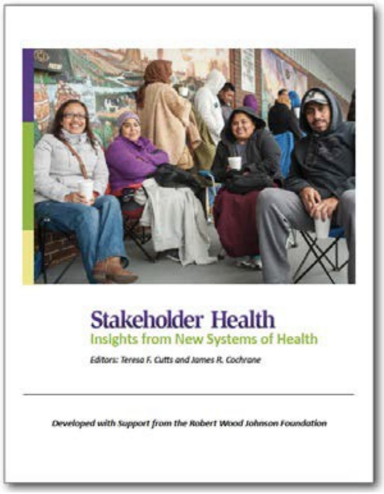
Stakeholder Health

Chapter 4

Optimizing the Patient Encounter: Relational Technology that Integrates Social and Spiritual Domains into the Electronic Health Record



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CHAPTER 4

Optimizing the Patient Encounter: Relational Technology that Integrates Social and Spiritual Domains into the Electronic Health Record

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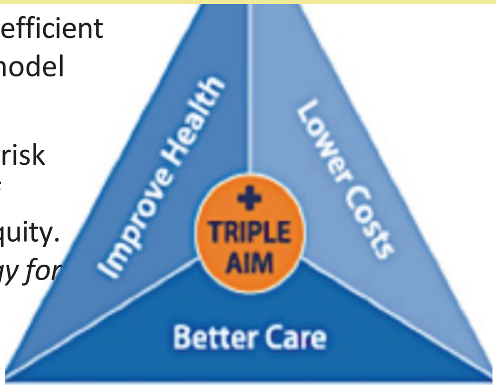
Introduction: Health Policy & The Future of Information Technology

Much has changed in the health care arena since the World Health Organization's (WHO) broad definition of health was developed in 1948. (See Chapter 10 for in-depth review of that current definition.) Today, the United States health care system is undergoing a rapid transformation in the way care is being delivered through population health management and the formation of new accountable care and payment reform models.

According to the WHO the United States has the highest health care spending costs but the poorest health outcomes when compared to other industrialized nations. Our health care system is known for being inefficient, fragmented and expensive. Nevertheless, with the adoption of Health Care Reform and new financing methods, there are opportunities to become more efficient and effective in the way we deliver care and move to a payment model that rewards value and not volume.



The integration of socioeconomic information and environmental risk factors into the Electronic Health Record is an important aspect of improving community and patient health, and achieving health equity. The 2010 Affordable Care Act (ACA) *Health Information Technology for Economic and Clinical Health* provision has created an essential foundation for meeting these objectives through better methods of storing, analyzing and sharing health information (Beeuwkes, Blumenthal, Buntin & Sachin, 2010).

ACA sets forth three objectives for the U.S. health system commonly referred to as the Triple Aim: to improve people's health, lower health care costs, and provide better quality care (Bisgnano & Kenney, 2012). The Triple Aim calls for a shift in the delivery of care to consider the social, economic, spiritual and environmental factors that affect the health of an individual. Providers should understand not only a patient's medical condition but also have a clear understanding of the social factors and living conditions that may be influencing their health. As noted in our earlier monograph (Health Systems Learning Group, 2013), Stakeholder Health believes that equity should be added as the fourth aim, expanding the objectives to a Quadruple Aim.

As described in Chapter 2 on social determinants, this means that providers must consider what else is going on in their patients' lives. Is healthy food available to help control their diabetes? What housing conditions and local triggers are affecting their asthma? Is the neighborhood safe so that walking is an option to control hypertension? Can patients afford their medications? What are patient's physical needs and what community resources are available to support healthy living? What resources can help treat the patient in a holistic and effective way? What are the cultural and spiritual considerations that might influence medical interventions?

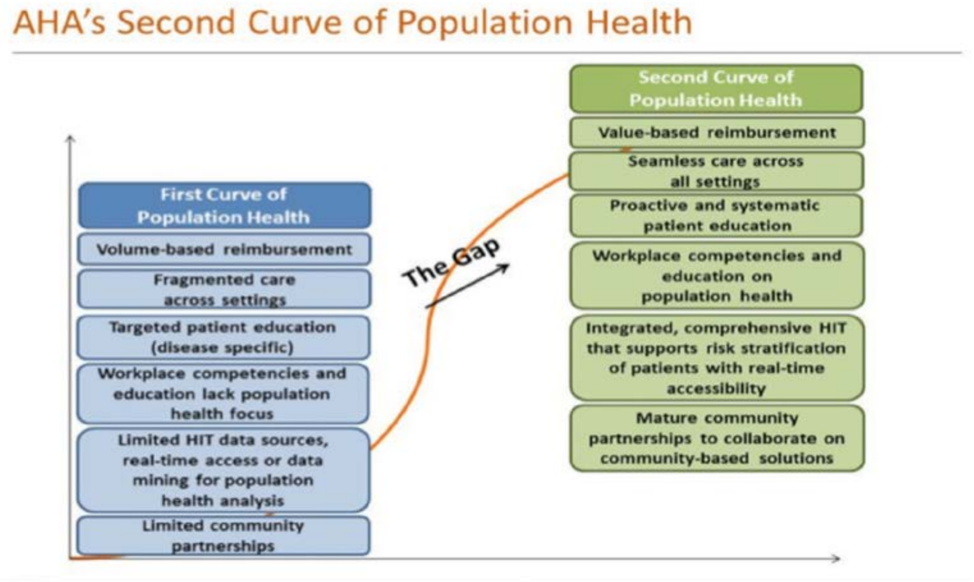
With 80% of poor health due to behavioral and social determinants, it becomes more and more crucial that providers optimize each patient encounter (County Health Rankings & Roadmaps, 2015). This can be made possible by the integration of physical, social and spiritual domains into the Electronic Health Record (EHR).

Fortunately, the shift towards incorporating the socioeconomic factors in the EHR is underway. The purpose of this chapter is to provide health care administrators and providers, policymakers, IT vendors and advocates with an overview of the importance of this much needed paradigm shift and the progress to date. We have included:

- An overview of the national organizations that have begun to integrate socioeconomic information and environmental risk factors into the EHR
- Technology challenges identified by Stakeholder Health members
- An overview of new models and promising practices
- A listing of potential domains to incorporate in the EHR
- Recommendations and a Call to Action.

Lastly, we view spirituality/faith as an important domain that must be embedded with all other domains with equal importance.

Overall, Stakeholder Health views the Affordable Care Act and the resulting policy environment as an opportunity to address the underlying causes of poor health in communities; make informed decisions to better align, integrate and leverage existing resources; and create partnerships with diverse stakeholders that will result in positive outcomes.


