EXECUTIVE SUMMARY

Evaluation of the Tools for Quality Program

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Introduction

NORC at the University of Chicago is pleased to present this final report on the evaluation of the Tools for Quality program to the California HealthCare Foundation (CHCF). The overarching objective of the Tools for Quality Program is to improve the health outcomes of uninsured and underserved populations in California. To support this objective, the program offered matching grants to California community clinics to implement chronic disease management systems (CDMS), in order to help providers improve care of patients with chronic conditions.

In 2009, Tides Foundation funded NORC to lead a 2-year evaluation of the program to identify opportunities and challenges associated with the implementation and use of CDMS by clinics and to assess the impact of CDMS use on quality improvement activities. This study assessed community clinics’ experiences implementing CDMS and the extent to which this experience prepared them for future acquisition and use of clinical systems, especially electronic health records (EHRs). Our results provide lessons learned to facilitate adoption and use of disease registry functionality to support quality improvement initiatives in community clinics and networks.

Background

Community clinics play a vital role in providing health care services to a patient population with a significant chronic disease burden. Currently, one third of Americans live with at least one chronic condition. Furthermore, an estimated 11.4 million Americans with chronic conditions are uninsured, thus having diminished access to care. Treatment of chronic illnesses proves costly, accounting for three-quarters of total health care expenditures in the United States. Given the high morbidity and mortality rates associated with these illnesses, experts agree that improving our methods for managing underserved populations with chronic conditions is a priority.

CDMS applications are designed to support organized care and management of patients by capturing, tracking, and monitoring care related to specific diseases. Successful implementation can potentially lead to a number of improvements including a streamlined clinical workflow, enhanced tracking and management of patients with chronic diseases, and stronger reporting of clinical measures, allowing clinics to ultimately build stronger quality improvement programs.

The Health Information Technology for Economic and Clinical Health (HITECH) provisions in the American Reinvestment and Recovery Act (ARRA) legislation have made EHR adoption a priority for all providers including safety net providers. The legislation requires providers to report on clinical quality
measures in order to demonstrate meaningful use of EHRs, however, many EHRs lack the ability to
generate complex population-level reports. Thus CDMS may play an important role in assisting clinics to
achieve meaningful use and to continue on a path towards quality improvement.

A major barrier for clinics’ successful implementation of health information technology (health IT)
software is a lack of resources, including financial resources required to purchase software and personnel
to provide managerial and technical expertise necessary to implement such software. In 2008, six
organizations came together to establish the Tools for Quality Program, with a shared goal of generating
technology-enabled quality improvement for California community clinics through matching grants for
the acquisition of CDMS. Led by CHCF and Tides Foundation, the funders included: Blue Shield of
California Foundation (BSCF), Kaiser Permanente Northern California Region, Kaiser Permanente
Southern California Region, and The California Endowment. The funding organizations proposed a
strategy to enable clinics to combine resources through networks in order to purchase, implement and use
an application to facilitate chronic disease management and improve quality of care.

Two rounds of funding were designated for California community clinics to purchase and implement
CDMS in the form of matching grants which covered, in most cases, less than 50% of the total cost of
purchase and implementation, including clinical laboratory system (lab) interfaces. Grant funds were
provided to the first cohort in June 2008 and the second cohort in June 2009. The matching grants were
used to fund five critical areas:

1. purchase of CDMS software and up to 15 software licenses per clinic;

2. interfaces between CDMS and practice management systems with the option of interfacing with
   major clinical laboratories;

3. participation in a three-day vendor-led training session;

4. funds for consortia organizations to host CDMS software and conduct regional learning sessions
   for in-network clinics in the Bay Area, southern California and central California; and

5. incentives for reporting on a standard set of diabetes measures for the California Primary Care
   Association (CPCA) Accelerating Quality Improvement Collaborative (AQIC) program.¹

¹ Incentives were provided to grantees that reported on a defined set of diabetes measures annually as part of the AQIC program.
The program and evaluation were supported by an advisory committee, established in 2008 to oversee the program. Comprised of experts and leaders in chronic disease management, health IT implementation and the needs of California’s community health centers, the advisory committee met regularly and provided ongoing insight into program operations and evaluation activities.

