attempting to maintain this balance over the years has not translated to a customer-friendly service.

After implementing the first round of RCI in which WIC/Family Planning/Immunization callers could now select a phone menu option to access a staff person to request information or ask a question, the QI team found that a lower proportion of incoming calls were being misrouted to central scheduling and administration (the timed-out default), and callers could now directly contact the receptionists in the WIC/Family Planning/Immunization programs. An unintended consequence of this action was that receptionists in WIC/Family Planning/Immunization that previously were not receiving direct customer calls now had to become accustomed to screening calls on occasion to determine who could best meet the client's need. However, this was found to be more efficient than the previous mechanism of asking the appointment scheduler to screen all calls or allowing the call to 'time-out' and then be transferred to administration.

After implementing the second round of RCI that included increasing the amount of time a caller had to make a phone menu selection and clarifying the description of EH services, the QI team found that the volume of calls being 'timed-out' and/or incorrectly forwarded to administration decreased markedly. In the past, callers who could not decide which menu option to choose would be automatically transferred to administration where the caller could talk to a person. However, nearly 90% of those calls could have been routed to a specific service, had the caller been able to correctly navigate the phone menu options. With the implementation of all five RCIs, calls being automatically transferred to administration were reduced by one-third. In fact, eight of nine branch office programs saw a reduction of misrouted calls after the implementation of the RCIs. Overall, misrouted calls were reduced by 33% soon after the changes were implemented. Through the course of process mapping, surveying customers about their call routing experience, and implementing a RCI process, MMDHD was able to reduce misrouted customer phone calls beyond the goal established in its aim statement.



Step Eight: Standardize the Improvement or Develop a New Theory

After examining the results obtained by implementing two RCIs, MMDHD moved ahead with standardizing the changes throughout the three-county district. Included in the standardization process was updating the call flow diagrams for each county phone system such that all phone menu options are similar—this will make future improvements district-wide easier to incorporate. Customer satisfaction will continue to be monitored by tracking client comments about the phone system on a quarterly basis. It's expected that an improvement will be noted as both staff and customers become acclimated with the changes made to the phone system.

Step Nine: Establish Future Plans

MMDHD has shared its accomplishments both internally with staff and externally with the public. Participation in the project was recognized at a district-wide meeting attended by all staff, at which time a presentation was shared that described the project and accomplishments. To thank all PHR's for their participation, the QI team shared a delicious cake that was designed to resemble the project storyboard. All activities and successes were also shared with the Board of Health during monthly board meetings and a press release was submitted to local media to disseminate to a wider audience. MMDHD will continue to monitor the progress of the QI project through results obtained from its client satisfaction surveys. MMDHD strongly believes in the value of the QI process that was established with the MLC-3 grant and will continue to use the lessons learned from this experience in future endeavors.

Closing Commentary:

MMDHD views this QI project as a success because the department was able to meet its revised aim statement, it enhanced staff knowledge and skills related to QI tools and processes, and it assisted in integrating QI into its organizational strategic plan.

A key lesson learned is that QI takes commitment and time. MMDHD would also recommend starting small with projects that are likely to provide early success, and then build on those accomplishments.

Case Summary Narrative– Norton County Health Department

Agency:
Norton County Health Department
Norton, Kansas

Quality Improvement Project Title:
Local Disease Investigation

Size of Jurisdiction Served:
Approximately 5,500

Contact Name and Email Address:
Gina Frack, prnhome@ruraltel.net

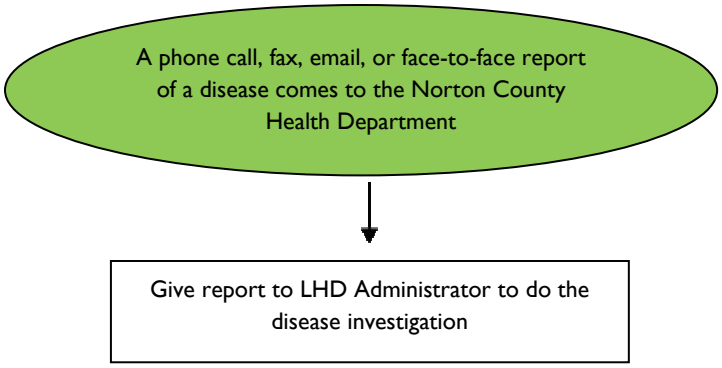
Introduction
Based on gaps identified by participating as a Beta Test site for the Public Health Accreditation Board (PHAB) the Norton County Health Department (NCHD) discovered many areas for possible quality improvement (QI) work. One that rose to the forefront due to the impact of not addressing this area was in regards to disease investigation. Typical with very small local health departments (LHDs), the capacity to handle day-to-day investigations was sufficient, but with even a small outbreak or in the event that the one person doing the investigations would be unavailable for any length of time created a barrier to this essential service being done timely and proficiently.

PDSA Steps

Step One: Getting Started
NCHD started by narrowing down possible QI projects identified in the Beta Test site process. Customer satisfaction for the family planning and immunization programs were considered, but ultimately passed over due to the potential life threatening impact of not addressing NCHD's capacity issues related to disease investigation. Only one staff person, the LHD administrator, routinely conducts disease investigations resulting in a significant lack of knowledge in all remaining personnel at the LHD.

Step Two: Assemble the Team
Of the seven full time staff, only five participated in this project. Team meetings were held with this small group initially to refresh member's knowledge of QI tools, techniques, and the purpose of such activities. This was incorporated as a part of a regular staff meeting. As work progressed into the actual QI project, meetings were scheduled just for QI work as needed with frequency being twice a week at the most. Discussion occurred as to the level of knowledge of "how to do" a disease investigation, but also where to find the resources. Four of the five team members were nurses. The fifth person was the office manager. Due to her position as the primary person answering phones, she needed to understand the process in her role as the "gatekeeper." The LHD administrator served as a QI consultant the project. Staff provided input as QI tools were used to determine the root cause(s).

Step Three: Examine the Current Approach
It was evident quite quickly that staff didn't know how to perform a disease investigation. A **process map** depicted quite well that the current process was nearly 100% reliant on the LHD administrator being available for disease investigations to be completed timely and accurately.



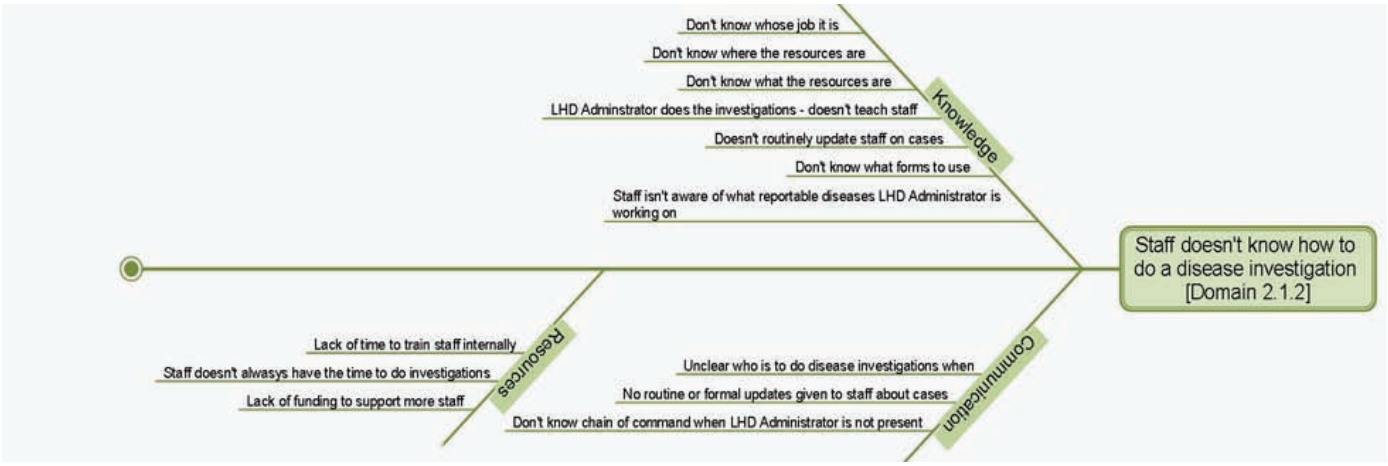
This capacity was then also very limited in the quantity of cases that could be worked by one person. This was due in part to the fact that the administrator was usually able to handle investigations as they arose and additional staff were seldom, if ever, asked to participate in the investigations. This system worked fine as long as the administrator was available and the number of reportable disease cases remained infrequent and/or few in number. Since knowledge, or the lack thereof, was thought to be the root cause of the capacity gap related to disease investigations, the team created a pre-post test to assess staff knowledge. The pre-test assessing staff knowledge of disease investigation was implemented with the four nurses since they would be conducting investigations. The average score on the pre-test was 71%. The team finalized the aim statement during this stage to:

Increase nursing staff knowledge and understanding of performing disease investigations of Kansas reportable disease(s) from 71% to 100% by November 30th, 2010. These percentages were measured by the number of correct responses on the pre-test.

Step Four: Identify Potential Solutions

QI tools such as a **fishbone diagram** and **interrelationship diagraph** verified that the root cause was lack of knowledge.

