

Hospitals as Hubs to Create Health Communities: Lessons from Washington Adventist Hospital

Stuart Butler, Jonathan Grabinsky and Domitilla Masi

Executive Summary

With today's emphasis on population health strategies to address "upstream" factors affecting health care, such as housing and nutrition deficiencies, there is growing interest in the potential role of hospitals to be effective leaders in tackling upstream factors that influence health, social and economic wellbeing. This paper explores the potential of hospitals to be such hubs by examining the experience of Washington Adventist Hospital (WAH), a community hospital in Maryland.

WAH is a particularly interesting example for several reasons. For instance, it is in a state with a health care budgeting approach and an enhanced readmissions penalty system that provides strong incentives for community outreach. The Adventist HealthCare system's mission statement also emphasizes community care. Moreover WAH has aggressively undertaken a range of community initiatives. These include partnerships with an organization to help discharged patients to sign up for social services and benefits, and with local church and faith community nurses programs, a "hotspots" approach to tackle safety and other issues in housing projects with a high incidence of 911 calls, and a proposed housing initiative with Montgomery County, Maryland, to address the transition needs of homeless patients.

The WAH experience highlights several challenges facing hospitals seeking to be community hubs. Among these:

- *The full impact of a hospital's community impact – especially beyond health impacts – is rarely measured and rewarded, leading to insufficient incentives for hospitals to realize their full potential.*
- *Creative approaches require regulatory and budget flexibility, especially at the state and county level, which is often lacking.*
- *Data sharing is needed for effective partnerships, but interoperability problems and privacy laws hamper this.*

There is a growing recognition that achieving good health in a community requires much more than effective medical services. Today's attention to "population health" is one result. [1]. Researchers and policy-makers have begun to shift their focus to the intersection of clinical health care and population health.¹ There is increasing interest among medical leaders in identifying and tackling such "upstream" factors as housing and nutrition deficiencies, which contribute to health problems. Another consequence is the attention to health care "hotspots" in neighborhoods, where a range of social, behavioral and economic factors lead to unusually high medical costs.

There is also a better understanding that when institutions in a community work together, such as health systems, schools, community organizations, religious institution and housing associations, there can be significant improvements, not just in health but in the prospects for social and economic improvement. Community schools and charter schools are often seen as potential leaders, or "hubs," in such partnerships to improve the physical and economic health of residents.²

Can health systems, and particularly hospitals – which are major institutions in many communities – be effective leaders in tackling upstream factors that influence health, social and economic wellbeing? It is easy to be skeptical,

¹ U.S. Health in International Perspective; Shorter Lives, Poorer Health, 2009.

² Walker, Lisa J., S. Kwesi Rollins, Martin J. Blank, and Reuben Jacobson, 2013.

given that hospitals are so often seen as detached from the life of the communities in which they exist.

But there have been steps in recent years to encourage hospitals to take a more active role outside their walls. For instance, the readmission penalties that apply to hospitals treating patients in the Medicare program have encouraged hospitals to begin investigating the living situation of discharged patients and address issues that might trigger a readmission, although many are still at the early stages of doing so.³ In addition, the Affordable Care Act (ACA) added several new requirements for non-profit hospitals, including producing a Community Health Needs Assessment (CHNA) every three years, at a minimum. The aim of the CHNA is to encourage hospitals to conduct an in-depth analysis of the health needs of the non-profit hospital's community and develop a strategy for how those needs will be addressed.⁴ The ACA also promotes the implementation of new models of care and health care provider payment mechanisms in Medicare that better support physicians in providing higher quality, population-centered care at lower costs (otherwise known as 'high-value' care). The Center for Medicare and Medicaid Innovation (CMMI) was created in the ACA to support the development and testing of these innovative health care models.

Are these incentives enough? And what is the capacity of a hospital to be a coordinating hub in a community? To investigate this we explore the experience of one community hospital in Maryland: Adventist HealthCare, Washington Adventist Hospital (WAH). The hospital is an interesting example for several reasons. For one thing it is in a state where the law adds extra incentives to reduce readmissions and the health budgets uniquely create additional incentives for hospitals. For another, the mission statement of the Adventist system explicitly emphasizes the community role: "We demonstrate God's care by improving the health of people and communities through a ministry of physical, mental and spiritual healing." Moreover, the Chief Medical Officer and senior staff is personally dedicated to improving patient health by building effective relationships with other institutions in the community. WAH has pioneered some creative approaches within its community. But as we shall see, it also faces a range of obstacles to its goal of helping to lead community change – obstacles that indicate the need for important policy reforms that could encourage more hospitals to become hubs that help improve a range of social and health conditions in their communities.

In this paper, we first describe Maryland's unique

health care financing system, which has helped encourage many of WAH's innovations; Section I describes the various services and initiatives at WAH aimed at addressing the community's broader determinants of health; Section II describes the research literature that undergirds WAH's approach, and describes how WAH collects data; and Section III explores the challenges WAH faces and recommends policy changes.

Maryland's Hospital Payment System

To understand the full incentives and opportunities reinforcing WAH's approach, it is necessary to review the broader health care financing context in Maryland. Since the 1970s, under a Medicare waiver, Maryland's hospitals have been reimbursed under an "all-payer" rate-setting system. This means that all private and public insurers pay hospitals the same rates for services, with the rates determined by an independent state commission.⁵ The evidence indicates that this program divided the costs of both uncompensated care and medical education more evenly among providers, and removed cost-shifting among payers.⁶ More importantly, the all-payer system slowed the growth of payments per admission. In 1976, the cost of a hospital admission in Maryland was 26 percent above the national average, but by 2007 it was 2 percent below the national average.⁷ However, because this system continued to pay hospitals on a fee-for-service (FFS) basis, meaning that hospitals received a payment for each service provided, there has been a strong incentive for Maryland hospitals to perform more services.⁸ Consequently, the state's Medicare hospital costs are currently among the highest in the nation.⁹

In an attempt to address this high spending, Maryland signed an agreement with the federal Department of Health and Human Services' Center for Medicare and Medicaid Innovation (CMMI) in 2014 to update its Medicare waiver.¹⁰ The goal of the new model under that agreement, the Global Budget Revenue (GBR), is to

⁵ Rajkuman, Rahul, Ankit Patel, Karen Murphy, John M. Colmers, Jonathan D. Blum, Patrick H. Conway, and Joshua M. Sharfstein, 2014.

