ABSTRACT

Objective: To describe the degree of public health and primary care collaboration at the local level and develop a model framework of collaboration, the Community Collaboration Health Model (CCHM).

Design: Mixed-methods, cross-sectional surveys, and semistructured, key informant interviews.

Setting: All local health jurisdictions in Colorado, Minnesota, Washington, and Wisconsin.

Participants: Leaders from each jurisdiction were identified to describe local collaboration. Eighty percent of local health directors completed our survey (n = 193), representing 80% of jurisdictions. The parallel primary care survey had a 31% response rate (n = 128), representing 50% of jurisdictions. Twenty pairs of local health directors and primary care leaders participated in key informant interviews.

Main Outcome Measure(s): Thirty-seven percent of jurisdictions were classified as having strong foundational and energizing characteristics in the model. Ten percent displayed high energizing/low foundational characteristics, 11% had high foundational/low energizing characteristics, and 42% of jurisdictions were low on both.

Results: Respondents reported wide variation in relationship factors. They generally agreed that foundational characteristics were present in current working relationships but were less likely to agree that relationships had factors promoting sustainability or innovation.

Conclusions: Both sectors valued working together in principle, yet few did. Identifying shared priorities and achieving tangible benefits may be critical to realizing sustained relationships resulting in population health improvement. Our study reveals broad variation in experiences among local jurisdictions in our sample. Tools, such as the CCHM, and technical assistance may be helpful to support advancing collaboration. Dedicated funding, reimbursement redesign, improved data systems, and data sharing capability are key components of promoting collaboration. Yet, even in the absence of new reimbursement models or funding mechanisms, there are steps leaders can take to build and sustain their relationships. The self-assessment tool and the CCHM can identify opportunities for improving collaboration and link practitioners to strategies.

KEY WORDS: collaboration, integration, primary care, public health
importance. The IOM’s 1998 report on the Future of Primary Care defined primary care as “practicing in the context of family and community,” implying the need for integration with partners at the community level. This echoes a foundational Family Medicine document, the Folsom Report, describing the critical role of primary care in working with “communities of solution.” Integration has been elevated as important for several years by leaders in both public health and primary care, yet it is unclear the degree to which such partnerships are actually occurring in practice.

Integration has both benefits and challenges, yet there is growing awareness that public health and primary care can each be effective, while having “a greater impact on the health of populations than either of them would have independently.” Primary care providers can benefit by incorporating population-based information garnered through public health relationships, which can enable them to better address underlying causes of disease and behaviors. Public health entities could benefit from accessing individual-level data for surveillance, having a conduit for disseminating health promotion messages, and having support for implementing population-based strategies in their communities. National agencies are directing more resources toward population health initiatives, and such initiatives can benefit from collaborations between public health and primary care.

With the population rapidly aging, growing more diverse, and facing shortages in public health and primary care workforce numbers, these sectors need each other more than ever. By 2030, 20% of Americans will be 65 years and older and more than half are projected to belong to a minority group by 2044, leading to increased chronic disease burden. The Health Resources and Services Administration estimates that by 2025, the supply of primary care physicians will increase by 11% but the demand will increase by 17%. Factors that could mitigate the inadequate numbers of primary providers include new models of care, as encouraged by the Affordable Care Act (ACA), the goal of which is improved population health. Similar workforce changes are occurring in public health departments, requiring development of a workforce with new skills and strategic partnerships. Reductions in disparities and improvements in population health require the combined action of both sectors. Emerging tools and calls for action have created the climate necessary to integrate public health and primary care.

Rowan et al describe integration across health sectors, as “a discrete set of techniques and organizational models designed to create connectivity, alignment and collaboration within and between the care and care sectors at the funding, administrative and/or provider levels.” Scottfield et al define integration as “the linkage of programs and activities to promote overall efficiency and effectiveness and achieve gains in population health.” Integration has different meanings for stakeholders and it occurs at different levels of the health system. However integration is defined, the literature calls for coordinated infrastructure and funding, a change in collaborative culture for both public health and primary care, and more coordination in health professional training programs.

