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The Multi-state Learning Collaborative Storyboards: Quality Improvement Lessons Learned from 162 Projects

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ABSTRACT

The Multi-state Learning Collaborative (MLC) brought health departments in 16 states together with public health system partners to prepare for national voluntary accreditation and to implement quality-improvement (QI) practices. Data from each of the MLC participating states were collected through a comprehensive process over three years. An Excel database of several hundred pages was derived, categorized by individual target area, and organized into thematic domains for further study. Available data were culled and compiled for each MLC project and synthesized across MLC target areas. Two-hundred thirty-four health departments participated in 162 mini-collaboratives in nine of ten target areas. Public health QI projects generally made substantial progress toward achievement of stated objectives. Well-developed aim statements were the lynchpins of successful QI projects. Basic QI tools were utilized consistently and proficiently. Application of best and promising practices was limited. There were no appreciable differences in the QI results according to state public health structure, nor were outcomes related to differences in mini-collaborative leadership. Hundreds of health department staff members were introduced to QI tools and the opportunity to apply them immediately to public health problems.

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BACKGROUND

The Multi-state Learning Collaborative: Lead States in Public Health Quality Improvement (MLC) brought state and local health departments (LHDs) in 16 states together with other stakeholders including public health institutes, healthcare providers, and universities to prepare for national voluntary accreditation, and to implement quality-improvement (QI) practices (Gillen, McKeever, Edwards, & Thielen, 2010).

The MLC afforded health departments and key partners a valuable opportunity to gain hands-on experience with QI as they applied QI practices to achieve specific goals such as increasing immunization rates, increasing the number of adults that engage in physical activity, and improving customer satisfaction. The three-year project, managed by the National Network of Public Health Institutes (NNPHI) with support from the Robert Wood Johnson Foundation (RWJF), continued the momentum of two previous MLC initiatives and was implemented in close collaboration with national public health partner organizations.

In addition to engaging in significant and varied efforts to prepare state, local, and tribal health

departments for national voluntary accreditation, the participants in the third phase of the MLC (2008-2011) were tasked with developing QI mini-collaboratives within their state that focused on improving performance and impact related to specific target areas. MLC participants designed the structure for their mini-collaboratives in a manner that aligned with their local context, with flexibility to set the number of participants, configure a combination of local/state health departments and other partners, and establish the timeframe for the mini-collaborative and its associated QI activities.

A menu of ten target areas with accompanying sub-targets was developed to focus the MLC participants' work on similar public health issues to promote shared learning and document whether the QI efforts of the mini-collaboratives achieved measurable change (Table 1). Five target areas incorporated various public health capacity or processes and five target areas included population-based health outcomes. All target areas measured an important area of public health work; were actionable—the public health system could implement activities to improve performance against the measure; and had an available source of data that could be used to measure

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improvement. Each of the MLC teams selected a minimum of two specific targets on which to focus its mini-collaborative QI efforts.

The mini-collaborative teams were guided to follow a Plan-Do-Check-Act (PDCA) model (Bialek, Duffy, & Moran, 2009; Gorenflo & Moran) that included the development of a specified aim statement to guide their work. While recognizing that aim statements frequently evolve and become more refined as the QI project progresses through the 'Plan' stage of PDCA, the aim allowed the mini-collaborative members to have agreed upon the measures of success before embarking upon a project. Mini-collaborative teams documented their aim statements and progress throughout the PDCA cycle on QI storyboards, which are housed on the NNPHI website.

Given the unique needs and context within each of the MLC states, the project action plans submitted by the 16 state teams differed substantially. In particular, the time periods projected for the duration of mini-collaboratives varied from 6 months to 2.5 years. This and other differences in approach led to variation in the strategies, activities, and results of the QI projects. As with the previous two phases of the MLC, there was an emphasis on supporting the participants in a learning laboratory format that allowed them to learn QI skills and methods and integrate these skills and methods within their context to explore the adoption of QI in public health (Beitsch, Mays, Corso, Chang, & Brewer, 2007; Beitsch, Thielen, Mays, Brewer, Kimbrell, J., Chang, C., . . . Landrum, 2006)

To understand how QI had been implemented to address public health issues and to document measurable improvements that had been made, NNPHI examined the QI mini-collaborative projects within each of the ten target areas. Our study capitalized upon the large number of QI mini-collaboratives engaged throughout the MLC. Efforts concentrated on harvesting general lessons related to public health QI implementation that were cross-cutting for all target areas to identify lessons learned that could inform the universal adoption of QI in public health practice.