⁶ Rajkuman, Rahul, Ankit Patel, Karen Murphy, John M. Colmers, Jonathan D. Blum, Patrick H. Conway, and Joshua M. Sharfstein, 2014.

⁷ Murray, Robert, 2009.

⁸ Murray, Robert, 2014.

⁹ Rajkuman, Rahul, Ankit Patel, Karen Murphy, John M. Colmers, Jonathan D. Blum, Patrick H. Conway, and Joshua M. Sharfstein, 2014.

¹⁰ "The Agreement Between The Health Services Cost Review Commission and Adventist Healthcare Regarding Global Budget Revenue and Non-Global Budget Revenue." Maryland's HSCRC, 2014.

³ Rau, Jordan, 2015 and Adamopoulos, Helen, 2014.

⁴ "New Requirements for 501(c)(3) Hospitals Under the Affordable Care Act." IRS, 2015.

remove the incentive for hospitals to increase volume by basing their revenue on “population-based” payment methods, rather than “service-based,” FFS methods.¹¹ Under GBR, the revenue of a Maryland hospital is now a yearly pre-determined amount of money based on historical levels of service and the number of people in the community, irrespective of the number of patients treated and services provided.

The hospitals receive this amount as long as they continue to provide high quality and efficient care. The quality care is measured through population-based performance metrics as well as a hospital’s performance in quality improvement programs, including the state’s readmissions reductions program.¹² Crucially, a hospital also incurs a readmissions penalty, and hence a reduction in its global payment, if a discharged patient is readmitted to the hospital or any other hospital within 30 days, regardless of the reason for the readmission (known as “all-cause”). The hospitals are allotted a certain number of readmission per year based on acuity and volume, if they go over this allotment, then they get penalized incrementally.

Under this model, Maryland hospitals are committed to achieving \$330 million in Medicare savings over 5 years and limiting the all-payer per capita total hospital cost growth to 3.58 percent.¹³ In theory, this capitated payment system should encourage Maryland hospitals to achieve the triple aim of better population health, lower health care costs, and improved patient care.

Section I: WAH Population Health Services and Services Offered by the Center for Health Equity and Wellness at the Adventist Healthcare

Although WAH’s mission statement commits it to addressing population health and community health needs, the new GBR model also means the hospital has both a strong financial incentive and a significant amount of flexibility in pursuing its mission, since the hospital’s bottom line is improved by taking steps to *reduce* the number of people who seek services from the hospital. Under the GBR model, the hospital can essentially decide to use its fixed budget however it chooses to maintain high quality, population-based care while containing health care costs. The combination of the global budget and readmission penalties both encourages and gives WAH the incentive to extend its focus beyond just treating patients’

diseases in the hospital. Rather, WAH has the financial inducement to help patients to maintain a healthy lifestyle after they leave hospital and also to work with the local community to find effective ways to improve health and reduce hospital admissions.

WAH primarily serves residents of Prince George’s County and Montgomery County. Based on data on discharges by county published in 2011, around 45 percent of WAH clients come from Prince George’s County and around 40 percent come from Montgomery County.¹⁴

Table 1 compares the demographics of WAH’s Community Benefit Service Area (CBSA) in 2011 — which is the area that covers 80 percent of discharges from the hospital—with that of the state of Maryland, as captured by the decennial census of 2010. In terms of the demographics of the residents, in 2011 the population of WAH’s Community Benefit Service Area (CBSA) had the following breakdown by race: 34 percent White, 44 percent Black, and 19 percent Hispanic,¹⁵ and a median household income of \$67,405. WAH’s CBSA has a significantly higher concentration of minorities (66 percent), than does the state of Maryland (42 percent). Although the median household income between WAH’s CBSA and the state are similar, the median household income of non-white families residing in this area is much lower.

Table 1

Demographic Characteristics of the Community Benefit Service Area (CBSA) and Maryland 2010-2014		
	WAH CBSA	Maryland
White	34%	58%
Black	44%	29%
Hispanic	19%	8%
Other	3%	5%
Median Household Income	\$67,405	\$70,017

Source: Washington Adventist Hospital: Community Health Assessment. 2013-2015 Decennial Consensus 2010

¹¹ Murray, Robert, 2014.

¹² "The Agreement Between The Health Services Cost Review Commission and Adventist Healthcare Regarding Global Budget Revenue and Non-Global Budget Revenue." Maryland’s HSCRC, 2014.

¹³ "Maryland All-Payer Model." CMS, 2015.

¹⁴ Washington Adventist Hospital Community Health Needs Assessment; 2013-2016, 2013.

¹⁵ Washington Adventist Hospital Community Health Needs Assessment; 2013-2016, 2013.

Figure 1 and 2 below map Washington Adventist Hospital's Community Service Benefit Service Area. The map shows how a great proportion of the discharges from the hospital come from zip codes that have high percentages of Hispanics and African Americans.

