

Research Findings Brief

No. PR2011-10

December 2011

www.unmc.edu/rural

Effectiveness and Challenges of Implementing Quality Improvement Strategies in Nebraska's Local Health Departments

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Research Highlights

- Although having an agency culture that accommodates quality improvement (QI) was rated by all local health departments (LHDs) as “essential” in planning and implementing a QI program or intervention in the LHD setting, only one-third (33.3%) of directors reported that their LHD culture actually accommodates QI.
- Although certain QI strategies were rated as “essential” or “highly important” in planning and implementing a QI program or intervention in the LHD setting, they are not fully implemented across all LHDs. Specifically, only 15.8% of LHDs reported having a QI plan; only 21.1% have a QI council, committee or team; and only 26.3% have a designated QI officer.
- The use of a QI model, defined change concepts, QI techniques, and quality measures or metrics were rated as “highly important” in planning and implementing a QI program or intervention; however, less than half of LHDs reported having actually used a QI model (47.4%), defined changed concepts (47.1%), QI techniques (47.1%), or quality measures or metrics (44.4%) for a QI program or intervention.
- Specific QI techniques, including Plan-Do-Study-Act cycles and control controls, have been found to be effective upon implementation within LHDs.
- Challenges in implementing QI models, strategies, tools, and techniques are related to an information gap regarding QI concepts and methodologies, an agency culture that does not accommodate QI, and a lack of capacity and resources within LHDs.

Introduction

Although the implementation strategies and effectiveness of quality improvement (QI) activities have been examined extensively for many industries, including the health care sector, very few studies have focused on the public health context. Furthermore, 17 of Nebraska's 21 local health departments (LHDs) serve multiple counties, ranging from 2 to 10 counties. Although this regional approach has advantages, such as scale economies for public health programs and coordinated preparedness for public health emergencies, the lack of knowledge about effective QI strategies for regional public health systems has made it difficult for regional LHDs to capitalize on these advantages. In 2011, the Nebraska Center for Rural Health Research conducted a two-phase study that examined the current status in implementing public health QI initiatives as well as the effectiveness and challenges of QI implementation in Nebraska's LHD practice settings. In the first phase, LHD directors were surveyed to identify the current status in implementing QI initiatives as well as the strategies that were being utilized. In the second phase, an in-depth discussion with LHD directors and representatives was facilitated in order to further identify the effectiveness and challenges of QI implementation within Nebraska's LHD practice settings. This brief summarizes the findings from the discussion with the LHD directors and representatives.

Methods

A facilitated discussion with directors and representatives from LHDs was organized by the Nebraska Center for Rural Health Research in October 2011 in conjunction with the Office of Community Health and Performance Management and the Public Health Association of Nebraska (PHAN). This



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meeting was held prior to the Public Health Association of Nebraska Annual Meeting in Grand Island, Nebraska. Approximately thirty people attended this meeting and included members of the Office of Community Health and Performance Management, representatives of PHAN, directors of LHDs in Nebraska and selected staff members that have a greater role in quality improvement activities within their LHD. During the meeting, attendees participated in an expert panel review of QI strategies and techniques in the LHD setting. The expert panel review consisted of two rounds. In the first round, each participant was asked to rate items from a metaset of identified QI models, strategies, tools, and techniques in terms of its importance in planning and implementing a QI program or intervention in the LHD setting. The metaset covered the following domains: (1) Accommodation of QI Culture within Agency, (2) QI Strategies, (3) QI Models, (4) Aim Statement, (5) Defined Change Concepts, (6) QI Techniques, (7) QI Measures or Metrics, (8) Data Collection, and (9) Statistical Methods or Analyses.

