HCQI HEALTHCARE QUALITY INITIATIVES
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HARVEST OF
Lessons Learned from
Accelerating Quality Improvement through Collaboration

for

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Table of Contents

I. Purpose………………………………………………………….. pg 3
II. Methods………………………………………………………….. pg 3
III. Summary of Findings ………………………………………..... pg 4
IV. Recommendations ….………………………………………….. pg 6
V. Findings………………………………………………………….. pg 9

Appendix A. List of Participants……………………………….. pg 22

Appendix B. AQIC Harvest Interview Schedule……………... pg 23

I. INTRODUCTION

PURPOSE

The purpose of this undertaking is to provide a qualitative harvest of lessons learned from the *Accelerating Quality Improvement through Collaboration (AQIC)* based on the actual experiences, insights, and learning of program participants. In the context of current and ongoing national initiatives to implement electronic health records, reorganize features of health care delivery and improve quality, understand facilitators and barriers to implementing systems and using data for improvement will inform the work of those supporting these changes. Specifically, this will help identify what lessons have application for the Implementation of HITECH, namely, the U.S. Department of Health and Human Services rules to help improve Americans' health, increase safety and reduce health care costs through expanded use of electronic health records (EHRs).

Accelerating Quality Improvement through Collaboration

The goal of AQIC was to spur the adoption of quality improvement methods and use of electronic data by California's safety net clinics to more rapidly improve diabetes (and ultimately other chronic disease) care for low-income patients. The initial structure for this was support for two statewide associations of safety net clinics to provide quality improvement processes across their constituencies. Focusing on diabetes measures, thirteen regional consortia worked with member clinics to accelerate the adoption of electronic disease registries, and implement the use of standardized clinical measures and regular reporting of performance, using common definitions and methodologies for data collection and aggregation. Financial incentives for consortia tied to measures reporting led to increased success on this dimension.

Informing support for HITECH

As part of the American Recovery and Reinvestment Act of 2009 the Health Information Technology for Economic and Clinical Health (HITECH) Act authorizes authorized incentive payments through Medicare and Medicaid to clinicians and hospitals when they use EHRs privately and securely to achieve specified improvements in care delivery. Among the programs created by the Department of Health and Human Services to fulfill this goal is the establishment of Regional Extension Centers (RECs), to support providers in adopting and becoming meaningful users of health information technology (HIT).

In California, a network of Local Extension Centers (LECs) has been established to coordinate Regional Extension Center services in local communities. LECs may be local clinic consortia, regional medical societies, health plans, or any other group that have the ability to assist providers in a community. Clarifying the lessons learned by those who supported AQIC activities may offer guidance to the California REC and LECs, as well as Consortia and other organizations engaged in supporting quality improvement and the adoption of electronic records for meaningful use.

Organization of this report

Following a description of methods, we begin with a summary of findings organized by the themes that emerged through analysis of interviews with AQIC participants. These include Leadership Engagement; Customization and Standardization; Sequence and Strategy; Time and Resources; Relationships and Teamwork; and Moving Toward Meaningful Use. We follow this with a set of recommendations for supporting organizations working to promote meaningful use of electronic data in current and future initiatives. Recommendations are grounded in the context of our work both as evaluators and active participants in the work of quality improvement. Finally, we include a detailed presentation of our findings from interviews with AQIC participants.

II. METHODS

We conducted twelve telephone interviews with seventeen AQIC participants during June and July, 2010. Participants were consortia leaders, quality improvement professionals, clinic staff including one chief medical officer, and one external consultant (see List of Participants in Appendix A). We used a semi-structured interview schedule (see Interview Schedule in Appendix B). All but one interview was audio recorded and notes were taken during the interviews. The recordings and field notes were reviewed and coded independently by both evaluators for themes and checked for inter-rater reliability. After initial review and coding, findings were organized into a set of themes, which we use below to describe our findings.

III. SUMMARY OF FINDINGS

Leadership Engagement

Meaningful Use will require strong clinic management and engaged leaders. The critical importance of engaging leaders in the work was unanimously noted by interviewed participants. Leaders promoted successful implementation by creating shared vision and common goals, establishing expectations and providing time and resources for the work. The role of the consortia can be critical for developing these, as well as providing a structure to support the work. Consortia served clinic leaders best when they created opportunities for them to learn from each other in face to face settings where data was shared transparently; where problems and learning were openly discussed.

Customization and Standardization

Clinics are different and at different stages of IT and QI development. Consortia addressed this by offering varying combinations of group learning and individual consultation. Consortia also bring to the table different resources and skill sets, and were required to balance the needs of clinics with their own internal resources. Implementation challenges were greater when there was a disconnect between consortia capabilities and the health information and quality improvement needs of the clinics. Consortia were better able to support implementation when they were able to standardize IT vendors used by their clinics. Consortia were more successful when they could accurately assess what a clinic needed, as were those who could take experiences learned from one clinic and apply it to another. Successful consortia took advantage of clinics who pioneered the way with IT and used them to help clinics with less experience.

