

Research Findings Brief

No. PR2014-1

July 2014

www.unmc.edu/rural

A Systematic Study of Quality Improvement Implementation among Local Health Departments in Nebraska

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Research Highlights

The quality improvement (QI) projects implemented by the local health departments included in this study were effective in reducing the Risk Priority Numbers associated with most of the identified failure modes in the process/service at which the QI project was targeted. This finding suggests that these QI projects were generally effective in improving the process and/or outcomes of the targeted programs/services.

Introduction

Quality Improvement (QI) is an essential task for all health departments.¹ Several recent studies have focused on various areas of public health QI. A study completed in 2009 found that using a statistical process control technique reduced waiting time and improved client satisfaction with the Women, Infants, and Children (WIC) program.² Another study showed how a QI initiative was used to improve the workforce capabilities in public health bio-preparedness through the provision of tools and a QI feedback loop.³ Nevertheless, there has been little research on conceptualizing the QI process in local health department (LHD) settings using a common analytical framework that allows for the comparison of different QI projects across different LHDs. In this study, we used the Failure Modes and Effects Analysis (FMEA) tool as a common framework to examine QI implementation across 4 LHDs in Nebraska.

Nebraska provides an ideal setting to study the implementation of QI initiatives within LHDs. There are 21 LHDs in the state, including 17 regional LHDs, with the size of service area ranging from 2 to 10 counties. This structure provides an interesting environment for studying the LHDs' implementation of QI initiatives within a regionalized context. The 4 LHD sites in this study were selected because they vary considerably in rurality of jurisdiction (including population density and number of frontier counties and urban counties), size of the LHD (including population size and number of counties served), and stage of QI implementation. One of the 4



**Nebraska Center for Rural
Health Research**

Support for this project was provided by a research grant from the Robert Wood Johnson Foundation through the National Coordinating Center for Public Health PBRN program. For further information contact Li-Wu Chen, PhD, liwuchen@unmc.edu, 402-559-5260, Department of Health Services Research and Administration, College of Public Health, University of Nebraska Medical Center, 984350 Nebraska Medical Center, Omaha, NE 68198-4350.

¹Baker, S. L., Beitsch, L., Landrum, L. B., & Head, R. (2007). The role of performance management and quality improvement in a national voluntary public health accreditation system. *Journal of Public Health Management and Practice*, 13(4), 427-429.

²Boe, D. T., Riley, W., & Parsons, H. (2009). Improving service delivery in a county health department WIC clinic: An application of statistical process control techniques. *American Journal of Public Health*, 99(9), 1619-1625.

³Drabczyk, A., Epstein, P., & Marshall, M. (2012). A quality improvement initiative to enhance public health workforce capabilities. *Journal of Public Health Management and Practice*, 18(1), 95-99.

LHDs contains an urban county and is a single-county LHD, serving a population of 289,800 with a population density of 337 people per square mile. The other 3 LHDs are all regional multi-county LHDs that contain only rural counties, with variation in population size and density, number of counties, and number of frontier counties. Therefore, these 4 LHDs represent the continuum of the local public health structure in Nebraska and provide a good setting to study variation in QI implementation by practice setting.

Methods

The FMEA tool developed by the Institute for Healthcare Improvement was used for this study.⁴ Each participating LHD was asked to provide data on 1 QI project that they had implemented. For each selected QI project, LHD staff members were asked to identify all steps of the original process at which the QI project was targeted. For each identified step, LHD staff members were asked to identify all possible failure modes, and then to assess the likelihood of occurrence, likelihood of detection, and severity of failure for each identified failure mode by assigning a numeric value ranging from 1 to 10 (with 1 being the least likely and 10 being the most likely). LHD staff members were asked to reassess the same failure modes after implementation of the QI project. A Risk Priority Number (RPN) was calculated for each failure mode by multiplying likelihood of occurrence, likelihood of detection, and severity. The RPN for the entire process was calculated by totaling all individual RPNs in the process. RPN was calculated separately for the process before and after QI implementation. It was expected that the RPN would decrease if a QI project was effective in improving the targeted process/outcomes.

Results

Local Health Department A

Issues

The LHD implemented a QI project to correct the process associated with a history of incurring finance charges on its credit card account.

Failure modes identified

Through FMEA, the following failure modes related to incurring finance charges on the credit card account were identified:

- Credit cards could be misplaced or stolen as each staff member is responsible for 1 credit card. Credit cards could also be misused as most purchases do not require pre-approval, so staff could use the credit card for personal purchases.
- Mail with invoices and credit card statement could be delayed or lost due to delays in the postal service. In addition, staff members might not complete vouchers in a timely manner.
- Due to an unplanned absence of the staff member responsible for vouchers, or the office manager, the fiscal agent may not receive a voucher in a timely manner, and hence payment may be delayed.
- Invoices or receipts could be lost or misplaced due to the absence of a process for management of receipts and vouchers, or because staff are not required submit vouchers immediately, which could lead to interest charges for late submission of vouchers.
- Staff may be in a hurry to submit vouchers that were not submitted in a timely manner, and fail to keep a copy of a voucher before sending it to the fiscal agent, which could result in both the office manager and the fiscal agent not having all necessary copies of a voucher.

