Bridging the Silos of Service Delivery for High-Need, High-Cost Individuals

Melissa Sherry, MPH,¹ Jennifer L. Wolff, PhD,¹ Jeromie Ballreich, MHS,¹
Eva DuGoff, PhD, MPP,² Karen Davis, PhD,¹ and Gerard Anderson, PhD¹

Abstract

Health care reform efforts that emphasize value have increased awareness of the importance of nonmedical factors in achieving better care, better health, and lower costs in the care of high-need, high-cost individuals. Programs that care for socioeconomically disadvantaged, high-need, high-cost individuals have achieved promising results in part by bridging traditional service delivery silos. This study examined 5 innovative community-oriented programs that are successfully coordinating medical and nonmedical services to identify factors that stimulate and sustain community-level collaboration and coordinated care across silos of health care, public health, and social services delivery. The authors constructed a conceptual framework depicting community health systems that highlights 4 foundational factors that facilitate community-oriented collaboration: flexible financing, shared leadership, shared data, and a strong shared vision of commitment toward delivery of person-centered care.

Introduction

MOST FACTORS THAT CONTRIBUTE TO HEALTH lie outside the health system. Health is produced and sustained in families, schools, communities, and the broader social and physical environmental context in which individuals are born and their lives unfold.¹ In contrast, most health care interactions are brief and intermittent.² For individuals who are socioeconomically disadvantaged, these relationships with the health care system may also be tenuous.³ The fact that the ratio of social service spending to health care spending is far lower in the United States relative to other industrialized countries⁴ could partially explain strikingly higher health spending and poor health outcomes, especially for the most socioeconomically disadvantaged.⁵ Fragmentation of health care and social service funding streams and delivery systems are other factors that have been identified as contributing to poor quality and less efficient care.^{6–8} These factors are particularly problematic for high-need, high-cost individuals, who are more likely to be socioeconomically disadvantaged.⁵

Robust evidence points to primary care as foundational in the provision of longitudinal, coordinated, accessible care, and in attaining more equitable outcomes and lower cost care.⁹ Care management programs are thought to be important facilitators of care for high-need, high-cost persons who commonly have a high burden of both medical and social

needs.¹⁰ However, most care management efforts to date have focused narrowly on coordination of health services delivered by health care professionals^{6,7} or transitions between health care settings, such as from hospital to home, or from nursing home to hospital.^{11,12} Only a few large-scale programs have developed and sustained meaningful coordination across the broad set of services delivered by public health departments, social service agencies, or community-based organizations that often assume an important role in the care of high-need, high-cost individuals in the United States.

Payment and delivery reform efforts that emphasize value have begun to motivate a more expansive orientation to coordinating health and social services in an effort to attain the “Triple Aim” of better care, better health, and lower costs.^{13,14} Some emerging programs that care for socioeconomically disadvantaged, high-need, high-cost persons have achieved promising results in part by bridging longstanding silos between health care providers, community-based organizations, social service agencies, and public health sector delivery systems.^{15–17} Recognizing that the attributes of such programs are highly influenced by financing, history of organizational collaboration, local culture, and population served, an understanding of what factors drive the formulation, success, and sustainability of such programs is nevertheless of great interest to state and local communities, as well as to the vision of a high-quality,

¹Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland.

²University of Wisconsin-Madison School of Medicine and Public Health, Madison, Wisconsin.

efficient, person-centered delivery system outlined in the National Quality Strategy.¹⁸ Therefore, this study identified and examined 5 innovative community-oriented programs that bridge health and social services delivery and that have demonstrated promising results. These programs were examined to identify 4 factors that facilitate community-level relationships and coordination of services across health care, public health, and social service agencies.

Methods

This study was conducted as part of a broader project to identify elements of programs that have demonstrated evidence of success in delivering care to high-need, high-cost individuals across the domains of health outcomes, quality of care, and costs.¹⁹ As this study focuses more narrowly on community-oriented models that bridge medical and nonmedical care, attention was restricted to a subset of programs that were actively coordinating services between health care organizations, public health, social service agencies, or community-based organizations. Because of the critical role that Medicaid plays in financing health services for individuals with disproportionately high needs and high costs, and its charge to meet both medically oriented as well as socially oriented services that pertain to long-term services and supports, particular attention was paid to innovative Medicaid-funded programs. Finally, this study sought to include programs that were located in diverse geographic regions of the country, and that were using particularly unique approaches to address multiple layers of health determinants. All of the programs had to demonstrate success on at least one of the Triple Aim outcomes.