Sequence and Strategy

There was good agreement among those interviewed about the high level sequence of steps, including goals and assessing current processes, assessing capabilities, workflow redesign with attention to operations improvement, data collection and validation, and data review and sharing for meaningful use. The experience of implementing registry was considered to be an important building block for moving on to EHR.

Beyond sequence, consortia encouraged a core set of strategies including convening multidisciplinary teams at the clinics, using quality improvement methods to redesign processes and do small tests of change, creating opportunities for shared learning between clinics, and targeted training, using a mix of face to face learning sessions and on-site consultation.

Time and resources

Nearly every participant observed that clinics underestimated the time and effort it takes to implement and learn to use registries and EHRs. In addition to time for data collection, validation and report generation, teams need time and space to reflect on the meaning of the data. Consortia also faced time and resource constraints, and used a variety of strategies to leverage learnings from clinics to help others.

Relationships and Teamwork

The value of shared learning cannot be underestimated. At every level, relationships cemented during face to face sessions echoed with positive interactions and collaborations. Consortia provided learning and sharing opportunities for clinic leadership that were highly valued, and they in turn, valued the sharing and learning that happened when consortia leaders were brought together. At the level of individual clinics, teams who worked together were more successful in implementing electronic systems and using data for improvement. Consortia who had staff capable of supporting work flow improvement, IT and QI were best poised to facilitate change in their clinics.

Moving toward meaningful use

Consortia with the trifecta of strength in leadership, QI and IT were best able to support their clinics in approaching the meaningful use of data, though many noted the multiple steps that needed to occur before this was possible. There are many steps that precede the ability to use data for improvement, and these take time. Additionally, the complexity of data measurement, validation and reporting is vastly underestimated and clinic staff, in general, have a superficial understanding of measures and pitfalls of data definitions.

Conversations that displayed meaningful use were most likely among clinics with the most quality improvement experience, and who have experience with a registry, in particular, the Federally Qualified Health Centers (FQHCs) who participated in the national Health Disparities Collaborative. An important milestone for many clinics was staff understanding of the relationship between data, measures, quality and patient health; this frequently occurred during the data validation process. Looking to the future, the pressure to do meaningful use too quickly might jeopardize the ability to do it well.

IV. **RECOMMENDATIONS**

1. Convene leaders: Given the importance of leadership engagement to the success of the enterprise, supporting organizations (consortia, regional or local extension centers) should purposefully convene clinic leaders and develop attributes for leaders undertaking meaningful use. Depending on the frequency of gatherings, consider conference calls or webinars to maintain focus and momentum between face to face sessions.

2. Provide leadership training: Develop leadership at the clinic level to support a facilitative leadership style that empowers front line staff and teams, as well as skills in change management. Lessons from AQIC suggest that the curriculum should include at a minimum: the importance of improving workflow as part of registry and EHR development; developing a multidisciplinary approach to integrate IT and QI; the power of setting goals and establishing expectations around the work; the importance of supporting teams with time and space not only for implementation but the sense making necessary for true meaningful use; and the value of a systems approach to the work, that is, encouraging their teams to test and learn their way to results and to encourage the clinic team when they experience setbacks. Because engaged leadership is pivotal to the work, consider extending leadership development and training programs to Consortia CEOs and leaders of the Local Extension Centers as well as clinic and practice leaders.

3. Formally assess clinic readiness: Local extension centers will need to accurately assess their clinics' readiness and preparation for meaningful use. They are thus, best able to match their internal capabilities to clinic need and to identify appropriate resources. Regional consortia may be valuable partners in this work if they are not the designated LEC.

4. Begin with a focus on clinic operations: Encourage clinics to use process improvement on clinic operations in anticipation of EHR implementation and meaningful use.

5. Insist that clinics take a team-based, multidisciplinary approach: Meaningful use is more than an IT project, and success requires a collaborative effort between information technology and quality improvement staff. Participation from leadership to the front line is essential for successful transformation.

6. Facilitate relationships at all levels through shared learning: Face to face learning sessions for leaders, clinicians, and office staff are not only an opportunity to put principles of adult learning into action, but provide valuable learning and networking opportunities; organizations who offer support for meaningful use implementation will need to leverage face to face learning and differentiate when best to use electronic media (webinars, conference calls) and when to use face to face learning. Given the likelihood of limited resources for on-site consultation, supporting organizations should go out of their way to establish strong relationships with IT and quality staff in clinics.

7. Develop training approach to accommodate variation: LECs should develop an approach to training that is robust enough that it accommodates practices at different stages of readiness and implementation. The flexibility to address staff turnover in clinics, especially during the early implementation phases will also be important. Some strategies for doing this include developing cohorts of clinics, using lessons learned from early cohorts to support later clinics, periodic orientation sessions for new staff or clinics joining a cohort "off-cycle." While a combination of in-person and virtual approaches may be used, the power of face to face sharing and learning cannot be overstated. Support for clinics should be based on an assessment of their current knowledge and capabilities and include team training, leadership development and guidance on operations improvement, IT, registry and EHR implementation, data validation, report

generation and finally, how to make use of data, to understand what it means and what areas of improvement the data reveal.