Figure 1 - Washington Adventist Hospital's Community Benefits Service Area (CBSA) and Percent Hispanic

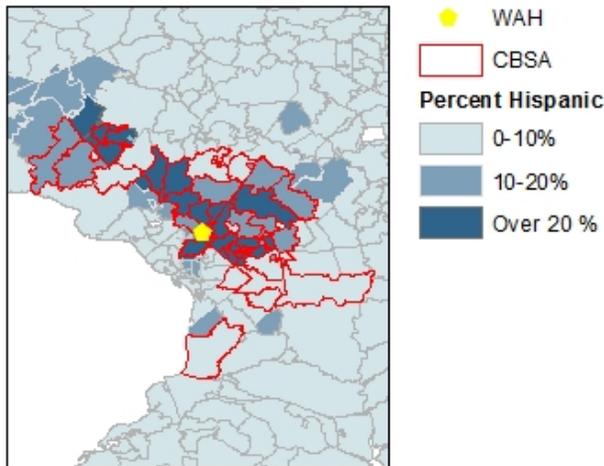
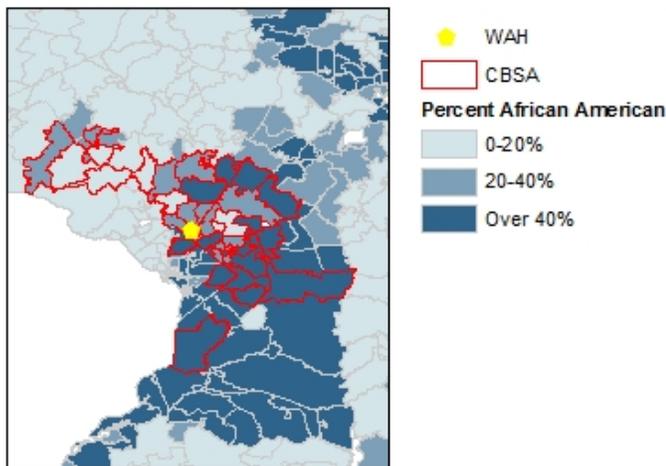


Figure 2 - Washington Adventist Hospital's Community Benefits Area (CBSA) and Percent African American



Source: American Community Survey 2009-2013.
 Unit of Analysis: Zip Code
 CBSA defined as area that covers 80 percent of discharges from the hospital.
 CBSA zip codes obtained from Washington Adventist's Community Needs Assessment 2013-2016

WAH is a particularly interesting example to examine because it has pursued community outreach and population goals with some innovative strategies that could be models for other hospitals. While undertaking these strategies, the hospital has encountered a number of obstacles and challenges that point to the need for reforms in regulation, budget and payment system and business models. These reforms will be needed if hospitals are to be able to play their fullest possible role as hubs for integrated approaches to improving the social and economic mobility, and health, with the strong commitment of the senior staff, who see such things as the CHNA as a valuable tool rather than merely as a requirement for tax exemption, WAH is undertaking several population health and community outreach initiatives. These are discussed in more detail below but can be summarized as:

Tackling “hotspots”: WAH staff has been influenced by the work of physician Jeffrey Brenner in Camden, New Jersey, and other health providers who have focused on the “upstream” causes of hospital admissions.¹⁶ The hospital identified the locations with unusually high rates of 911 calls and assembled staff and volunteers to organize such things as apartment safety checks and half-day clinics — with physicians and behavioral health staff — in certain housing projects where residents were prone to call 911. Thanks to WAH’s success in tackling these hotspots the hospital has replaced many emergency room visits with house calls and regular clinic visits.

Building community networks: WAH is taking the lead in creating a network of organizations within the local community, from churches and parish nurses to the community garden. The networks coordinate services for specific individuals — not just direct health services but also social services and volunteer support. In the early stages the hospital was the physical location for regular meetings of this network, called by WAH the “cross continuum team,” to discuss strategy and the needs of specific individuals. WAH now employs a community health worker, and has enhanced its information and training programs for local organizations and volunteers.

Assembling and exchanging information: WAH recognized that a good exchange of information is one of the keys to successful coordination between the hospital and outside organizations, enabling individuals to obtain the full range of services they need. WAH has devoted considerable resources to this. For instance, when patients are admitted the staff complete an online questionnaire not

¹⁶ Gawande, Atul, 2011 and Manchanda, Rishi, 2013.

just dealing with medical details, but also providing information on the patients' social determinants of health. The questionnaire offers information on poverty, income, education level, utilities and other household cost burdens, and eligibility for social service benefits. This information is enhanced with details supplied with details by community clinics, and shared with them. WAH also has a partnership with the Structured Employment Economic Development Corporation (SEEDCO), a nonprofit dedicated to advancing economic opportunity, to help link patients to social services.

Developing formal partnerships: In addition to building relationships with local community organizations, WAH has also established formal partnerships with service institutions to enhance its ability to coordinate services within the community. The SEEDCO arrangement is one such partnership. Others include a close (now onsite) relationship with CCI Health and Wellness Services — a Federally Qualified Health Center (FQHC) — as well as partnerships with Family Services Inc. (an organization that offers a variety of health and social services), churches, and parish nurse networks. WAH has set up a number of such partnerships that allow it to address its patients' broader health needs and spread its reach beyond its hospital wall and into the community. Most of these partnerships are relatively new development. The oldest arrangements (Family Services Inc. and Walgreens Bedside Delivery) are two years old, while most were launched in the past year. In some cases, such as with SEEDCO and Family Services Inc.— the partnership is a way of contracting out segments of WAH's population health spectrum of activities where another organization has more expertise than WAH staff — allowing WAH personnel to continue to practice at the “top of their license”.