Changes made through the QI project

The following changes were made to address the identified issues:

- Staff members must submit a voucher form for a purchase they make immediately upon returning to the LHD after making the purchase, or as soon as they receive an invoice, and must attach the invoice or receipt to the voucher.

⁴Institute for Healthcare Improvement (2014). Failure Modes and Effects Analysis (FMEA) Tool. Accessed on July 22, 2014, at <http://www.ihl.org/resources/Pages/Tools/FailureModesandEffectsAnalysisTool.aspx>

- A voucher is not sent to the fiscal agent directly, but is submitted to the office manager, who makes and files a copy, and submits the voucher to the director for signature.
- The day of the week to mail vouchers to the fiscal agent was changed from Monday to Tuesday. Staff travelling to Kearney on Monday or Tuesday are allowed to deliver the vouchers to the fiscal agent.
- Access to the LHD's online credit card account was granted to the office manager, allowing her to check the credit card account weekly and reconcile the online account with the copies of vouchers that she has. If she identifies a missing voucher, she immediately contacts the fiscal agent, and if she determines that the fiscal agent does not have a copy of the voucher, she notifies the staff member responsible for the voucher and asks him or her to submit it.
- The LHD developed a reporting system for the credit card account. The office manager now updates the LHD director and staff on the credit card account status during monthly team meetings.

Outcomes

A 47% reduction in the overall RPN was observed after the QI project was implemented. With the changes that the LHD made to several steps, the failure modes' RPNs decreased in all but 1 step in the initial process of credit card use and reimbursement. Changing the day of the week to send vouchers to the fiscal agent and allowing staff travelling to Kearney to hand deliver the vouchers and timesheets helped to *reduce the RPN* associated with the failure mode of delayed payments due to invoices or credit card statements being lost or delayed in the mail *by 44%*. Requiring staff to complete a voucher form immediately upon purchase helped *decrease the RPN* associated with the failure mode of misplacing or losing invoices/receipts, and/or late submission of vouchers *by 64%*. Also, giving the office manager access to the online credit card account allowed her to better address issues related to missing vouchers, contributing to a *70% reduction in the RPN* associated with the failure mode of outstanding invoices and charged interest for late voucher submission. The improved communication between the office manager and the fiscal agent helped to *reduce the RPN* associated with the failure mode of the LHD and the fiscal agent not having copies of vouchers *by 83%*.

Local Health Department B

Issues

The LHD is currently in the process of developing its infrastructure in order to apply for Public Health Accreditation Board (PHAB) accreditation. One of the key components of the accreditation process is organizing documentation on the various policies and procedures necessary for an LHD to operate. One of the standard steps recommended by PHAB is for the LHD to systematically review the documentation required within the standards and measures and make notes on items that need to be completed to ensure that the LHD is "up to speed."⁵ Therefore, the LHD is implementing a QI project to ensure that all policies are easily retrievable by staff.

Failure modes identified

Through FMEA, the following failure modes related to document retrieval were identified:

- Due to the absence of a standard procedure for saving files, as well as lack of access to the shared network drive, staff members kept files on their computer's C drive or on a portable data storage device.
- Master folders, folders, and subfolders were created based on a staff member's own way of organizing documents. Because there was no standard procedure for file and folder organization, staff often saved a file in the wrong folder.
- Names of the folders and subfolders were also chosen based on the decision of the staff member who created it, causing difficulties for staff members who tried to locate desired documents, as they could easily choose the wrong folder due to the similarity in folder names, use of acronyms, and misnamed folders.

⁵Public Health Accreditation Board (2013). Getting Started. Accessed on March 15, 2013 at <http://www.phaboard.org/accreditation-overview/getting-started/>

Changes made through the QI project

The following changes were made to address the identified issues related to document retrieval:

- A new procedure was set in place and requires staff members to choose among 1 of 4 master folders, which were created based on content, to save a document.
- Subfolders within master folders were created based on the title of the project and the content familiar to staff members, so that staff can find desired files more quickly.

Outcomes

A 50% reduction in the overall RPN was observed after QI project implementation. The failure modes' RPNs decreased for several steps in the initial process for document retrieval. Creating 4 master folders contributed to a 99% reduction in the RPN associated with the failure mode of selecting wrong folders in the process of locating a file. In addition, setting standards for naming folders reduced by 77% the RPN associated with the failure mode of staff confusion about folder names due to similarity of names, acronyms, and misnaming. The step related to using search functions and key words to locate desired documents still remained in the process. Setting standards for naming folders also reduced the likelihood of staff confusion when locating a file using the search function, decreasing by 80% the RPN of the failure mode associated with identifying multiple titles or no titles by search results.