The metaset was created based on the findings from the 2011 Local Health Department Quality Improvement Survey conducted in the first phase of the study. In order to develop this survey, we examined other documents, such as the QI taxonomy developed by the University of Minnesota as well as by continuous input from the Nebraska Public Health Practice-Based Research Network Steering Committee.¹ The survey also modified questions from the Multi-State Learning Collaborative 2011 Annual Survey designed by the University of Southern Maine as well as from the National Association of County and City Health Officials' 2010 National Profile of Local Health Departments. The survey was completed by 19 (90.5% of sample) LHD directors in Nebraska. The survey ascertained the extent of implementation of QI models, strategies, tools, and techniques within Nebraska's LHDs. In the second round, discussion participants were given an anonymous summary of the aggregated ratings, which included the median rating of the responses. The aggregated median rating from the first round along with the results from the 2011 Local Health Department Quality Improvement Survey were presented to the participants and used to facilitate a discussion and build a consensus on what QI strategies work best and on the challenges of QI implementation within the LHDs. The facilitated discussion was then transcribed and open-coded for emerging themes and content using QSR's NVivo 9 Data Analysis Program. The unit of analysis for the rating and implementation results presented in this brief was a LHD, not an individual meeting participant. If more than one individual from a LHD participated in the meeting, we required the participants to reach a consensus at the LHD level and reported only the consensus results back to the meeting facilitators.

Results

Expert Panel Review Round One Review

Table 1 shows the median rating of importance of each of the domains from the first round of the expert panel review. All domains were rated as "essential" or "highly important" in planning and implementing a QI program or intervention in the LHD setting.

Table 1. Median Rating of Quality Improvement Domains, Nebraska 2011 (N = 19)

Domain	Median Rating of Importance
1. Agency Culture Accommodates QI	5
2. QI Strategies	5
3. QI Model	4
4. Aim Statement	4
5. Defined Change Concepts	4
6. QI Techniques	4
7. Quality Measures or Metrics	5
8. Data Collection	5
9. Statistical Methods or Analyses	4

Scale: 1 = Not important at all; 2 = Slightly important; 3 = Moderately important; 4 = Highly important; 5 = Essential

¹ Riley, W., Lownik, E. "Process Analysis in Local Health Departments: Using Quality Improvement Methods and Techniques to Identify Failure Modes." AcademyHealth Annual Research Meeting. Seattle, WA. June, 2011.

Accommodation of Quality Improvement Culture within Agency

Table 2 shows the median rating of importance as well as the extent of implementation within Nebraska’s LHDs regarding items within the Accommodation of QI Culture within the Agency domain. All items were rated as “essential” in planning and implementing a QI program or intervention in the LHD setting. However, only one-third (33.3%) of LHDs reported that their LHD culture actually accommodates QI, which suggests a discrepancy between perception of importance and actual implementation.

Table 2. Accommodation of Quality Improvement Culture within Agency: Median Rating of Importance & Extent of Implementation within Nebraska Local Health Departments, 2011 (N = 19)

Item	Median Rating of Importance	% Implemented in LHD
Agency culture accommodates QI.	5	33.3
Leaders (e.g. board, senior management team) are receptive to new ideas for improving agency programs, services, and outcomes.	5	100.0
Agency data are shared with staff for performance improvement purposes.	5	84.2
Agency looks at matters in a respectful way without blaming others when things go wrong.	5	89.5
Agency routinely asks staff members to contribute to decisions.	5	100.0
Improving quality is well integrated into the way many individuals responsible for programs and services work.	5	63.0

Scale: 1 = Not important at all; 2 = Slightly important; 3 = Moderately important; 4 = Highly important; 5 = Essential

Quality Improvement Strategies

Table 3 shows the median rating of importance as well as the extent of implementation within Nebraska’s LHDs regarding items within the Quality Improvement Strategies domain. Although all items were rated as “essential” or “highly important” in planning and implementing a QI program or intervention in the LHD setting, they are not fully implemented across all LHDs. Specifically, only 15.8% of LHDs reported having a QI plan; only 21.1% have a QI council, committee, or team; and only 26.3% have a designated QI officer.

Table 3. Quality Improvement Strategies: Median Rating of Importance and Extent of Implementation within Nebraska Local Health Departments, 2011 (N = 19)

Item	Median Rating of Importance	% Implemented in LHD
Agency designates a QI officer.	4	26.3
Agency establishes a process for identifying QI priorities within many programs and services.	4	47.4
Agency has job descriptions, including specific responsibilities related to measuring and improving quality, for individuals responsible for programs and services.	5	31.6
Staff members at all levels participate in QI efforts.	5	68.4
Agency has a QI council, committee, or team.	4	21.1
Agency has a QI plan.	5	15.8
Customer satisfaction information is routinely used by many individuals responsible for programs and services.	4	52.6
Agency allocates sufficient time for staff to participate in QI efforts.	5	31.6
Accurate and timely data are available for program managers to evaluate the quality of their services on an ongoing basis.	5	47.4
Agency staff are aware of external QI expertise to help measure and improve quality.	4	31.6