Fishbone Diagram



After much discussion of ideas and ways to increase staff knowledge, the team determined the following three solutions as a result of root cause analysis:

- Create a process map general enough for all reportable diseases and flexible enough to be applicable to whatever the specific reportable disease may be.
- Provide training on the internal process at NCHD, including rationale for disease surveillance, available resources, and what authority the public health statutes say regarding disease investigation.
- Staff will learn best by periodically "doing" a disease investigation with the "stand by" assistance of the resident expert – the LHD administrator.

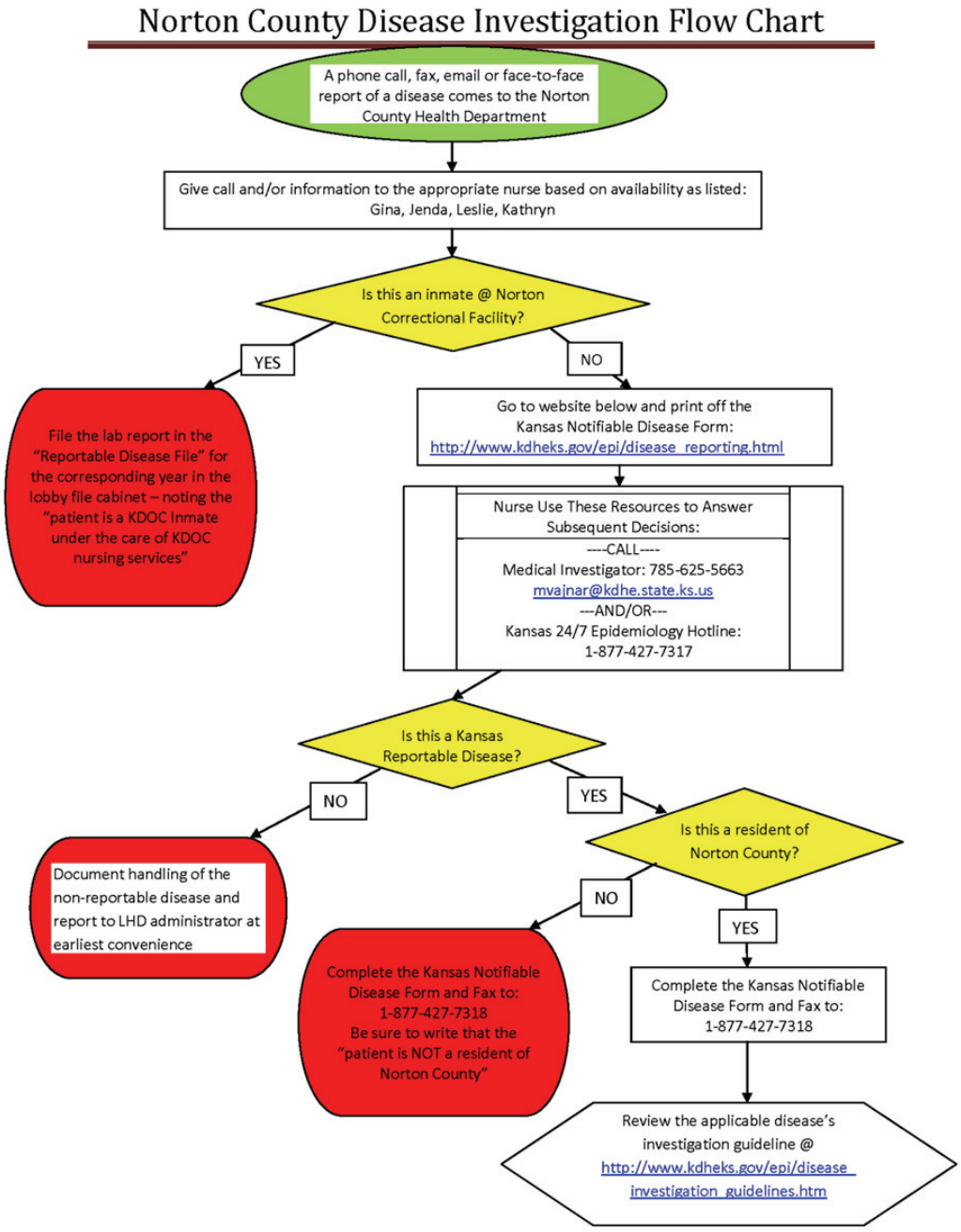
Step Five: Develop an Improvement Theory

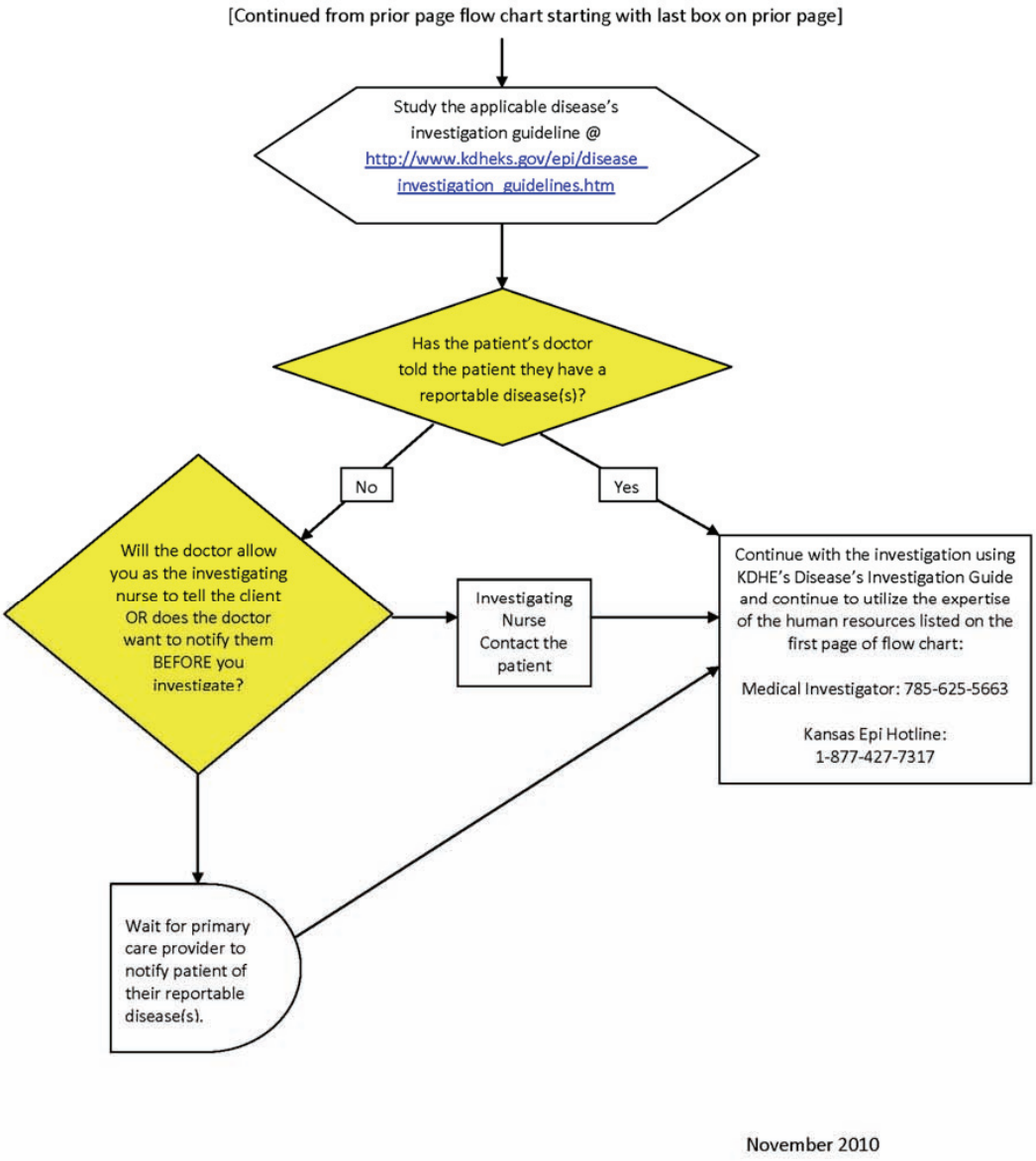
The QI team developed the following improvement theory:

If staff are provided with the knowledge of how to do a disease investigation, then the entire NCHD's capability of performing this essential service will increase.

Step Six: Test the Theory

The pre-test content was based on basic understanding of epidemiology, resources for conducting disease investigation, and the statutes/laws related to disease investigation. The team received training through a power point presentation covering the basics of epidemiology with help from the Kansas Department of Health and Environment. The team developed an **internal process map** with step-by-step decision points and a list of 24/7 available resources for staff to use in the event that they had to conduct a disease investigation independently. The process map was tested in staff meetings through table top exercises with modifications made accordingly. Following all training activities, nursing staff completed the post-test.





Step Seven: Study the Results

The post-test yielded an average score of 100% among the four nurses, thus meeting the project's aim statement.

Step Eight: Standardize the Improvement or Develop a New Theory

It was felt that "field testing" the process map would be the best way to determine its effectiveness and accuracy. However, no reportable diseases presented during the applicable timeframe of this QI project. The process map was used after the conclusion of the QI project. The first time it was field tested, staff suggested some verbiage changes and alteration of one decision point. No further refinements were made thereafter, but continued field testing has been minimal due to the low number of reportable disease investigations in the jurisdiction.