8. Create communities of practice: In addition to creating opportunities for clinic or practice leadership to share and learn, communities of practice should be created for other staff such as clinic managers, clinical leaders, and QI and IT staff . This may include front line staff who have designated responsibility for quality improvement and information technology.

9. Resist the pressure to skip steps: The pressure to do meaningful use too quickly might jeopardize the ability to do it well. LECs can help clinics and practices avoid pitfalls associated with hasty implementation that does not factor in office flow redesign and build improvement as a response to data analysis both for point of care, and for population management. Be mindful of the lessons from AQIC and other initiatives of the steps required to engage staff and bring them up to speed on all the steps that need to occur before clinics or practices can begin to think about meaningful use. Clinics who participated in AQIC or other initiatives may be ready to look at standard reports and consider the meaning of the data, but others will take considerable time to get there. Supporting organizations should keep in mind the lessons from AQIC about the time and effort needed to accomplish this work.

10. Create opportunities for supporting organizations to learn from each other: Just as the relationships between consortia in AQIC yielded valuable results, so will relationships between Local Extension Centers. Relationships established and solidified during face to face gatherings can lead to increased consultation and shared work between LECs or other supporting organizations, like regional consortia. Scare resources can be leveraged by supporting knowledge management across the LECs. The Regional Extension Center should schedule face-to-face sharing and learning sessions so that these relationships can be established and enhanced. Focus on also strengthening sharing between LECs and regional consortia as the clinics may depend on their regional consortium for support after the LECs have concluded their work.

11. Encourage use of common vendors: To a great extent, AQIC consortia who were supporting clinics with a limited number or single vendor were in a much stronger position to understand the systems issues and support clinic staff. To

the extent that this is not possible, various LECs might specialize in certain EHR products and collaborate with each other, with other consortia or service providers for training and support. This will enhance local leverage with vendors to obtain the modifications required for electronic systems to be useful for care delivery, population management and improvement.

12. Continue building QI capacity: Successful achievement and sustainment of meaningful use will be in large part dependent on the ability of clinic and practice staff to truly understand how the pieces fit together, and the relationship between data, measures, and improvement. Regional and statewide offerings to build this capacity should continue, and the various stakeholders should meet to discuss their roles in this effort. Improve advance notice for learning events so clinics have adequate time to plan to attend.

V. FINDINGS

Iterative coding revealed six themes, or major categories of lessons learned from participant interviews: Leadership Engagement; Customization and Standardization; Strategy and Sequence; Relationships and Teamwork; Time and Resources; and Working Towards Meaningful Use. Below we share the voice of the AQIC participants in a description of these lessons organized under these headings.

Leadership Engagement

There was absolute consensus among those interviewed about the critical importance of leadership engagement. Leadership support impacted the ability of clinics to successfully engage in IT implementation, data collection and reporting, and ultimately meaningful use of information, in a number of ways. At the highest level they provided vision and a focus on a common goal. Key actions leaders took to support the work and achieve results included demonstrating an active interest in the work, empowering front line staff, and creating expectations by setting goals. They built cultures where staff could try new things without fear of failure and they committed resources like time and space to do the work.

Stating an often heard theme on the topic of vision, one community clinic director said that “leadership and a commitment to a common goal” is essential, adding that “leadership sets the common goal, makes sure all know why we are collecting the data, developing the registry and the vision. They get consensus around what and why we are doing it - this is a big success factor.”

Reflecting on the importance of leadership engagement, many participants recited a similar list of the qualities that made leaders effective, such as curiosity, accountability, creating a structure for improvement, and allocating time and space to do the work. Those who got the best results “have an expectation of improvement, create accountability and a structure for the work, who act on data and dedicate time and resources to the project.” “Leaders help support a culture of encouragement by creating time and space to do the work, the culture can make or break implementation.” Another observed, “clinics with innovative leaders do well, the ones who understand the value of data and how to use it,” adding later, “clinics did better when they have strong leaders who get it, they empower staff, commit resources and give time and space to try it, make mistakes and learn." Clinics do less well when they are "lone soldiers" without a strategy or plan. Echoing the importance of culture, one participant noted that leaders needed to create a culture of safety, "clinical leadership plays a big role, they encourage individuals to try new things."

Consortia used a variety of strategies to secure leadership engagement. One of the most successful and often reported was creating opportunities for leaders to share with each other. Consortia sponsored leadership sessions where transparency and curiosity reigned. Others talked about the "business case, incentives, competition, and peer pressure." A participant advised, "engage leaders from the beginning, they have to be the ones who understand and embrace this, who see the difference in their perception of verses the reality in practice habits" at their clinic. At a very practical level, leadership support is especially important in the beginning phase of the work. The start of the work is labor intensive and when leaders do not commit to it, staff may lose the will to continue because so much front line time is devoted to implementation. "It is time consuming in the beginning, so get the support of the CEO and CMO."