AHA's Second Curve of Population Health

The American Hospital Association (AHA) table above illustrates the differences in the First Curve (current system) and the Second Curve (necessary to meet the Quadruple Aim).

The Second Curve

As we move more deeply into health reform and the achievement of the Quadruple Aim, we find ourselves at a critical juncture. The American Hospital Association has said that “Hospital leaders need to develop strategies that move their organizations from the first curve, or volume-based environment, to the second curve, in which they will be building value-based systems and business models” (American Hospital Association, 2014). From now on, optimizing opportunities to improve individual and population health must include mature community partnerships and integrated health information technology.

The Causes of Health

As noted in Chapter Two, the *County Health Rankings* model of Population Health reinforces our understanding that the causes and management of disease are far more complex than the resultant illness itself (County Health Rankings & Roadmaps, 2015). The model identifies many factors that, if improved, can help make our communities healthier places to live, learn, work and play. It also weights the social determinants of health, reminding us that we must address factors outside the walls of the hospital to meet the health needs of patients and reduce the burden of cost, both human and financial, for them and for the health system.

Roadmaps to Health

WEB OF TRUST

According to the Roadmaps of Health, only about 20 percent of people’s health status is related directly to Clinical Care (County Health Rankings and Roadmaps, 2015). The other 80 percent relates to health behaviors and the “social determinants” of health. With this in mind, Stakeholder Health members have identified four critical markers that can, and are beginning to erode the “old” boundaries between health care and health, and hospital and community. We believe that working in the context of these markers can produce tangible cost savings, and improve health outcomes and the quality of care.

1. **Socially Complex People in Socially Complex Neighborhoods:** We know that the most significant factors in determining health come from human interactions, health behaviors, and the social and physical environment. This knowledge demands that our Information Technology (IT) systems link the underlying factors (determinants) of a person’s health to his/her environment.
2. **Larger Scale Partnerships:** It is crucial to identify and engage partners already invested in improving community well-being. Effective partnerships also call for IT systems that address and connect the value represented in these partnerships.
3. **Redesign the Connectivity:** Health systems face multiple data-sharing challenges (including HIPAA compliance) in creating a single identifier that would connect each patient with the appropriate community partners. Properly done, Health Information Exchanges (HIEs) could serve as sources of both patient data and community intelligence. The challenges that thwarted the first versions of HIEs could be employed as opportunities to rethink a new HIE framework for care coordination and genuine population/community health. For example, the recidivism rates of individuals presenting in the ED with substance abuse issues were daunting for a southern California hospital, not only because of the unresolved issues patients confronted, but also because their need for care was persistent and the hospital was not the optimal care provider beyond the perceived need for emergency care. Utilizing a health information exchange technology called CareConnect™, a new process of referral and case management to link individuals to community-based behavioral health

services filled the gap to make care coordination a reality. Ultimately, patients are better served and the demand for emergency room care by this vulnerable population is reduced.

4. **Better Aligned Incentives:** We need to know far better how to incentivize health systems to engage with patients more holistically.

ENHANCING WHOLE-PERSON CARE THROUGH TECHNOLOGY

As providers and community partners consider not only clinical needs but also the determinants that make a person healthy (or not), relevant information may be obtained through use of both the Health Information Exchanges and Electronic Health Record.

Individuals and patients can democratize the data by granting permission to share information with resource partners along the health continuum, which, as emphasized in other chapters, requires building and establishing trust. Geographic data and the implications of socioeconomic factors (social determinants) would be standard across all settings. A more holistic model of care can be achieved through connections with a community of providers, including family members.

THE STAKEHOLDER HEALTH INFORMATION TECHNOLOGY (IT) WORK GROUP

Stakeholder Health's earlier monograph on *Strategic Investment in Shared Outcomes: Transformative Partnerships between Health Systems and Communities* (Health System Learning Group, 2013) outlined our whole-person, whole-community vision with the intent of helping our partners strategically align their community investments.

Following the publication of the monograph, the Stakeholder Health IT Work Group, co-chaired by Dora Barilla, Dr.Ph., of Loma Linda University Health and Eileen Barsi of Dignity Health, set out through a series of subsequent meetings and discussions held from July 2013 to the present, to envision Information Technology that would ensure optimal care coordination in our communities.

Currently, the Electronic Health Record (EHR) technology that is widely sold (and, to some degree, required by the ACA's Meaningful Use provisions 1.0 and 2.0) does not begin to address the opportunities documented in the Stakeholder Health ensemble of practices noted in the 2013 monograph.

Those practices (see HSLG, 2013, page 15) focus directly on two interrelated groups: the people whom hospitals identify as the most challenging patients ("socially complex") as well as, the least desirable neighborhoods ("socially complex"); and large-scale partnerships that could align the requisite network of not-for-profit and faith-based entities that work in, and share hope for, these patients and neighborhoods.

Our IT Work Group quickly reached consensus that the current EHR format falls short in providing population health and neighborhood information and saw the need to make it more meaningful. Its members set out to create an IT framework that would optimize patient encounters by addressing not only physical health, but also the unaddressed issues that can negatively affect patients' and communities' health.

STAKEHOLDER HEALTH ENVISIONING

In discussing our IT needs in the context of “the complex patient” scenarios and in relation to various traditional and non-traditional partners along the health continuum, the same questions came up repeatedly:

1. How do caregivers know what resources are available in the community?
2. What services do the community partners provide?
3. How can we access these resources to optimize the health of an individual?

This dream of interconnectedness and robust IT systems to support it captured our imaginations. There has never been a greater moment to ensure the connectivity and validity of community assets. With the current Health Reform mandates we find ourselves at a new juncture, a time that points to the need for addressing health inequity and, ultimately, achieve better health outcomes. Sharing relevant information across the health care continuum is imperative and this can be done only in partnership with diverse stakeholders, including patients.

DATA FRAMEWORK FOR HEALTH EQUITY

A 1987 Institute of Medicine report entitled “Socioeconomic Status and Health: Closing the Gap” pointed out that as early as the 12th Century, people at the lowest socioeconomic levels had higher death and illness rates.

Over the last two decades, additional studies have generated an even clearer understanding of the disproportionate, unmet, health-related needs of vulnerable populations. Population health data have given us summary statistics and detailed information about specific health conditions.

This retrospective type of review, utilizing well-established principles of measurement and analysis, has also provided epidemiologic information about risk factors that have informed public health planning strategies and shaped health service delivery systems (Summarizing Population Health: Directions for the Development and Application of Population Metrics, 1998).