Local Health Department C

Issues

The LHD, in partnership with the local medical society, is implementing a QI project to develop a structure for local health care providers' patient referral to the Living Well program and to increase the number of participants in the program. The Living Well program, an evidence-based program, is based on the Stanford University Chronic Disease Self-Management program, which is well established in the literature as an effective program to help chronic disease sufferers manage their disease.⁶ The Living Well program has been in place within this LHD district since 2009, but the program has had limited success in participants completing workshops.

Failure modes identified

Through FMEA, the following failure modes related to local health care providers' patient referral to the Living Well program were identified:

- The team fails to meet because of busy schedules.
- The physician network recruitment plan is not completely developed.
- Physicians are not willing to meet because of their busy schedules.
- Physicians do not agree to refer patients to the Living Well program.
- Physicians fail to refer patients to the Living Well program because of lack of time.
- Participants in the Living Well program fail to fill out the surveys completely or accurately.
- Participants in the Living Well program fail to mail their survey completion certificate to their physician or the physician does not read or acknowledge the patient's accomplishment.
- The LHD is unable to conduct interviews with physicians participating in the Living Well program.
- The referral system for the Living Well program is not consistent and replicable.

Changes made through the QI project

The following change was made to address the identified issues related to local health care providers' patient referral to the Living Well program:

- The process was altered to seek referrals to the Living Well program not only from physicians, but also from health care, medical, and rehabilitation facilities.

⁶Lorig, K.R., Ritter, P., Stewart, A.L., et al. (2001). Chronic disease self-management program: 2-year health status and health care utilization outcomes. *Medical Care*, 39(11), 1217-1223.

Outcomes

A 25% reduction in the overall RPN was observed after the QI project was implemented. The RPN for the failure mode of the team not meeting to develop the referral program plan decreased by 30% after QI implementation. However, the RPN increased by 88% for the failure mode of not completely developing a physician network recruitment plan. The RPN increased by 13% for the failure mode of physicians' not agreeing to refer patients to the Living Well program, and the RPN increased by 140% for the failure mode of not being able to conduct interviews with physicians. On the other hand, the RPN decreased by 29% for the failure mode of physicians' unwillingness to meet, and the RPN decreased by 11% for the failure mode of physicians' failure to refer patients to the program. Although there was no change observed in the participants filling out the post-survey, there was a 51% reduction in the RPN for the failure mode of participants' failure to mail a copy of their survey completion certificate to their physicians.

Local Health Department D

Issues

The LHD implemented a QI project in order to achieve a goal of having 85% of women who receive the LHD's Women, Infants, and Children (WIC) program benefits receive individualized breastfeeding education during every WIC clinic visit. WIC's Special Supplemental Nutrition Program is a federally funded program that provides low-income pregnant and postpartum women, infants, and children with nutritious food, nutrition counseling (including breastfeeding support), and linkage to services.⁷ Studies have found that participation in a WIC program increases the number of low-income women initiating breastfeeding their babies.⁷

Failure modes identified

Through FMEA, the following failure modes related to the WIC breastfeeding education program were identified:

- Clerks were likely to forget to refer clients to a certified professional authority (CPA) for a nutrition education visit.
- CPAs were unavailable to have a nutrition education visit with a client.
- The LHD was short of staff.
- Due to lack of guidelines, CPAs would forget to give complete information about breastfeeding to their clients.
- Clients cut the visit short due to lack of time.
- Clients were not open to breastfeeding information or did not consider breastfeeding their child. Language barriers could influence the amount of information disseminated to non-English speaking clients since clerks who often act as interpreters were busy with other duties.

Changes made through the QI project

The following changes were made to address the identified issues related to WIC breastfeeding education program:

- The LHD was fully staffed, which allowed the clerks to act as interpreters for the non-English speaking clients as needed, along with completing their duties.
- The LHD reinforced the charting process by asking the clerks to pass the charts to CPAs, and asking the CPAs to document the visits properly.
- CPAs were required to discuss a topic based on a client's breastfeeding education record and on the topics discussed with the clients during previous visits.

Outcomes

A 36% reduction in the overall RPN was observed after the QI project was implemented. Increasing the staff at the LHD reduced the RPN by 97% for the failure mode of staffing shortage. Organizing the information and

⁷Chatterji, P., & Brooks-Gunn, J. (2004). WIC participation, breastfeeding practices and well-baby care among unmarried, low-income mothers. *American Journal of Public Health, 94*, 1324-1327.

using breastfeeding education records and forms reduced the RPN by 95% for the CPAs' failure to give complete information about breastfeeding to their clients.

Acknowledgements

We thank the directors and staff of the local health departments who participated in this study. We thank members of the Steering Committee of the Nebraska Public Health Practice-Based Research Network for their input to the design and implementation of this study. We also thank Sue Nardie for her help with editing the brief.