At a local level, such an orientation requires intensive and sustained partnership commitment. Yet, achieving local integration could enhance the capacity of both sectors to carry out their missions and link with other stakeholders to catalyze collaborative, intersectoral improvements in population health.

The limited research regarding public health and primary care integration has identified factors that may influence the level and type of system integration—including competitive marketplaces and the type of public health efforts that care systems are involved in. Halverson et al, for example, determined that system-level public health-primary care collaboration, as evidenced by self-reports of collaboration, was more evident in local markets that had higher levels of Health Maintenance Organization (HMO) penetration and lower HMO competition. They concluded that in highly competitive marketplaces, targeted efforts to facilitate coordination may be necessary. The nationwide growth in the number of Federally Qualified Health Centers (FQHCs) providing primary care may be a factor in what complementary services local public health leaders choose to focus on, as evidence suggests that increases in local primary care service by these providers are associated with decreases in primary care service by public health systems. In another study, managed care plans that were involved in public health activities were most likely to participate in those involving the delivery or management of individual health services and health information exchange.

Although local and state health departments have been key actors in promoting health and reducing disparities, the efforts and services of public health systems are increasingly viewed within the context of intersectoral partners that share responsibility and accountability for population health. Maximizing the effectiveness of multiple sectors invested in
population health improvement, therefore, requires research illuminating varied sector perspectives and the interorganizational relationships needed to impact population health.\textsuperscript{18,19} To our knowledge, few studies have examined the nature and degree of public health and primary care integration, or proposed frameworks to characterize integration, from the perspectives of these local actors committed to community health improvement. The goal of this study was to characterize and quantify levels of integration between local health departments and primary care clinics in a sample of states and identify key factors promoting effective integration.

Methods

The research team was made up of leaders from public health and primary care practice-based research networks (PBRNs) in each of the 4 study states (Colorado, Minnesota, Washington, and Wisconsin). Representatives from each state’s public health and primary care PBRN participated on the Study Advisory Committee (SAC), which advised our study’s development, implementation, analysis, translation, and dissemination. We employed a mixed-methods, cross-sectional design, with our qualitative methods and results described elsewhere.\textsuperscript{20} In this article, we describe our study’s quantitative findings and development of the Community Collaboration Health Model (CCHM). Institutional review board assessment by all participating universities of investigators in each state deemed this study exempt.

Study population

Our survey sample was drawn from the 241 local health jurisdictions across 4 study states, with the intention of including the public health leader and at least 1 primary care leader from each jurisdiction. The 4 states were decentralized in terms of public health state-local structure and similar in terms of population demographics. Three of the 4 study states adopted Medicaid expansion. Jurisdictions represented the geographies of the states’ single-county, multicounty, city, or city/county health departments. The local health director and several primary care leaders from each jurisdiction were invited to participate. We oversampled primary care leaders (physicians, clinic supervisors, or other leadership) in each jurisdiction, recognizing that a statewide sample of primary care leaders would be more difficult to reach than local public health leaders representing specific jurisdictions. Primary care researchers on the study team identified potential primary care respondents from PBRN membership lists, as well as other state-based medical membership organizations such as local Academies of Family Physicians.

Study instrument

We found no preexisting survey instruments measuring collaboration between public health and primary care but did identify more general surveys of partnership and collaboration from other sectors, particularly education.\textsuperscript{21-27} When possible, we drew questions from existing, validated surveys and adapted or developed new questions, as needed. We developed parallel surveys for our public health and primary care sectors, with consistent domain constructs and themes that emerged from our study’s key informant interviews,\textsuperscript{20} as well as from other studies of collaboration.\textsuperscript{28,29} Survey constructs included vision/mission, organizational structure, aligned leadership, partnership factors, sustainability, shared data and analysis capacity, innovation characteristics, relationship building, communication, and contextual variables.