As such, consideration of not only the physical and clinical needs of individuals, but also of social needs and relevant environmental factors, must take place with prospective intelligence and predictive analytics. As yet, however, a comprehensive approach to addressing these unmet needs has not been realized.

The overarching objective of Stakeholder Health is to seize this opportunity, share the vision for the future, and act on the knowledge that we now have available. We believe, with the appropriately developed support and application of the information technology accessible today, that the potential to improve the health of populations and meet the goals of health care reform is unlimited.

THE INFORMATION TECHNOLOGY VISION

If traditional health care has primarily focused on the physical needs of a patient, we are now at a point of convergence in which we must also pay attention to the social needs of an individual and take into consideration the environmental risk factors that may negatively affect health. But the reality is that clinicians are likely to have neither the time to tend to both the physical and social needs in a limited office visit, nor ready access to the relevance of place and community resources for the health of the person s/he is treating.

To assist clinicians with ready access to tools that can provide resources and linkages when patient needs become known, Stakeholder Health would design a model based on a person’s journey of health and needs and not only on hospital needs or traditional payer-specific segmentation. Imagine, then, during a patient assessment, if the providers considered the following questions:

1. What are the person’s clinical needs?
2. What are the person’s social needs?
3. Are the person’s basic or fundamental needs being met?
4. What potential hazards lurk in the person’s physical environment, the places he or she lives, works and plays?

Then, with the answers to those questions, imagine the resources that may open up. In this scenario, what would the various partners along the continuum need?

- **Individuals:**
  - Should be connected to resources and services in their own communities
  - Need education about their conditions and reasons why behavior changes may be required
  - May need information about the potential or actual health risks in their environments
  - May need community providers' support to work on their health improvement goals.
- **Non-Clinical Caregivers:**
  - May need more information from the patient, or assumed by the patient's socioeconomic status
  - Need to know community resources and the types of services provided near the patient's home
  - Need real-time connections to community-based resources in order to link immediate support to the individual at the point of care.
- **Community-based organizations:**
  - Need a connection to providers
  - Need the patient's relevant information in order to provide optimal support.

Ultimately, how can the individual, caregiver and community all be in alignment to ensure that appropriate interventions are occurring as needed? Clearly, there is a need for bi-directional communication between community-based organizations, clinical providers and non-clinical caregivers.

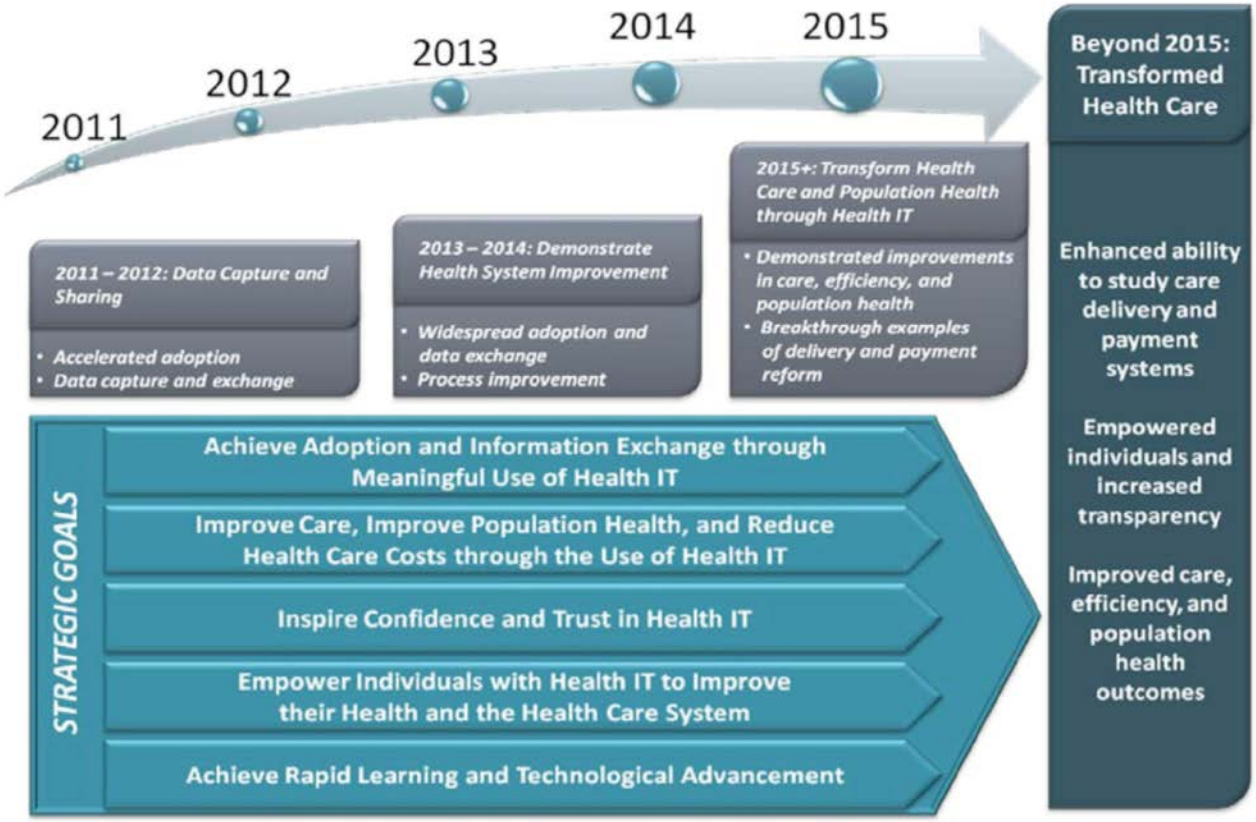
Finally, beyond provider assessments and/or primary care visits, how can IT help systems take the quantum leap from retrospective analysis (only) to prospective/predictive analytics? How can these systems provide tools that do not exist today but are vital to optimal care?

This IT challenge was vetted at meetings that brought together additional Stakeholder Health members from across the country. At the Washington DC gathering, participating staff from the Office of the National Coordination for Health Information Technology (ONC IT) included the Medical Director of Meaningful Use ONC IT. Among the issues raised were, "Who owns the information?" and, "How can it be democratized in a manner that will protect the privacy of an individual's health record while sharing what is relevant to members of those providing support or care in the community?" There was overall agreement that the inclusion of all aspects of health will result in more optimal care. And, though we may not achieve the ideal, we can certainly begin to make a more meaningful difference in population health through interoperability, health information exchanges, and the integration of socioeconomic variables that negatively affect health.