A Summary of WAH's Programs and Partnerships

1) Hospital-based procedures and programs

Risk Assessment and Readmissions Review. To help reduce the hospital's number of unnecessary hospital readmissions within 30 days of discharge, WAH has implemented a comprehensive patient risk assessment and readmissions review program. When patients are admitted to the hospital, nurses screen all patients for their risk of readmission, using a unique risk stratification tool (Appendix A) that was developed by WAH and based on key characteristics of its patients who had experienced readmissions in the past. For example, the tool identifies whether a patient has a high-risk diagnosis (such as pneumonia or end stage renal disease); is on a high number of medications; is living alone; or has insufficient financial

resources, medium, or low risk and are subsequently offered an appropriate intervention. If a patient score is “low” then no special intervention is considered necessary. If the score is “moderate” a transitional care nurse consult is requested. And if the patient score is “high” he/she is offered a transitional care nurse consult or a consult with CareLink (see below). This tool will soon be electronic, using fields already documented within the electronic medical record (EMR).

Moreover, if the EMR indicates that the patient is experiencing a 30 day hospital readmission, the hospital staff conduct an intense “readmissions review” to evaluate why the patient was readmitted. The review consists of a medical chart review and interviews with patients, family members, and providers. This information is then passed along to a Readmissions Review Team, a multidisciplinary, intra-hospital team that meets monthly at WAH and works with the Population Health Team to develop unique action plans and next steps for each readmitted patient. The team usually includes: the Vice-President of Nursing, the Director of Case Management, the Vice-President of Physician Integration, the Chief Financial Officer, the Director of the Emergency Department, the Director of Quality, the Director of Population Health Management, the Chief Medical Officer, and the Population Health Supervisor. Based on the specific topic being discussed that month, the monthly meeting may also include a number of key stakeholders from the community.

“We started with the patients who had made the most visits to the ED last year. We developed a plan for each patient and worked our way down the list. The plan is an outline of the medical treatment the patient will receive while they're in the ED. It keeps care consistent between providers and helps the patients know what to expect. By doing this, we have decreased ED visits and I think we've improved appropriate follow up. We've also increased patient compliance with outpatient management and this improves their health. “

Dr. Linda Nordeman, Emergency Department Medical Director, Washington Adventist Hospital

Transitional Care Program. Every morning, WAH registered nurses (RNs) check the hospital census to see who will be discharged that day. When the RNs go on rounds, they explain the free transitional care program to patients nearing discharge and ask them to join. If the patient accepts, the RN sets up a time to carry out a home visit. For every patient in the program, WAH ensures that an RN conducts a home visit within 48-72 hours of

discharge. The home visit is then followed by phone calls with the patients for 90 days, on a need by need basis, until they are stabilized and integrated back in the community. During a 40-45 minute home visit, the nurse carries out a number of tasks intended to empower the patient and ensure their safety:

- **Safety Check** – inspecting their living environment and ensuring that it is safe, and that there are no hazardous materials around.
- **MedRec** – walking through the patient’s medications, e.g. explaining doses and setting up pillboxes. They also provide education on how to properly discard medications that have expired. This is important as medication errors and lack of compliance to medications is one of the primary reasons why low-income patients experience readmissions.
- **Discharge Instructions Review** – reviewing discharge instructions with the patient to ensure they understand what they need to do post-acute care.
- **Preparation for PCP Follow-up** – preparing patients for their next visit with their primary care practitioner (PCP), who may not have even known the patient was hospitalized. The “See you in 7” program (see below) ensures that patients have a follow up appointment with their PCPs within 7 days of discharge.
- **Chronic disease management** – providing congestive heart failure (CHF) or diabetes patients with disease-specific education and action plans to prevent exacerbations that could lead them to the emergency department (ED).

Within the transitional care program, there is also a “high-risk discharge program” for patients who are diabetic or are deemed likely to have a risky post-hospital discharge period. Patients are identified as ‘high risk’ through the use of a discharge-screening tool. The tool is a discharge checklist that evaluates whether patients have what they need upon leaving the hospital by checking off statements such as “I have the medical equipment and supplies that I will need at home” or “I understand what medications to take and their purpose and side effects.” If a patient is deemed “high risk” they are offered more time with the RNs.

Emergency Department (ED) High Utilizer Discharge Programs

Familiar Faces. To address the needs of patients who make frequent use of the Emergency Department (ED), the Population Health Team and the ED team meet every two weeks to review high ED utilizers and develop comprehensive care plans for them. The aim is to change expensive and unnecessary utilization patterns by providing these individuals with multidisciplinary care plans, including the ED physician streamlining care

coordination with specialists and other follow-ups. But the plan does not only cover medical care. The aim is also to make sure patients also have their social needs met. So the Population Health Team will connect patients with community resources, arrange transportation for them to get to follow-up appointments, and engage the patient’s family and other sources of support.

U-Turn Program. This WAH program focuses on decreasing unnecessary admissions and readmissions at WAH. When a patient enters the ED, an RN and a social worker assess patients for medical and social needs and, if there are alternatives to admission or readmission, the RN works to connect the patient with the appropriate emergency area and community services after discharge from the ED (without being admitted to the hospital). For example, if the RN learns that a patient does not have a primary care physician (a common reason for resorting to the emergency room), the RN might refer the patient to CCI Health & Wellness Services (see below). As part of the U-Turn Program, WAH also partners with 9 local skilled nursing facilities to increase and improve the link between patients released from the emergency department and their follow up management of chronic conditions. Patients can also receive needed referrals to shelters, social benefits, and psychiatric assessments, among many other services.

The ED also partners with WAH’s Skilled Nursing Facility to allow for increased communication regarding the plan of care for a skilled nursing facility patient – individuals who often end up in the hospital. The aim of the program is to expedite treatment of this patient population and allow for their appropriate and timely admissions. For example, many times nursing home patients are admitted to the hospital for things that could be handled by the skilled nursing facility. Due to the streamlining of communication WAH has implemented with the ED, these patients are sent to the ED, and then they turn them back into the skilled nursing facility, since the ED has better communication and a clearer understanding of what the skilled facility can handle. The Population Health Team can now assist the ED by calling the nursing facility and finding out whether they can provide a service e.g. administer an IV, so that a patient does not have to be unnecessarily hospitalized.