Step Nine: Establish Future Plans

Monthly staff meetings include planned time for sharing of the prior month's disease investigation activities. For any newly hired personnel that may be expected to assist or conduct disease investigations, training will utilize the process map tool. The QI team has shared this project with NCHD county commissioners and some local partners. The project has also been shared with public health peers in Kansas and across the nation.

Closing Commentary:

This particular QI project was a useful project for NCHD to conduct its first true QI project. Staff were the "drivers" of the project which they report was liberating. NCHD staff enjoyed the freedom of focusing on what they felt was most important to the work they do. One remaining challenge for very small LHDs, is the fact that QI remains "project based" – meaning experience with QI remains externally driven and ends when the "project" ends. To achieve a culture of QI, the process will have to become more formalized, internally sustainable, and never-ending.

Case Summary Narrative– Tooele County Health Department

Agency:
Tooele County Health Department
Tooele, Utah

Quality Improvement Project Title:
Internal Policy and Procedure Review, Update, and Training

Size of Jurisdiction Served:
58,000

Contact Name and Email Address:
Jeffrey R. Coombs, jrcoombs@utah.gov

Introduction
Tooele County Health Department (TCHD) participated as a Beta Test site for the national Public Health Accreditation Board. During the self-assessment conducted by TCHD, a need to review, update, and train employees on departmental internal policies was identified. Many of the internal policies had not been reviewed in over ten years and there was little documentation on training of employees on internal policies. The department recognized that many of the policies were outdated, which could lead to inefficiency, confusion, discrepancies, and potential liability.

PDSA Steps

Step One: Getting Started
Once TCHD identified internal policy review as an opportunity for improvement, baseline data were collected. At the onset of the quality improvement (QI) project only 6.6% of internal policies had been updated within the last three years. The findings and proposal for a QI project were submitted to the Executive Director and senior administrative staff. The administrative staff approved resources including staff time from all divisions in the health department, clerical support for a QI team, and a timeline of three months to develop a process and implement an improvement.

The administrative staff charged the QI team with establishing a sustainable process to have all internal policies reviewed, updated, and presented to appropriate staff every three years.

Step Two: Assemble the Team
Knowing that departmental policies and procedures affect all divisions and employees of the health department, a cross-cutting QI team both by division and job duties was selected. The team included executive management, a line supervisor, and clerical staff. Invitations were given by the Deputy Director so staff knew the project was supported by executive management. The team met every two weeks during the duration of the QI project.

To further identify the problem and opportunities for improvement, the QI team began by using **nominal group technique** (NGT) for **brainstorming**. This allowed all team members to solicit input. It was emphasized that all ideas and thoughts were open for discussion. Team members discussed their experiences with drafting internal policy and in receiving training. It was determined that the process varied by division and there was not consistency in process. Training was provided in differing venues and, in some circumstances, could not be recollected by some team members.

The team was charged with defining an initial aim statement:

All departmental internal policies need to be reviewed, updated, and presented to appropriate staff at least every three years.

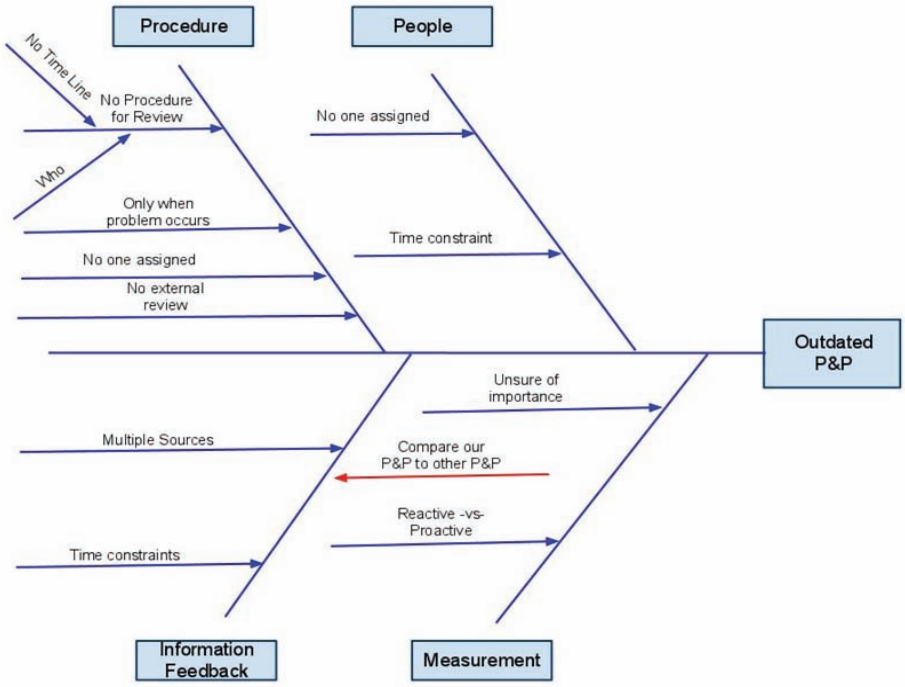
Step Three: Examine the Current Approach

In examining the current approach of how internal policies are created or updated, the QI team developed a **process map**. A division would identify a need for a new internal policy or amend an existing one. The division head would draft a policy and make sure it was not in conflict with existing local health department, state, county, or other policies or laws. The draft would then be submitted to the Executive Director for review. Upon approval from the Director it would then be presented to staff.

Process map

Baseline data indicated that 6.6% of the departmental policies and procedures had been reviewed or updated in the last three years and less than 20% had been presented to staff for training. A survey of all staff indicated that only 40% of staff could identify where to find internal policies on the department's intranet site.

The QI team determined that in order to identify potential solutions the team should focus on hindrances in the current approach. Root cause analysis of why internal policies were outdated was performed by using a **Fishbone Diagram**. Four categories were identified as contributing factors. They included: Procedure, People, Information Feedback, and Measurement.



After examining the current approach and establishing root cause, the team revised and updated the aim statement to: "By December 2, 2010 the percentage of departmental policies reviewed, updated, and presented to appropriate staff within the last 3 years will increase from 6.6% to 35% and a process implemented to assure 100% of all policies are reviewed, updated, and presented to appropriate staff every 3 years."

Step Four: Identify Potential Solutions

QI team members considered potential solutions to improve the current approach. After discussion and multi-voting to determine changes, the QI team identified the following changes for improvement:

- Assign someone to track and report policies and procedures
- Establish a time frame for review of current policies and procedures
- Develop a standard operating procedure for policy review
- Adopt a departmental policy about regular review and training of staff on internal policies and procedures

Step Five: Develop an Improvement Theory

Based on the assessment data and aim statement, the QI team developed a series of improvement theories. An "if then…," approach was used to describe the team's theories.

- If TCHD assigns a staff member the responsibility of tracking policies and procedures for regular review, then they will not become outdated and ineffectual.
- If TCHD develops a Standard Operating Procedure for policy review and training, then staff will be trained on internal policies and procedures on a regular basis.
- If TCHD develops a Policy and Procedure checklist and trains supervisors how to use it, then policies will be reviewed and updated in a more timely and proficient manner.
- If the above listed approaches are used, then the percentage of policies reviewed, updated, and presented to staff will increase from 6.6% to 35% by December 2, 2010.
- If all staff are trained in an all staff meeting about how to access internal policies through the department intranet staff awareness will increase from 40% to 80%.

Step Six: Test the Theory

The QI team assigned a staff member to draft a Standard Operating Procedure for policy and procedure review, update, and training. The Standard Operating Procedure was drafted, reviewed, and amended by the team for a final draft. The executive office manager was identified and designated to track policy and procedure review and a time frame for section reviews was also established. The time frame established has all policies reviewed within a three year period.

A spreadsheet was developed that tracked which policies and procedures had been reviewed and presented to appropriate staff. Status of policy and procedure review and last training dates were recorded and compared to data collected from a spreadsheet after actions were implemented.

During the review process it became unclear if some policies and procedures were still in effect. In some circumstances policies were duplicated in several different sections. Internal policies were separated and numbered by division. Some policies covered similar topics with slight variation. Some organizing occurred to rectify inconsistencies.

Step Seven: Study the Results

Baseline data indicated that 6.6% of the departmental policies and procedures had been reviewed or updated in the last three years and less than 20% had been presented to staff for training. Post intervention indicated that by November 30, 2010, 56% of policies and procedures had been reviewed and updated and 45% presented to staff for training. Staff utilizing the policy and procedure checklist reported the process to be more efficient and defined than prior to intervention. Two weeks after staff had been trained on where to locate internal policies and procedures, a survey indicated 93% of staff could locate them on the department intranet.

A significant improvement was made in all tested areas. Staff charged with drafting policies and procedures stated greater understanding and consistency in the designed process. The true test of the effectiveness of this improvement will be if the process can be sustained over time. It is critical that data be collected over time at one, three, and five years to determine sustainability.

Step Eight: Standardize the Improvement or Develop a New Theory

A staff person was permanently assigned to track policy and procedure update, review, and training. This responsibility will be added to the employee's job description and goals. A policy and procedure tracking database was created to facilitate continued monitoring and improvement. A standard operating procedure and policy development, update, and review checklist was disseminated to all division heads with training on how to use it. As part of national accreditation self-evaluation, further reviews will determine if this intervention has a lasting effect.