A number of participants discussed the importance of ongoing communications between the consortia and clinical leaders. More than one reflected on the challenge of turnover in clinic leadership, "we start all over again with communication . . . we had one CEO who was going to pull the plug on the project because she did not understand it, we always have to sell it." Likewise when leaders lack "understanding of what this operation involves" it is a barrier to implementation.

Participants also talked about the need for the consortia to engage their own Boards in data analysis because this serves as an additional leverage point for change. One executive recommended starting "at the board level. Give the board quarterly updates, progress reports, share with them what it takes to get this done." Because the clinic CEOs comprise most of the consortia board members, "they are involved in program development at their clinic, they have ownership, not just buy in - so it works at two levels!" Another participant mentioned the strength of sharing data, "when the Consortium Board as a whole looks at the data across all of their clinics, people start comparing data, and those clinics that haven't been focused on improving get the message." The Chief Medical Officers as a larger group of all consortia, also provide leadership support. As they begin to "share unblinded data across all clinics . . , they get more comfortable and begin to shared unblinded [further] across the whole state.” Some consortia already post quality data on their web sites.” This type of sharing leads to curiosity about results and increased sharing and deeper learning. Leaders thus, expand their sphere of influence.

One participant summarized how facilitative leadership empowers progress and hierarchical leadership deters it. Clinic progress is inhibited “when leadership is concentrated at the top. It slows down EHR and registry implementation and its use.” Leaders “who are stuck in the past have a hard time fully grasping how EMR can help with better care. They need to release the reigns so that the competent others can do the work.”

Customization and Standardization

A frequent theme was the need for both customization and standardization, the reasons they are required, and the challenge of balancing clinic needs and consortia resources. Clinics are different and unique - one approach did not fit all. Key features of clinics which participants felt necessitated customization or differentiated approaches included rural vs. urban location, extent of infrastructure support, quality improvement experience, information technology sophistication, and history of electronic health record and registry use. One participant wrapped it up, noting that, ”clinics have different cultures, barriers, technical challenges, different systems, IT savvy, staffing support.“

While many recognized that it would be desirable to customize their approach to working with clinics based on these features, consortia themselves differed in their own resources and ability to offer a customized approach. For example, some had the skill and capability to provide support for EHRs with internal consultants and others could not provide on-site technical assistance. One director said, “we bring the clinics together, run learning sessions, host webinars and do remote support to help them. We don’t have enough resources to do one-on-one technical assistance, ideally we would.” Other consortia described how they provide technical assistance onsite, and telephonically as well as offer opportunities for shared learning.

The challenge for consortia was to find the line between customization and standardization, given their own resources and those of the clinics. A consortia director said, “we have learned that we have to meet a broad spectrum of needs and we learned what can be standardized for all and what needs customization. When we think of tools and training, and technical assistance, we learned we need both, we need standard communication and messages, but processes flexible enough to meet clinics where they are - both large and small."

Consortia found they had to match clinic needs with their own resources and internal expertise. For instance, consortia with fewer resources fostered learning between clinics so that those with less experience could learn from successful clinics. They promoted site visits and conference calls. Consortia who had consultants learned by doing, that is, they used lessons learned from one clinic implementing electronic health records and registry enhancement to help others, "we use lessons learned from other practices who have customized their reports and templates already." One participant consultant shared how she customizes her approach based on the clinic need, "At a smaller site, I convened the entire team from the doctors to billing and at a large site, it was hard to get the whole team, so I worked with clinic leaders and the manager, and I am more directive with larger sites." The skills of consortia staff also impacted how they worked with clinics. One disconnect between clinic need and a consortia staff person with little IT expertise brought about this comment, "they did not really want me there, I got in the way of work."

When clinics within a consortium standardized and selected the same electronic heath record or registry the consortia found themselves better able to support them. "The clinics were able to decide together and in advance how they wanted information to be stored, how to find and locate it and how they wanted things to look." When different electronic health information systems are chosen, it creates a challenge for consortia to assist clinics so that, "We do different things to meet the needs of multiple users."

Several consortia addressed differences in clinic experience and capabilities by developing assessment tools to "identify where each clinic is with knowledge and experience, to help the clinics identify their first steps." This approach helped consortia tailor their approach because clinics "have different sophistication, they have different needs."

Strategy and Sequence

There was good agreement among those interviewed about the high level sequence of how teams learn about registry, EHR, and begin meaningful use. The experience of implementing registry was considered an essential building block for moving on to EHR. Moving on to EHR and meaningful use was predicted to be a greater challenge for clinics without previous experience with registry, quality improvement or operations improvement. One consortia participant advised others to "Challenge the assumption that the registry you have is out of date and won't fit with the EHR."

The general implementation began with establishing goals and assessing clinic readiness, followed by a focus on operations improvement beginning with workflow, moving on to data collection, validation, and only then approaching meaningful use of data for improvement.