METHODS

Data Sources

NNPHI collected data from each of the MLC participating states through a comprehensive process over three years, compiling information from multiple sources: mini-collaborative QI storyboards, grantee quarterly and annual reports, two annual site visits to participant states, presentations at biannual MLC national meetings, and other national public health meetings.

Analysis

An extensive database was derived from the sources described, categorized by individual target area, and organized into several thematic domains for further study: the mini-collaborative participants; the rationale for target area selection; project aims; root cause analysis and use of QI tools; teams and partners engaged in QI; description of interventions; results; use of best practices; products and tools developed; challenges faced during the project; lessons learned; future QI directions; and project impact. Qualitative synthesis of all ten target areas and components, focusing on the cross-cutting lessons and themes across all targets collectively, was drawn from the comprehensive database.

RESULTS

Mini-collaborative activity is summarized in Table 2 by target area, state, number of participating health departments (local and state), the number of QI storyboards submitted, and duration of the mini-collaborative. Two-hundred thirty-four local and state health departments participated in 162 mini-collaboratives in nine of the ten target areas. Despite the enormous variety within and between each of the target areas, there are findings related to QI that cut across all ten target areas. These general findings related to project implementation, documentation, and management/structure have implications for public health practitioners engaging in QI and for organizations supporting QI capacity development among practitioners.

QI Project Aim Statements

Generally, progress toward achievement of project aims was seen across the 162 projects reviewed. Occasionally assessment was more difficult because of the underlying amorphous nature of the original aim statement, which evolved over time as the QI project was implemented. In some cases, aim statements lacked specific metrics such as baseline measures or time-frames, most frequently seen within QI projects focused on one of the capacity/process target areas (although not exclusively). However, it was evident even in these instances, because there were aims serving as a barometer, that some level of improvements had been made. For example, several counties in one state made significant efforts to increase community engagement in planning initiatives (health improvement planning target area). Despite not having defined specific metrics to measure engagement in all cases, increased involvement from community members was documented (see MN storyboards).

Mini-collaborative QI projects were an eclectic, dichotomous blend of the bold and reserved. Aims that were more modest in scope were more likely to be met. In addition, aims more clearly articulated in terms of being specific, measurable, and actionable also were likely to be achieved. This was most commonly observed within the QI projects aiming to reduce infant mortality. One county in South Carolina sought “to increase the percentage of multigravida clients with positive pregnancy tests referred to WIC who keep their first appointment from 65% to 80%” and achieved this aim (see Dillon County QI storyboard).

Widespread Use of QI Tools

Scanning across the targets, basic QI tools such as brainstorming, cause and effect (“fishbone”) diagrams, the “five why’s,” and affinity diagrams were utilized consistently and with evidence of proficiency. Flowcharting of processes and cause and effect diagrams were deployed with the greatest frequency and were an important aspect of root cause analyses. Surveys were also utilized as an informative data gathering device to guide improvement interventions. More advanced tools such as radar charts, Pareto charts, and interrelationship digraphs were seen in a variety of QI projects within the health outcome target area addressing vaccine preventable diseases as well as the capacity/process target areas related to both health improvement planning and customer service. Considered collectively, the consistent and thoughtful use of QI tools provides evidence that QI has gained a foothold in participating health departments.

Future QI Plans

Nearly all QI teams reported the intent to conduct further work on their QI projects. Many planned to spread the results of the pilot intervention internally or to other health departments, and in some cases, statewide. Occasionally, promising QI results inspired wider planned adoption of QI across multiple programs. Despite the robust nature of future QI expectations, ongoing monitoring of QI data was inconsistently reported. Additionally, relatively few QI teams noted acceptance of pilot test results as the new standard for their agency. Although both monitoring and standardization are critical aspects of retaining the gains achieved through the PDCA cycle, follow-up monitoring and standardizing pilot PDCA test results were not explicitly stated in MLC guidance or requirements.