See You in 7. The Transitional Care Team, the ED U-Turn Team, and the Case Management Team are all responsible for playing a part in ensuring that patients have a post-acute follow up appointment with their primary care physician within 7 days of discharge, and that patients get the most out of their visit. RNs are therefore tasked with creating a folder of discharge notes, monitor changes in medication, and help patients prepare follow-up questions

for their primary care physicians.

Remote Patient Monitoring Program. WAH has recently contracted with a company, Trapollo, to place tele-scales and blood pressure cuffs in certain patient's homes to evaluate for increasing signs and symptoms of congestive heart failure. The program identifies hospital patients with chronic conditions prior to discharge and sends them home with the devices. The devices ask questions each day about symptoms related to their heart and allows them to input biometric data into the device. The devices are Bluetooth or wireless connected, and the data gets sent to a dashboard at WAH almost immediately after the patient records it. A nurse monitors patients (she/he can monitor 75-100 patients on a daily basis) and intervenes as needed to assist patients and prevent readmissions. WAH expects the program to expand to patients with diabetes and chronic obstructive pulmonary disease.

"So let's say a nurse is following 50 patients, so she will see all of their patients listed, and will get it broken down by green, yellow and red. She knows she needs to take care of the red right away, because that person violated a threshold in the system. The yellow are the ones who just don't report it. We convert them from either yellow to green. The average nurse in the industry today can monitor around 75-100 patients pretty effectively on a daily basis. You have efficiencies of scale; one person can track up to 75 to 125 patients."

John Aldridge, Chief Operating Officer for Trapollo

2) Partnerships with Other Organizations

WAH has developed a range of partnerships with medical and other organizations in the community that help to connect their patients to various social services, medical services and community benefits, with the aim of strengthening their abilities to maintain good health.

Seedco Earn Benefits Program. In January 2015, WAH contracted with the nonprofit Structured Employment Economic Development Corporation (SEEDCO) to make it easier for patients to identify and sign up for social services and benefits they are eligible for. SEEDCO is a national organization founded in 1987 and its mission is to "advance economic opportunity for people, businesses and communities in need."

In this initial partnership, SEEDCO makes online software called Earn Benefits available to WAH. This system connects low-income patients and their families to public and private benefits programs. WAH is the first hospital in the country to start such an initiative with SEEDCO, and the partnership involves the hospital's

Population Health Team, its volunteer office, and staff of Community Clinics Incorporated (CCI). The software is run entirely through Community Health Workers and volunteers, many of them college students interested in becoming involved in healthcare.

Many WAH patients are not aware of the benefit programs they are eligible for — benefits and services that might stabilize them financially and address other problems that reduce their quality of life and add to their health risks. WAH uses a team of volunteers who are trained to identify uninsured patients from the electronic health record — and others in their household — and screen them for a number of benefits such as Medicaid, food stamps, child care subsidies, housing and energy benefits, and tax credits that help low-income households secure long-term employment opportunities and achieve financial stability. The software streamlines access to the benefits enrollment process and WAH follows the patients' application processes through their stay at the hospital. WAH also gives CCI access to this system and they are responsible for following up with patients and helping them continue through any application processes. Completed benefits program applications can be submitted through WAH or CCI.

The benefits software system is likely only the first step in this partnership. WAH is exploring ways to expand its partnership with SEEDCO to include other social services partnerships, such as workforce development and housing assistance. In this way the hospital may be able, through a partner as an intermediary, to engage in a wide range of community services as some health systems with much deeper and expansive roots in their own community have done (such as Montefiore in the Bronx, New York).

"Institutions such as WAH are critical in connecting low-income people with the many benefits programs they are eligible for but not enrolled in because of a lack of awareness. They are on the frontlines everyday with people who are in need of assistance. With Seedco's EBO tool, WAH can very easily and quickly see which programs patients are eligible for, from healthcare and food assistance to tax credits—over 20 different programs in Maryland—and walk them through the application process. Our partnership with WAH is a perfect example of how social service organizations and public-private institutions can work together to greatly expand how we serve vulnerable populations."

Jean E. Henningsen, MSW. Deputy Director, Earn Benefits

Carelink. WAH also partners with the Integrated Health

Services Department of Family Services Inc., a multi-service organization that offers a variety of health and social services to the community and an intensive outpatient care management program that helps patients in the transition and coordination from hospital to home using a community based care model. WAH usually refers 15 to 20 of their clients with the most severe behavioral health issues and/or the ones with the highest risk of readmission (as determined by the readmission tool), to Family Services Inc. every month.

For each patient, a community health worker from Family Services Inc. completes an initial screening of the patient, including a Medication Reconciliation and Needs assessment. After completing the assessment, a number of pathways-connecting clients to needed community resources are assigned to assist the client with staying out of the hospital. Their team of counselors, nurses and community health workers follow the patient closely for 30 days, meeting with them an average of 6 times over to month, to try and monitor their performance. WAH pays Family Services per patient and has an option to extend the care for an additional 30 days if deemed appropriate by the staff at WAH.

CCI Health and Wellness Services. WAH has large underserved, low-income and undocumented populations. To address the needs of these households, WAH partnered with CCI Health and Wellness Services. CCI is a Federally Qualified Health Center (FQHC), which receives special federal resources to help treat underinsured populations and has strong community ties. Although CCI already has facilities in the community, in an agreement with WAH, the clinic has recently opened a facility housed within the WAH campus. This allows CCI to work very closely with the hospital staff and patients, and share medical and other data. Case managers at WAH easily refer WAH patients who can be treated more appropriately at CCI. The CCI-WAH partnership also links with the SEEDCO program, permitting sharing of information. WAH also grants CCI access to Cerner (hospital EMR system), permitting a one-way sharing of information.