Step Nine: Establish Future Plans

The plans for continued improvement include:

- Pre– and post-test evaluation of employee retention on departmental policy and procedure training
- Track and record compliance with select policies and procedures
- Continue to identify staff ability to locate current policies and procedures
- Do a comparative analysis of TCHD's policies and procedures with other local health departments in Utah

The results of this QI project were shared with all health department staff. The staff who participated in the QI team were recognized in all staff training for their contributions. Additionally, the have been displayed as a story board at various public health association meetings and presented to the Tooele County Board of Health.

Closing Commentary:

This was the first formal QI project utilizing PDSA methodology at TCHD. The project laid the groundwork and created a template for other divisions within TCHD. Other QI projects started since this demonstration have included: improvement in WIC children immunization rates, reduction of repeat critical violations at food establishments, and proposals for many other projects now to be prioritized and reviewed by the department.

A culture of QI is beginning to grab hold, and employees at all levels are feeling more involved and vested in projects and improvements.

APPENDIX B: HOW TO CONDUCT A BASIC EVALUATION

According to the *CDC Framework for Program Evaluation in Public Health*, "Health improvement is what public health professionals strive to achieve." In order to identify whether health improvement has been achieved one must evaluate the effects of public health actions.[1] The CDC framework describes a series of steps that can be undertaken that allow for an understanding of each program's context and will help the organization improve how program evaluations are conceived and conducted. The material presented here will guide you through the basic principles of conducting an evaluation. You can find more detailed information about the CDC Framework on the web at: http://www.cdc.gov/mmwr/preview/mmwrhtml/rr4811a1.htm.

Evaluation and Quality Improvement

You might wonder why, in a Guidebook about quality improvement (QI), there would be any information on evaluation at all! There are two reasons this information is important. First, the differences between QI and evaluation can be confusing. They may seem like completely distinct processes in some cases, whereas in other situations they can seem almost identical. Indeed, there are differences and similarities and this appendix will help you begin to think through what those are. Second, evaluation can be an asset to your QI work at your health department. When you implement an evaluation during the design phase of a program and continuing through the life of the program, evaluation can help determine if activities are working toward reaching program goals and objectives. Evaluation can help to more closely align program activities with desired outcomes while the program is operating. Evaluation can also help identify the strengths of your program and activities, which can be helpful in identifying best practices to be celebrated and shared. The information and data generated through these processes can provide a great starting point or resource for your QI work. Let's explore the similarities and differences in more depth.

Evaluation activities can seem very similar to activities carried out during a QI project. In fact, there are several areas that may overlap and interact, and QI and evaluation activities can work hand-in-hand. You can use evaluation data as a starting point, or baseline, for improvement activities, and you can collect similar data at future points to see if your change was an improvement. You can also use data collected during an evaluation to assess performance and to target areas where improvements can be made, as well as to monitor outcomes. Using QI to address problems identified through an evaluation can help improve the responsiveness of a program to the problem it was designed to address.

However, there are key differences in the philosophies underlying evaluation and QI. Evaluation helps to determine the effects of a program on participants. QI, on the other hand, posits that any program can be more effective if staff expertise is applied to improve the processes through which the program is implemented. Evaluation examines program implementation and outcomes to determine whether the program is being carried out as intended to reach its intended outcomes, while QI involves adjusting the processes used to carry out programs to improve the outputs of those processes.

In addition, the fundamental questions being asked by an evaluation or a QI project are different. Evaluation seeks to determine whether you are doing what you set out to do and achieving what you intended to achieve. Conversely, QI asks whether the adjustments you are making to how you do things are having the effect you intended.

While the tools used for evaluation and QI activities, such as logic models, or survey or observational data, may overlap, the methodology of each are different. Evaluation is ideally conducted beginning with the formation of a

project or program and continues throughout, and even beyond, the life of the project or program. Alternately, QI activities occur during implementation, when an opportunity to improve processes presents itself. Also, evaluation is often carried out by an outside, objective observer, whereas QI is a group process carried out by stakeholders in the process.

Finally, evaluation and QI work toward different, but complementary, outcomes. **Evaluation can help identify problem areas or gaps between program activities and goals, while QI activities actually address those problems or gaps**. Evaluation activities and QI activities complement each other well, and you can use the two together to effectively identify and fix issues as they arise.

The following table highlights the key differences between evaluation and quality improvement activities.

Key Differences Between Evaluation and Quality Improvement		
	Evaluation	***Quality Improvement***
Purpose	Determines whether your program is doing what you intended for it to do	Determines whether adjustments you are making to your program are improving the program
Philosophy	Determines whether the effect of the program on participants is worth the resources needed to implement the program	Uses staff expertise to improve the processes by which the program is implemented
Timeframe	Starting at program outset, continuing through the life of the program	At specific points in time when an improvement opportunity is identified
Responsible Party	Outside, objective observer	Program stakeholders
Outcome	Identify gaps between program activities and goals	Address identified gaps

Understanding Evaluation Terminology

Evaluation is a terminology-heavy field. This section defines a few of the key terms used in this appendix.

Defining Program

Let's begin by defining program. The CDC defines program as "any organized public health action."[1] Programs can include direct service interventions, community mobilization efforts, research initiatives, surveillance systems, policy development activities, outbreak investigations, laboratory diagnostics, communication campaigns, infrastructure-building projects, training and education services, and administrative systems.

Defining Program Evaluation

Now, let's take it a step further and think about program evaluation. The CDC defines program evaluation as the systematic collection of information about the activities, characteristics, and outcomes of programs to make judgments about the program, improve program effectiveness, and/or inform decisions about future program development.[1] In other words, when you evaluate a program, you collect information in a systematic manner to learn about how the program operates, about the effects it may be having, and/or to answer other questions of interest.

Evaluation can be integrated with program operations, particularly when the emphasis is on practical and ongoing evaluation that involves program staff and stakeholders, not just evaluation experts. Evaluation complements

program management because it involves gathering necessary information for improving and accounting for program effectiveness. Regardless of how the evaluation is used, it requires the collection of credible and valid information about a program in a manner that makes the information potentially useful. Public health professionals have routinely used evaluation processes when addressing questions from concerned citizens.

Process Evaluation

A process evaluation documents how a program is implemented and if it was implemented as intended.[2] Process evaluation answers questions about who, what, where, why, when, and how in order to understand if the program was implemented as planned and the changes that occurred over the course of implementation. When conducting a process evaluation you should examine whether program activities are taking place, who is conducting the activities, who is being reached through the activities, and whether sufficient inputs (i.e. the resources used to make a program possible) have been allocated. Process evaluation is helpful throughout the life of a project. While a program is being implemented, it can be used to identify challenges, barriers, gaps, and fidelity issues—these findings can be used to inform QI activities. Once the evaluation has identified program outcomes, process evaluation data can be used to help explain those outcomes. Examples of process evaluation activities could include:

- Documenting *Barriers* to implementation
- Documenting *Changes* in the program design
- Documenting *Resources* required to implement the program

Outcome evaluation

Outcome evaluation assesses whether a program caused the changes it was intended to accomplish, as well as changes that were unexpected or unanticipated. This type of evaluation focuses on the systematic collection of information to assess what a program has achieved. A program's outcomes are often described in terms of time, for example the terms short-term, mid-term, and long-term outcomes are often used.[2] The reason for looking at outcomes over time is that often programs are designed to change something in the short-term that is thought to be related to a longer-term health outcome. For example, changing attitudes toward exercise in the short-term might increase levels of physical-activity in the mid-term, which might decrease obesity in the long-term, which might ultimately reduce cardiovascular disease, diabetes, and premature death. Each of these levels of outcomes is important and could be measured as part of an evaluation. Some other examples of what might be measured in an outcome evaluation include:

- Changes in attitudes, beliefs, and behaviors
- Changes in risk or protective factors
- Changes in the environment, including public and private policies, formal and informal enforcement of regulations, and influence of social norms and other societal forces
- Changes in trends in morbidity and mortality

Outcomes are measurable and achievable indicators that show a program is having the intended effect.[3]

Conceptualizing an Evaluation

The first step to conceptualizing your evaluation involves reviewing or developing program objectives. Objectives are the benefits you expect to achieve as a result of spending time and effort on program activities. Keep in mind that program objectives should be S.M.A.R.T: **S**pecific, **M**easurable, **A**chievable, **R**elevant, and **T**ime-bound (see Chapter 5 for a more thorough description of S.M.A.R.T.). Use your program theory to develop your objectives, as well as your program's goals and activities—each of these components of your program should be logically related.