Two types of grantees were awarded matching grants for CDMS software acquisition: 1) individual community clinic grantees, and 2) consortia or networks of clinics, which received additional funding to host CDMS software for in-network clinics and to organize and lead a set of four regional learning sessions. Each learning session involved a full day of on-site participation hosted by the consortia in one of three regions, and included a combination of formal presentations on specific topics, break-out sessions, demonstrations, and open question and answer formats. Consortia also played a critical supportive role for in-network grantees outside of the learning sessions, in some cases offering training, technical assistance and implementation support, and creating opportunities to coordinate resources and collaborate outside of sessions. All grantees participated in formal three-day training led by the i2iTracks vendor.

Each grantee clinic or network was required to purchase CDMS software to participate in the program. Criteria for CDMS software inclusion was developed by funders based on critical areas of functionality related to chronic disease management. The funders supported grantees’ purchase of CDMS software of their choice that met these criteria, however i2iTracks was the only approved CDMS software for purchase as no other suggestions were submitted by grantees for inclusion in the program. I2iTracks is a chronic disease management system that uses interfaces with practice management systems, labs, or EHRs to automate disease registry functions, allowing users to produce robust population-level reports to track and manage conditions and reducing duplicative data entry.

The software allows multiple users to simultaneously document care using the system, supporting a team-based care approach. Built-in report templates facilitate completion of federal and regional reporting requirements, including the Health Resource and Services Administration (HRSA) Uniform Data System (UDS) report and the AQIC report, among others. Users can also conduct ad-hoc queries using simple or advanced search mechanisms, or set up custom reports.

At the point-of-care, i2iTracks can be used as a reference tool through reminders, prompts and easy retrieval and entry of relevant patient data. The tool allows providers to enter data into a patient visit summary sheet, which is a form that each organization designs to track the most important information on
patient care and chronic conditions, such as diabetes care measures. This data is then stored in the system and can be easily retrieved and manipulated for reporting.

**Overview of Grantees**

Cohort 1 included 16 grantees representing a total of 33 clinics. A second cohort of nine grantees representing 11 clinics was selected for matching grants in June 2009. Subsequent to being funded, six cohort 1 clinics and five cohort 2 clinics dropped out of the program, each for different reasons. A total of three host consortia and 27 clinics completed the program and four cohort 2 grantees have implemented CDMS to date.

Among those participating, sixteen clinics self-hosted their CDMS software, while 11 clinics used a hosted CDMS solution provided by a network. Almost all grantees selected diabetes as their first area of focus and started by using a CDMS module focused on improving care to this population. The diabetes module allows clinics to capture data from existing systems, enter data by hand and produce reports specific to improving quality of care delivered to diabetic patients.

At the time of this report, NORC was able to obtain 2 full years of data from cohort 1 grantees, including information on pre and post implementation conditions. Of a total of six cohort 2 grantees, four grantees had fully implemented CDMS. Thus this report focuses on cohort 1 grantees, but also includes themes from the limited number of cohort 2 grantees for which we have information to the extent that they expand upon or extend findings from cohort 1.

**Purpose and Approach**

Our evaluation of the Tools for Quality Program focused on formative issues related to planning, implementation and early use of CDMS for quality improvement. We looked at clinics’ existing resources and program participation at two intervals: 1) pre-implementation and 2) post-implementation. Our findings provide lessons learned to facilitate adoption and use of disease registry functionality to support quality improvement initiatives in community clinics and networks. We also sought to assess to what extent grantee experiences with the implementation and use of CDMS prepared them for future acquisition and use of other clinical systems, especially electronic health records (EHRs). Overall, we sought to:

1. **Assess grantee clinics’ experiences in implementing and using CDMS**
2. **Assess the effect of existing information technology (IT) and quality improvement (QI) resources, network participation, and learning sessions on implementation experience**
3. Assess the impact of the program on a clinic’s ability to track quality metrics, generate reports and implement continuous quality improvement

4. Identify key lessons learned

Evaluation Activities and Findings

Our evaluation relied on several basic sources of information. We conducted two rounds of surveys and semi-structured discussions with grantees as well as a limited number of site visits.