Walgreens 340b Drug Program. The Walgreen's program is a Partnership with Walgreens to provide 30 day supply of discharge medications prior to discharge from WAH. The goal of this program is to have that 30 day supply of medications in the patient's hands before they leave, to make it more likely the patient will continue taking medications as directed and to ensure they have enough to last them until their follow up primary care appointment. WAH subsidizes these medications if necessary, based on the patient's financial and payer status. WAH is currently in discussions on how to possibly expand this program, and possibly making this practice

standard of care for all patients.

Prescription Produce Program (Partnership with Long Branch Health Enterprise Zone). Good nutrition is another common need for many low-income patients after they are discharged. To address this, WAH recently initiated a partnership with the nearby Crossroads Farmers Market and Long Branch Health Enterprise Zone. Under this arrangement, hospital staff can write a bar-coded "prescription" for healthy foods for underinsured/uninsured patients with diabetes. The prescription allows its patients with diabetes to purchase healthy foods at a local market nearby. With 12 vendors featuring an array of fresh, local, healthy fruits and vegetables, the market improves food security and nutrition for low-income residents through its "Fresh Checks" program, which matches federal money with private funds to double consumers' buying power.

"Crossroads was the first market in the country to launch a double dollar program which matches money with federal nutrition benefits when people spend their food stamps, or other federal nutrition benefits. This means that when people spend their food stamps on our market we double their value, and so if someone spends \$10 on fruits and vegetables, we double the money, so then they get \$20. This means that low-income people are able to afford more food, and farmers make more money. It's a win-win."

Christie Bach, Crossroads Community Food Network

Montgomery County EMS Partnership. WAH has a partnership with the Montgomery County Fire and Rescue Service to provide in home safety checks for many of the low-income housing developments in the county. The County Fire and Rescue Service send them the results, and when they find something that is an issue with the safety of their home, they work to get the individual resources to fix the problem. One major focus is to fit smoke detectors in the houses of senior citizens.

Housing and Homelessness Initiatives. WAH has undertaken a number of initiatives with a focus on housing. For example, the hospital identified locations that were responsible for a disproportionate number of 911 calls and investigated causes and possible remedies. In one case, both substance abuse and routine care needs appeared to be the causes. WAH began sending substance abuse counselors to the housing project on a weekly basis. The hospital also arranged for a physician to make house calls, though it soon became clear that arranging transportation to the CCI clinic would help reduce the need for some of

these physician visits. These initiatives significantly reduced the number of residents ending up in the emergency room. In another project serving low-income families, also simply arranging transportation to the local clinic significantly reduced 911 calls.

More recently, Adventist HealthCare has been discussing ways to meet the needs of the homeless population who are discharging from the hospital and are too ill to recover from their medical condition in a shelter or on the streets, but do not meet criteria for hospital care. This would be a collaborative effort with other community-based programs serving the homeless population, local hospitals and the Montgomery County government.

WAH also has received a county grant, in conjunction with other county hospitals and senior living facilities, to develop a plan for care coordination among a number of housing developments with the aim of reducing readmissions and addressing population health needs.

"...Montgomery County has approximately 127,000 Medicare beneficiaries and we analyze various hospitalization-related data associated with that area. We bring a lot of data to the community, but the members know the rest of the story. They know what happens on a daily basis and they have the relationships to make change happen. So we meet communities where they are and identify what's already happening within a local area. We build on those efforts and help a community group strengthen their partnerships and collaborative improvements for the long term."

Carla K. Thomas, Director of Care Transitions, VHQC

QIO Partnership. WAH partners with its Medicare Quality Innovation Network – Quality Improvement Organization (QIN-QIO), Virginia Health Quality Center, and other community partners to collaborate in ways to improve care transitions across the healthcare continuum by applying the latest quality improvement tools and techniques. The partnership is involved in VHQC's quality improvement project that focuses on coordinating care for Medicare beneficiaries and reducing avoidable 30-day readmissions to the hospital. The involvement with VHQC's quality initiatives aligns with Medicare's three-part aim to improve care delivery, improve health, and reduce growth in cost for Medicare beneficiaries. VHQC helps hospitals, skilled nursing facilities, home health agencies and other community care partners work together on process improvement at the community level.

3) Partnerships and Programs Run by The Center for Health Equity and Wellness at Adventist Healthcare

In addition to the many program mentioned previously, there are many community initiatives that are housed at WAH but managed through the Center for Health Equity and Wellness at Adventist Healthcare. In this section we talk about two of the programs: Churches and Family Nurses Program and The Tobacco Cessation Program.

Churches and Faith Community Nurses Program. Linking its patients, and discharged patients, with social supports is central to Adventist HealthCare and Washington Adventist Hospital's strategy of improving health and socio-economic conditions in the community. One of the most important networks for this strategy is the religious community – an important reason why affiliation with a religious institution is one of the questions the hospital asks in its intake questionnaire. The program targets members of faith communities in its efforts to promote healthy living, lifestyle change, prevention practices, and works with congregants to decrease risk factors that impair health and wellbeing.

Although not formally contracted, The Center for Health Equity and Wellness at Adventist HealthCare has set up a network with over 140 faith communities at various levels to assist with meeting the health care needs of their congregations. The network of faith community nurses meets on a bi-monthly basis within the hospitals to provide education, resources and support.

The faith community nurse model is mostly volunteer-based, and central to the logic is that nurses in the field can address health issues before they exacerbate. According to Betsy Johnson, a faith community nurse at one of the most active congregations, with more than 1,100 members, some of the many programs offered within their congregation include classes on diabetes, healthy cooking, CPR, safe food handlers and depression recovery. They also offer periodic health screenings to help people track their health and progress. Another important program at this congregation is a joint home-visiting program by the Faith Community Nurse and the Pastor.