Logic Model

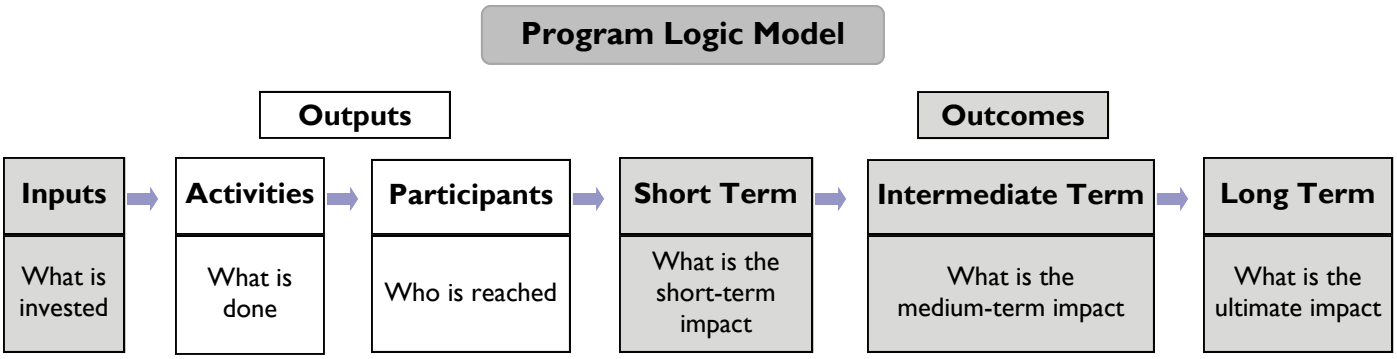
The second step of conceptualizing your evaluation is designing a logic model. Designing or focusing your evaluation can be a complex process. Your program wants to achieve specific objectives, and to do so you must gather resources, conduct activities, and produce outputs. A program logic model is a good first step in sorting out

how these things relate to each other because it will illustrate the link between the activities you have planned and the changes you intend to produce. The logic model will:

- Specify both the process and outcome portion of your program
- Illustrate the relationship between program inputs, outputs, and expected outcomes
- Identify the evaluation questions you want to address
- Identify what you want to measure as part of the evaluation

Additionally, a logic model helps you ensure that the activities you have planned are logically linked to the outcomes you want to see as a result. Often, developing a logic model helps illustrate weaknesses in the logic underlying a program, which can lead to changes in program design or changes in targeted outcomes. In either case, it's important to revisit your program objectives (step 1) after your logic model is complete to make sure they are still on point.

The following graphic displays a basic logic model template, which describes the relationship between program inputs, outputs, and intended outcomes. The first three boxes of the logic model can be measured as part of a process evaluation. Your inputs box should include information about the resources that make your program possible, such as funds, staff, community support, curricula, and any other important resources that you need to operate your program. Your activities box should include what you will do to accomplish your program goals. Activities include, for example, delivering a curriculum, developing a policy, or planning and hosting community events. The participants box lists who will be affected by the activities you implement. This could include the clients you serve, the community you are targeting with a policy change, or the partners you work with, for example.



The last three boxes include the short-term, intermediate, and long-term outcomes. The customers included in your logic model reflect what you believe will happen as a result of your program. In the short-term they reflect how your program will influence knowledge, attitudes, beliefs, or skills. In the mid-term they reflect how your program will influence behavior change and action. In the long-term they reflect how your program will influence health status or other social conditions. These are what drive your outcome evaluation and they all describe what your program is designed to change.

After you create your logic model, the questions listed below should be addressed.

- What will be evaluated?
- What aspects of the program will be considered when assessing program performance?
- What evidence will be used to indicate how the program has performed?
- What evaluation methods will be used and who will provide the data?
- What conclusions regarding program performance are justified by comparing the available evidence to the program objectives?
- How will the lessons learned from the inquiry be used to improve public health effectiveness?

What will be evaluated?
Your logic model will likely include more information than you will be able to measure as part of the evaluation, so think of this question as a way to focus your evaluation on the most important components of the logic model. What is the intent or motive for conducting the evaluation? For example, will the evaluation provide insight, change a program practice, assess effects, and/or influence participants? When addressing this question you should also think about the individuals who will receive evaluation findings or benefit from being a part of the evaluation. In addition, this question can help you figure out the level of the evaluation, such as a system of related programs, a single program, or a project within a program.

What aspects of the program will be considered when assessing program performance?
The second question asks you to further target your evaluation by identifying the variables that will be measured to determine if the program was successfully implemented and achieved its outcomes. At this step in the process you will need to look at each component of your logic model that will be evaluated, as well as your program objectives, to select factors that will speak to program performance. If your program objective has to do with the effectiveness of training, you might consider the most important variables related to 'effectiveness' – for example, fidelity to the curriculum, knowledge gained by participants, and/or change in participant behaviors over time.

What evidence will be used to indicate how the program has performed?
In this step you will specify the information will you need to assess the effectiveness of your program. The factors you selected to assess program performance will each need to be translated into measures. Measures translate an idea or concept into something that can be observed, counted, or compared with a standard. For example, fidelity to a curriculum can be measured by tracking the number of hours of instruction, the number of sessions completed, and/or observations of lesson administration.

What evaluation methods will be used and who will provide the data?
The methodology used in your evaluation should be considered carefully. When you are addressing this question, start by formulating your evaluation questions. These questions address the program objectives you are evaluating, and they cover all the important factors that will be used to determine if your program was well implemented and achieved its intended outcomes. For example, if your program objective has to do with the effectiveness of training, your evaluation questions might include:

- Was there an increase in participants' knowledge as a result of the training?
- How satisfied were participants with the training?
- Did participants use what they learned at the training?
- Did the training have an effect on participants' work?

Once you have developed evaluation questions, you will need to decide how these questions will be answered. Considerations for this decision include who will provide the information, what tools will be used to guide data collection, when and how information will be collected, and how collected data will be analyzed. A table can be useful in organizing your evaluation. The following table illustrates how a program objective and related evaluation question might be addressed.

Evaluation Planning Template					
Program Objective	**Evaluation Questions**	**Data Source**	**Participants**	**Timeframe**	**Method of Analysis**
Implement a training program that increases participant knowledge by 50% over baseline measurements by the end of the calendar year.	Was there an increase in participants' knowledge?	Pre-Post Knowledge Test	Individuals who participated in the training program	Before and immediately following training activities	T-test or Percent change from Pre- to Post-Test

What conclusions regarding program performance are justified by comparing the available evidence to the selected standards?
In this step you will decide how you will interpret your data. Your evidence should be gathered in a way that allows you to determine if you met your program objectives. When planning your evaluation and determining when you will be able to draw conclusions, make sure you keep in mind your timeline. There may be a lag between exposure to an intervention and outcomes. For example, a policy change, such as a smoking ban, is unlikely to result in an immediate reduction in lung cancer rates. You will want to be sure that when you get to the point of reviewing evidence, you will be able to determine whether the evidence indicates that you have met your program objectives, including both your objectives for program implementation and your objectives for program outcomes. Your plan for reviewing evidence should be linked to your evaluation questions as well.

How will the lessons learned from the inquiry be used to improve public health effectiveness?
What will you learn, and what recommendations might you make about the program based on the evidence? When you consider recommendations be sure to consider how improvement can be made. Review your conclusions, and look at how your results can help staff improve and how the program/project itself can improve. An additional component of this final step of planning your evaluation is to determine how the information will be disseminated to your team and to other stakeholders. Make sure that you will be able to put the results in perspective by making comparisons based on what you expected and what resulted.

Example of a Basic Evaluation
Evaluation becomes easier with hands-on practice and by reviewing examples of evaluation in action The following example illustrates a basic evaluation of a public health program.

Sunnyside County Health Department examined county BRFSS data and identified that approximately 52% of the 7,000 county residents aged 50 and older reported receiving a Fecal Occult Blood Test (FOBT) within the past year. Recognizing that when colorectal cancer is found early and treated the 5-year relative survival rate is 90%, Sunnyside County Health Department decided to create a program to improve rates of early identification of colorectal cancer within their jurisdiction. Program activities included distributing educational materials within the health department and county residents, and providing free FOBTs to low-income, uninsured county residents age 50 and older, for a possible program population of 2,000 individuals. The objectives of Sunnyside County Health Department's Colorectal Cancer Screening Program are to:

1. Disseminate information about the screening program through community media sources at least once per month.
2. Increase the rate of health department clients aged 50 and older who report awareness of colorectal cancer screening recommendation by 75% during the first program year.
3. Complete 700 FOBTs for eligible clients each year of the 2 year program.
4. Increase the rate of low-income county residents aged 50 and older who are appropriately screened for colorectal cancer to 70% within 2 years.

Sunnyside County Health Department developed these program objectives using the S.M.A.R.T. criteria. For example, the third objective utilized their BRFSS and other county level data to set an achievable goal for the number of FOBTs that should be completed each year to meet the desired outcome. The objectives were specific, focused on an achievable rate of screening, were relevant to the goals of the program, were designed to be measurable, and had a goal date set for when each would be accomplished.

After setting objectives, developing a logic model and focusing the evaluation, Sunnyside County Health Department developed a set of evaluation questions based on each program objective:

- Objective 1
  - How many information dissemination activities were implemented per month?
  - When was information disseminated?
  - Through what outlets was information disseminated?
  - Who was the target audience for each dissemination activity?
  - What types of information were disseminated?
- Objective 2
  - Was there an increase in clients' awareness of colorectal screening recommendations?
  - How did clients learn about colorectal cancer screening recommendations?
- Objective 3
  - How many FOBTs for eligible clients were completed each year of the program?
  - What factors influenced clients' decision to seek a colorectal cancer screening?
- Objective 4
  - Was there an increase in the rate of low-income county residents aged 50 and older who are appropriately screened for colorectal cancer after two years of program implementation?

In order to answer these questions, Sunnyside County Health Department had to decide what they would measure, who would provide the data, through what method, when the data would be collected, and how the data would be analyzed. The table below illustrates Sunnyside County Health Department's plan for addressing one of their objectives: "Increase the rate of health department clients aged 50 and older who report awareness of colorectal cancer screening recommendation by 75% during the first program year."