We began the evaluation by reviewing materials submitted by grantees as part of their participation in the program. Our review of grantee materials included grantee proposals, quality improvement plans, and regularly submitted grantee and consortia progress reports. We used this information to summarize background information on grantees, learn about their resources prior to the grant and understand their demographics.

NORC also consulted with advisory committee members in the early phases of the project to obtain insight on the evaluation framework, and later led several semi-structured interviews with advisory committee members to obtain feedback on instrument design for the study.

Primary data collection was conducted at two intervals: pre-implementation (round 1) and post-implementation (round 2). For both round 1 and 2 data collection activities we fielded a survey, reviewed consortia progress reports and led semi-structured discussions with a small subset of clinics. We concluded our round 2 data collection activities with site visits to seven clinics.

The first round of data collection focused on grantee characteristics at the start of the program and their initial implementation experiences with CDMS, the role of learning sessions conducted by consortia funded under the program, and early lessons learned. In round 2 we examined the use of CDMS by providers and support staff, the impact of CDMS on clinic operations and clinical outcomes, clinics’ future plans for CDMS in the context of the EHR incentive program, and barriers and enablers of progress. Below, we outline findings from each of these stages.

Planning for implementation requires more effort than anticipated. Findings suggest the need for a deliberate planning process prior to implementation, greater emphasis than is typically planned for training and an understanding that the implementation of CDMS is likely to surface a series of unexpected infrastructure and software issues that require resolution. As a result of these obstacles, often a product of
deep reliance on legacy systems, we found that migrating to CDMS often takes much longer than anticipated.

**Workflow redesign is critical for optimal use.** Using CDMS effectively requires significant changes to clinical workflow. Provider and support staff engagement in each step of the implementation process is essential to ensuring that the process meets the needs of clinic staff and that the software can be used by clinic staff to achieve its intended purpose. In many cases, prior to implementation, clinics did not have a baseline understanding of the various workflows already in place throughout their sites. As clinics started down the path of planning and implementation, they noted a significant need to learn and document their existing workflow and data entry processes and then re-work and re-document those processes in the context of using CDMS.

**Existing IT and staff resources had an impact on clinics’ ability to implement.** In interviews and discussions, all clinics indicated that their IT and staffing resources prior to grant award impacted their decision to host CDMS applications locally or to outsource hosting to the consortia. While most of the grantees had some form of registry prior to the program, most commonly the PECS system formerly supported by HRSA, they varied in terms of how they entered data into their existing registries and whether they had instituted a specific workflow for their diabetic population to compliment the reports and decision support they were receiving from the existing registries. This variation affected the scale of changes to clinical workflow and data entry processes that would be necessary to implement CDMS under the Tools for Quality Program. The approach to interfacing to CDMS also varied depending on how existing software was hosted.

In order to work effectively, the CDMS diabetes module uses both demographic and diagnostic data from a practice management system as well as clinical data from laboratory tests. Most grantees implemented interfaces between clinical laboratories’ systems and CDMS as well as between each clinic’s own practice management system and CDMS. In a limited number of cases, clinics used existing interfaces between their practice management system and clinical laboratories’ system allowing them to set up a single interface between the CDMS and their practice management system.

**Data cleaning is time and resource intensive, but essential to assure the accuracy and completeness of CDMS reports.** Grantee clinics discovered a host of inconsistencies in the way encounters and patient data were entered into their practice management systems, which led to duplicate patients and encounters, and inaccuracies or difficulties in reconciling whether key procedures or tests were conducted for a particular patient at a particular encounter. Cleaning these data and setting new rules for data entry into all
systems or reinforcing existing rules for staff to ensure consistency in data entry practices provided a crucial step in the implementation process for many grantees. Most grantees spent significant time going back to source systems such as their practice management systems to clean data. They also anticipated that additional data cleaning would be necessary as part of planned EHR implementation projects.