Adventist HealthCare supports the Faith Community Nurses in many ways, including offering access to health care professionals and community resources for lectures, classes, screenings, flu shots and other programs that take place in their place of worship. The faith community nurses also make their communities aware of special programs that they offer at their hospitals that may benefit their parishioners, such as cardiovascular and cancer screenings, maternal health programs, grief recovery, and other support groups. Faith community nurses also provide hospital visits for members of their congregations, and are at times a part of the transitional care team to develop a

discharge plan. This may include coordinating meals to be delivered to the congregant's home, or providing transportation to follow up appointments. Adventist HealthCare is exploring ways to further incorporate the valued faith community nurse into the transitional care process.

Tobacco Cessation Program. The Center for Health Equity and Wellness at Adventist Healthcare also manages a tobacco cessation program at WAH since 2002. This is operated through a County-based grant program. In 2013, the program at WAH was recognized for best practices by the Maryland Million Hearts Symposium, and in 2014 was offered additional funding from the State Department of Health and Mental Hygiene to expand this program to Shady Grove Medical Center. Nursing staff identifies patients who are smokers in their chart, and based on this information, certified tobacco cessation counselors see these patients. Patients are assessed based on their tobacco history and willingness to quit, and encouraged to join the program. The program offers patients free nicotine replacement therapy and over-the-phone counseling for up to a year. The counselors also follow up with these patients throughout the year to coach them to stay tobacco-free.

"...for every patient that comes into either hospital [Washington Adventist Hospital or Shady Grove Medical Center], the nurses account for their smoking history in their chart, and based on that, we get an order to see the patient while they are still in the hospital. We look at their tobacco history and past quit attempts, their willingness to quit, and we encourage them to be a part of the program..."

Samantha Watters, Tobacco Cessation Program, Washington Adventist Hospital and Shady Grove Medical Center

Section II: Looking at the Evidence

What does the available research literature suggest about the efficacy of population health strategies like the ones being implemented by Washington Adventist? On the overall efficacy of population health initiatives, the literature is still very limited, with little quality, experimental evidence on programs. Nevertheless, the evidence that is available does suggest that social determinants can be predictive of health outcomes, and that population health strategies have shown to reduce costs and generate positive return on investments. Under some circumstances, there is an improvement in health outcomes.

A 2011 OECD study looked at variations in health and social services expenditures across OECD countries, to assess their impact on a series of population-level health

outcomes.¹⁷ The study found that, after adjusting for the level of health expenditures and GDP, social service expenditures were associated with better outcomes in infant mortality, life expectancy, and increased potential life years lost. This study only tests correlations, and so the results should be interpreted with great caution, as they do not show any causal connections. Nonetheless it suggests that attention to broader domains of social policy may lead to improvements in health outcomes.

There is also evidence linking social determinants to health outcomes. For instance, a comparative risk assessment study looking at disease-specific mortality statistics from nationally representative health surveys derived from the National Center for Health Statistics found that smoking and high blood pressure were responsible for the largest number of deaths in the United States in 2005. Taken together, the role of tobacco, obesity, and physical inactivity accounted for 36 percent of deaths.¹⁸ Moreover, a 2009 World Health Organization publication looked at the percentage of total deaths around the world attributable to major risks and found that, in high-income countries, 45 percent of deaths were attributable to some combination of poor diet, physical inactivity, and drug or tobacco use.¹⁹

There is also evidence to suggest that investments in population health may reduce costs and generate a positive return on investment for hospitals. A 2012 meta-analysis²⁰ looked at 30 studies on the return on investment of population health programs, and filtered them according to methodological rigor (based on whether they had a quasi-experimental or experimental design and had been peer-reviewed) and saliency (how recently they had been published). The authors found that a comprehensive population health program can yield a positive return on investment, measured as changes in direct health care costs divided by program costs, of \$1.88 per dollar spent after an average interval of 2.2 years, with substantial returns more likely to occur after three or more years.

Although this research is promising, there is still a great deal of uncertainty surrounding the value of population health programs. For one thing, it is difficult to determine which mix of programs works best. To a degree, this is likely to depend on the circumstances, as each

¹⁷ Bradley, Elizabeth H., Benjamin R. Elkins, Jeph Herrin, and Brian Elbel, 2011.

¹⁸ Danaei, Goordarz, Eric L. Ding, Dariush Mozaffarian, Ben Taylor, Jurgen Rehm, Christopher J.L. Murray, and Majid Ezzati, 2009.

¹⁹ Global Health Risks: Mortality and Burden of Disease Attributable to Selected Major Risks. WHO, 2009.

²⁰ Grossmeier, Jessica, Paul E. Terry, David R. Anderson, and Steven Wright, 2012.

hospital develops programs that appear to best fit the needs and context of their community. Moreover, the research evidence supporting many of these programs is limited, as noted earlier, and many of them are poor in methodological quality.

In the case of WAH's programs, however, some population health initiatives similar to those that WAH is experimenting with have been rigorously evaluated. So in examining WAH's experience it is useful to review what the literature has to say on them. Consider two of WAH's largest programs: care-coordination programs and tele-health initiatives.

