

Case Report ■

Community-wide Implementation of Health

chaired by a stakeholder leader specifically skilled in the area of concentration and charged with formulating specific recommendations. An ambitious time line was set (Figure 1). Time and effort were donated by members according to organizational abilities and resources. Specific financial con-

tributions were not required, but there was an expectation of contributions in kind. Members donated office space, information technology support, and legal and business planning services. An Agreement to Participate was drawn up, asking for commitments to: (1) state-wide EHR implementation through collective action, (2) formation of a collaborative organization to carry out the mission, and (3) a cooperative, mission-driven ethic. All participants signed on as founding members (Table 1). This was followed by release of the first dollars from BCBSMA to support the Collaborative's formal filing for incorporation with the State of Massachusetts as the Massachusetts eHealth Collaborative (MAeHC).

A formal organizational structure was defined (Figure 2). Board seats were assigned to each signatory organization and an executive committee was formed, with representation from each sector of t

standards/vendor selection working group was formed. The working group established 2 key precepts: (1) identify a practical number of qualified vendors from the more than 200 available, and (2) give physicians choices in selection of vendor for their practice. Technical standards were specified to facilitate clinical data exchange, quality/safety initiatives, and evaluation.¹² These include:

issued to communities throughout the state.¹¹ The Request for Applications defined “community” broadly (including the “community” of practices relating to one or more local hospitals) and included requirements to recruit at least 80% of community practices, and obtain the participation of the local hospital, other community health facilities, and local leadership (Table 2). In addition, communities had to establish an organizational structure, designate a local project leader, and commit resources toward implementation. Selection criteria emphasized local physician and community leadership to ensure participation and a coordinated effort.

Thirty-five of 55 potentially eligible communities in the state submitted first-round applications; 6 were selected as finalists and underwent a second more detailed round that included site visits and town meetings with selection committee members. Three communities (North Adams/Williamstown, Brockton, and Newburyport) were selected as demonstration sites in March 2005, just 12 months after the original summit meeting. All accepted the invitation to proceed.

Establishing Technical Standards and Conducting Vendor Selection

To facilitate EHR selection by communities and practices and encourage best offerings from vendors, a technical

best met their specific needs and not have to spend time and effort in vendor selection and contracting, which can be problematic for most practices.¹³

Evaluation

Because it is a demonstration project, the MAeHC initiative received detailed evaluation. Coalition experts developed an evaluation plan that specified 6 areas of study: (1) use of technology, (2) barriers to and facilitators of adoption, (3) implementation tactics, (4) impact on safety (e.g., medication errors), (5) impact on quality, and (6) economic issues. The evaluation proposal was approved and budgeted at \$3.5M (nearly 7% of the project’s total expenses). Grant support was obtained, offsetting about 40% of the expense. Evaluation methods include automated record reviews, manual chart reviews, and questionnaires.

Finalizing Plans with Practices and Establishing Confidentiality/Security Standards

Each prospective practice completed a detailed survey and underwent a site visit by project staff to help plan EHR implementation. The Collaborative assembled a team of individuals with expertise in practice organization and information technology to perform the initial consultative site visits and to subsequently work with practices in converting to electronic records and reorganizing workflow and operations.

Data security practices and privacy/confidentiality standards were developed through a process of extensive discussion and debate both within the Collaborative and with the communities. The sensitive issue of patient control over data exchange was resolved by implementing an “opt in” model, in which patients are specifically asked to agree to

as-needed electronic exchange of their clinical data between clinical sites (no permission is sought to have data stored in the practice’s EHR).

Contract language with each community was drawn up, and individual practices formally signed on to the project, committing to: (1) full conversion from paper records to EHRs, (2) full participation in all evaluation and community data-sharing activities, and (3) upholding data-security and privacy standards. In return, full funding of their office EHR purchase, implementation, and operations (exclusive of practice staff time and opportunity costs) was guaranteed through June 2008 (with all necessary upgrades and technical support).

Current Status: Recruitment, Adoption, Implementation, and “Opting In” by Patients

Physician recruitment and retention have been strong. Of 561 physicians in 167 practices originally invited to participate in the program, 548 (98%) physicians in 159 (95%) practices accepted the offer. Since accepting the offer, 53 physicians in 18 practices have withdrawn from the program, leaving 141 participating practices, yielding an overall participation rate of 84% of all physicians and 88% of all practices in the pilot communities. Offsetting these withdrawals, approximately 75 physicians have joined the program since the recruitment effort, mostly through organic growth of practices already participating in the project. The main reasons for withdrawal from the project were: (1) EHR provided through another program, (2) dissatisfaction with choice of EHR vendors, (3) EHR not suited to their specialty, and (4) in one instance, physician death.