*Learning sessions provided a valuable source of implementation support.* Overall, grantees viewed the learning sessions as useful opportunities to collaborate with peers, to learn about new ways to use CDMS, and to obtain support when needed. Some clinics established ongoing external workgroups with peers after forming relationships during learning sessions. In addition to reporting on a number of benefits derived from session attendance, grantees offered suggestions for improving the format and structure of future learning sessions. A central challenge was assuring learning session content was appropriate given that clinics often implemented at different paces. One successful resolution was to invite advanced grantee clinics to present their early experiences and identify challenges that slower implementers should expect to encounter. In some cases, host consortia arranged to bring in even more advanced clinics that were not part of the Tools for Quality program to inform the efforts of the advanced grantee clinics. Further, learning session workgroups focusing on specific topic areas such as point-of-care data entry, interfacing to local vaccination registries, or issues of concern for specific stages of implementation (e.g., data cleaning), were considered highly constructive even for those clinics that had already implemented, but were looking to expand their uses of the product.

*Network support is critical for organizations with limited resources.* Engagement with networks or consortia for hosting and training was an important component of the Tools for Quality Program. Our results indicate implementation support and hosting by health center networks was essential for community clinics with limited IT resources. Clinics reported that the decision to use a hosted CDMS solution was based on the clinic’s size, availability and extent of in-house IT infrastructure, experience implementing other health IT solutions, and existing relationships with networks. Those who relied on networks or member clinics to host their applications, typically smaller clinics with fewer IT resources, received additional support from the networks in the form of project management, technical support, training or system implementation. Although it was less likely for self-hosted clinics, usually larger organizations with more robust IT resources, to receive additional support from networks outside of the learning sessions they reported advantages of local control over the application and flexibility to tailor it to their needs.

*Manual data entry cannot be avoided despite interfacing with other systems.* In interview discussions and surveys, grantees reported using a number of methods to populate data into CDMS. Results from
round 2 data collection indicate that all clinics were entering data both manually as well as through interfaces with practice management systems and/or lab systems. While most data is automatically populated through these interfaces, some important items such as vital signs required manual entry. Additionally, clinics noted that women’s health presented unique challenges in terms of changes to workflow and data entry, as Pap smear tests required interpretation from providers prior to or at the time of data entry.

 Clinics customized CDMS to expand use beyond diabetes. Findings reveal that all grantee clinics used CDMS in various ways to meet their quality improvement needs. Each clinic tailored the patient visit summary sheet to meet the particular concerns of their providers and the organization as a whole. For example, some diabetic patient visit summary sheets included additional measures for other chronic diseases, which allowed providers to enter information on comorbid conditions. Medical Assistants were then able to track multiple conditions using CDMS. Additionally, some clinics found they were able to track new conditions or enhance their methods for tracking existing conditions.

 Regularly, clinics conducted ad-hoc queries to identify patients in need of follow-up as well as to run reports. Some clinics had not yet produced their own reports for regular use, while others produced standard reports and continued to add measures to improve the information available to support quality improvement.

 While clinics used CDMS in many different ways, all grantees used CDMS to support three common functions:

1. To identify diabetic patients who would otherwise fall through the cracks, e.g. those who have not had an HbA1C test or foot exam in 6 months;
2. To track high risk diabetic patients as a second step in the process after tracking patient visits and diabetes management; and
3. To track care delivered to individuals with other conditions such as asthma and women’s health.

 Clinics improved existing processes and reporting through the use of CDMS. All clinics reported that they experienced process improvements, such as more efficient clinic workflows, better tracking of diabetic patients, and enhanced follow-up procedures, with some clinics reporting improvements in the number of diabetics who received HbA1c tests and foot exams. A small number of advanced clinics reported improvements in overall HbA1c levels for diabetic populations, and most clinics suggested that over time their ability to better manage patients through the use of CDMS would lead to improved health
outcomes. All clinics also indicated that they were able to use CDMS to produce reports more efficiently than using older registries or paper charts.