Best/Promising Practices

QI project teams made concerted efforts to engage other MLC states and consult the literature, searching

for evidence-based practices to incorporate in or inform their efforts. Several interventions were based on work in other projects: a public health nurse orientation program in Wisconsin and a nurse mentorship pilot in North Carolina were modifications of programs in other Wisconsin LHDs and Georgia respectively. Several projects focused on the chronic disease target area adopted previously developed models, but few have been rigorously evaluated. Examples include 5-2-1-0 messaging for childhood obesity, (American Academy of Pediatrics, 2013), Commit2BFit (2013), and the 50 Million Pound Challenge (2013).

Whereas there was limited documentation of the application of best and promising practices across the QI projects, this result may have reflected a number of factors, including the relatively few proven interventions for many public health problems. In addition, PDCA and rapid cycle improvement of existing processes and activities were centered on discrete granular responses to local data derived from root cause analysis. Best practices typically are not sufficiently specific to address the finite level of need in process improvement. As a result, the MLC participants often explored innovations to existing processes and used QI to guide their efforts towards improvement. Exceptions were seen in the immunization target area, relying on direction from *The Guide to Community Preventive Services* to decrease patient no-show rates (U.S. Centers for Disease Control and Prevention, 2013). In addition, CATCH, an evidence based intervention, was used in Oklahoma to address childhood obesity (chronic disease target area) (“CATCH After School”). Another notable exception was related to tobacco, inspired by the *Clinical Practice Guidelines for Treating Tobacco Use and Dependence* in South Carolina and New Hampshire (Tobacco Use and Dependence Guideline Panel, 2008).

New Tools and Products

The MLC QI mini-collaboratives developed multiple new tools and products including, but not limited to, QI training materials (agendas, presentations, other tools); QI project charters; QI action plans; QI team handbooks; QI skills assessments; and QI reporting templates. A number of other products related to the specific target areas were also developed, such as workforce development plans and toolkits, customer satisfaction surveys, and maternal and child health resource guides. The extensive array of tools and products developed are showcased on the NNPHI website (National Network of Public Health Institutes, 2010).

Implementation of New Processes or Programs

When mini-collaboratives selected their target areas, it was anticipated that improvements would focus on pre-existing processes, activities, and programs. In fact, for many of the capacity/process building targets and chronic disease risk factor reduction targets the implementation of new efforts rather than the improvement of existing efforts predominated. For example, mini-collaboratives that addressed community health profiles (CHPs), health improvement plans (HIPs), and customer service were largely focused on developing new instruments and products rather than refining current work.

Similarly, although chronic disease accounts for the greatest burden of illness in the United States, and as a target demonstrated the highest level of interest among participating MLC states, limited dedicated funding streams are allocated to current prevention programs. Some teams may have sought to utilize QI in launching new programs to fill an intervention void in a critical area of need rather than make improvements to existing efforts. QI teams in at least three MLC states concluded that for some activities, like developing a HIP or implementing a new public health intervention, QI may not be the optimal strategy; *Quality Planning* – the first step of the Quality Trilogy as defined by Juran (1988) – may be more suitable (Call, Gizzi, & Mason, n.d.).

QI Models and Frameworks

Complementing the use of PDCA in most mini-collaboratives, specific QI models or frameworks were also deployed. Mini-collaboratives in Montana incorporated Lean Six Sigma in their efforts to improve efficiency of immunization processes (Duffy, Moran, & Riley, 2010). The state health departments in Minnesota and Iowa implemented Lean Kaizen to improve laboratory testing and contracting processes respectively.

In addition to these QI Models and Frameworks, South Carolina and Kansas adopted the Institute for Healthcare Improvement (IHI) Collaborative Model to Achieve Breakthrough Improvement (2003) for their work to reduce tobacco dependency and infant mortality respectively. The ‘Breakthrough Series Model’ proved well-suited to health outcome targets with strong evidence based interventions constituting their “change packages.” Although the IHI model appeared to be most effective with the health outcome targets, Kansas was able to be successful in employing the structured learning format to its work on the

capacity/process target area of developing community health profiles.

Structure and Management of QI Work

There does not appear to be any difference in the QI results obtained in MLC states with more decentralized public health structure compared with more centralized control. In addition, there were no apparent differences in the work between mini-collaboratives comprised of LHDs of varying size. Moreover, teams in New Hampshire composed of public health system partners, and lacking LHDs in these regions, appeared to perform comparably.