Evaluation Planning Table

Program Objective	Evaluation Questions	Data Source	Participants	Timeframe	Method of Analysis
Increase the rate of health department clients aged 50 and older who report awareness of colorectal cancer screening recommendation by 75% during the first program year.	Was there an increase in clients' awareness of colorectal screening recommendations?	Survey	50 Health department clients aged 50 and older	Monthly, during eligible clients' visits to the health department	Descriptive statistics – Percent answering survey question correctly
	How did clients learn about colorectal cancer screening recommendations?	Survey	50 Health department clients aged 50 and older	Monthly, during eligible clients' visits to the health department	Descriptive statistics – Percent indicating each source of information

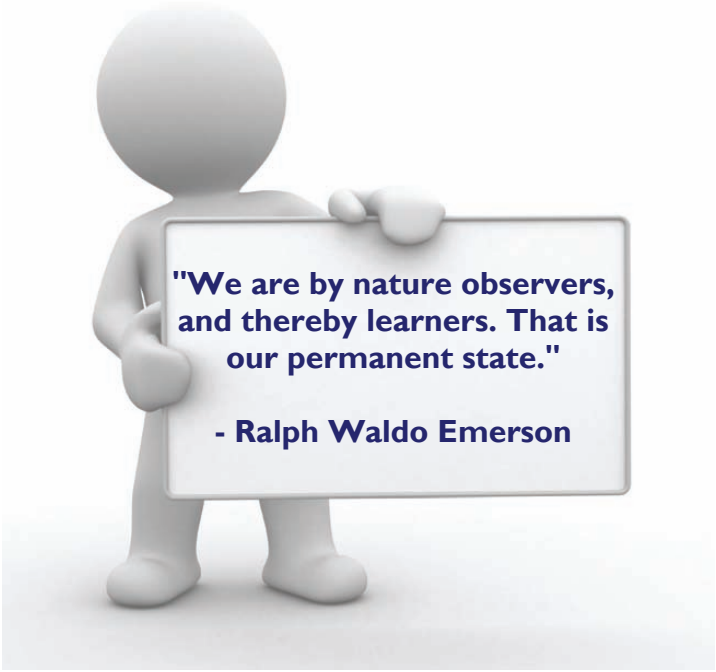
Once the basic evaluation plan was developed, Sunnyside County Health Department selected and created the evaluation tools they needed. For example, in order to track dissemination of program information, the evaluation staff collected information in a spreadsheet about the number, timing, outlets, content, and audience of each dissemination activity. To measure awareness, Sunnyside County Health Department added in two questions to the client satisfaction survey that was already being distributed to clients each month. Secondary data from clinic records and BRFSS data were examined in order to determine the rate of clients screened, and the rate of appropriate screening of low-income adults aged 50 and older in the community.

Once they collected their data, Sunnyside County Health Department used their objectives and evaluation questions to decide how to analyze their data. For example, they used the information in their dissemination spreadsheet to determine if they were able to disseminate information about the screening program through community media sources at least once per month. They also used the information to determine how many dissemination activities were implemented overall, when and to whom information was disseminated, the outlets that were used for dissemination, and the types of information that was disseminated. This information was used to describe program implementation as part of the process evaluation.

To measure program outcomes, Sunnyside County Health Department compared their results after program implementation with data collected prior to implementation of the program. The findings were reviewed to determine if there was an increase in appropriately screened program clients and county residents, as well as to see if program clients attributed their choice to be screened to program activities. Sunnyside County Health Department also used findings to determine whether modifications could be made to the program to improve outcomes, and they tested these modifications using PDSA!

Additional Resources

There are many useful resources available online about how to conduct an evaluation. The CDC Framework for evaluation is most helpful, and will guide you through the process of developing your evaluation plan. You can access the CDC framework at http://www.cdc.gov/mmwr/preview/mmwrhtml/rr4811a1.htm. There is also a resource page on the CDC website at http://www.cdc.gov/eval/resources.htm that has links to logic model resources, journals and online publications related to evaluation, and step-by-step guides to evaluation. The University of Wisconsin – Cooperative Extension has a Planning a Program Evaluation Worksheet available online that will walk you through the evaluation process. The worksheet lists a series of relevant questions and has space for you to complete the information. The questions will help guide you in developing your evaluation. The worksheet can be accessed at http://www.uwex.edu/ces/pdande. This website also has great information on logic model development. If you would like more in-depth information about program evaluation, the W.K. Kellogg Foundation has a good, free evaluation handbook, that can be accessed at http://www.ojp.usdoj.gov/BJA/evaluation/links/WK-Kellogg-Foundation.pdf.



APPENDIX C: ADDITIONAL RESOURCES

There are myriad resources available on quality improvement (QI) from websites and books to training seminars and consultants that can provide specialized training. You most likely noticed links and references in each Guidebook chapter. We encourage you to explore those links and references because they contain very practical and useful information and are not all duplicated here. This appendix, for the most part, aims to include additional descriptions and information. You will find electronic, print, and training resources that are useful in practice. Following are items related to each chapter of the guidebook along with a brief description of the information available for each resource.

Chapter 1: Quality Fundamentals

- ***The Public Health Quality Improvement Handbook***. Edited by: Public Health Foundation (PHF) President Ron Bialek, PHF Senior Quality Advisor John W. Moran, and PHF Quality Improvement Consultant Grace L. Duffy.

  Available at: http://bookstore.phf.org/product_info.php?products_id=660

  The messages in the handbook are from leaders, physicians, practitioners, academics, consultants, and researchers who are successfully applying the tools and techniques they share. The chapters are written to support the leaders and workforce of the public health community.

- ***ASQ***

  Available at: http://asq.org/

  ASQ is a leading authority on quality in all fields, organizations, and industries.

- ***Public Health Foundation – Performance Management and Quality Improvement***

  Available at: http://www.phf.org/focusareas/PMQI/Pages/default.aspx

  PHF offers a number of resources related to QI on their website, including demonstrations and programs facilitated by PHF, free online training on applying QI tools and techniques, and other resources and tools that comprise case studies, publications, and toolkits that can help an individual or team as they do their QI work.

- ***Quality Improvement Consultants***

  Available at: http://www.naccho.org/topics/infrastructure/accreditation/upload/NACCHO-NNPHI-QI-Consultant-List-REVISED-060710.pdf

  This dynamic list, developed collaboratively by NACCHO and NNPHI, provides information on persons interested in providing technical assistance around the design and implementation of QI projects in public health.

Chapter 3: Organizing a QI Project

- ***The Discipline of Teams*** by Jon R. Katzenbach and Douglas K. Smith

  Available at: http://meridiancoaches.com/resources/Discipline_of_Teams.pdf

  This article discusses team dynamics, including the four elements that make teams function: common commitment and purpose, performance goals, complementary skills, and mutual accountability.

- **The Team Handbook, Third Edition** by Joiner, Brian L.; Streibel, Barbara J.; Scholtes, Peter R.

  This updated best-selling, comprehensive resource book provides everything you need to create high performing teams. In addition, book purchasers will be able to download electronic versions of forms and templates found in the book for use within their organization. Available at: www.asq.org.

Chapter 4: Using the Plan-Do-Study-Act Cycle

- ***The Improvement Guide: A Practical Approach to Enhancing Organizational Performance*** by Gerald Langley, Thomas Nolan, Kevin Nolan, Clifford Norman, and Lloyd Provost

  Based on W. Edwards Deming's model, this guide offers an integrated approach to testing and improvement. Using simple stories to illustrate core ideas, the authors, all active consultants, share a flexible model for improving quality and productivity. They draw from research conducted in manufacturing, government, and schools to present a practical tool kit of ideas, examples, and applications. Includes a Resource Guide to change concepts so even beginners can utilize tested techniques of highly experienced practitioners. Available at: www.amazon.com.

- ***The ABCs of PDCA*** by Grace Gorenflo and John W. Moran

  Available at: http://www.phf.org/resourcestools/Documents/ABCs_of_PDCA.pdf

  This resource contains basic information on conducting a QI project using Deming's PDCA (also known as the PDSA) model.

- ***NNPHI Public Health Performance Improvement Toolkit***

  Available at: http://nnphi.org/tools/public-health-performance-improvement-toolkit-2

  The Public Health Improvement Toolkit is an online collection of tools developed by public health practitioners through their own efforts to implement performance improvement activities.

- ***NACCHO Quality Improvement Toolkit***

  Available at: http://www.naccho.org/toolbox/program.cfm?id=25&display_name=Quality%20Improvement%20Toolkit

  The NACCHO toolkit allows users to search for QI resources, including literature, tools and templates, QI examples, and information on organization-wide QI.

- ***ASTHO – Quality Improvement Resources***

  Available at: http://www.astho.org/Programs/Accreditation-and-Performance/Quality-Improvement/

  ASTHO supports states' quality improvement efforts through resources and technical assistance.

- ***Institute for Healthcare Improvement***

  Available at: http://www.ihi.org

  The IHI website contains interactive tools, including an Improvement Tracker and a Project Manager, as well as information on quality improvement methods, measures, and case studies. The website operates as a community, sharing data among members for greater collaboration and dissemination of best practices.