The study team relied on a case study approach to distinguish features of programs that promote or inhibit cross-sector collaboration and to understand the relevance of the broader environment in which each model program is based. To frame these points with details about each of the programs, the team summarizes descriptive information about each program, characteristics of the population served, and distinct or innovative attributes of each program in Table 1. To further inform the understanding of opportunities, challenges, and unique features of each program, the study team conducted directed interviews with leaders at each of the model programs using a semi-structured interview guide (available on request). Leaders of each model program were identified by expert referral on the basis of fulfilling a central organizational role, knowledge of daily operations and program history, and involvement in strategic decisions. Two coauthors conducted semi-structured interviews with at least 1 member of the leadership team from each of the model programs identified. Each participant who was interviewed provided permission for interviews to be audio-recorded and recordings were subsequently transcribed. The Johns Hopkins Bloomberg School of Public Health Institutional Review Board approved this study.

Finally, the study team developed a conceptual framework (Fig. 1) to graphically depict key elements that facilitate or impede coordination across specific domains of service delivery. The framework draws on elements of the Social Ecological model,²⁰ the Chronic Care Model,²¹ information obtained from case study programs and key informant interviews, and Kindig and Isham's writings regarding population health models.^{1,22} Although many

analogous terms have been used in the literature, including Accountable Care Communities and Accountable Health Communities, among others, this study uses the term Community Health Systems to broadly describe partnerships within and across levels of the social ecological model to produce health in the community.^{22–24}

The top panel of the framework depicts health as resulting from individual factors and behaviors, social and family support, and community-level attributes and organizations that collectively transpire within the context of broader payment and regulatory policy. The middle panel of the framework encompasses key mechanisms described in the literature²² and that emerged in the interviews as facilitating coordination of services across health care, public health, social service agencies, and community-based organizations. Key elements of shared financing, shared leadership, shared vision, and shared data are depicted as collectively comprising a “service and accountability integrator,” that facilitates cross-sector collaborations within and across contributing layers that are presented in the top panel of the framework. Finally, the lower panel of the framework presents improved population outcomes as resulting from an empowered community of health through greater efficiencies, reduced duplication of services, and improved quality, coordination, and communication within a given community.

Results

Case study programs were located in 5 states (Alaska, Massachusetts, Minnesota, Ohio, and Oregon), and represented programs of substantially different geographic reach, from state wide (Care Oregon), to county wide (Hennepin Health), to specific community (Gatekeeper). Table 1 presents the characteristics of each program. None of the programs examined fully integrated each of the 3 mechanisms—shared financing, shared leadership, and shared data—that comprise the service and accountability integrator in the framework. As presented in Table 2, all of the case study programs were actively bridging nonmedical and medical service delivery; however, the particular service delivery components and the mechanisms that comprise the service and accountability indicator varied widely. In each case, the health system initiated cross-sector collaboration, was the primary contributor of financing for data and operational infrastructure to bridge organizations, and functioned as the integrating entity. The specific strategies that were employed to achieve elements of the service and accountability integrator varied considerably and collectively provide insight into facilitators of collaborative approaches will be detailed in the following sections.

Shared vision and mission-oriented decision making

All case study programs were intensely focused on the whole person and thus were highly committed to meeting both medical and social needs. By focusing first and foremost on the needs and wants of individuals as people rather than as patients, organizations were able to identify critical mismatches between the capacity of health care organizations and the services and supports of greatest benefit to the individuals served. Efforts to close service delivery gaps led health care organizations to initiate community collaborations to build delivery capacity and form new relationships with public health systems, social service agencies, and