Scale: 1 = Not important at all; 2 = Slightly important; 3 = Moderately important; 4 = Highly important; 5 = Essential

Quality Improvement Model

The use of a QI model was rated as “highly important” in planning and implementing a QI program or intervention; however, less than half (47.4%) of LHDs reported having actually used a QI model for a QI program or intervention. Furthermore, three out of four listed specific QI models were rated as “highly important”; however, only 29.4% of LHDs

reported having actually implemented the Model for Improvement, only 12.5% have implemented Six Sigma, and only 25.0% have implemented Baldrige (Table 4).²

Table 4. Quality Improvement Model: Median Rating of Importance and Extent of Implementation within Nebraska Local Health Departments, 2011 (N = 19)

Item	Median Rating of Importance	% Implemented in LHD
Agency uses QI model.	4	47.4
<u>Model for Improvement</u> : a tool that identifies an aim statement, metric, and change concepts, then makes relatively small changes and rapidly expands their scope through PDSA cycles	4	29.4
<u>Lean</u> : model focused on improving the flow or methods related to process.	3	41.2
<u>Six Sigma</u> : an approach designed to reduce the incidence or number of defects or errors associated with a process.	4	12.5
<u>Baldrige</u> : a framework for achieving performance excellence through an assessment of organizational strengths and opportunities.	4	25.0

Scale: 1 = Not important at all; 2 = Slightly important; 3 = Moderately important; 4 = Highly important; 5 = Essential

Aim Statement

Articulating an aim statement was rated as “highly important” in planning and implementing a QI program or intervention in the LHD setting; however, slightly more than half (52.6%) of LHDs reported having actually articulated an aim statement for a QI program or intervention. Specific components of an aim statement were also rated as “highly important” in planning and implementing a QI program or intervention in the LHD setting; however, less than half of LHDs reported having clearly identified a process targeted for improvement (44.4%), a timeframe by which the improvement will be made (38.9%), and a measurable goal that defined the project’s success (47.4%) within their aim statement (Table 5).

Table 5. Aim Statement: Median Rating of Importance and Extent of Implementation within Nebraska Local Health Departments, 2011 (N = 19)

Item	Median Rating of Importance	% Implemented in LHD
Agency articulates an aim statement for QI program/intervention.	4	52.6
Aim statement has a clearly identified <u>process</u> targeted for improvement.	4	44.4
Aim statement has a clearly identified <u>timeframe</u> by which the targeted improvement will be made.	4	38.9
Aim statement has a clearly identified <u>measurable goal</u> that will define the success of the project.	4	47.4

Scale: 1 = Not important at all; 2 = Slightly important; 3 = Moderately important; 4 = Highly important; 5 = Essential

Defined Change Concepts

Applying defined change concepts was rated as “highly important” in planning and implementing a QI program or intervention in the LHD setting; however, slightly less than half (47.1%) of LHDs reported having actually applied a defined change concept for a QI program or intervention. Specifically, applying Plan-Do-Study-Act (PDSA) cycles was rated as “highly important” in planning and implementing a QI program or intervention in the LHD setting; however, less than half (47.4%) of the LHDs reported having actually used PDSA cycles for a QI program or intervention (Table 6).

² Some participants commented that the implementation rate for some QI models (e.g., Lean) may be overestimated by LHDs, as some LHDs may implement a similar (informal) model that may differ from the model in question.

Table 6. Defined Change Concepts: Median Rating of Importance and Extent of Implementation within Nebraska Local Health Departments, 2011 (N = 19)

Item	Median Rating of Importance	% Implemented in LHD
Agency applies <u>defined change concepts</u> for any QI program/intervention.	4	47.1
<u>Plan-Do-Study-Act (PDSA) cycles</u> : an approach used to test a change in the real work setting—by planning it, trying it, observing the results, and acting on what is learned.	4	47.4

Scale: 1 = Not important at all; 2 = Slightly important; 3 = Moderately important; 4 = Highly important; 5 = Essential

Quality Improvement Techniques

The use of QI techniques was rated as “highly important” in planning and implementing a QI program or intervention in the LHD setting; however, slightly less than half (47.1%) of LHDs reported having actually used a QI technique for a QI program or intervention. Specifically, the use of run charts, control charts, cause-and-effect diagrams, and prioritization matrices were rated as “highly important”; however, the reported use of these QI techniques ranges from 27.8% to 52.6% within LHDs (Table 7).