Likewise, the outcomes were not affected by differences in the types of organizations guiding and leading the mini-collaboratives. Whether direction originated with public health institutes, state health departments, or other groups did not appear to impact results. In contrast, the *style* of management may matter. Those mini-collaboratives receiving clearly articulated expectations, with well-defined intervals between learning sessions and action cycles, and accessible technical assistance were more likely to achieve stated aims. Health departments participating in these mini-collaboratives learned to use more QI tools (basic and advanced), tended to have more developed aim statements (with baseline measures, time periods, and discrete interventions), and were more likely to have quantifiable results.

Mini-Collaborative Management Improved with Experience

Project management and the work of the QI teams became noticeably more sophisticated as the grant cycles progressed (Joly, Booth, Shaler, & Conway, 2012; Joly, Booth, Shaler, & Mittal, 2012). Training modalities were expanded to include webinars, telephone conference calls, and technical assistance, in addition to standard face-to-face meetings. The mix and timing of learning sessions and action cycles (during which teams implemented the QI concepts they had learned) became more optimized for the given target. Over time, expert QI consultants also were identified and contributed to this advancement.

Teams and Partnerships

Across all target areas, most mini-collaborative teams were internally comprised of health department staff and leadership, often across disciplines. Even targets seemingly correlated with external partners and public health systems such as HIP or chronic disease,

Table 1. Multi-state Learning Collaborative Three Target Areas

Capacity/Process Target Areas and Sub-targets	Health Outcome Target Areas and Sub-targets
<p><i>Community Health Profile</i></p> <ul style="list-style-type: none"> ▪ Health related data is or are organized into a comprehensive community health profile ▪ A uniform set of health indicators is developed into a community health profile that describes the population's health 	<p><i>Reduce the incidence of vaccine preventable diseases (immunizations)</i></p> <ul style="list-style-type: none"> ▪ Increase the percentage of children immunized according to ACIP standards
<p><i>Health Improvement Planning</i></p> <ul style="list-style-type: none"> ▪ A health department led community health improvement planning process convenes partners and facilitates collaboration resulting in an improvement plan including health objectives and improvement strategies ▪ A community health improvement plan is developed with partners which complements the statewide health plan 	<p><i>Reduce the burden of tobacco related illness</i></p> <ul style="list-style-type: none"> ▪ Reduce the percentage of adults age 18 or older who smoked at least 100 cigarettes in their lifetime and are current smokers ▪ Reduce the percentage of adolescents in grades 9-12 who smoked one or more cigarettes in the past month ▪ Reduce the percentage of the population exposed to secondhand smoke
<p><i>Assure Competent Workforce</i></p> <ul style="list-style-type: none"> ▪ The workforce is assessed to determine its ability to deliver population based services, and a workforce development plan is crafted ▪ Increase the proportion of public health departments that incorporate specific public health competencies into personnel systems 	<p><i>Reduce the burden of alcohol related diseases and injury</i></p> <ul style="list-style-type: none"> ▪ Reduce the percentage of adults 18 years and older who reported binge drinking in the past 30 days ▪ Reduce the percentage of adolescents aged 12-17 who reported drinking in the past 30 days
<p><i>Customer Service</i></p> <ul style="list-style-type: none"> ▪ A customer satisfaction process is in place, and results are routinely utilized to enhance program acceptability to customers 	<p><i>Reduce infant mortality rates</i></p> <ul style="list-style-type: none"> ▪ Increase the percentage of pregnant women receiving prenatal care in the first trimester
<p><i>Culturally Appropriate Services*</i></p> <ul style="list-style-type: none"> ▪ Accurate and current information is available in formats that are culturally appropriate, linguistically relevant, and accessible to the target populations ▪ The health department provides health education services in the language used by and within the context of the target population ▪ Procedures are in place for communicating with groups and individuals about disasters and emergencies following established standards ▪ The health department provides targeted, culturally appropriate information to assist individuals to understand what decisions they can make to be healthy 	<p><i>Reduce preventable risk factors that predispose to chronic disease</i></p> <ul style="list-style-type: none"> ▪ Increase the percentage of adults 18 years of age and older who engage in 30 minutes of moderate physical activity 5 or more days each week ▪ Increase the percentage of adolescents in grades 9-12 who engage in 20 minutes of vigorous physical activity 3 or more days each week ▪ Reduce the percentage of adults age 18 or older who have a BMI greater than 25 ▪ Reduce the percentage of overweight or obese children and adolescents aged 6-19 ▪ Reduce the percentage of obese adults aged 20 or older