TABLE 1. CASE STUDY PROGRAMS: COMMUNITY-BASED MODELS THAT BRIDGE SILOS OF SERVICE DELIVERY

Name of Program	Target Population	Core Organizations	Services Delivered	Financing Model	Governance	Successes (Cited Reference)
<i>Southcentral Foundation (SCF), Alaska</i>	60,000 Alaska Native and American Indian population.	Patient-centered Medical Home	Comprehensive health care system providing physical, mental, emotional, and spiritual wellness	45% of finance comes from Indian Health Service, 40% third-party revenue, and the remaining budget is from private grants and donations	“Customer-owned” governing board guides SCF to carry out its mission to achieve wellness through health and related services. Its mission is underscored with 3 key points: shared responsibility, commitment to quality, and family wellness.	Reductions in all-cause hospitalizations, hospitalizations for unintentional injuries, and asthma-related hospitalizations. Decreased use of emergency care. ^{A,B}
<i>Care Oregon's Health Resilience Program as part of Health Share of Oregon</i>	Medicaid and Medicare beneficiaries	Coordinated Care Organization working with community organizations, health plans, universities, educational institutions, and government agencies such as county health departments	Comprehensive physical, behavioral, mental, and dental care along with housing, transportation, use of Trauma Informed Care principles, food services, vocational trainings	CMMI grant supplemented with in kind support from Care Oregon	Board of directors from multiple health and community partners	Reductions in hospital admissions and emergency room visits ^C
<i>Hennepin Health, Minnesota</i>	Medicaid expansion ages 18–64 years; 11,000 clients who are prospectively enrolled, not attributed	A partnership of a county-affiliated hospital, primary care clinics, health plan, and human services and public health department	Comprehensive physical, behavioral, mental, and dental care along with supportive housing, chemical addiction, and vocational services	Per-member per-month capitation and partner risk-sharing agreement	MOU, business agreements to facilitate shared data, jointly staffed operations, committees and joint decision-making structure	+2.5% primary care visits; –9.1% ED visits/1000; –3.2% inpatient admissions/1000 ^D
<i>Gatekeeper Program, Ohio</i>	Broadly defined, but generally older adults who were in need of some “service”	Local hospitals; Gatekeepers were recruited from organizations that had contact with older adults	Comprehensive assessment, service coordination	Private funding through foundations; funding through local hospital	Local hospital	Statistically significant reduction of ED visits and hospitalizations. Statistically significant cost savings. ^E
<i>Commonwealth Care Alliance, Massachusetts</i>	Older adults with physical and cognitive disabilities; dual eligible	Medicare, Medicaid, primary care clinics	Care coordination, education/training, individual and comprehensive care plans, coverage for nonmedical and ancillary service	Per-member per-month capitation. Similar to Medicare Advantage.	Contracted providers throughout Massachusetts	Lower than average expense ratio ranging from 74% to 76% compared to national averages ranging from 78% to 86%. ^{F,G}

^ADriscoll DL, Hiratsuka V, Johnston JM, Norman S, Reilly KM, Shaw J, et al. Process and outcomes of patient-centered medical care with Alaska Native people at Southcentral Foundation. *Ann Fam Med* 2013;11 Suppl 1:S41–49.

^BJohnston JM, Smith JJ, Hiratsuka VY, Dillard DA, Szafran QN, Driscoll DL. Tribal implementation of a patient-centered medical home model in Alaska accompanied by decreased hospital use. *Int J Circumpolar Health* 2013;72. DOI: 10.3402/ijch.v72i0.20960.

^CKlein S, McCarthy, D. CareOregon: Transforming the role of a Medicaid health plan from payer to partner. *Case Study*, 50. <http://www.commonwealthfund.org/publications/case-studies/2010/jul/careoregon>. Last accessed March 17, 2016.

^DSandberg SF, Erikson C, Owen R, Vickery KD, Shimotsu ST, Linzer M, et al. Hennepin Health: A safety-net accountable care organization for the expanded Medicaid population. *Health Aff (Millwood)* 2014;33:1975–1984.

^EBarrett DL, Secic M, Borowski D. (2010). The Gatekeeper Program: Proactive identification and case management of at-risk older adults prevents nursing home placement, saving healthcare dollars program evaluation. [Evaluation Studies Research Support, Non-U.S. Gov't]. *Home Health Nurse* 2010 28: 191–197. doi: 10.1097/01.NHH.0000369772.41656.4e. Last accessed January 12, 2016.

^FMeyer H. A new care paradigm slashes hospital use and nursing home stays for the elderly and the physically and mentally disabled. *Health Aff (Millwood)* 2011;30:412–415.

^GPorter ME, Baron JF. Commonwealth care alliance: Elderly and disabled care. *Harvard Business School Case 708-502*. April 2008 (Revised May 2008).

CCMI = Center for Medicare and Medicaid Innovation; ED = emergency department; MOU = memorandum of understanding.

FIG. 1. Community health systems conceptual framework

community-based organizations based on a shared vision of improving the social determinants of health for high-risk, high-need individuals.