Table 7. Quality Improvement Techniques: Median Rating of Importance & Extent of Implementation within Nebraska Local Health Departments, 2011 (N = 19)

Item	Median Rating of Importance	% Implemented in LHD
Agency uses QI techniques.	4	47.1
Run Charts	4	42.1
Control Charts	4	27.8
Radar Charts	3	11.8
Cause-and-Effect Diagrams	4	27.8
Prioritization Matrix	4	52.6
Brainstorming	5	79.0
Spaghetti Maps	3	17.7
Opportunity Maps	3	5.6
5 S's	3	11.1

Scale: 1 = Not important at all; 2 = Slightly important; 3 = Moderately important; 4 = Highly important; 5 = Essential

Quality Measures or Metrics

The use of quality measures and metrics was rated as “essential” in planning and implementing a QI program or intervention; however, less than half (44.4%) of LHDs reported having actually used a quality measure or metric for a QI program or intervention. Furthermore, among specific quality measures or metrics, the use of ongoing monitoring was rated as “highly important”; however, 47.4% of LHDs reported having actually used ongoing monitoring as a metric for a QI program or intervention (Table 8).

Table 8. Quality Measures or Metrics: Median Rating of Importance and Extent of Implementation within Nebraska Local Health Departments, 2011 (N = 19)

Item	Median Rating of Importance	% Implemented in LHD
Agency uses quality <u>Measures or Metrics</u> .	5	44.4
<u>Process Stability</u> : a metric that assesses the stability of a process (i.e., how much variation in the process is there). The more variation, the less stable the process.	3	5.3
<u>Process Capability</u> : a metric that assesses the capability, including efficiency and quality, of a stable process.	3	36.8
<u>Ongoing Monitoring</u> : a metric that continually measures for process control and sustainability.	4	47.4

Scale: 1 = Not important at all; 2 = Slightly important; 3 = Moderately important; 4 = Highly important; 5 = Essential

Data Collection

All listed sources of data collection were rated as “essential” or “highly important” in planning and implementing a QI program or intervention; however, not quite half of LHDs reported having actually collected data via survey

administration, secondary databases, personal interview, group meetings, and focus groups for a QI program or intervention (Table 9).

Table 9. Data Collection: Median Rating of Importance and Extent of Implementation within Nebraska Local Health Departments, 2011 (N = 19)

Item	Median Rating of Importance	% Implemented in LHD
Survey/Questionnaire	5	47.4
Existing databases	5	42.1
Personal interviews	5	42.1
Group meetings	4	47.4
Focus groups	4	42.1

Scale: 1 = Not important at all; 2 = Slightly important; 3 = Moderately important; 4 = Highly important; 5 = Essential

Statistical Methods or Analyses

Table 10 shows the median rating of importance as well as the extent of implementation within Nebraska’s LHDs regarding items within the Statistical Methods or Analyses domain. The application of statistical process control and time series analysis was rated as “highly important” in planning and implementing a QI program or intervention; however, less than one-third of LHDs reported having applied statistical process control (21.1%) and time series analysis (31.6%) for a QI program or intervention.

Table 10. Statistical Methods or Analyses: Median Rating of Importance and Extent of Implementation within Nebraska Local Health Departments, 2011 (N = 19)

Item	Median Rating of Importance	% Implemented in LHD
Statistical process control: the application of statistical methods to monitor and control a process to ensure that it operates at its full potential to produce conforming product(s).	4	21.1
Time series analysis: a method for analyzing a series of successive data points in order to extract meaningful statistics and other characteristics of the data.	4	31.6
Multifactorial analysis: a statistical method used to describe variability among observed variables in terms of a potentially lower number of statistically significant predictive factors.	3	16.7

Scale: 1 = Not important at all; 2 = Slightly important; 3 = Moderately important; 4 = Highly important; 5 = Essential

Effectiveness of Quality Improvement Implementation

During the facilitated discussion, specific QI techniques were mentioned as being effective upon implementation. Specifically, participants noted improvements made within their public health practice by the use of PDSA cycles and controls charts.