SAC members reviewed survey questions and rated their importance on 2 dimensions: relevance to constructs and level of priority for inclusion. This resulted in a refined list of questions with corresponding summary ratings. Pilot testing was conducted across participating states, among selected public health and primary care representatives identified by SAC members. Pilot testers were not included in the survey sample. The final surveys contained 38 items and took less than an average of 12 minutes to complete.\textsuperscript{30}

Survey implementation

SAC members provided contact information for each local jurisdiction’s public health and primary care leaders in their state, as well as demographic data for their local jurisdictions. We followed a Survey Implementation Protocol and fielded the surveys over February-May 2015 using REDCap survey software.\textsuperscript{31} Primary care respondents provided responses regarding the nature of integration in the context of the specific public health agency in the jurisdiction in which their practice was located. Public health respondents provided responses reflecting their most typical interactions with primary care in their jurisdiction, recognizing that their working relationships may differ with different practices.

Model development

Drawing from the themes identified in the qualitative and the quantitative results, researchers observed 2 distinct dimensions emerging: foundational and energizing (Figure). Foundational characteristics,
those related to building the foundation of a relationship, included aligned leadership, mutual trust and respect, and having a shared vision. Energizing characteristics were more action-oriented, or energizing, and included having dedicated funding and staff, working on specific projects or programs, sharing data, and implementing formal agreements such as contracts or memoranda of understanding. The foundational and energizing concepts were further reflected in the quantitative data. Using a mixed-methods approach, the team created linkages between the qualitative and quantitative data, which allowed the team to explore further how the concepts were reflected in both sets of data and the relationship between the 2 sets of data. To do this, survey questions were assigned to each dimension based on exploratory factor analysis (data not shown). In addition, the data were reviewed to determine the appropriateness of the assignment of each survey item to the foundational or energizing dimension. The resulting model proposed that foundational and energizing characteristics were related, with the foundational forming the horizontal axis and energizing forming the vertical axis. The result is a 2 × 2 framework, which describes how partnerships with various combinations of each dimension interact. For example, a partnership that rated both high foundational and energizing scores would be viewed as the most integrated in their collaboration, where those with low on both would be the least integrated partnerships. The team drew on expert opinion provided by the SAC and PBRNs to provide feedback on the overall framework and data distributions.

**Analysis**

Descriptive statistics and cross-tabulations were performed for public health and primary care surveys separately. Foundational or energizing scores were associated with the level of agreement reported on each question. The distribution of scores was reviewed, and median cut points were used to identify high versus low scores for both dimensions. The combination of foundational and energizing score determined jurisdictional placement within the CCHM. Sensitivity analysis was performed to examine the change in distribution within the CCHM based on different cut points. All data analysis was performed using SAS 9.4 software.

**Results**

The overall response rate was 80% (n = 193) among local health directors and 31% (n = 128) for primary care. Because of oversampling, primary care respondents covered 50% of all possible jurisdictions. There were 71 jurisdictions in which at least 1 public health and 1 primary care respondent responded (29% of total possible).

Overall, 64.3% of participating jurisdictions comprised stand-alone health departments and 67.2% represented single counties (see Supplemental Digital Content Table S1, available at http://links.lww.com/JPHMP/A464). Participating public health jurisdictions predominantly served populations of less than 50,000 (64.8%). The most common type of primary care practices was independent single-specialty or multispecialty group practices (27.2%), with others being a part of FQHCs (19.2%), local health care systems (19.2%), or regional health care systems (16.8%). Primary care respondents tended to be in large population centers (43.2%), with higher percentages of the population in poverty and residents representing minority groups than nonrespondents.

To assess the degree of variation regarding how public health works with its local primary care practices, respondents were asked to estimate the number of freestanding primary care practices in their jurisdiction and how they worked with those practices.
The highest proportion of public health respondents reported having 1 to 4 practices (46%), followed by 5 to 19 (37%), and 20+ practices (17%). Most public health respondents stated they worked consistently across clinics (31%) or had the same general relationship (44%), with only 25% reporting the working relationships varied widely among clinics.