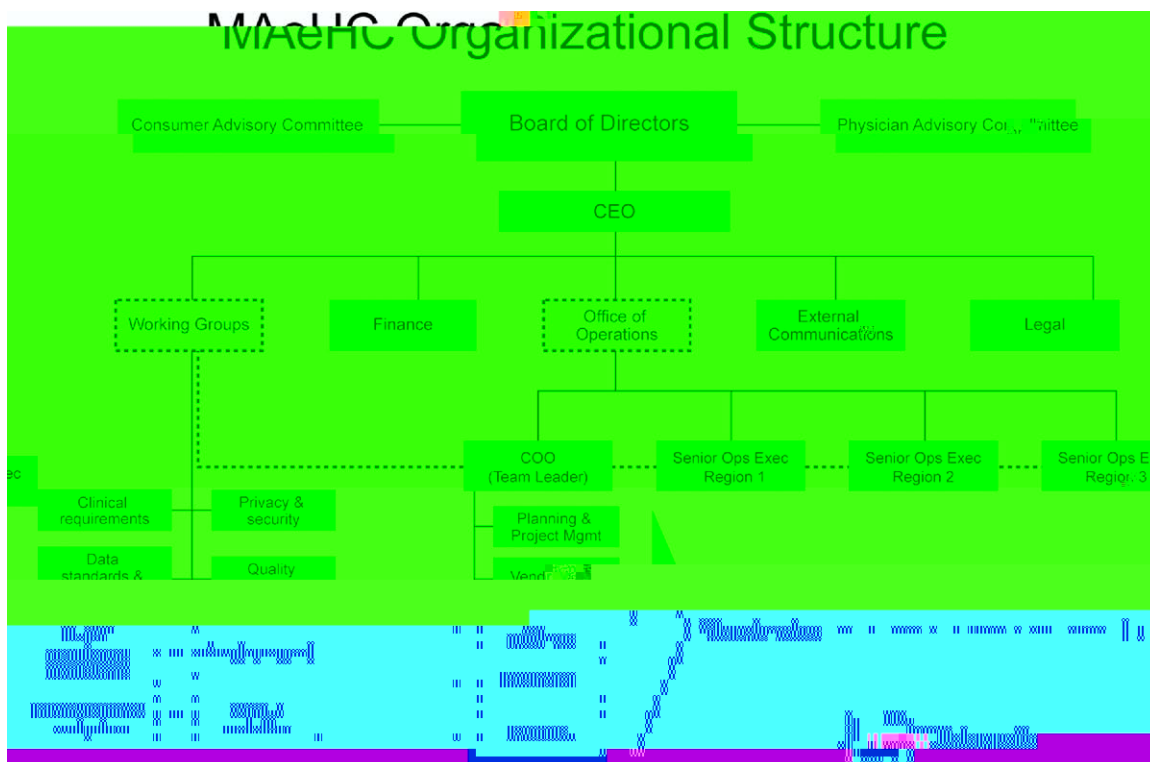


Figure 3. Organizational structure of the Massachusetts eHealth Collaborative. CEO = chief executive officer; COO = chief operating officer; MAeHC = Massachusetts eHealth Collaborative.

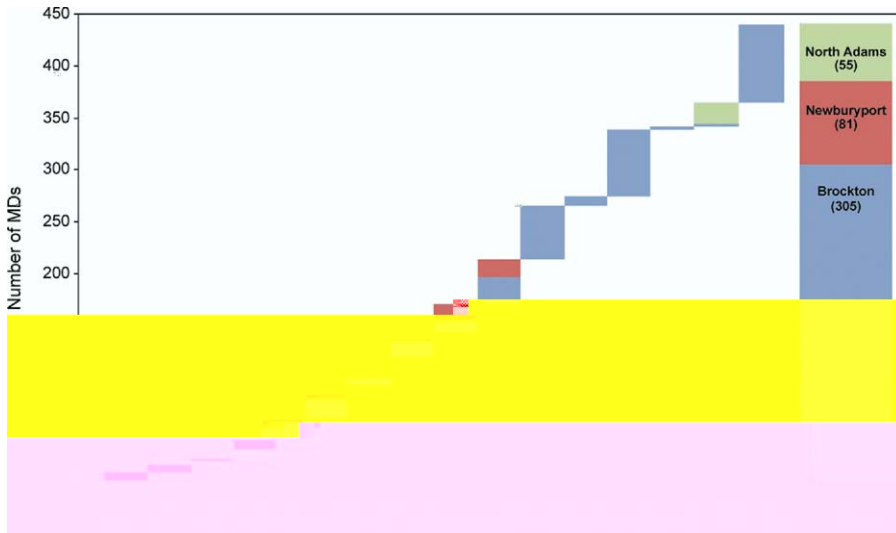


Figure 4. Distribution of practices and adoption rates among the 3 communities as of July 1, 2007.

Implementation has been nearly complete (Figure 4). Of the 141 initially participating practices, 138 (98%) have fully implemented their EHR as of September 2008. One of the remaining practices is scheduled to “go live” in November 2008; 2 practices have failed implementation. Early data show that levels of provider utilization of key functionalities such as electronic prescribing are very high. Duration of time to implementation has ranged from 4 months to 9 months, with 4 months being typical for a small office practice (1 month of preparation work and 3 months of work with the vendor).