A Call To Action: Integration of Socioeconomic Information Into the Electronic Health Record (EHR)

Stakeholder Health is calling for the integration of socioeconomic information into the Electronic Health Record (EHR) and/or through Health Information Exchanges. We are offering another voice to the collective chorus that acknowledges the importance of this information in providing comprehensive whole-person care. Other voices include:

The following chart gives an overview of the ONC Strategic Plan, 2011–2015:



A. OFFICE OF THE NATIONAL COORDINATOR FOR HEALTH INFORMATION TECHNOLOGY (ONC)

Stakeholder Health has engaged staff from the Office of the National Coordinator for Health Information Technology (ONC) in this dialogue. The federal government's vision is "a health system that uses information to empower individuals and to improve the health of the population" and the ONC's mission is "To improve health and health care for all Americans through the use of information and technology," Dept. of Heath Information Technology,(2011).

Complementing the work underway by our government in its health IT strategy, Stakeholder Health is calling for a level of meaningful use that will make the EHR more potent in helping providers optimize patient encounters in addressing the full spectrum of factors that may be negatively influencing their health. This goal is not unlike one objective of the ONC, which is "to propose health information exchange and interoperability requirements that are more rigorous, so that patient information follows patients to the point of care and informs critical health decisions by health providers."

According to the Federal Health Information Technology Strategic Plan, in order to ensure that this type of exchange can take place:

- We must overcome barriers across geographies and among stakeholders (providers, laboratories, hospitals, pharmacies, behavioral health and patients).
- We must address additional barriers as identified in the Federal Health Information Technology Strategic Plan, such as an insufficient demand for electronic health information, the lack of a model for facilitating data exchange, security restrictions, and disparate federal, state and local policies that hinder the exchange of crucial information.
- Information exchange will require rigorous interoperability standards so that data can be used by multiple stakeholders.

B. THE AMERICAN HOSPITAL ASSOCIATION

In 2013, the American Hospital Association (AHA) Advocacy Agenda cited concerns about readmission measures and the methodology for payment penalties established in the Affordable Care Act (ACA) under P.L.111-148 and P.L.111-152 (American Hospital Association, 2013).

Specifically, the federal Hospital Readmission Reduction Program (HRRP) began imposing financial penalties on hospitals for "excess" (as compared to "expected") readmission levels on October 1, 2012. In incremental percentages, penalties can reduce hospital payments as much as three percent, with the initial three targeted conditions being myocardial infarction, congestive heart failure and pneumonia.

However, according to AHA's 2013 Advocacy Agenda, "the current readmission measures do not adequately adjust for socioeconomic factors." The agenda briefing also noted that "AHA has adamantly advocated that the Centers for Medicare and Medicaid Services (CMS) adjust the readmission measures to reflect socioeconomic differences in the patient populations served by different hospitals."

Substantial research has shown that readmissions are the result of many factors; some are within a hospital's control, and some are related to the lack of resources elsewhere in the community, such as: adequate numbers of primary care clinicians; access to pharmacies, home health services and rehabilitation services; transportation difficulties; and access to healthy eating alternatives. There is compelling evidence that safety-net hospitals and others serving large numbers of low-income individuals will have difficulty reducing readmissions due to the lack of certain resources in the communities they serve" (American Hospital Association, 2013).

C. UNITED STATES SENATE

In June 2014, Senators Joe Manchin (D-WV), Roger Wicker (R-MS), Bill Nelson (D-FL), and Mark Kirk (R-IL) introduced The Hospital Readmission Accountability and Improvement Act (Kirk, Nelson, Manchin & Wicker, 2014). This bipartisan legislation proposed an amendment to the Hospital Readmission Reduction Program (HRRP). The amendment would have required that CMS account for patient socioeconomic status when calculating risk-adjusted readmission penalties.

The sponsors noted that, all other factors being constant, socioeconomic conditions (such as poverty, low literacy levels, limited English proficiency, minimal social support, poor living conditions and limited community resources) very likely have direct and significant impacts on hospital readmissions. The bill also noted that including these factors would improve accountability and quality of care.

The bill did not become law, but it does signal raised awareness of the full range of health factors.

D. INSTITUTE OF MEDICINE OF THE NATIONAL ACADEMIES

In *Capturing Social and Behavioral Domains in Electronic Health Records: Phase 1*, an Institute of Medicine (IOM) report of the National Academies Committee identified 17 domains considered good candidates for inclusion in electronic health records (EHR). A second report, subtitled *Phase 2*, pinpointed 12 measures related to 11 of the initial domains (see sidebar on 12 Measures for Inclusion). The report considered the implications of incorporating the measures into all electronic health records (Institute of Medicine of The National Academies, 2014b).

The Committee identified certain domains related to neighborhoods and communities, and concluded that this information was potentially geocodable. If the EHR contains information about the geographic location (zip code or census block) where a person lives or works, that information could be linked to other databases to identify environmental conditions like air pollution or the availability of sidewalks, public transportation and healthy food (Institute of Medicine of The National Academies, 2014a).

12 MEASURES FOR INCLUSION IN THE ELECTRONIC HEALTH RECORD (IOM, 2014B)

Race/ethnicity, tobacco use, alcohol use, and residential address, education, financial resource strain, stress, depression, physical activity, social isolation, intimate partner violence, and neighborhood median household income.

The Committee charged with the development of the domains prioritized them in accordance with evidence on the association of health outcomes and the geographic locations. They concluded that there could be some utility for having the information in the EHR. Among the specifications considered, therefore, was the "usefulness of the domain as measured for decision making between the clinician and patient for management and treatment" (Institute of Medicine of The National Academies, 2014a).

This specification, in particular, limited those aspects of health for which management and treatment may not be within the realm of either participant.

Understandably, the IOM Committee's report concluded that some key measures were excluded if there were limitations in the ability of health providers to act upon the information presented. However, they also said, "Currently, the absence of social and behavioral determinants of health in EHRs limits the capacity of health systems to address key contributors to the onset and progression of disease. The addition and standardization of a parsimonious panel of social and behavioral measures into EHRs can help spur policy, system design, interoperability, and innovation to improve health outcomes and reduce health care costs" (Institute of Medicine of The National Academies, 2014a).

The IOM report affirms Stakeholder Health's belief that in order to support health beyond the traditional means offered yesterday, we must push beyond the boundaries of the EHR and explore the opportunities to strategically utilize data elements tomorrow.

According to the 2014 IOM report, "Capturing Social and Behavioral Domains in Electronic Health Records, "some domains reviewed but not selected were theoretically linked to health, but lacked an adequate evidence base to support routine collection of data.

"By limiting the recommended domains to those for which a reasonable evidence base exists, the committee is confident that the smaller set of domains and measures will result in the collection of crucial data for patient care, improvement of population health, and further expansion of the knowledge base to facilitate the development of precision medicine or other strategies for improving the health status of the U.S. population."