“In the medical clinic, we were having difficulties in regards to electronic medical records. We’ve had difficulties getting patients to make a follow-up appointment because ... We’ve been on EMR for over a year. We were having a little difficulty because we would send the task electronically to the checkout desk, but the patient no longer stops at the checkout desk ... because they used to have a piece of paper and when they would start to go past the checkout desk, somebody would see the piece of paper and tell them that they needed to come to the checkout desk. And so we [now] have a PDSA where we give them a really obscene bright green card ... that says ‘stop at the checkout desk’.... It’s a very simple PDSA. But it has improved our process for getting people scheduled for follow-up appointments.” (Participant)

“Right now we are using control charts, which I’m a big fan of because it’s more black and white and you know what’s good and what’s bad, clinic went well today, what didn’t go well.” (Participant)

Challenges of Quality Improvement Implementation

Among the challenges in implementing QI models, strategies, tools, and techniques, four major themes emerged from the facilitated discussion: (1) QI Knowledge Gap, (2) Agency Culture, (3) Capacity, and (4) Resources.

Quality Improvement Knowledge Gap

Several LHD representatives indicated that there was an information gap or lack of knowledge of QI methodologies or terminology within their health districts. They also indicated a distinct need for additional training in QI methodologies for public health.

"Sometimes you think you're somewhere but you don't speak the language or you don't know enough to really know where you are on the path if you haven't seen the whole map. You might think you're down the map this far, [but] because you don't know the map, you're really not that far or you are farther along than you think." (Participant)

"I think that knowledge is power and I think what we need ... is the knowledge to use the power.... The bottom line is we need some type of component and something that works for us, and the bottom line is we need the knowledge to do something." (Participant)

"I think everybody wants to do it. We just need to have the training and the tools to do it best." (Participant)

Several LHDs also indicated that although they were not utilizing a formal QI methodology, they were, in fact, using a similar informal methodology.

"...I was doing something similar to that, not that I was trained in Lean or Baldrige or whatever as something similar to that form and we'll use different forms depending on what we are trying to do whether we are trying to correct errors or whether we're trying to increase efficiency or a different type of technique." (Participant)

Agency Culture

LHD representatives also indicated a need to change the culture within the health departments in order to make QI a priority and acceptable to the staff of the LHDs.

"...the agency has to be open to the people not doing well ... to have the ability of somebody coming forward and somebody saying this process is not working because of X, Y, and Z. And that's an unpopular standpoint, so I look at the culture that way, to promote a positive culture among staff. It takes a lot to move that [way] because as human beings we all want to do a good job all the time so sometimes when we screw up or don't do something right, there's a hesitancy to come forward and say, 'you know what, this process is not working.' And you have to have that to have continuous quality improvement ... so it's changing that culture where it's safe to come forward and say, 'you know what, this isn't working, and now we can work on it and it's okay that it's not working.'" (Participant)

Capacity

LHDs also indicated that the lack of QI initiatives could be due to the lack of capacity, including the availability of staff time.

"There's just no way that we have the capacity to ... go towards quality improvement and we don't have any of those models, we can't possibly do that with our small staff in our capacity, we could never, I know I sound really negative, but we could never put a full-scale program like that in, we just barely get our work done." (Participant)

One participant attributed that the insufficient capacity to the relatively recent formation of LHDs in the state of Nebraska.

"I think it has a lot to do with the fact that the majority of the rural health departments are new, relatively, in the world, and our first goal was survival and starting programming and developing programming and it still is and we're still there and we're just a little over a toddler. It's like Maslow's Scale of Needs, you gotta start with survival and then developing programs before you have anything to evaluate. So you add that to the fact that we have limited staff and so you can value that very highly. But to put a system in place, you have to have staff, and if we're doing the program, we have the choice of doing the program or doing a specific process of QI." (Participant)

Resources

The LHD representatives also noted a lack of funding available for QI activities within LHD budgets.

"I think Lean is expensive to implement; generally I think it's implemented in agencies with a lot of resources ... It's time intensive and it takes a lot of training to train a team on Lean; it's a very expensive training." (Participant)

Acknowledgements

We thank the directors and staff of the local health departments who participated in this study. We would also like to thank the Office of Community Health and Performance Management and the Public Health Association of Nebraska with their assistance in planning and implementing the meeting. Additionally, we thank Sue Nardie for her help with editing this brief.