Chapter 6: The Importance of Data and Measuring Improvement

- ***The Six Sigma Way Team Fieldbook*** by Peter S. Pande, Pobert P. Neuman, and Roland R. Cavanagh

  This book is a highly practical reference for team leaders and members, outlining both the methods and the basic steps a team must follow in an improvement effort. There is excellent emphasis on data and measurement. Much of the information is appropriate for PDSA users as well as users of the Six Sigma method. Available at www.amazon.com

- ***Understanding and Controlling Variation in Public Health*** by Marlene J. Mason and John W. Moran

  Available at: http://journals.lww.com/jphmp/Fulltext/2012/01000/Understanding_and_Controlling_Variation_in_Public.12.aspx

  This article describes the concept of variation based on Deming's knowledge and defines basic terms related to variation.

- ***Baldrige National Quality and Performance Excellence Program: Health Care Criteria for Performance Excellence***

  Available at http://www.nist.gov/baldrige/publications/criteria.cfm

  The 2011-2012 Health Care Criteria for Performance Excellence are used by organizations that are primarily engaged in furnishing medical, surgical, or other health services directly to people.

- ***County Health Rankings***

  Available at: http://www.countyhealthrankings.org/

  The County Health Rankings provides reports by state, ranking the health of its counties according to several factors, ranging from individual health behaviors, education and jobs, quality of healthcare, environment, and other factors.

Chapter 7: Quality Improvement Tools

- ***Quality Improvement Tools and Techniques*** by Peter Mears

  This comprehensive text covers the important quality-improvement tools and techniques. It intentionally avoids too much math and statistics, couching everything in simple language. The statistical tools are fitted into the improvement context, using a simple case example that shows how they all relate. The reader thus learns both how the tools work and when to use them. Available at www.amazon.com

- ***The Public Health Memory Jogger II: A Pocket Guide of Tools for Continuous Improvement and Effective Planning***

  Available through: www.goalqpc.com

  This handbook is a convenient, on-the-job reference for public health teams and is focused on teaching teams about the quality improvement process.

- ***Tool Time for Healthcare: Choosing and Implementing Quality Improvement Tools***

  Available through: http://www.langfordlearning.com/shoppingcart/products/Tool-Time-Handbook-12.1-for-Healthcare.html

  Tool Time contains diagrams and explanations of 60 QI tools and their suggested uses.

Chapter 9: Building a Culture of Quality – In Public Health

- ***Roadmap to a Culture of Quality Improvement***

  Available at: http://www.naccho.org/topics/infrastructure/accreditation/qi-culture.cfm

  NACCHO developed this resource to assist health departments as they work to ensure that QI is institutionalized and becomes part of the way that health departments do business.

- ***Turning Point Guidebook for Performance Management*** by Patricia Lichiello and Bernard J. Turnock

  Available at:http://www.turningpointprogram.org/Pages/pdfs/perform_manage/pmc_guide.pdf

  The *Turning Point Guidebook for Performance Measurement* offers the fundamentals of performance measurement in public health, covering basic background information on performance measurement and key components in developing such a process.

- ***Leading Change*** by John P. Kotter.

  Available at:http://www.kotterinternational.com/

  Dr. Kotter offers a practical approach to an organized means of leading, not managing, change. He presents an eight-stage process of change with highly useful examples that show how to go about implementing it.

- ***Switch: How to Change Things When Change is Hard*** by Chip and Dan Heath.

  Available at: http://www.heathbrothers.com/switch/

  In a compelling, story-driven narrative, the Heaths bring together decades of counterintuitive research in psychology, sociology, and other fields to shed new light on how we can effect transformative change. *Switch* shows that successful changes follow a pattern, a pattern you can use to make the changes that matter to you.

- ***We Don't Make Widgets: Overcoming the Myths that Keep Government from Radically Improving*** by Ken Miller.

  Available at: http://www.governing.com/books/widgets.html

  Written for middle and senior-level managers in state, city and county government, this book aims to explode the myths that prevent dramatic improvement in government operations.

- ***What Works for Health: Policies and Programs to Improve Wisconsin's Health***

  Available at: http://whatworksforhealth.wisc.edu/background.asp

  This database provides resources related many policies and programs aimed at improving population health. It provides information on evidence of effectiveness, population reach, impact on health disparities, implementation, and other key information for each included policy and program.

- ***The Community Guide: What Works to Promote Health***

  Available at: http://www.thecommunityguide.org/index.html

  The Guide to Community Preventive Services contains information on programs and policies aimed to improve health and prevent disease in communities.

Appendix A: Public Health Quality Improvement Case Studies

- ***QI Storyboards***

  Available at: http://nnphi.org/program-areas/accreditation-and-performance-improvement/resources/qi-storyboards

  NNPHI has posted all of the storyboards created by health departments who participated in QI projects through the Multi-State Learning Collaborative.

- ***Accreditation Beta Test QI Efforts***

  Available at: http://www.naccho.org/topics/infrastructure/accreditation/beta-test-qi-projects.cfm and http://www.astho.org/programs/accreditation-and-performance/accreditation/

  These sites contain information on the quality improvement projects conducted by each of the state and local health departments that were part of the PHAB Beta Test.

Appendix B: How to Conduct a Basic Evaluation

- ***Program Development and Evaluation***

  Available at: http://www.uwex.edu/ces/pdande/evaluation/index.html

  University of Wisconsin – Extension provides information on developing and conducting evaluation.

- ***CDC Framework for Program Evaluation in Public Health***

  Available at: http://www.cdc.gov/mmwr/preview/mmwrhtml/rr4811a1.htm

  CDC's framework guides public health professionals in their use of program evaluation, providing information on the steps in program evaluation practice and standards for effective program evaluation.

- ***W.K. Kellogg Foundation Evaluation Handbook***

  Available at: http://www.wkkf.org/knowledge-center/resources/2010/W-K-Kellogg-Foundation-Evaluation-Handbook.aspx

  This handbook provides a framework for thinking about evaluation as a useful program tool.

APPENDIX D: GLOSSARY

Accreditation (Public Health)

The development of a set of standards, a process to measure health department performance against those standards, and reward or recognition for those health departments who meet the standards.

Affinity Diagram

An interactive data collection method, which allows people to identify and sort large quantities of ideas in a short time.

Aim Statement

A concise, specific written statement that defines what the team hopes to accomplish with its QI efforts. It includes a numerical measure for the future target, it is time specific and measurable, and it defines the specific population that will be affected. For more information, see the *Institute for Healthcare Improvement* website: http://www.ihi.org.

Assessment

A systematic process of collecting and analyzing data to determine the current, historical, or projected compliance of an organization to a standard.

Baseline Measurement

The beginning point, based on an evaluation of output over a period of time, used to determine the process parameters prior to any improvement effort; the basis against which change is measured.

Benchmarking

A technique in which a company measures its performance against that of best in class companies, determines how those companies achieved their performance levels, and uses this information to improve its own performance. Subjects that can be benchmarked include strategies, operations, and processes.

Best Practice

A superior method or innovative practice that contributes to the improved performance of an organization, usually recognized as best by other peer organizations.

Bias

Degree to which your data are inaccurate due to the way you took your measurement.

Brainstorming

A technique teams use to generate ideas on a particular subject. Each person on the team is asked to think creatively and write down as many ideas as possible. The ideas are not discussed or reviewed until after the brainstorming session.

Cause and Effect Diagram

A tool for analyzing process dispersion. It is also referred to as the "Ishikawa diagram," because Kaoru Ishikawa developed it, and the "fishbone diagram," because the complete diagram resembles a fish skeleton. The diagram illustrates the main causes and subcauses leading to an effect (symptom). The cause and effect diagram is one of the "seven tools of quality" (see definition).

Centerline

A line on a graph that represents the overall average mean operating level of the process.

Checklist

A tool for ensuring all important steps or actions in an operation have been taken. Checklists contain items important or relevant to an issue or situation. Checklists are often confused with check sheets (see definition).

Check Sheet

A simple data recording device. The check sheet is custom designed by the user, which allows him or her to readily interpret the results. The check sheet is one of the "seven tools of quality" (see definition). Check sheets are often confused with checklists (see definition).

Client

The party for which professional services are rendered or the person using the services of a social agency. A customer or patron (reference "Customers" or "Stakeholders").

Common Cause Variation

Causes of variation that are inherent in a process over time. They are natural parts of a process or system and affect every outcome of the process and everyone working in the process. Also see "special causes."

Completeness

Having all the data you need to answer your questions, including data that might challenge your conclusions or provide an alternative explanation.

Continuous Improvement (CI)

A philosophy and attitude for analyzing capabilities and processes and improving them repeatedly to achieve customer satisfaction.

Continuous Quality Improvement (CQI)

An integrative process that links knowledge, structures, processes, and outcomes to enhance quality throughout an organization. The intent is to improve the level of performance of key processes and outcomes (*National Committee on Quality Assurance*).

Control Charts

A tool used to identify and distinguish the common and special causes of variation in a process or system.

Correlation (statistical)

A measure of the relationship between two data sets of variables.

Culture Change

A major shift in the attitudes, norms, sentiments, beliefs, values, operating principles, and behavior of an organization.

Customer

External

A person or organization that receives a product, service, or information but is not part of the organization supplying it.

Internal

The recipient (person or department) within an organization of another person's or department's output (product, service, or information).

Cycle

A sequence of operations repeated regularly.

Data

Factual information, especially information organized for analysis or used to reason or make decisions. A set of collected facts. May be defined as documented measurements or observations.