Challenges to the IT Vision

Before the vision of Stakeholder Health and others can be realized, a number of challenges must be addressed. One challenge is data availability. The Institute of Medicine study identified the need for research on the usefulness and feasibility of collecting social and behavioral data beyond that which is now collected. In addition, identification of interventions and treatments that effectively address the impact of social and behavioral determinants on health may generate the need to add new domains and measures in the EHR. Currently, there is no process for making such judgments (Institute of Medicine of The National Academies, 2014b, p. 16).

THE IMPORTANCE OF NON-CLINICAL DOMAINS

The November 2014 Institute of Medicine report, *Capturing Social and Behavioral Domains* and Measures in Electronic *Health Records: Phase 2*, noted that "EHRs have potential as essential tools for improving quality, increasing efficiency, and expanding access to the health system (Friedman, 2006; Friedman et al., 2010). They provide crucial information to providers treating individual patients, to health systems about population health, and to researchers about the determinants of health and the effectiveness of treatment. The inclusion of social and behavioral domains in EHRs is vital to all three."

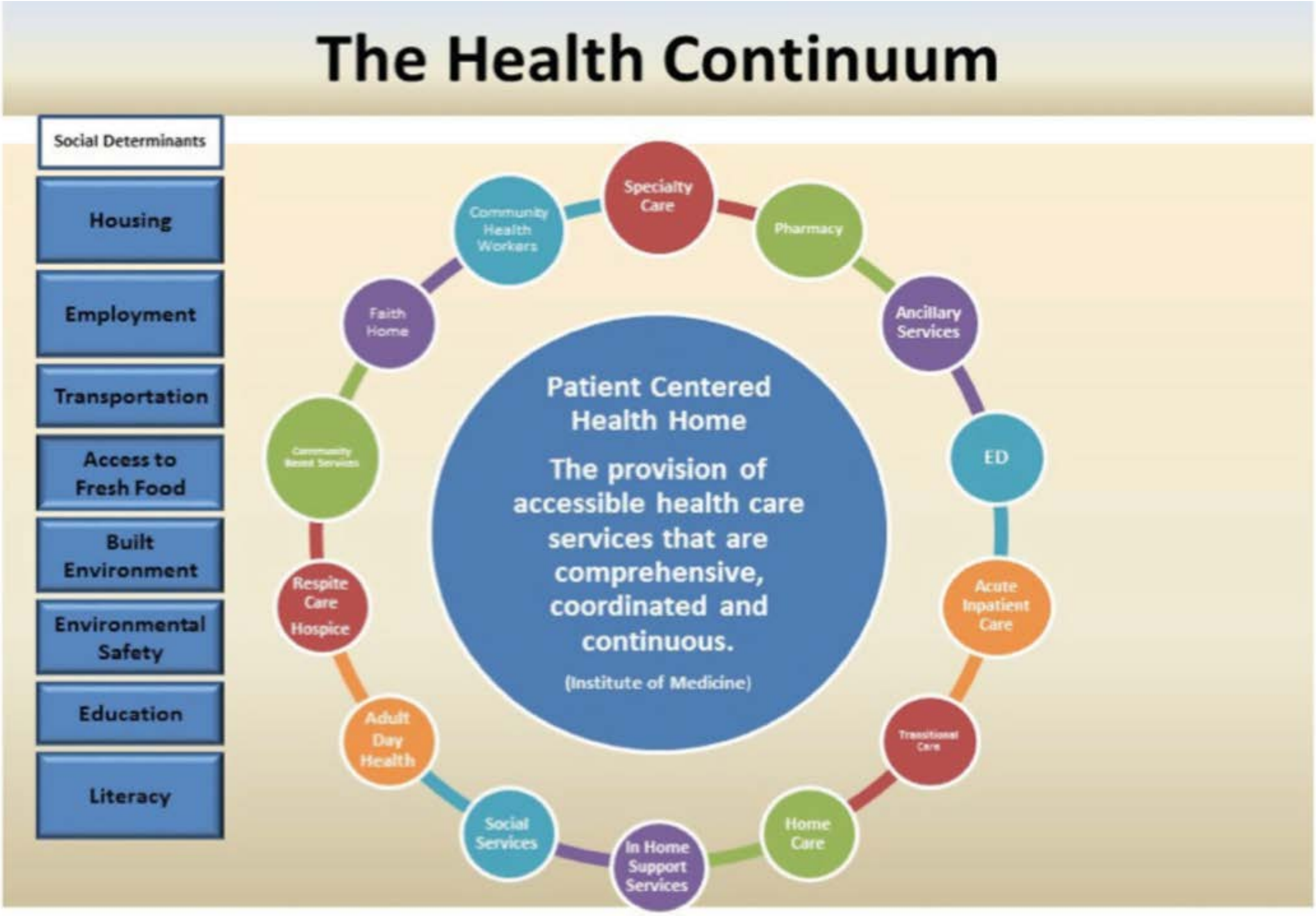
TECHNOLOGY CHALLENGES IDENTIFIED BY STAKEHOLDER HEALTH AND IN THE IOM STUDY, "CAPTURING SOCIAL AND BEHAVIORAL DOMAINS AND MEASURES IN ELECTRONIC HEALTH RECORDS, PHASE 2, NOVEMBER 2014"

- **HIPAA** – Health information is protected by the federal Health Insurance Portability and Accountability Act of 1996, the Federal Health Information Technology Strategic Plan (HIPAA). HIPAA restricts the sharing of patient information by health care professionals. Certainly, we must vigorously protect patients (and the integrity of EHRs) from confidentiality breaches. Still, for EHRs to be optimized, we must collect data consistently across the country. This requires a commitment from all parties—including the patient—to sometimes allow access to sensitive personal data.
- **Interoperability** – Technology platforms that cannot "talk with one another" present one of the greatest challenges. Longtime users of EHRs, such as Denmark, New Zealand and Sweden, have benefited from the interoperable use of patient data. Practitioners and hospitals in those countries can access patient information—physician notes, examinations and prescribed medications—across the health system. This allows providers to plan across primary, secondary and long-term care settings (Gray et al., 2011).
- **Single Identifier (unique personal identifier used across multiple systems)** – EHR information on social and behavioral determinants could direct clinical utility in cases where this knowledge is relevant to diagnosis, treatment or prognosis. ACOs, perhaps, could best manage community health by using data systems that merge clinical data stored in EHRs with data from community information systems. These community systems often provide compositional and contextual information about the environments in which individuals reside, work and learn. Knowledge about the environmental factors that affect disease (and risk), as well as the distribution of community resources, may well become as important for managing patients' health as knowledge of clinical indicators like body mass.