Overall, public health and primary care reported relatively low levels of working together, yet relatively high levels of satisfaction with current working relationships. Respondents were asked to rate their working relationship on a 1 to 5 scale, with 5 representing consistently working together on a variety of health topics and needs. Only 41% of public health and 26% of primary care respondents rated themselves as consistently or frequently working together. Yet, public health and primary care respondents were fairly satisfied with that relationship (59% and 54%, respectively).

Public health (95%) and primary care respondents (79%) stated that the overwhelming reason for collaboration was to improve population health in their community (Table 1). Interestingly, sharing costs and maximizing resources were noted least frequently for public health and at low levels for primary care (29%).

Respondents reported relatively high levels of agreement for questions related to foundational characteristics, such as having a shared vision and mutual trust/respect and strong leadership (Table 2). However, public health respondents (81%) were much more likely to report that their staff were knowledgeable about building and supporting working relationships than their primary care respondents (41%). Public health also tended to perceive greater organizational value from working together (94% vs 76%).

**TABLE 1**

<table>
<thead>
<tr>
<th>Reason for Working Together (Check All that Apply)</th>
<th>PH (n = 193)</th>
<th>PC (n = 128)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improve population health in the community</td>
<td>95%</td>
<td>79%</td>
</tr>
<tr>
<td>Good public health practice (PH only)</td>
<td>91%</td>
<td>n/a</td>
</tr>
<tr>
<td>Engage more stakeholders in work</td>
<td>81%</td>
<td>31%</td>
</tr>
<tr>
<td>Improve individual patient care</td>
<td>79%</td>
<td>59%</td>
</tr>
<tr>
<td>Meet specific program requirements or mandates</td>
<td>60%</td>
<td>38%</td>
</tr>
<tr>
<td>Extend population/demographic reach</td>
<td>53%</td>
<td>36%</td>
</tr>
<tr>
<td>Build more credibility in the community</td>
<td>50%</td>
<td>18%</td>
</tr>
<tr>
<td>Share costs and maximize resources</td>
<td>44%</td>
<td>29%</td>
</tr>
</tbody>
</table>

Abbreviations: n/a, not available; PC, primary care; PH, public health.

Public health and primary care reported lower levels of agreement, with questions focused on energizing characteristics (Table 3). The largest differences between public health and primary care respondent perceptions related to having formal structures in place to support joint work, defined roles/responsibilities, effective leadership to navigate change, and freedom to explore new programs or initiatives.

Taking both dimensions into consideration, the distribution of jurisdictions across the 4 quadrants of the CCHM showed the majority fell in the low foundation/low energizing quadrant (42%), followed by 37% in the high foundation/high energizing, 11% in high foundation/low energizing, and 10% in low foundation/high energizing.

**Discussion**

Leaders in both sectors value working together in principle; yet, in practice, there were low levels of agreement that critical relationship factors currently exist in their cross-sector collaborations. Interestingly, both public health and primary care reported relatively low levels of consistently or frequently working together; yet, both sectors were reasonably satisfied with their working relationship. This may reflect relatively low expectations for their work together. Most research to date has focused on identifying
exemplar partnerships and models.\textsuperscript{28,29} We drew from these model exemplars to develop our survey constructs and thus examined similar relationship factors. Yet, our study reveals the broad variation of experiences among local jurisdictions in these 4 states and potentially low expectations for these partnerships. This suggests that while it is helpful to study exemplars and best practices, and to disseminate those approaches, it is also critical to understand the challenges faced by local jurisdictions in building these partnerships.

Overwhelmingly, both public health and primary care reported that improving population health was a strong motivation for working together. This fits with national calls and literature connecting such collaboration to a shared vision for reducing health care costs and improving health outcomes.\textsuperscript{5,33} Neither sector emphasized cost savings gain as a motivation for collaboration—in fact, survey responses suggest that both sectors lacked financial and staffing capacity to support these collaborations in the long term. A shared vision may not be enough without incentives, resources, and clear expectations for collaboration. Yet, emerging models, such as Accountable Communities for Health, set priorities for health improvement and prevention—priorities that are arguably only achievable through collaboration across the public health and primary care continuum.\textsuperscript{34} Aligning health care reimbursement to include multiple sectors could also ensure important financial support for collaboration. Other approaches to creating sustainable partnerships involve shared staffing models and community health workers. One example from the qualitative phase of our study\textsuperscript{20} involved a local jurisdiction with public health and primary care leaders jointly funding an “integration specialist” position intended to align efforts around population health promotion activities. Health Extension, named but unfunded in the ACA, represents another model to catalyze collaboration.\textsuperscript{25}