*No MLC state team chose to work on culturally appropriate services

Table 2. Multi-state Learning Collaborative QI Summary for Participating States

Target Area	State	# Health Departments	# Mini-collaboratives with Submitted Storyboards	Mini-collaborative Length
<i>Community Health Profile</i>	Iowa	7	7	3/09-11/09
	Kansas	56	10	3/10-1/11
	Michigan	2	2	4/09 - 4/10
	Missouri	1	1	9/08-1/10
	Oklahoma	1	1	9/08-9/10
	Wisconsin	7	1	
<i>Health Improvement Planning</i>	Illinois	6	6	3/09-12/10
	Michigan	3	2	9/08-10/09
	Minnesota	28	18	10/09-2/11
	New Hampshire	3	1	8/08 - 11/09
<i>Assure Competent Workforce</i>	Indiana	23	8	10/08 - 12/10, 1/09-12/10, 10/08 - 4/11
	Missouri	12	4	
	North Carolina	5	1	4/09 - 11/10
	Wisconsin	3	3	4/10 - 10/10
<i>Customer Service</i>	Florida	16	1	1/09-12/09
	Michigan	2	3	4/09 - 4/10, 4/10 - 2/11
	Montana	10	3	11/08-4/11
	New Jersey	18	4	9/08 - 1/10, 1/10 - 2/11
	North Carolina	8	7	9/08 - 3/09
<i>Reduce the incidence of vaccine preventable disease</i>	Michigan	2	2	4/09 - 9/10, 4/09 - 12/10
	Missouri	1	1	2/10 - 2/11
	Montana	22	5	11/08-4/11, 2/10-3/11
	New Jersey	20	3	9/08 - 1/10, 1/10 - 2/11
	Washington	3	3	10/08 - 12/10
	Wisconsin	1	1	9/09 - 12/10
<i>Reduce preventable risk factors that predispose to chronic disease</i>	Florida	10	10	9/08-4/11

	Illinois	4	4	3/09 - 12/11
	Iowa	2	2	3/10 - 3/11
	Michigan	2	2	9/08-6/09
	Minnesota	22	11	11/09 - 3/11
	New Hampshire	3	3	9/08-6/09
	New Jersey	2	2	1/10-2/11
	Oklahoma	1	1	9/07-8/10
	Washington	3	3	10/08-10/10
<i>Reduce infant mortality rates</i>	Indiana	3	2	4/10 - 4/11
	Kansas	11	3	1/09 - 1/10
	South Carolina	4	4	3/10-12/10
	Washington	3	3	10/08-10/10
<i>Reduce the burden of tobacco related illness</i>	Minnesota	3	2	11/09-12/11
	New Hampshire	3	3	4/10-4/11
	South Carolina	8	8	11/08-6/09
<i>Reduce the burden of alcohol related disease and injury</i>	Wisconsin	8	1	11/08-5/09
TOTALS		352	162	

were more likely to be internally directed. Florida, Kansas, and Minnesota formed mini-collaboratives that involved large numbers of teams and health departments. Kansas emphasized regional teams to further the development of shared services. Reportedly, these teams were often challenged by the logistics of working across broad geographic areas with multiple health department partners. In response, Kansas developed tools to facilitate communication. Although all barriers were not surmounted, regional teams often achieved their aims and attained superior results. Their efforts demonstrate that large size is not an impediment to successful mini-collaboratives. By the same token, smaller sized learning collaboratives also achieved their aims, leading to the conclusion that size or configuration had little direct impact on mini-collaborative and team performance.

DISCUSSION – LESSONS LEARNED

Recent publication of the Association of State and Territorial Health Officials and the National

Association of County and City Health Officials survey results on QI has strengthened the understanding of the current status of public health agencies in terms of their QI training and implementation (Beitsch, Leep, Shah, Brooks, & Pestronk, 2010; Leep, Beitsch, Gorenflo, Solomon, & Brooks, 2009; Madamala, Sellers, Beitsch, Pearsol, & Jarris, 2012; Madamala, Sellers, Beitsch, Pearsol, & Jarris, 2012). By examining the implementation of individual QI projects, and studying the interplay among public health partners within public health systems in greater depth, the present examination of MLC QI mini-collaborative projects complements existing knowledge.

