



QUALITY IMPROVEMENT METHODOLOGIES

Determining the Best Approach for Incorporating QI into Your Agency's Practice

February 2020

What's in a Method?

Kaizen, Lean, Six Sigma, and Lean Six Sigma methods are often used by health departments to make measurable improvements in their business processes. Some health departments simply use a Plan-Do-Study-Act (PDSA) cycle. All of these methods are interrelated and understanding the similarities can help distinguish the differences.

As a starting point, it's helpful to think of PDSA as a summary of the steps involved in the other four methods. Kaizen, Lean, Six Sigma, and Lean Six Sigma were created initially for the manufacturing industry, and PDSA is a more generic framework that captures the progression of thoroughly examining a current process and its problems, followed by developing solutions, then testing the solutions and measuring the results, and ending by institutionalizing a new process. The steps in the other four methods conceptually are quite similar and many differences largely are a matter of semantics.

Furthermore, all four methods focus on improving processes and require participation from all employees involved in the process in order to achieve maximum effectiveness. They rely on data to understand the problem and whether changes result in improvement. Moreover, the methods essentially all use the same tools and often combine approaches. Finally, all are grounded in a philosophy of continual improvement; therefore, QI is not merely a series of discrete improvement efforts but rather is part of an organization's culture.

However, there are some useful distinctions to understand, related to philosophy and specific objectives. The chart below is intended to highlight these differences and help you determine the best approach for incorporating quality improvement into your agency's practice.

This document was developed with feedback from PHAB's Evaluation and Quality Improvement Committee, and in consultation with Grace Gorenflo.

	PDCA/PDSA	Kaizen	Lean	Six Sigma	Lean Six Sigma
Defined	A cycle for identifying and testing a change. Plan-Do-Check-Act (PDCA) and Plan-Do-Study-Act (PDSA) are the same thing and reflect different translations from the original Japanese concept.	Philosophy of gradual, incremental and orderly continuous improvement, always working to create more value and less waste. Kaizen “events” or “blitzes” are intensive sessions involving all employees working on a process to identify and make multiple rapid improvements. This column describes a Kaizen event.	A method to maximize customer value while eliminating waste. Follows the A3 process that essentially is a version of PDCA. (The specific steps are outlined below in the PDCA section.)	A method to greatly reduce the probability that an error or defect will occur. Follows the DMAIC process (described below)	An approach to eliminating waste and variation; combines both Lean and Six Sigma tactics.
Objective	Test a change on a small scale before adopting it as a standard practice.	Make small, incremental changes that add up to significant changes over the longer term.	Develop a set of standardized practices that maximize process speed (least amount of time) and decrease waste (no unnecessary steps).	Reduce variability in the outputs or products of a process.	Increase quality and reduce de-defects/variation while increasing process speed and efficiency
Situations in which the approach is most helpful	PDSA is a part of Kaizen, Lean and Six Sigma methods. All of them entail steps to: examine the problem and its root causes and identify potential solutions (plan); test the solutions (do); analyze the results of the test (study); and implement the new process (act). On its own, PDSA is a useful framework for process improvement when it is not clear whether one of the other approaches is indicated.	Any process in which changes can be tested in a very limited time period.	When a process is too slow to meet customer needs. When a process is felt to be overly cumbersome due to excess motion, people, supplies, or time delays.	When a process has established “normal limits” for its measurable outcomes and yet the outcomes vary more than what is considered to be within the normal limits. The goal is to reduce the variation so all outcomes are within normal limits.	Combination of situations in which it would be helpful to apply both Lean and Six Sigma tools and methods.