Study respondents generally reported having mutual trust and respect, a shared vision for improving population health, and some basics of relationship building in place. Yet, vision and good intentions do not necessarily translate into action—as suggested by our low level of agreement among action-oriented items. Clarifying roles and responsibilities, creating formal structures for collaborative work, and identifying financial resources to sustain work together are steps we believe public health and primary care leaders need to take in their jurisdictions to promote effective, long-term collaborations. Research is also critical as we need evidence for how to effectively support public health and primary care in examining their own collaborations, identifying strategies to improve their partnerships, and studying the implementation of tools and strategies for maximizing these community efforts in creating local conditions for health. Despite local jurisdictions that can be highlighted as exemplars of collaboration,\textsuperscript{28,29} in reality, broad variation and challenges persist in the experiences of local jurisdictions in these 4 states.

An important benefit of conducting this research through the public health and primary care PBRNs was the ability to engage these networks in reviewing study results and assisting with interpretation. A variety of forums were used to engage local public health and primary care practitioners, local elected officials, researchers, and health system representatives, in addition to state health department staff. Overall, stakeholder participants not only felt that study findings aligned with their experiences but also noted that their relationships with counterparts varied over time. The CCHM resonated with stakeholders and was

\begin{table}
\centering
\caption{Energizing Characteristics}
\begin{tabular}{|l|c|c|}
\hline
 & PH (n = 193) & PC (n = 128) \\
\hline
Decision makers from both organizations take a lead role to direct how we work together & 49\% & 38\% \\
Provided with updates that keep me informed about [PC/PH] activities in our community & 46\% & 73\% \\
Communication happens at both formal meetings and in informal ways & 85\% & 71\% \\
Formal structures in place to support work (eg, contracts, MOU, grants) & 41\% & 20\% \\
Working with [PC/PH] has made our organization more aware of community needs & 57\% & 45\% \\
Adequate financial resources have been secured to support working together & 10\% & 9\% \\
Leadership in my organization is able to effectively navigate the changing culture of PC/PH service delivery & 76\% & 55\% \\
Leadership in my organization has the freedom to explore new programs or initiatives & 93\% & 73\% \\
Our organization shares personal health information electronically with [PC/PH] & 23\% & 22\% \\
Collaboration roles/responsibilities are well defined & 28\% & 41\% \\
Adequate portion of staff FTE is dedicated to supporting collaborative work & 24\% & 18\% \\
\hline
\end{tabular}
\end{table}

Abbreviations: FTE, full-time equivalent; MOU, memorandum of understanding; PC, primary care; PH, public health.
considered useful for not only measuring the degree of collaboration but also helping identify priorities for improving such collaboration.

**Study limitations**

Even with oversampling, primary care respondents differed substantially from the overall distribution of jurisdictions, skewing toward areas of high population and higher levels of poverty. Also, primary care respondents from larger jurisdictions may have had difficulties characterizing their overall working relationship with public health, given the one-to-many ratio of public health to primary care practices. Taken together, the primary care results are important for voicing that sector’s perspective but may not be as representative as the public health responses. Potential primary care respondents frequently cited competing time demands; thus, it is possible that those who completed the survey were particularly committed to the concept of collaboration. It is unclear whether that biased our responses or whether they were particularly realistic responses, given respondents may have represented those with the most knowledge and commitment. Future research in primary care settings may need to consider other ways to engage respondents and/or offer incentives for participation. Another limitation relates to generalizability of results, since the 4 study states were all decentralized and had similar population demographics. Additional research including a broader variety of state-local systems could inform this topic further.

**References**