Shared leadership

The study team defines shared leadership as incorporating the representation and active involvement of partner organizations through a governance structure that builds on or-

ganizational strengths and minimizes weaknesses to build a stronger collaboration that assumes collective ownership and accountability for outcomes. Further, shared leadership requires incorporating the voice of the community and the people served. The specific governance structures and approaches to shared leadership varied greatly across case study programs, and were interconnected with organizational financing. Program governance varied from predominantly health system led (Commonwealth Care Alliance,

TABLE 2. CASE STUDY PROGRAMS: SERVICE DELIVERY COMPONENTS

	<i>Southcentral Foundation</i>	<i>CareOregon</i>	<i>Hennepin Health</i>	<i>Gatekeeper</i>	<i>Commonwealth Care Alliance</i>
Medical care providers	XXX	XXX	XXX	XXX	XXX
Public health	XXX	XXX	XXX		
Dental care	XXX	XX	XXX		XXX
Housing	XX	X	X		
Educational system					X
Criminal justice system	XX	X	XX		
Transportation	XXX	XXX	XX	X	XXX
Community-based organizations	XXX	XXX	XXX	X	XX
Faith organizations	XX				
Family and social support systems	XXX	XX	XX	X	
Mental and behavioral health	XXX	XXX	XXX	X	XXX
Social services	XXX	XXX	XXX	X	XXX
Substance abuse and detox services	XXX	XXX	XXX	X	XXX
Employers and vocational training	XXX	X	X		
Food banks	X	X	X	X	
Legal aid	X		X		
Area Agencies for Aging Populations	X	XXX		X	XX

XXX=services provided through entities within overarching partnership structure; XX=services provided through contracts between partnering organizations; X=services provided through referral.

Gatekeeper), to shared leadership and collaboration across multiple partner organizations (Hennepin Health, Care Oregon), to community directed (Southcentral Foundation). To better illustrate differences in leadership structure, examples of 2 programs are briefly described.

Hennepin Health is an Accountable Care Organization that was formed in 2012 to serve the Minnesota Medicaid expansion population. Hennepin Health is a 4-way partnership between a safety net hospital, federally qualified health center, health plan, and local public health agency, all of which are collectively at risk for financial performance and are departments or affiliates of county government. To coordinate efforts across partner organizations, Hennepin Health has created a collaborative partnership in which decision-making responsibilities are shared through an overarching governance structure supported by operating committees that focus on topics such as care coordination, data and analytics, and financing.

Southcentral Foundation is an Alaska Native-owned nonprofit health care system that has served its tribal community since 1982. The organization undertook a radical transformation in 1999 toward self-determination in which it shifted from a paternalistic delivery model providing care to “beneficiaries” to one governed by “customer-owners.”¹⁶ The community-led leadership structure and reformulated care model have resulted in improvements in customer-owner engagement and trust, employee retention, and efficiencies and cost reductions associated with fewer emergency department visits and hospitalizations.^{25,26}

Shared financing

All 5 case study programs identified flexible payment structures as critically important to success. Flexible payment structures enabled the formation of cross-sector collaborations, the use of health care dollars for nontraditionally reimbursed services, and the ability to share or reinvest savings in the community and community partnerships. Here the study team refers to the term shared financing as capitated, prospective, or flexible payment structures that enable organizations to deploy resources in nontraditional ways. For example, flexible financing allows the use of health care dollars for social services, investment in community infrastructure, or efforts to support the long-term sustainability of continued collaborative community-oriented partnerships. The programs examined relied on a variety of sources of funding and payment mechanisms, including capitated payments (Southcentral Foundation from the Indian Health Service and Hennepin Health from a state Medicaid agency), hospital and local property tax funding (the Gatekeeper program), Medicare and Medicaid waivers (Commonwealth Care Alliance), and awards from the Center for Medicare and Medicaid Innovations (Care Oregon). Because of a lack of sustained funding, the Gatekeeper program was reconfigured to encompass a narrower health-system focus. Programs deployed resources to better manage care or reduce costs by investing in social services and community infrastructure to meet the needs of the people served. As said by one health system representative:

The community usually asks for only about half of what is being delivered, so when you decide for the community what they need, you tend to overbuild things that they wouldn't want. Listening closely to what the commu-

nity wants results in leaner organizations and more satisfied patients.