Deming Cycle

Another term for the plan-do-study-act cycle. Walter Shewhart created it (calling it the plan-do-check-act cycle), but W. Edwards Deming made it popular, calling it plan-do-study-act. Also see "plan-do-check-act cycle."

Deviation

In numerical data sets, the difference or distance of an individual observation or data value from the center point (often mean) of the set distribution.

Effect

The result of an action being taken; the expected or predicted impact when an action is to be taken or is proposed.

Effectiveness

The state of having produced a decided on or desired effect.

Efficiency

The ratio of the output to the total input in a process.

Evaluation (Program Evaluation)

A systematic collection of information about the activities, characteristics, and outcomes of programs to make judgments about the program or improve program effectiveness. A tool for making informed decisions about future program development.

Fishbone Diagram

See "cause and effect diagram."

Flowchart

See "process map."

Forcefield Analysis

A way of organizing ideas to help identify the forces and factors in place that support or work against the solution of an issue or problem.

Gantt Chart

A type of bar chart used in process planning and control to display planned and finished work in relation to time.

Goal

A broad statement describing a desired future condition or achievement without being specific about how and when.

Histogram

The most commonly used graph for showing frequency distributions, or how often each different value in a set of data occurs. This is a numerical tool. It is one of the "seven tools of quality" (see definition).

Improvement

The positive effect of a process change effort.

Indicators

Established measures to determine how well an organization is meeting its customer's needs and other operational and financial performance expectations.

Inputs

The products, services, and materials obtained from suppliers to produce the outputs delivered to customers.

Iterative

Characterized by or involving repetition, recurrence, reiteration, or repetitiousness.

Lean

Lean is an operational strategy oriented toward achieving the shortest possible cycle time by eliminating waste. Its key thrust is to increase the value-added work by eliminating waste and reducing incidental work.

Logic Model

A picture displaying the underlying logic behind a program, connecting inputs to outputs (activities and participants) and outcomes.

Matrix

A chart to assist in systematically identifying, analyzing, and rating the presence and strength of relationships between two or more sets of information.

Mean

A measure of central tendency. The arithmetic average of all measurements in a data set.

Measure

The criteria, metric, or means to which a comparison is made with output.

Measurement

The act or process of quantitatively comparing results with requirements.

Median

The middle number or center value of a set of data in which all the data are arranged in sequence.

Methodology

An organized, documented set of procedures and guidelines for one or more phases of a research study, such as analysis or design. Many methodologies include a diagram documenting the results of the procedure (a step-by-step "cookbook" approach for carrying out the procedure).

Operational Definition of a Functional Local Health Department

A set of 45 standards developed by NACCHO with input from public health professionals and elected officials from across the country. The standards are based on the Ten Essential Public Health Services and describe the responsibilities that every person, regardless of where they live, should reasonably expect their LHD to fulfill. The standards provide a framework by which LHDs are accountable to the state health department, the public they serve, and the governing bodies to which they report. LHDs can use the definition and the standards to assess local efforts, measure performance, improve quality, expand functions, enhance activities, and communicate the role of local public health to their governing bodies, elected officials, and the community.

Organizational Performance

Ability of an organization to meet its goals and achieve its mission. Performance can be gauged in terms of four key indicators:

- effectiveness: the degree to which the organization achieves its objectives;
- efficiency: the degree to which it generates its products using a minimum of inputs;
- relevance: the degree to which the organization's objectives and activities reflect the necessities and priorities of key stakeholders; and
- financial sustainability: the conditions to make an organization financially viable.

Organizational Capacity

The ability of an organization to carry out the essential public health services, and, in particular, to provide specific services, such as disease surveillance, community education, or clinical screening. This ability is made possible by specific program resources, as well as by maintenance of the basic infrastructure of the public health system.

Outcome Evaluation

Focuses on the systematic collection of information to assess the impact of a project (outcomes). Addresses questions related to the impact of the project and which outcomes were achieved.

Outputs versus Outcomes

Outputs refer to products, materials, services, or information provided (internal or external) from a process. Outcomes relate to a final product or end result due to a process of logical decision making.

Pareto Chart

A numerical tool that illustrates the factors that are most significant on a bar graph. It is one of the "seven tools of quality" (see listing).

Plan-Do-Study-Act (PDSA) Cycle (or the Shewhart Cycle; also referred to as the Deming Cycle, after W. Edwards Deming)

Named for Walter Shewhart, who discussed the concept in his book, *Statistical Method from the Viewpoint of Quality Control.* It is the continuous improvement cycle of Plan, Do, Study, Act (also known as Plan-Do-Check-Act).

Performance Measures

Quantitative measures of capacities, processes, or outcomes relevant to the assessment of a performance indicator. They are used to assess achievement of standards.

Process Evaluation

Focuses on the implementation and operation of a project (process). Process evaluation addresses questions, which relate to whether the project was implemented as planned, whether there were changes to the project plan, and, if so, why those changes occurred.

Qualitative Data

Data composed of words, providing in-depth, contextualized, and meaning-driven descriptions of anything from an individual's experience to a community's history.

Quality Improvement (QI)

Quality improvement in public health is the use of a deliberate and defined improvement process, such as Plan-Do-Check(Study)-Act, which is focused on activities that are responsive to community needs and improving population health. It refers to a continuous and ongoing effort to achieve measurable improvements in the efficiency, effectiveness, performance, accountability, outcomes, and other indicators of quality in services or processes which achieve equity and improve the health of the community.

Quantitative Data

Data that is measured or identified numerically and can be analyzed using statistical methods.

Rapid Cycle Improvement (RCI)

An improvement process based on the plan-do-study-act (PDSA) model. The Rapid Cycle Improvement model entails four steps: set the aim (goal), define the measures (expected outcome), make changes (action plan), and test changes (solution). The concept behind RCI is to first try a change idea on a small scale to see how it works; then modify it and try it again until it works well for staff and customers and becomes a permanent improvement.

Reliability

The extent to which the same measure or the same study would have the same result if it were repeated.

Repeatability

The variation in measurements obtained when one measurement device is used several times by the same person to measure the same characteristic.

Run Chart

A chart showing a line connecting numerous data points collected from a process running over time.

Sample Size (N):

The number of units in a sample.

Scatter Diagram

Graphs pairs of numerical data, one variable on each axis, to look for a relationship. It is one of the "seven tools of quality"(see definition).

Six Sigma

A method that provides an organization with tools to improve the capability of their business processes. This increase in performance and decrease in process variation lead to defect reduction and improvement in profits, employee morale, and quality of products or services.

S.M.A.R.T.

Acronym used to ensure evaluation and research objectives are specific, measurable, achievable, relevant, and time-bound.

Special Causes (variation)

Causes of variation that arise because of special circumstances. They are not an inherent part of a process. Special causes are also referred to as assignable causes. Also see "common causes."

Stakeholder

Any individual, group, or organization that will have a significant impact on or will be significantly impacted by the quality of a specific product or service.

Standard

The metric, specification, gauge, statement, category, segment, grouping, behavior, event, or physical product sample against which the outputs of a process are compared and declared acceptable or unacceptable.

Standard Deviation (statistical)

A computed measure of variability indicating the spread of the data set around the mean.

Story Board

Graphic representations of an organization's quality improvement journey. A QI story board is a visual depiction of the team's story, beginning at the "plan" phase and ending at the "act" phase. It can be updated continually throughout the PDSA Cycle. Graphics are key when creating a story board with minimal complementary text. The QI story board should include key elements of all stages of the PDSA process.

Stratification

A procedure used to describe the systematic subdivision of data to obtain a detailed understanding of the underlying structure. This procedure can be used to break down a problem to discover its root causes and set into motion appropriate corrective actions.

Stretch Standard

A standard designed to position an organization to meet future requirements.

Survey

The act of examining a process or questioning a selected sample of individuals to obtain data about a process, product, or service.

Target Population

Observable or measurable elements, sampling units, or subjects that will be studied to determine change and the desired outcome.

Team

A group of individuals organized to work together to accomplish a specific objective.

Theory

An explanation for known facts or phenomena.

Timeline

A schedule or timetable for completing the PDSA Cycle of quality improvement.

Validity

Whether you are really measuring what you intend to measure.

Variation

A change in data, characteristic, or function caused by one of four factors: special causes, common causes, tampering, or structural variation.

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Appendix B

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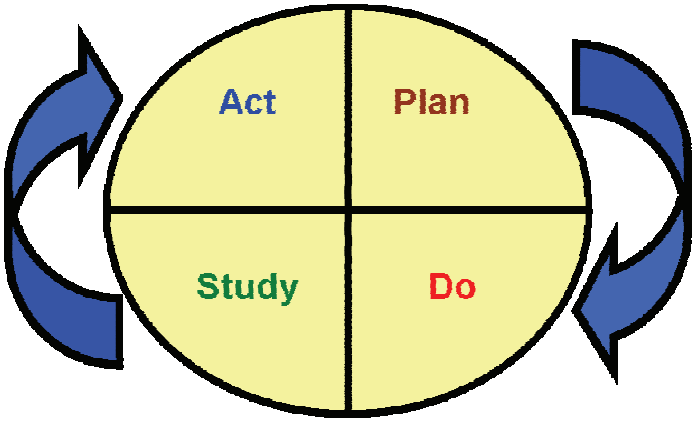

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