		PDCA/PDSA	Kaizen	Lean	Six Sigma	Lean Six Sigma
Major Steps	Plan	<ul style="list-style-type: none"> - Define the problem - Gather baseline data - Convene the team - Create aim statement - Develop flow chart - Conduct root analysis - Identify and mistake-proof solutions. - Carefully consider the proposed solutions, identify problems that could occur, and revise the solutions as needed. - Develop a workplan to test the changes 	<ul style="list-style-type: none"> - Define the problem - Gather baseline data - Convene the team - Review current situation/process - Identify root causes/key issues - Create high impact solutions 	<ul style="list-style-type: none"> - Identify the problem and convene the team - Develop a “current state” process map that identifies problem areas (and gather baseline data if needed) - Conduct a root cause analysis - Identify countermeasures - Develop an “ideal state” process map - Develop a plan for implementation - Develop a follow-up plan with predicted outcomes - Communicate with everyone affected by the process 	<ul style="list-style-type: none"> - Define: Articulate the problem and convene the team, customer, voice of the customer and critical process outputs - Measure: Establish baseline process performance measures - Analyze: Identify root causes, develop hypotheses as to why problems exist and prove or disprove the hypotheses 	
	Do	<ul style="list-style-type: none"> - Test/Implement the changes and collect data 	<ul style="list-style-type: none"> - Test solutions 	<ul style="list-style-type: none"> - Implement the plan 	<ul style="list-style-type: none"> - Improve: Develop and pilot test solutions then collect data to measure improvements. 	
	Study	<ul style="list-style-type: none"> - Analyze the results 		<ul style="list-style-type: none"> - Evaluate results according to the follow-up plan 		
	Act	<ul style="list-style-type: none"> - Do more planning and testing or, once desired results have been obtained, institutionalize the new process and monitor indicators to “hold the gains” 	<ul style="list-style-type: none"> - Obtain sponsor approval to install solutions - Install solutions 		<ul style="list-style-type: none"> - Control: Create a Monitoring Plan to continue measuring the performance of the process and develop a Response Plan in case performance lags. 	

	PDCA/PDSA	Kaizen	Lean	Six Sigma	Lean Six Sigma
Key tools	<ul style="list-style-type: none"> - Flowchart/Process - Map - Data Tools (e.g., run chart, Pareto chart) - Root Cause Analysis Tools (e.g., fishbone diagram, interrelationship diagram, force field analysis) 	<ul style="list-style-type: none"> - Value Stream Mapping - Gemba Walk - Root Cause Analysis Tools - Pareto chart 	<ul style="list-style-type: none"> - Value Stream Mapping - Takt Time - Root Cause Analysis Tools - Load Balancing - 5S - 8 Wastes - Kanban 	<ul style="list-style-type: none"> - Voice of the Customer - Value Stream Mapping/ Process map - SIPOC diagram - Root Cause Analysis Tools - Kanban - Control charts 	
Notes on Value Stream Mapping		Value Stream Mapping captures detailed measurements of many small improvements that, when combined, can add up to significant improvements.	Value Stream Mapping readily identifies wasteful steps in a process	Value Stream Mapping/Process Maps identify problems that can lead to variation in process outputs	

References

Gershon, M. "Which Process Improvement Methodology to Implement. <https://www.semanticscholar.org/paper/Choosing-Which-Process-Improvement-Methodology-to-Temple/2360292ae7eeea30d02aba080bf241e76d9e97a4> Accessed 10.18.19

Nayab, N. A *Comparison of Various Quality Improvement Methodologies*. <https://www.brighthubpm.com/methods-strategies/121894-a-review-of-the-relationship-among-various-quality-improvement-tools/>

Scoville R, Little K. *Comparing Lean and Quality Improvement*. IHI White Paper. Cambridge, Massachusetts: Institute for Healthcare Improvement; 2014. (Available at ihi.org)

Taylor, C. *Comparing Improvement Methods*. <https://service.asu.edu/blog/comparing-improvement-methods> Accessed 10.30.19

Valencia, S. *Process Improvement: Which Methodology is Best for Your Project?* <https://slideplayer.com/slide/4633961/> Accessed 10.30.19

PDSA Example

Kuber, K. Public Health Quality Improvement Exchange. *Forest County Potawatomi Car Seat Safety Program*. Wed, 10/09/2013 - 13:39. Available at <http://www.phqix.org/content/forest-county-potawatomi-car-seat-safety-program>. Accessed October 30, 2019.

Kaizen Example

Lenartz, S. Public Health Quality Improvement Exchange. *Public Health Laboratory: Influenza Process Improvement Kaizen*. Mon, 10/23/2017 - 15:26. Available at <http://www.phqix.org/content/public-health-laboratory-influenza-process-improvement-kaizen>. Accessed October 30, 2019.

Lean Six Sigma Example

Shultz, R. Public Health Quality Improvement Exchange. *Enforcing Public Health Law: Improving the Administrative Hearing Process to Reduce Staff Time*. Wed, 05/28/2014 - 21:57. Available at <http://www.phqix.org/content/enforcing-public-health-law-improving-administrative-hearing-process-reduce-staff-time>. Accessed October 30, 2019.