As mentioned previously, all programs focused on the delivery of person-centered care as an overriding priority—as stated by one key informant, “meeting individuals where they are.” The availability of flexible financing afforded programs the ability to invest in a different approach to delivering care to address the distinct needs of persons with unhealthy, fragile, or absent social supports, unstable housing, and challenges associated with a lifetime of trauma. For example, Care Oregon and Hennepin Health have partnered with community organizations to secure stable housing, provide peer mentorship and job training, and have deployed community health workers to outreach and engage difficult to locate patients. As health system-led efforts that focus on persons with impaired function, the Gatekeeper program and Commonwealth Care Alliance focus on allowing individuals to remain in the community. These programs rely heavily on nurse case managers to conduct home visits, accompany individuals to medical visits, communicate with the individual’s medical care team, and coordinate social services as needed. Available evidence presented in Table 1 indicates that these programs reduced acute health events and associated costs through stronger collaborative relationships, more coordinated care, and the provision of a range of nonmedical services to better meet the needs of the individuals served.

Shared data and information

Shared data refers to the exchange or integration of information to support organizational decision making, clinical monitoring, surveillance, identification of risk, and process improvement across organizations and sectors. The exchange and integration of identifiable information about individuals’ health and social needs across organizations was a significant challenge for all of the case study programs. Barriers to data sharing and integration that were cited include legal and privacy concerns associated with sharing personal health information, the lack of established definitions and approaches that are necessary for information exchange, inconsistencies and lack of trust in the quality of data collected across organizations, and enormous variability in the ability to collect or report relevant data because of health information technology infrastructure and analytics.

Although none of the health systems interviewed had established a fully functional health information exchange system to share data between health care organizations and other sectors, several programs relied on “workaround” data infrastructure to facilitate data sharing. For example, Care Oregon has developed a stand-alone Web-based “super registry” for partner organizations to jointly monitor individuals’ use of health and social services and to view which specific providers and organizations are interacting with patients, the frequency and types of interactions, and the types of services being used. Although the system does not interface with electronic health records or a statewide health information exchange, it has allowed coordination and information sharing across teams that are not otherwise linked by a common data exchange platform. As one interviewee noted, community linkages can benefit outreach and proactive targeting of services:

There were a lot of services for seniors in the community; however the [high-need, high-cost individual] had to be able to access those services or they had to have a support system in place to access those services for them. That left a whole group of [high-need, high-cost individuals] who were more at risk, those who were functionally impaired, or had memory issues, or had mental health illness, who lacked transportation, who nobody was identifying, and who were not identifying themselves and getting access to services.

A key challenge in the care of high-need, high-cost populations is outreach and surveillance so as to proactively identify and deliver preventive services that avert more costly and disruptive acute episodes. Individuals with disability, transportation challenges, homelessness, mental health conditions, and with substance abuse or chemical addiction may be hard to find and engage when they are not actively in treatment. Partnering with public health agencies and community-based organizations was identified as an approach that allows health care organizations to more successfully identify and engage these hard-to-reach populations, some of whom harbor mistrust of health care professionals. Although such partnerships would ideally build on shared data for surveillance, programs had developed approaches in the absence of a formal data sharing system. For example, the Gatekeeper program in Ohio developed a community referral model to identify high-risk individuals in partnership with a network of trained community volunteers such as bank tellers, police officers, paramedics, and pharmacists. Volunteers initiated referrals directly to the Gatekeeper program for older adults who identified as being potentially at risk or who might benefit from community services.

Discussion

This study examined 5 community-oriented programs that have achieved success in the care of high-need, high-cost individuals by bridging health care, public health, and social service delivery. The 5 programs varied widely across multiple dimensions, including geography, populations served, local culture, organizational partners, and nature of financing. Nevertheless, all 5 programs shared common attributes, including an intense “whole person” orientation, flexible financing, and shared cross-system governance structures that facilitated productive community-level collaborations spanning health care, public health, and social service agency delivery systems.

Drawing from case studies of 5 community-oriented programs, the study team constructed a conceptual framework that depicts factors that stimulate and sustain cross-service sector community health system collaborations in the care of individuals with high needs and high costs. The framework summarizes how new collaborative community partnerships, facilitated by shared financing, shared data, shared vision, and shared leadership, contribute to enhanced service delivery capacity, reduced redundancy, and promising results on outcomes that span person- and family-centered care, quality, and efficiency. The conceptual framework developed reflects a “total population health” orientation as a rationale for bridging multiple levels of social determinants of health that exist at the community level through broader partnerships than deployment of health care services. Successfully assuming responsibility for the health of an entire population shifts the nature of care in fundamental ways that aligns

health care delivery and public health so as to focus on the needs of the entire community, including outreach to high-need, high-cost individuals who may be less visible within existing systems of care.