  It is a strongly held opinion that a single patient identifier may be key to interoperability of the electronic health record to ensure appropriate care, reduce medical errors, and avoid duplicate tests; but concerns about privacy and identify theft have challenged the realization of that goal. On a business trip one of the authors found herself in need of emergency care for an episode of atrial fibrillation and was overwhelmed in a hospital by their need to know current medications, allergies and medical history. Though she realized how very important the information was to share, she was in a medical crisis and not thinking clearly. All of the information was on her health provider's system, but access to the information was not readily available on the out-of-town hospital system. Treatment was needed immediately. The value of interoperability and a single patient identifier became apparent to her personally in that moment of profound vulnerability.
- **Provider Education** – The inclusion of broader data in an EHR could foster better clinical care and enable information on the relationship between health determinants and treatment efficacy. Because most health care providers have been trained in clinical care (only), the integration of new EHR measures will require additional provider education.

Connecting with Community-Based Promising Practices

Several promising practices clearly demonstrate the benefit of shared information, including socioeconomic, environmental and relevant clinical information. Yet, with the explosion of data from various sources, the task of aggregating, evaluating and translating the *data* into meaningful *information* has remained a challenge. According to the federal Agency for Healthcare Quality and Research, the current health data infrastructure does not have the capability to translate data into usable information; this includes associated meta-data (Agency for Healthcare Research and Quality, 2014).



Democratization of information with relevance for support systems is key to achieving this level of sharing. This democratization would be empowered by patient permissions that allow different levels of information for support systems and interventions across the health continuum. The Health Continuum Sidebar, which includes the determinants of health cited earlier, begins to note the potential areas along the care continuum that Stakeholders Health IT members have identified and acknowledge may be a partial listing of community and related services.

Health systems can already collect and access an abundance of data at the community level or at the point of clinical contact, but this information is rarely considered in the treatment of disease—partly because the publicly available data and personal health information are not often connected. Further, the social and behavioral determinants of health are rarely incorporated into the EHR.

The time has also come for clinicians to ask not only, “What is the matter *with* you?” but also “What matters to you as an individual?” In other words, how do we begin to capture the *life aspirations* of the person in addition to meeting only the objectives of the health system? Health systems and clinicians must be equipped to understand the answers to these questions and collaboratively address the social needs of their patients and their communities. If not, the Quadruple Aim will not be realized.

Stakeholder Health's thoughtful health systems have long identified the need to address social determinants in the clinical setting, and recognize the opportunity to integrate the relevant vital information into the health record and into an appropriately considered plan of care. *(See The Health Continuum sidebar.)* They are eager for the technology that supports this endeavor in collaborative efforts to treat the physical, emotional and spiritual aspects of an individual. This cannot be done by the health system alone, but must include community partners. We will need the technology to support such collaborations. In September 2014, the Stakeholder Health IT Group and partners thus identified Promising Practices and new technologies that can connect *all* factors that contribute to health improvement. Among those highlighted were:

A. GEOGRAPHICAL INFORMATION SYSTEMS (GIS) TECHNOLOGY

GIS mapping identifies and helps navigate community resources as well as areas of disproportionate need. Incorporating GIS technology into the health care environment is an opportunity to give location a clear presence in the health of an individual and community (Esri, 2010). It also allows for a new data lens that can incorporate community data with individual data to inform providers of the patient's "place" or the environment—and its clinical relevance. GIS, in short, gives us the ability to focus on small geographic areas in which care can be delivered and managed with clinical value.

A number of health systems have begun the journey of incorporating GIS information, including Loma Linda University Health, Children's National Hospital, Adventist Health, and Duke University Health System. The benefits of utilizing GIS technology include:

- Geography becomes the common analytical denominator for linking individual and aggregate data to geographic place data.
- Internal hospital IT systems engineers can produce more accurate geographic information at modest costs. However, the most efficient long-term solution is to engage the assistance of their data system vendors.
- The GIS lens allows the provider and the individual to share the same view helping to bridge the understanding of health conditions.

Appropriating and utilizing externally generated data in real time (e.g., population change, health service demand, physician capacity and community resources) will require new analytical skills that are typically not present today in most health systems. Training will be crucial. It is also important to recognize, then, that "accountable care" requires systemic data changes. Both clinical and administrative Information must be historically consistent.

B. PROVIDER PERFORMANCE SYSTEM (PPS)

Under the federal Delivery System Reform Incentive Payment (DSRIP) program, states have a unique opportunity to advance delivery system and payment reform upgrades within their Medicaid programs. New York State's DSRIP initiative, for example, incorporates a broad set of health and social service providers, called Performing Provider Systems, to drive transformational delivery system integration. This could be a model for the nation.

The Medicaid Analytics Performance Portal (MAPP) is a performance management system that can also provide tools and performance management technologies to Provider Performance Systems in their effort to develop transformative DSRIP programs.

C. COMMUNITYCOMMONS.ORG

Community Commons is a web portal where data, tools and stories come together to inspire change and improve communities. The tool provides public access to thousands of layers of meaningful data, allowing mapping and reporting to users wanting to thoroughly explore community health.

Commons users can gain a deeper understanding of community assets and opportunities, and convey that knowledge through partnerships and collaboration. There is no charge for using Community Commons. A more in-depth review of this tool can be found in Chapter Six on Mapping.

D. COMMUNITY RX

Community Rx is a Chicago-based intervention designed to connect health care with self-care by engaging community navigators to help residents to identify health assets (Lindau, 2016). First, a 90-student MAPS Corps from Chicago's South Side uses cellphones to assess community assets. The assets are put into Health.eRx, through which Community Health Information Experts (CHIEfs) connect patients to community-based service providers and other social support resources. High school students map the assets of 26 communities in 12 zip codes. Chapter Six on mapping offers more detail on this program.

E. HEALTH LEADS

Health Leads allows clinics, physician offices and other providers to prescribe not only medications but also food, housing and heating assistance. Patients take their prescriptions to a designated help desk where volunteer Advocates (undergraduate college students) help them access community resources and public benefits. The impact of Health Leads is two-fold:

- The Health Leads program expands capacity to secure crucial non-medical resources. For example, the Dimock Center, a federally qualified health center (FQHC) in Boston, routinely screens every pediatric patient for basic resource needs. The physicians, nurses and social workers say that they feel empowered to ask "real" questions of their patients because they know Health Leads can help. An example is the patient who cannot pay his or her rent, or are running out of food at the end of the month.
- In 2012, 90 percent of Health Leads student graduates entered jobs or graduate studies in the fields of health or poverty.