**Future uses of CDMS.** The Tools for Quality program was initiated prior to the American Reinvestment and Recovery Act (ARRA) and HITECH. Approximately ten months after the evaluation started, HITECH became law and the policy was introduced to provide incentives for Medicare and Medicaid providers for meaningful use of electronic health records (EHRs). To ensure that we captured the impact of these external factors on the program, we assessed how the EHR Incentive program influenced grantee implementation experiences and future use of CDMS. Below we highlight some key findings:

- **Clinics will both adopt EHRs and continue using CDMS, at least in the short-term.** In response to HITECH, grantees and networks reported uniformly gearing up for the implementation of EHRs. Discussions with clinic staff revealed that grantees had relatively low expectations about the ability of EHRs to perform population health management functions similar to those available in CDMS. Of twenty-six total cohort 1 clinics responding to the round 2 survey, 78 percent reported they plan to continue using CDMS in the short-term.

- **Clinics plan to expand their use of CDMS.** Twenty-two of 24 respondents in the round 2 survey indicated they have future plans to expand CDMS use. When asked to describe all of the ways they plan to use CDMS in the future, forty-six percent indicated they will add new chronic disease modules. Thirty-eight percent of clinics also noted they plan to increase the number of users of i2iTracks throughout their clinics by implementing i2iTracks at additional sites or in other clinic departments such as dental or behavioral health departments, or by bringing on board additional types of users, such as clinicians. Notably, twenty-five percent of respondents indicated they will also use CDMS to track measures such as immunizations or obesity. Five out of twenty-six respondents also indicated they plan to use i2iTracks to expand referral activities. Findings from interview and site visit discussions further suggest that in the near-term grantees plan to use CDMS to focus on improving existing processes; conducting panel management, or managing panels of patients with particular chronic diseases; and improving the internal reports that they produce. In the long-term they anticipate expanding the use of i2iTracks throughout their clinics and using i2iTracks to track and manage additional patient care measures.

- **The Tools for Quality Program will help grantee clinics and networks implement EHRs.** While 96 percent of cohort 1 grantee clinics (26 out of 27) did not have an EHR in place at the time of the 2nd round survey, clinics reported in discussions that they were in the process of evaluating or acquiring EHR systems and will likely have these in place within the next year. They also indicated that the Tools for Quality Program was instrumental in helping them to understand the
importance of training, workflow analysis, establishing stakeholder buy-in, cleaning data and planning for transition.

Conclusions and Recommendations

CDMS’ are important software applications that play a critical role today in helping community clinics track and manage uninsured and underserved patient populations with a high presence of chronic disease. These software applications help clinics in the following ways:

- Managing data to effectively track care processes and outcomes for patients with chronic illnesses and reaching out to those patients for the purpose of improving their care
- Assisting grantees to meet federal, state and regional reporting requirements
- Helping clinical and administrative leaders to produce ad-hoc reports and queries based on clinic needs
- Serving as a critical tool to improve quality of care and enhance care processes
- Helping enhance communication on quality issues within the organization
- Serving as an important learning opportunity and stepping stone for EHR implementation

Below we produce a set of recommendations for implementation and use of CDMS based on findings from our evaluation. Many of these areas also offer practical lessons applicable to EHR implementation in community clinic settings.

It is important to establish a ‘culture of quality’. Effective technology-enabled quality improvement projects typically require strong support for quality improvement as an organizational priority. The project must be supported by all levels of staff, including administration, provider leaders, medical assistants, IT staff and outreach staff. Clinics with this level of support across the organization experienced a cleaner implementation and were able to derive more benefit from CDMS use. Particularly, input from providers and clinical support staff on key initial steps such as the design of visit summary sheets is important to ensure that CDMS will meet user needs and provide the highest utility for the clinic.