The health system served as the convening entity and source of financial resources for all of the programs examined. Flexible financing was uniformly reported as instrumental in allowing the formulation of creative partnerships, investment in community infrastructure, and funding of nonmedical services. A range of flexible payment approaches could and are being used to stimulate community health system collaborations, including social impact bonds and other pay-for-success models,²⁷ hospital community benefit dollars,^{28,29} and capitated payments that combine resources from Medicare and Medicaid. Some states are innovating with supplemental funding through State Innovation Model awards from the Center for Medicare and Medicaid Innovation³⁰ or state initiative such as the Maryland all-payer rate-setting system.^{31,32} Although flexible payment strategies of health system resources are stimulating cross-sector collaboration, the definition and measurement of “success” has largely been dictated by health system stakeholders. Whether it is feasible for health system, public health, and social service organizations to formulate a shared vision of community health system success, and how such a vision varies from the Triple Aim paradigm of health care success is not straightforward, although the concept of community engagement has gained traction as a core concept of shared accountability in performance measurement.³³

Sharing information across service delivery systems was a major challenge for each of the 5 programs examined. Although interoperability is a core feature of functional health information technology, efforts to promote and measure interoperability have largely been limited to eligible clinical providers and hospitals. Given the importance of nonmedical services in the care of high-need, high-cost individuals, strategies that encompass information exchange with a broader range of organizations could prove beneficial in achieving Triple Aim outcomes.³⁴ For example, use of health care information could allow public health agencies to tailor educational initiatives and interventions for a given community,³⁵ whereas use of public health information could help health care organizations develop strategies to identify and outreach at-risk persons who are not in care.³⁶ The expansion of state health information exchanges to include public health and social services data may offer a longer term solution to reduce the data sharing burden on health systems and communities.

Although Medicare and Medicaid payment and delivery reform are motivating population health initiatives, most efforts to date have focused on specific populations enrolled by a given program and attributed to a particular provider.^{37,38} The programs examined took a broader orientation to defining the population they serve as encompassing both individuals in care and receiving services, as well as those at risk but who may require outreach. Current Medicare and Medicaid statutes prevent these programs from investing resources in individuals not directly enrolled in these programs, but creating partnerships and collaborations with other public and private payers could overcome some of these barriers. Another lesson is that several of the programs examined worked in close collaboration with organizations

entrenched in, operated by, and trusted in the communities they serve, reflecting their focus on person-centered care. The language of person-centeredness was common among the interviewees, while the term patient-driven was not often used. This subtle shift in language reflects the importance of the individual as a person and not a patient.³⁹ The emphasis on person-centered care versus person-directed care connotes a supportive structure wherein the health system, community resources, and family work together collaboratively.

Results from this study confirm the importance of context in implementation science, and raise important questions regarding the diffusion of innovative community-oriented models of care, such as the applicability of model fidelity.⁴⁰ Although the programs examined shared common attributes, they operated under highly diverse circumstances and relied on wide-ranging strategies to meet the specific needs of their community using approaches that were developed collaboratively with partner organizations. Study results suggest that critical elements to success in community-oriented models of care include attending to the distinct needs of specific local populations, drawing on community strengths and resources, and engaging in collaborative strategic partnerships with local community organizations. If no “one size fits all model” can be adapted for all contexts, policy makers and funders may require different criteria and methods to determine how to direct efforts toward promising programs and policy solutions. The study team surmises that flexible shared payment models and integrated data exchanges may facilitate enhanced effectiveness and improved health outcomes for communities; however, these tools must come together through a service and accountability integrator with the vision, resources, and leadership to enable meaningful collaboration. More research will be needed to determine best practice approaches to structuring, measuring, and sustaining the community health integrator function that represents the foundation of Community Health Systems. Likewise, additional work is needed to understand how best to address social determinants that contribute to community health.

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Prior Presentation

Preliminary results of this study, as well as the conceptual model described in this paper, were presented at the Academy Health Annual Research Meeting in Minneapolis, Minnesota in June 2015.

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Address correspondence to:

Dr. Jennifer L. Wolff

*Department of Health Policy and Management
Johns Hopkins Bloomberg School of Public Health
624 N. Broadway, Room 692
Baltimore, MD 21205*

E-mail: jwolff@jhsph.edu