With over 160 projects involving 234 public health departments seeking measurable results in nine of ten target areas (one target area was not selected by any mini-collaboratives), the MLC has been the largest investment to date on the potential impact of QI on public health performance. Examining the QI storyboards, quarterly and annual reports, and

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presentations resulting from this vast body of work, what are the lessons learned for the broader public health community, and what are the next steps to further advance practice and incentivize adoption of QI? Distilling the immediate caveats of wisdom from three years of intensive work into meaningful takeaways threatens to reduce the multi-layered and nuanced findings into platitudes. Nonetheless, several lessons can be considered in evaluating future investments to build capacity among health departments to adopt and implement QI.

- Like acquiring any new complex skillset, the QI learning process is time intensive. Learning QI skills and methods and their application can be most impactful when there are opportunities to apply and continually practice QI on priority issues in need of improvement. Additional investment as well as consistent ongoing attention and support for practice are required for QI to be effectively deployed widely within health departments. However, basic and advanced QI tools can be rapidly learned and applied, and skills can be maintained through regular use. Overwhelmingly, participants in the MLC who were skeptical at first expressed the value of QI, describing the rewards in being able to engage a team to apply tools and see improved results. As one MLC participant said: “It’s not about the work we do; it’s about *how* we do the work.”
- Well-crafted aim statements that include baseline data, target level improvement data, and a timeline for projected improvement are a prerequisite for high performing teams and results-oriented QI projects. Sound aims resemble SMART objectives: specific, measurable, attainable, realistic, and timely (Bialek et al., 2009). QI projects should begin with an aim that best incorporates the current understanding of the team as it embarks initially upon its QI journey and then refine it over time, as the QI team collects data and explores root causes of the problem in the ‘Plan’ phase of the Plan-Do-Check-Act (PDCA) cycle. Well-developed aim statements are worth the early investment of time to develop and refine them.
- For some activities, like implementation of new programs, developing a plan (e.g., health improvement plan), or even improving a process or outcome with slowly

developing results (e.g., obesity), PDCA and QI may not be the optimal strategy. Quality Planning may be more suitable, along with traditional public health program development processes. Understanding and clarifying this distinction through training and technical assistance may be important among health departments that face budget constraints and often seek mechanisms with which to implement public health interventions to fill the gaps. Further, guidance on distinctions between QI and traditional public health program management (program design/planning, implementation, and evaluation) would be valuable.

- Well-organized QI mini-collaboratives, with clear expectations and defined cycles of action and learning, are instrumental to team QI performance and achievement. QI mini-collaboratives that received clearly articulated expectations, with well-defined intervals between learning sessions and action cycles, and accessible technical assistance learned to use more QI tools (basic and advanced), tended to have more developed aim statements, and were more likely to have quantifiable results.
- QI can be practiced successfully in any public health environment: the size and structure of the health department are immaterial. In addition, rapid learning takes place when teams are comprised of internal health department staff in a non-threatening environment; achieving dramatic health impact may require teams with members from key public health system partners as well.
- When applying QI in public health, best and promising practices should be sought, and utilized when applicable to the aim. However, in the absence of, or as a complement to best practices, value is also added by networking within the public health QI community of practice to learn which methods others have tested and found successful.
- Finally, future investments to explore the impact of QI should include extensive plans for follow-up to improve assessment of whether intentions to spread QI and sustain it within the health department were carried forth.

Limitations

Based upon observations during multiple site visits to the 16 MLC participating states, and data derived from annual and quarterly reports, and national presentations, QI storyboards frequently understated or under-reported the activities of the mini-collaboratives. As a result, the summary described herein may not fully credit the QI teams for the magnitude of their achievements, potentially underestimating the actual impact of the mini-collaboratives and QI team projects to the MLC. In addition, the cross-cutting examination across all target areas does not attempt to distinguish the work of the mini-collaboratives in any single target area; considering them collectively may obscure or miss the deeper meaning within any one target.

CONCLUSIONS

Courtesy of the Robert Wood Johnson Foundation, MLC enabled over 230 health departments to be engaged in an intensive three-year QI learning experience. Hundreds of health department staff members were introduced to QI tools and the PDCA cycle, with the opportunity to apply them immediately to stubbornly resistant public health problems of significant magnitude through 162 team-based QI projects. Participants became committed members of an active community of practice supported by NNPHI. As a result, the largest public health QI database of QI projects has been assembled, and provides fitting testament to the rich accomplishments of their efforts.

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