Goals and assessment: There was strong consensus about the need to begin with a clear goal and assess clinic readiness and capabilities. "It is an important first step to understand the clinic goals, what are they hoping to get out of this, what outcomes do they want? Then assess if they can get there - look at internal processes, resources and infrastructure, their capabilities . . . establishing goals upfront helps the clinic form its team." One participant recommended a clinic "develop a charter, do an assessment, share the results with the group" adding, "we have some good ideas now how to do this, we have a readiness tool and for each of the meaningful use measures, they do a gap analysis and then we help the clinics understand the common gaps and address those." Clinics had a wide variety of capabilities related to quality improvement, previous registry experience, health information technology, and even basic computer literacy. A consortia consultant spoke about the need to train on basic computer literacy if needed. Establish a champion in each department. One added that if possible clinics "close down a few hours a week to focus on visit simulation and training."

Workflow : Understanding and redesigning work flow emerged as a necessary early step, and many consortia had processes to support this. One consortium shared their approach to "identify where each clinic was in knowledge and experience in using electronic systems. We help them identify the first steps, which work process to focus on and how this impacts their normal work day." She added, "When clinics are identifying work flow to improve, they need more hands on support." Another said, "start at the front desk and then make a process flow map of how to room a patient, how information should be collected for registry . . . Then revise, improve and test the flow."

They all agreed, workflow redesign for registry implementation and should precede EHR. One wisely advised, "Don't wait on workflow or else the workflow design can be difficult once things are in place.“ Previous registry experience helped; lessons learned from i2i Tracks and PECs were mentioned. These clinics understood the value of data and “are excited about it.” A couple of seasoned consortia executives mentioned the three uses of data, “at point of care, panel or population management, and to see what to make better.” This seemed to be an important organizing framework for their work with clinics and leaders.

Attention to operations improvement: Some consortia leaders felt very strongly about conducting process improvement on clinic operations, before moving on to improving clinical quality. “We had a case study, EMR went better in a clinic where they focused first on clinical operations versus the one that first focused on clinical quality. . . make sure and deal with billing systems first” adding, “if a clinic is weak in operations, delay the EHR, strengthen operations and efficiency, you need this to get through EHR implementation.” This includes “billing, front office, access, human resources, basic process improvement.”

Data collection and reports: Supporting clinics as they began to collect data and generate reports, required consortia to use flexible strategies and a logical sequence like assessing clinic readiness, “Look at what they are collecting and why, what they are doing with their data . . . start with registry, then go to EHR - this really helps get ready for meaningful use”.

Data validation: Data validation produced rich benefits that went beyond improving data accuracy. The process offered an important opportunity for staff to understand the relationship between the data, measures and quality of care. Once clinics get reports, “do data validation, spend a lot of time focusing on the accuracy of the data, then look at completeness of care.” Another recommended, ”Walk them through the data validation process, step by step, cover the what and the why, they need help with validation.” Validation creates a curiosity about the data and leads to more questions and learning.

Data validation also offered a venue to address frequently arising concerns from clinicians about data accuracy. One participant noted, “if the clinic doesn’t trust the data, either its source, timeliness or accuracy, then we helped the clinic work through this. We usually hear push back with data when the clinic gives providers feedback or shares it publicly across providers. The more transparency, the more questions there are about accuracy. It takes a while to get through validation of the data and build the team’s comfort level with the data, to trust the data. . . . then they can use it.”

Data review and sharing: "After clinics began to generate data and reports and start doing data validation, they are ready to meet and share across organizations." "At clinicians meetings we review the population data monthly and look at immunization rates, pap smears and mammography rates, as well as diabetes, hypertension outcomes. Now we are starting to look at depression. . . we are much better with data now." It is at this point that clinics are ready to begin the meaningful use of data to improve quality.

In addition to sequencing of steps, a number of overarching strategies were repeatedly raised. The core strategies, which generally cross sequence boundaries include: creating multidisciplinary teams, using quality improvement and small tests of change, creating opportunities for shared learning, and facilitating relationships between clinics and the vendor.

Multidisciplinary teams: Many participants cited the importance of pulling together a multi-professional team of clinicians, and operations who can champion the work. "Get the support of CMO." Frequent guidance was also given to be sure that quality staff were working hand in hand with information services staff on registry implementation. One stated quite simply, "implementing a registry is not an IT project." The technology requires IT support, but to make meaning of the information you need staff who understand quality improvement. One participant put it this way, "I went over the data before it was submitted to AQIC and it didn't make sense, I talked to the person who submitted the data and he was an IT guy, he was annoyed and said, 'someone gave me the data and I submitted it.' When the person who reports the data is not the person who collects it or uses it, there is a disconnect. . . we need to focus more on why we are collecting this data, what are the ways to use it, who benefits from it and take the time to reflect on what it means."