The approach to clinical data exchange has varied by community, ranging from all providers electing to use the same vendor (making data exchange technically easier) to use of a central architecture by multiple vendors. In the first community to “go live,” 94% of patients are “opting in” for clinical data exchange.

Budget and Resources

The overall budget for the MAeHC collaborative and its pilot programs is approximately \$50 million, with the greatest proportion (approximately 42%) allocated to purchase and implementation of EHRs in the offices of the 495 physicians. About 11% was dedicated to clinical data exchange. Program staff and direct overhead expenses were limited to approximately 21% of the total budget, although the preponderance of personnel effort was dedicated to on-site support of the participating practices. Legal fees accounted for 5% of the budget. There has been no strict accounting of the enormous amount of time and other in-kind contributions by member organizations since project inception, but estimated economic value likely totals in the hundreds of thousands of dollars, given the thousands of hours of work donated by highly skilled professionals.

Discussion

The MAeHC’s demonstration effort achieved widespread adoption of EHRs in 3 Massachusetts communities. Adoption rates in excess of 90% are rare in the United States except in integrated delivery systems.¹⁴ This effort helped identify and highlight factors essential to successful large-scale EHR adoption as well as underscore important barriers.

Factors Essential to Large-scale EHR Adoption

Factors essential to this initial success included strong financial backing, intensive practice support, commitment to collective action, clear goals, leadership from the physician community, governmental support, and a community-based focus.

Financial underwriting from the Massachusetts nonprofit payer community (i.e., BCBSMA) was critical to the high rates of adoption and implementation. The challenge of “you build it, we’ll fund it” derived from enlightened self-interest and realization on the part of BCBSMA that the financial return from an interoperable EHR with decision support and clinical data exchange could be substantial if efficiency is improved, waste reduced, and health outcomes improved.³ Absent the availability of financial resources from the payer community and the willingness to expend them, funding EHR adoption becomes much more problematic, especially for small primary care practices that do not have the necessary capital. Payment reform will be essential to widespread EHR adoption.

Moving more rapidly to large-scale EHR adoption requires that those who will benefit most financially (i.e., payers and purchasers¹⁵) put up the necessary capital, either directly or through enhanced reimbursement. Most small- to medium-sized practices, especially those delivering primary care, find themselves unable to afford electronic medical records and may not derive much return from any such investment.^{8,13} Since the bulk of patient care in the United States is delivered by such practices, their lack of funding contributes to the United States lagging far behind most other industrialized nations in EHR implementation.¹⁰ The “skin-in-the-game” argument for substantial physician investment ignores the major costs in time and effort that even a “free” EHR implementation program such as this one entails.

Practice support emerged as an essential ingredient. Conversion from paper to electronic records represents a fundamental change in practice organization and operation. For smaller practices, such transformation can be nearly impossible without external support. Setting up a team of practice operation facilitators to work with individual practices proved essential, as did having continued information tech-

nology support. Support was provided at all phases, from planning the implementation and redesigning the workflow, through installation and training, and with ongoing support. This model acknowledges an important potential pitfall: divorcing system implementation from workflow design can lead to adoption failure. Budgeting for such support needs to be generous—typically about one-third of total expenses. Only one practice failed implementation in the MAeHC (<1% rate), while the failure rate with typical vendor implementations anecdotally approaches 33%.¹⁶

Collective/collaborative action also proved critical. From the outset, all members of the health care community were welcomed, based on the view that the proposed mission required a pooling of resources and the active participation of all stakeholders. This imparted to the project a mission-focused ethic and culture that transcended any particular organization and encouraged contributions of necessary financial resources, expertise, and political support. It also promoted efficient, effective utilization of scarce resources and helped leverage and focus the enormous capabilities and talent scattered throughout the state. In tapping collectively into the aspirations of individuals and organizations in the health care community, the project provided opportunities to carry out ideas on a large scale and encouraged much pro bono

ence, and diligence to ensure that vendors live up to these requirements.

Privacy and security concerns represent another challenge, especially important to effecting clinical data exchange. As noted, the community approach has been extremely valuable in helping to elicit privacy concerns and implement local solutions that ensure the security of patient data. Details of the privacy/confidentiality solutions worked out by communities are beyond the scope of this article, but “opting in” by patients was selected by communities as the preferred approach and was highly effective.

Contracting costs and efforts can be formidable. The real cost of contracting lay in the enormous amount of time required to negotiate and finalize contracts with the large number of project participants. Initial plans did not adequately account for the necessary time. The Collaborative spent approximately 5% (\$2M) on contracting and associated legal services. The contracting agenda included practice and vendor contracts; privacy and security practice rules for individual practices, community data exchange, and data warehousing; research contracts; institutional review board management; and patient consent and education (over 500,000 patients). No organization that we are aware of has undertaken such a broad set of technical, organizational, legal, and social issues in

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