Opportunities for Communities, Providers and IT Vendors

Communities, health providers and IT vendors have many opportunities to collaborate on IT systems that include community and social determinants in community health improvement efforts, e.g.:

1. The new IT system should be integrated into the existing IT systems and not be a separate portal.
2. Small geographic areas should become the context in which care is delivered and managed. Mapping of community assets such as primary care physicians, faith-based organizations, community centers, and farmers' markets can give providers and individuals a better understanding of the location of health assets near patient's home locations.
3. Data collection tools must include granular, census-tract-level data. Fitting data into more granular levels—neighborhood levels ideally as opposed to simply the county level—is challenging but necessary to making data relevant to the health of local communities.
4. Hospital data should be geocoded so that patients' home addresses have clinical relevance.

5. Public Health has multiple data sources, but we must define Public Health's new partnership role in the redesigned health system. We must also understand the data available, ways they share relevant data and information, and their organizational readiness in the world of the Quadruple Aim.
6. Health systems are hiring expensive people to code data, but they are not engaging health care staff to translate IT data into useful information. As hospitals build new business analytics infrastructures, we must adequately resource the business intelligence—not just add more data.
7. Who is the "they" that would bring together public health, hospital, and community?
8. How can data platforms be used to promote cross-sector health improvement initiatives in communities? The Federal Reserve, for example, is investing in community health improvement, but existing data structures and platforms do not support a collective approach to health improvement.
9. What are the viable options for health planning in communities? Health planners understand the questions and challenges they face, but communities may not have adequate data or information.
10. "Systems thinkers" must participate in data development. This work cannot be done in isolation. We need the data and information technology that support a health system's journey into our new future—and not hold us in the past.
11. Social Media may not be tightly controlled but as proven in models like PatientsLikeMe, Inc., can be much more effective in sharing community resources. If we shift the control over to the individual, and allow them to be in control, this alleviates the challenges posed by HIPAA. How can we use publicly available websites to register community resources and provide users with the logic to navigate based on their individuals needs or interests?

GIS CASE STUDY

Very few health systems have realized any type of real-time Information system that could provide a sense of what is actually happening, what is about to happen, or what actually happened.

Loma Linda University Health has created a Community Health Management System (CHMS) that Incorporates GIS technology into their IT data platform. Their vision is one of real-time, geographically enabled, health utilization Information that providers can use to Influence resource utilization, patient care, and population health decisions. In effect, the CHMS Introduced the concept of an "accountable-care ecosystem."

The data generated from this system has helped identify community hazards that trigger Increased ER utilization and hospital readmissions for children with uncontrolled asthma. It has Identified areas where patients do not have access to a pharmacy; the hospitals and clinics can now send the patients home with the necessary medications. CHMS also targets food deserts in which the hospital can help communities advocate for healthier food options.

CHMS has made "location" clinically relevant, and is being Incorporated into the Loma Linda University Health system of care.

Identified Domains to Fulfill Our IT Vision

Stakeholder Health members recommended domains necessary for inclusion in the EHR that were consistent with those of the 2014 *Institute of Medicine (IOM) report entitled Institute of Medicine: Capturing Social and Behavioral Domains and Measures in Electronic Health Records*. While the data domains identified in the Stakeholder Health conversations were not vetted as thoroughly as those in the IOM report were, many of the Stakeholder Health domain categories paralleled those of the IOM and conversations throughout the field. While the IOM domains are not intended to serve as a final list, the table below includes the IOM's EHR domains and adds a spiritual domain to the list.

POTENTIAL ELECTRONIC HEALTH RECORD DOMAINS

Socio-demographic Domains

- Sexual Orientation
- Race/Ethnicity
- County of Origin/U.S. born or non-U.S. born
- Education
- Financial resource strain
- Gender identity

Psychological Domains

- Health Literacy
- Stress
- Negative mood and affect (depression and anxiety)
- Psychological assets (conscientiousness, patient engagement/ activation, optimism, self-efficacy)
- Cognitive function in late life
- Psychological assets

Behavior Domains

- Dietary patterns
- Physical activity
- Tobacco use and exposure
- Alcohol use
- Abuse of other substances
- Sexual practices
- Exposure to firearms
- Risk-taking behaviors

Individual-Level Social Relationships & Living Conditions

- Social connections and social isolation
- Exposure to violence
- Social support
- Work conditions
- History of incarceration
- Military service
- Community and cultural norms

Neighborhoods and Communities

- Neighborhood and community compositional characteristics
- Socioeconomic and racial/ethnic characteristics
- Neighborhood and community contextual characteristics (air pollution, allergens, other hazardous exposures, nutritious food options, transportation, parks, open spaces, health care and social services, educational and job opportunities)

Spiritual Domain (not included in IOM report)

- Religious affiliation
- Place of worship/support
- Religious beliefs that could impact care
- Aspirations (what matters to you?)
- Spiritual screening (or assessment by a qualified health professional) and spiritual care

Stakeholder Health believes that the Spiritual Domain is a critical variable of overall health.

Recommendations/Call to Action

Stakeholder Health members are committed to working with community stakeholders and IT vendors to create the necessary technology to fulfill a vision of better health for individuals and communities. We are ready to begin a journey of collaborative learning on the following action items and invite you to join with us in these efforts:

1. **Create alignment** with health system data and community health data.
   - Location becomes clinically relevant and provides meaningful context for diagnosis, treatment and healing of patients.
   - The Community Health Needs Assessment (with additional, explicit focus on also making assets visible) becomes the new context for linking community to health systems overall strategy.
2. **Commit to documenting the issues and processes** involved in equipping a large health system to undertake a systemic adoption of analytical tools and techniques that will assist the health system in delivering on the promise of accountable care.
   - Perform geographical data audits on all data collection systems used within the health care system (HR, Medical Staff, Vendor, Visitors, etc.)
   - Benchmark the quality of all data before making improvements so that the benchmarks can be documented and communicated to management and data users (e.g., the percentage of unique addresses that can be verified at street level is one good measure of geographical accuracy).

- Inform health system IT vendors about the adequacy of on-going data quality efforts. Seek their assistance in integrating work-saving steps (across the entire workflow) that could be impacted by a bad or inaccurate street address (e.g., skip tracing, undeliverable bills, wrong service delivery address for a patient or visitor encounter, an employee hire, a medical staff office location or a health care-seeking consumer who has requested information from a web site).