Quality improvement: Quality improvement was seen as an integral part of all steps in the sequence. A resounding point made by those interviewed was the need for a quality improvement perspective in order to successfully implement registry and make meaning out of data. "If practices have experience doing quality improvement, then they have a better idea of how to use data and what kind of reports they will need." Another added, "to pull reports, someone who knows how to read a chart, how to generate the data." In addition, one consortia leader wisely observed, generating reports is more than pulling data, there is a need to understand why something is measured, what are the data definitions, how is the data structured, what is included in the denominator." "Most people have a superficial understanding of measures and the pitfalls of data definitions. If you aren't struggling with this you aren't understanding it." Several spoke of the need for leaders to engage with the data and pay attention to it, commit to making changes based on the data, of taking time and creating space for data reflection and change.

Opportunities for shared learning: As mentioned above, consortia varied their approaches to supporting clinics, but all included opportunities for shared learning. Some consortia set up users groups and this is a "clear advantage" when a consortiums clinics or health centers use the same system. One interviewed recommended, "Encourage health centers and clinics to reach out to others who have done it - see what they have done, to take advantage of this. Do site visits." Another consortium sponsored regular, every two week vendor calls and facilitated relationships between the clinics and vendor. Yet another reported, "we did lessons learned in the monthly peer network meetings of MD directors, nurses and an interdisciplinary QI group." One said, we hold "regular ongoing meetings with clinics (monthly) and other consortia where clinics talk through the measures, how to collect data, we even helped in the beginning with data entry." One recurrent point was the importance of stocking learning sessions with opportunities for shared learning, and minimizing the use of presenters or experts who are "talking heads."

Training: Much of the conversation about strategy centered on the topic of training. Each consortium seemed to develop a unique approach to clinic training. Most used a hybrid model of learning collaboratives, organized face to face training, webinars, and then some on site consulting or technical assistance, "you need to do the two activities in parallel." There was a mix of face to face learning sessions because "clinics like to hear what others are learning," both training and consulting that contribute to development of sense making of data. One consortium shared how they facilitated learning and training among clinics implementing the same electronic systems, "we did a face to face training and had 3 clinics using the same product, they shared training and as one turned on their registry they invited others who missed training, or add staff turnover, to come watch. This was followed with technical assistance."

The mix of learning opportunities depended on the consortium resources and clinic needs, "in the perfect world there is a combination of learning approaches." While some consortia were able to provide consultants for on-site technical assistance, others took a different tack. One consortium even "bought training for the clinics, we sent them to i2i user group meetings. It encouraged them." Generally the smaller clinics got more help on site than others. One said, "we did not offer consultants, just training, we had i2i come and train and we had QI staff help with data entry for the small clinics - it was a combo of staff and training."

As noted above, each consortium set up networking opportunities for clinics to share lessons learned along the road to EHR and registry implementation. They gladly took advantage of the AQIC regional learning and technical support.

Training was needed in both information technology systems and in the most basic of skills. Some clinics need basic computer and information technology skills, one participant remembered "training staff on basic computer use, that seemed arcane, but even using a mouse, key stroke - basic computer mastery was needed."

Training was not enough. Consortia leaders shared that training without dedicated and protected time to practice what is learned is necessary.

Time and resources

Clinics required both time and resources to implement EHR and registries, and to develop the sophistication to act on data in order to improve patient care and population health. Nearly every participant observed that clinics underestimated the time and effort it takes to implement and learn to use registries and EHRs, and how labor intensive it is, "it's a lot more work than you think to get the clinics to standardize measures . . . even before starting to use data for improvement." Leaders who allocated time and dedicated resources actively made a difference in clinic success because clinics needed time not only to implement information technology systems, but then "they need time to ask what does this mean, they need space to look at the data and ask what it means. Some have time to do it, others don't." Clinics simply need, "protected time to learn and practice skills."

Time and resources were issues for some of the consortia as well, one participant interviewed said, "there is so much we know that could help the clinics prepare themselves but there isn't the time or capacity to help them." Another said, "it comes down to staffing and funding; more staffing would be good." One participant in a rural area commented, "resources are the biggest factor in ease of adoption. Some of the isolated, rural area clinics need us, we provide some administrative support, bring them together and they work with sister organizations to do this, then they don't have to figure it all out for themselves." Several consortia spoke of taking time to, "collect lessons learned to better help the next clinic" and the need to conserve their resources - to "take those lessons, challenges, and integrate them back into the learning community before implementation then I wouldn't have to repeat myself." More than one consortium reported supplementing clinic resources by providing assistance with data entry.

Relationships and Teamwork

Repeated comments by participants emphasized the relation-based nature of this work at multiple levels, including relationships between consortia, relationships between clinics within consortia and relationships between staff in individual clinics.