The most effective implementation follows a stepwise plan with distinct phases which build upon one another. While it may be tempting to implement more than one technology at a time, such as implementing a new practice management system and CDMS simultaneously, this caused significant delays and created problems with staff buy-in for some clinics in this study. Adjusting workflow patterns and accommodating a new technology takes time and effort, and clinic staff benefitted from focusing efforts on one technology at a time. Additionally, some clinics implemented multiple chronic disease
modules at once to increase efficiency, but measures and reports developed for each module were often less sophisticated than staff would have liked because of the time required to attend to ongoing implementation issues associated with other modules. Results indicate a slow and deliberate approach to implementing modules may be important for EHR implementation, as clinics adopting integrated systems may prefer to implement new practice management systems first and then implement basic EHR functionality, opting to implement more complex features such as clinical decision support last.

**Updating, validating and improving quality data is an ongoing process.** The most successful clinics established mechanisms to continually improve upon existing measures, mechanisms and processes. Some suggested that determining what to measure and selecting the most useful measures was a difficult phase of the project, as clinics often needed to test measures to determine what data was missing, what was most important, and what should be included or excluded until they began using the measures and criteria they developed. Thus, an ongoing plan for updating, validating, and improving quality measures is critical. While most clinics found that there is no such thing as “perfect data”, the quality of data can be maximized through thoughtful, structured approaches to data cleaning and acceptance that some degree of trial-and-error will be necessary to achieve data that is usable for reporting.

There are many approaches to data validation, however the clinic must make a commitment to assess their data and decide how they will address issues as they arise. For example, the clinic can assign staff to identify errors and prioritize their importance, and to make priority changes in the appropriate systems on an ongoing basis. Clinics acknowledged that data validation is a continuous process and essential to achieve provider buy-in and assure CDMS produces valuable reports.

**Regular, clear communication is required to achieve lasting and far-reaching QI results.** Community clinics depend on strong communication to affirm their mission, strengthen their programs, and help teams work together to better manage chronic disease. A lack of dissemination of information across different departments or team leaders can produce efforts that are implemented in limited silos and do not have a broader organizational impact. Once clinics have determined the measures they will use for QI purposes, it is important to assure the data entry and measurement process is consistent across the organization. Quality improvement requires regular and clear communication amongst all levels of staff.

Many organizations established subcommittees dedicated to particular chronic disease areas of focus, and these subcommittees communicated uses and findings of CDMS to the larger QI committee and clinical and administrative leadership. Further, it is important to develop a path for sharing new information which impacts other departments’ data entry and use of CDMS, so that any issues can be identified
quickly and shared easily with all impacted staff. The most effective clinics employed formal, informal, traditional and innovative approaches to improving communication. For example, one clinic used an email listserv dedicated solely to sharing new information about diabetes in CDMS. Other clinics made sure that the CDMS implementation team consisted of a multi-disciplinary set of members representing all key departments within the clinic.

**Leadership engagement is necessary for CDMS to register organizational impact.** In order to maximize the benefits of CDMS implementation, the individuals and committees charged with managing implementation and use of the system must have both the support and the attention of clinic leadership at the highest levels. Support from this group is often provided initially at the time of pursuing funding or setting up business relationships. However, we found that it was important for top clinic management to stay engaged throughout the process of implementation and use. This is because ongoing attention from clinic management is required to determine how to take action in response to trends in clinic operations unearthed by the analysis from CDMS, and to marry this analysis with specific management functions, such as providing feedback and compensation for individual clinicians or teams. Moreover, if used effectively, CDMS software can be used to learn more about the organization broadly and to affect change.

**Coordination of multiple resources reduces barriers to health IT implementation.** Learning sessions, technical support and assistance provided by consortia or networks allowed clinics to further their QI capabilities, share knowledge around implementation issues and uses of health IT software, and build stronger relationships. As part of this program, community clinics that lacked significant infrastructure, expertise, support and staffing resources were able to successfully implement health IT software through use of a hosted solution. In all cases, clinics suggest that coordination and collaboration with networks and other clinics eased the burden associated with this process. These lessons are particularly relevant as clinics begin the EHR adoption process as many community clinics will be in a good position to benefit from group purchasing efforts or centralized software hosting, regional technical assistance and support programs, and peer-to-peer learning workgroups.
References