3. **Build a community of learning** around health system geo-analytics that can increasingly and continuously support community health management and be capable of supporting daily operations.
   - Commit to documentation of the issues and processes that will equip a large health system to adopt analytic tools and techniques.
   - Develop a workshop for health system decision support and other analytics support professionals to understand the basics of geospatial information and learn how other organizations have leveraged these technologies.
   - Invite physicians with specialized training in geospatial sciences to teach clinical staff how geographically enabled information can be broadly deployed in practice settings to increase analytical precision at the population health and clinical decision-support levels.
   - Develop pilot demonstrations, document and share findings, and showcase best practices.
4. **Commit to moving beyond situational awareness.** The analytical needs of delivering a continuous and meaningful chain of care are far more challenging than simply reporting status at a given moment.
   - Data, including geographically enabled clinical data, must become actionable, and measurable in a relatively short time span (e.g., preventing undesirable readmissions, for example, cannot wait until all data is scrubbed). We must think like 911 operators who must make sure an ambulance goes to the “right” place—the first time out.
   - “Managing” community health requires a different analytical framework and a more refined way to describe exactness: how a community is defined geographically, its exact boundaries, and its service delivery pattern/network.
   - Traditionally, clinical data is thought to be of specific, necessary and immediate value to patients. At the same time, population health data is viewed as general, nice to know, and long-range. These contrasting perspectives no longer suffice when identifying the information needed to operate a large health system across a socially and culturally diverse, widely distributed “community.”
   - The new data “voice” in health care will be about process, not just results. Improving the processes to create, deliver and understand data within the context of accountable care will require thoughtful and proactive modernization of the data, information systems, and workflows that underpin the organization.
5. **Make geographical accuracy a priority** in all internal systems: patient registration, medical staff credentialing, employee registration, vendor supplier registration, etc.
   - Add address verification and geocoding software as part of existing systems. For example, geographic standards already exist within HL7—Version 3.0. Implement it and require your system vendors to support the standard.
   - Create staff capacity to manage and evaluate the accuracy and usability of all geographic information. As with clinical coding, geography has requirements for historical consistency, data analysis, and guiding community care evaluations.
   - Incorporate community resources and their location to individuals as an integral part of the community of care.

- Drive out inefficient data-handling and data-linking inefficiencies. Implement automated systems to add geographic analytical value to existing data streams for both internal and externally generated data: EHRs, state vital event reporting, state and federal environmental reporting, etc. In contrast, spending time and money on ad hoc data cleaning efforts is inefficient and defeats the value of 24/7 systems.

6. **Work with existing IT vendors** to bring existing systems (and future systems) up to current geographical data accuracy standards **and be more inclusive of social determinants.**
   - Create briefing sessions for IT vendors. Focus on the need for more accurate address verification and geocoding workflows.
   - Create documentation supporting IT vendor needs for specific requirements concerning geographical standards, including address verification and geographic information software conventions and techniques.
7. **Commit to partnering with governmental entities** to engage in:
   - Open advisory committees with opportunity for public comments.
   - Feedback and input for rulemaking groups regarding IT policies.
   - A back-up mandate for public input.
   - Partnerships for the joint development of recommended IT capabilities.
   - Work with public health entities to share community health data.
8. **Work with IT to connect providers** to accessible and current databases of community resources.
   - Explore development of real time bio-directional system with feedback loop.
   - Track health changes/outcomes post connection to community based services.
   - Consider a common site for resource information, e.g., CDC Community Health Improvement Navigator (CHI Navigator).
9. **Commit to having a single patient identifier** that traverses all IT source systems to ensure that a patient's longitudinal record of care across the clinical and community space is maintained.
   - Work with regional HIE to enforce the maintenance of a universal identifier (UID).
   - Ensure EHRs, billing systems, community settings have access to this UID.

Conclusion

Health care finds itself at a crossroad; it is no longer business as usual. There are many factors that influence an individual's health outside of traditional health care settings. Incorporating knowledge about a patient's spiritual aspirations and both the socioeconomic and environmental risks must be part of the standard of care and incorporated into the Electronic Health Record and included as a part of the data incorporated into health systems overall strategy. We need to create the appropriate connections for our health systems and the community to ensure quality of care is provided to all. It is time to re-think how we share relevant information across the health care continuum that protects the individual's privacy while providing the highest quality of care. In one of Stakeholder Health's face-to-face meetings, members thus dreamed without inhibition about their IT vision, and compiled a list of questions in multiple categories to help inform innovators and vendors working on IT solutions (see below). SH hopes that these clarifying questions might activate others working in the IT improvement space to envision and create the optimal EHR.

Stakeholder Health pledges to work with national organizations like the American Hospital Association, the Institute of Medicine, the Association of American Medical Colleges, faith-based groups, politicians/ legislators, advocates and medical IT vendors to increase awareness to move the industry to accept this important and much needed shift in the delivery of care.

Our members view the Affordable Care Act and the current policy environment as an opportunity to: address the underlying causes of poor health in communities; make informed decisions to better align, integrate and leverage existing resources; and create partnerships with diverse stakeholders that will result in positive outcomes.

WHAT DO WE NEED?

COMMON MEASURES

- What is "standard" socioeconomic data? Is there a set of common, core measurements?
- What "standard" socioeconomic data do we need?
- Where does this data currently "live"? How do we gather it?
- What are the standard elements of shared EHR and Public Health data?
- What are the common denominators for data relating to shared causes?
- How do we capture data around social and cultural barriers (bias, distrust, etc.)?
- How do we re-frame and examine hospital disparities data?

DATA VALIDITY

- How do we identify gaps in data relevance?
- How do we make the data real-time and relevant to the clinical intervention?

BI-DIRECTIONALITY

- How do we make data bi-directional so we can connect pre- and post-acute services to a consolidated EHR?
- How do we ensure the validity of bi-directional data?
- How do we create data reciprocity between the health system and the community?
- How can data systems help hospitals work more closely with Public Health?

SECURITY

- How do we ensure the security of bi-directional data?
- Which key elements of the EHR could be shared for population health purposes, e.g., what would be of value?
- Who "owns" the data?

C-SUITE VALUE

- How do we display infographics and dashboards that are meaningful to health system executives?
- How do we use data to create C-Suite value and support for the incorporation of publically available data into the EHR?

COMMUNITY

- How do we create data value for the communities we serve?
- How can shared data provide opportunities for resource alignment?
- How can shared data provide opportunities for shared investments?
- How do we garner feedback for course correction?
- How do we educate all data users?
- How do we align faith and education resources with other partners?

SOCIAL RETURN ON INVESTMENT (SROI)

- How do we capture the social value of such a data platform?
- How do we calculate SROI opportunities for all partners?

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