Relationships between consortia: Relationships between consortia were valuable at several levels, from offering much needed moral support, to specific ideas for how to do the work, and finally to shared work with joint training activities. Many participants highlighted the importance to them of the sharing and learning that occurs across consortia, "I belong to a super region that meets monthly on the phone and in person, so we share across consortia on how to meet meaningful use and the AQIC requirements, we share what is going on in other practices, about QI too." One consortium team shared the value created when "all the consortia meet, six times a year and the CEOs talk all the time, they rely on each other for feedback and sometime share staff to participate in each others' activities, working with colleagues around the state and with funders lets us be involved in designing the projects." Another added, "One important element for success is discussions between consortia, about what our clinics were doing, not doing, and statewide challenges." Cross consortia collaboration in training and shared learning was viewed as a strength, "reaching out to colleagues, sharing resources was tremendously helpful." Relationships and sharing also led to the shared development of regional trainings, helping consortia stretch their own resources.

Several participants highlighted the synergistic effect participating in multiple CHCF programs. For example, one mentioned Tools for Quality, where "super-regions come together and share best practices, not just technology, where learners compare clinical outcomes, or learning leadership skills and how to create a culture of change."

Relationships between clinics: Consortia fostered relationships between their clinic members, and which served an important function for learning and spread. Relationships with other leaders helped leaders engage, "a clinical leader finds out what to do through their networks." Sharing lessons learned, networking for the purpose of learning, and learning from other who have gone before was powerful. "Clinics like to hear what others are learning." An executive said, "we share learning about IT systems and tools, it was so successful that we started a users group of peers."   Another said, "we created small groups so people could learn from each other; focus on common problems . . . we talk and don't feel like we are the only ones that have this particular problem." One participant remembered the i2i Tracks implementation and said, "the positive, unintended consequence was sharing best practices of implementation . . . the regular meetings of the community of learners, the positive peer pressure shaped the culture of our network; even the two clinics who did not join at first, ended up doing it. This sharing was a watershed event for culture change, how to manage change, use data, and QI infiltrated the organization. This changed our coalition role, now we lead initiatives, and bring the health centers together." Almost every participant mentioned the value of convening the clinic leaders regularly to deepen relationships and to share lessons learned, even "getting the medical directors together quarterly and look at the chronic disease data, to share." Some suggested that the networking extend deeper into the clinics so that clinic managers, clinicians, nurses, quality improvement professionals and the like meet together to share and learn from one another.

The power of the clinic to clinic sharing was based on personal relationships developed by time spent together. Several participants mentioned the value of relationships that form during face to face learning sessions. They facilitated shared learning, "they are more valuable than webinars, I know they are expensive, hard to get to, but the benefit is significantly more. When people spend a day together they start to share. On a webinar, you can tune out, do your emails but not in a learning session where the person next to you might be your boss. The energy is high, people share, you see people you haven't seen in a while, it is worth the effort to do it." Several agreed that regional learning sessions are preferable to state wide ones because "community is lost." But the face to face learning needed to be active, based on what each other were learning, not "talking consultants" and content should be practical. However, one participant shared that it doesn't help if the wrong person attends a learning session or learning community network meeting because "they listen but they can't implement when they get back home."

Teamwork within clinics: Teamwork was found to be an important feature that first fosters, and then develops and matures with implementation of EHR and registry. This feature is linked to the strategy described above of creating multidisciplinary teams, but focuses on what is takes for these teams to work together effectively. One participant said, “First pull together a team that represents all aspects of clinical work, including operations providers, clinicians who work with patients. This promotes what is important and then they can champion this with others - they are the ones who deal with patients and know how to look at the data.” Teams who “look at a report and then act on it, who have leadership support to implement change, who have time to do it are successful.” A vital characteristic of teams who succeed is that they “are curious.” The most effective teams were composed of a clinical operations manager, a clinician, a front office representative and IT or QI when possible. As one group of consortia said, “Engage frontline staff in the design from the start, engage them in the definition work; then share practices from other sites.” “Focus on billing first, then move into clinical improvement because it builds on trust “now we can trust each other and can talk about it.”

Moving Toward Meaningful Use

While the emphasis in the first two phases of AQIC was on data collection, validation and reporting of common measures, some clinics developed the ability to make sense of data and use it for improvement. Several mentioned using data three ways: to improve processes, outcomes, clinic operations and clinic flow; at point of service patient care; and for population management. They emphasized the importance of common goals and shared understanding among clinic staff about why data collection and reporting were key to better patient and panel management. An evolution emerged of selecting a clinical outcome, collecting data, identifying gaps between best practice and clinic providers. This generated interest among clinicians. When this was followed with transparency, data validation, and then later with discussions about what the data meant as well as sharing data with others at networking events - it lead toward making meaningful use. One consortium said, “meaningful use equals standardized data entry, validated data that you know is correct and then it can be used meaningfully.” “Clinics have to first understand that data is probably bad before it is good. We did day long sessions on data validation and had clinics share their results.” The consortia offer clinic leaders time to reflect on their reports.

Participants spoke clearly about the amount of work that needs to be done before meaningful use can occur; both to deal with technical issues and to create shared understanding, “It is a lot more work than you think to get the clinics to standardize measures. A lot has to do with technology, process and the people. Improvements helped us with workflow, data entry and cleaning the data or refining and defining it in ways the clinics hadn't thought of before. Lots is needed to happen before starting to use data for improvement." Many clinics continue to struggle with data validation and report generation and but some were able to advance to using data: for improvement with patients at the point of care; for population management; and overall improvement. But, it takes time, one participant quote said, "It has taken us over 5 years to get here." Another said, "It was a 5 year project we tried to do in two years."

"We have medical directors looking at the data reports and they are interested and want to know how it effects their practice" what the data means and what actions they should take based on the data. Even clinics in areas with little managed care said, "we are going to use data to drive our policy because we don't have health plans here."

Clinics with the most quality improvement experience, who have experience with a registry are further along the developmental curve in preparation for Meaningful Use. In particular, the Federally Qualified Health Centers (FQHCs) who participated in the national Health Disparities Collaborative and gained registry experience with the Patient Electronic Care System (PECS) are better prepared than others. Specifically, the registry tool, i2i Tracks was mentioned as easy to use and reported that clinics with i2i Tracks experience transitioned more easily to the next steps of EHR implementation. "If practices have experience doing quality improvement they have a better idea how to use data and what kind of reports they will use." Because i2i Tracks "interfaces electronically with labs and practice management systems, many clinics decided to keep i2i Tracks along side their EHRs until the EHR products get more registry functionality." ,i2iTracks has a distinct advantage over earlier generation registry tools like CDEMS, and PECS "because so much data had to be entered manually that clinics did not spread the registry use across all of their providers and sites. With i2i, they are using the registry across their entire patient populations, for diabetes care, well-child care, women's health care, etc. We don't think any EHR product currently out there can match it."

Finally, given the history of registry and quality improvement use in California, clinics who do not yet have registry, may be in important ways different than the clinics who were early adopters, or even in the majority when it comes to electronic health systems. Additional strategies may be required to support these late adopters to achieve meaningful use of data for improvement.

Appendix A. List of Participants

Jorge De Luna: Clinical Services Coordinator: Community Health Partnership

Debra Farmer, President and CEO: Westside Family Health Center with Marie McKinney, Chief Operating Officer

Cathy Frey, Executive Director: Alliance for Rural Community Health

Carol McHale, Quality Improvement Coordinator: Redwood Community Health Coalition

Robert Moore, MD, Chief Medical Officer: Redwood Community Health Coalition, Medical Director: Community Health Clinic Ole, and Chair:AQIC Steering Committee/

Amy Petersen, Program Manager for Continuous Quality Improvement: San Francisco Community Clinic Consortium

Margie Powers, Consultant to AQIC: Margie Powers Consulting

Barbara Ramsey, MD, Chief Medical Officer: Alameda Health Consortium/Community Health Center Network and Rachel Holloway, Health Information Technology/Quality Improvement Manager (HIT/QI Manager), Community Health Center Network

Christy Rosenberg, Director: Council of Community Clinics

Jaspreet Sodhi, Quality Improvement Director: Central Valley Health Network with David Quackenbush, CEO and Sean Folweiler, Clinical Applications Specialist

Doreen Bradshaw, Executive Director: Health Alliance of Northern California with Yolanda Ybarra, Performance Improvement Director

Appendix B. AQIC Harvest Interview Schedule

1. Facilitators and Barriers for Clinics

   What have you seen as the biggest help in getting clinic personnel to understand the importance of registry data and to use it for improvement?

   Was there anything you did to foster this?

   What was the biggest barrier in getting clinics or practices to implement and then use the registry?

2. Engaging Leaders and Other Clinic Staff

   When you think back to engaging clinic staff in improvement, CEOs CMOs the board, what most helped you do this? What seemed to help engage them, to get their buy in? What was the effect of their engagement, ie, what if anything changed, once they got engaged?

   > What, if anything facilitated their connecting with data and metrics?

3. What approaches did you find worked best in helping clinic staff learn the tools and strategies of quality improvement?

   > Probe: Face to face encounters or meetings, learning sessions, on site training, peer to peer, site visits. Why?
   >
   > What could have made the approach even more helpful?
   >
   > What type of expertise is needed: Quality improvement, information technology?
   >
   > What might have made the less useful approach help the team(s) more?

4. What do you think would help clinics the most with meaningful use?

   > Probe: face to face; technical assistance; experts; peers; collaborative learning? Why?

5. What advice do you have for a coach or trainer helping a clinic go through these changes?

6. Successful Teams

What were the features of teams that were particularly successful in implementing quality improvement using electronic data?

7. Role of Context

When you did on site TA or a learning session,what if any difference does context seem to make, and how does this influence getting results? Any reason one approach is better than the other?

8. Workflow

Did you help the clinic or practice redesign workflow? If so what helped them do this, who was involved, how did you approach it, how did the clinic decide whether the flow is better now?

> Probe: What happened, if they did not redesign work flow – was it ok? In hindsight do you wish you had done this with them?

9. Consortia Capabilities

What support do you, as a consortia person need to do this work? What was most critical to your work, to how you did it? To your success?
What advice would you give to clinics [local extension agents] who want to begin using data from an EMR to support quality improvement?