Care Coordination. Taken together, the broad evidence on the effect of care coordination programs on health outcomes (similar to WAH's transitional care program) so far is mixed to negative. A randomized study looked at the effect of 15 care coordination programs on hospitalizations, costs, and quality-of-care outcomes measured using claims data from 18,309 patients over 4 years, and found little differences in hospitalizations, and no difference in net savings for the patients involved.²¹ Moreover, in 2012, the Congressional Budget Office (CBO) released a brief looking at admissions and Medicare spending for 10 major disease management and care coordination demonstrations, comprising of a total of 34 care-coordination programs. They found that the programs had little or no effect on hospital admissions, and no effect (or, under some circumstances, a slight increase) on hospital spending.²²

This is not to say that care-coordination programs have no value, however, or cannot be effective at reducing costs and improving health outcomes. The literature cited above suggests that these programs are indeed likely to be more effective *under certain conditions*. For instance, transitional care programs in which care managers had substantial direct interaction with physicians and significant in-person interaction with patients — as WAH seeks to do — are more likely to reduce Medicare spending than other programs (CBO).²³ Meanwhile care programs with substantial in-person contact that target moderate to severe patients can be cost-neutral and improve some aspects of care, such as preventable hospitalizations for congestive heart failure.²⁴ Moreover, the CBO analysis suggests that the implementation of many of these demonstrations was hindered by Medicare's FFS payment system (CBO), and that they may have

functioned better under a new payment and delivery model.²⁵

These nuances are important, as WAH's transitional care model meets many of the key conditions that seem to lead to success: care managers have substantial direct interactions with physicians, and the program involves in-person visits with patients. Moreover, Maryland's shift to the GBR model should facilitate care-coordination among the different actors. While this suggests that WAH's transitional care program is on the right track, there needs to be a careful examination of the models used in successful care coordination programs. They could prove useful for WAH and other hospital systems.

Tele-Monitoring. The evidence on the effect of tele-monitoring interventions targeted at patients with chronic heart failure, similar to the patient monitoring program being implemented by WAH, is scarce but promising. A meta-analysis looking at studies on the effects of home tele-monitoring on patients with heart failure (filtered, again, based on relevance and methodological rigor) found that, taken collectively, home tele-monitoring interventions reduce the relative risk of all-cause mortality and heart failure-related hospitalizations compared with those patients undergoing usual care.²⁶ Moreover, focusing on the 12 randomized controlled trials that looked at the initiatives that exclusively used automated device-based tele-monitoring programs (similar to the program being used by WAH) showed a significant relative reduction of 35 percent in all-cause mortality, and a 23 percent reduction in heart-failure related hospitalizations among patients in the intervention groups compared to those in usual care.

So, overall, the literature on population health is scarce and often lacks methodological rigor. But, as a whole, it does suggest that population health initiatives may reduce costs, generate positive return on investments, and, under some circumstances, improve health outcomes. The literature also suggests that tele-monitoring initiatives and transitional care models, under the right structures, can be effective for improving health outcomes. For these reasons, WAH's emphasis on the social determinants of health could well be a good strategy.

Data Collection and Performance Tracking at WAH

WAH collects a variety of data, which it uses to report to the local government, as well as to keep track of the performance of some of their programs. WAH gathers and reports its clinical data through their Electronic Medical Record (EMR), using the software Cerner, through which

²¹Peikes, Deborah, Arnold Chen, Jennifer Schore, and Randall Brown, 2009.

²²Nelson, Lyle, 2012.

²³Nelson, Lyle, 2012.

²⁴Peikes, Deborah, Arnold Chen, Jennifer Schore, and Randall Brown, 2009.

²⁵Nelson, Lyle, 2012.

²⁶Kitsiou, Spyros, Guy Pare, and Mirou Jaana, 2015.

they log-in all their demographic and medical records. They also share their EMR data with CCI Health and Wellness Services, regarding appointments, patient outcomes, and other medical documentation for the patients they share. The data exchange goes one-way, since, because of interoperability issues, CCI does not grant WAH access to their EMR.

Under this system, Maryland has set up sophisticated state-level information Health Information Exchange (HIE) named the “Chesapeake Regional Information System for our Patients” (CRISP)²⁷, which allows hospital staff to keep track of patient readmissions across hospitals. HIEs were created to address the interoperability problem and better allow health care providers and patients to access and share clinical data electronically.²⁸ CRISP connects WAH with other hospitals in Maryland, allowing them to share hospital and medical records; create electronic referrals; notify each other if patients visit other hospitals in the state; and overall better understand readmissions patterns.

WAH receives notifications in real time for patient admissions, intra-facility transfers, and discharges in the state of Maryland. The WAH staff often use this data to further stratify patients, look at trends, and to guide some of their population health initiatives. For instance, nurses at the transitional care program look at CRISP reports daily when deciding which patients to reach out. The state of Maryland also uses CRISP to benchmark hospitals against each other based on preventable readmissions. It releases this information on a monthly basis.

Given that most of the population health initiatives at WAH are still in their infancy, the hospital is still refining the metrics it uses to measure them. At this point, most of the metrics from the programs are being assembled manually, or tracked in a basic spreadsheet. Some programs, like the tele-health initiative, have their own automated databases. In the future, WAH is aiming to break down the silos across its initiatives by centralizing all of their population health programs into Cerner. But they do face a series of challenges in doing this, especially as it relates to data sharing and medical record interoperability. Some of these challenges will be addressed in the recommendations section of this report.

Section III: Observations and Recommendations

Washington Adventist Hospital has joined the ranks of medical systems that recognize the importance of going outside the walls of a hospital to work with others to

address the issues in a community that cause many people to arrive at the emergency room. The senior medical staff at WAH and Adventist Healthcare sees “upstream” strategies not just in terms of health care efficiency, but also as central to their mission and their role in the community. They have also proven to be particularly creative and energetic in designing new approaches to population health and community outreach.

Studying WAH allows us to explore a number of issues that influence population health initiatives, as well as the role and effectiveness of hospitals as hubs in a community. Maryland’s unique hospital payment system creates incentives for WAH that raise broader questions about how best to encourage hospitals to play a leading role in their communities. Several of the hospital’s initiatives suggest approaches that could be used more broadly and the potential challenges to doing so.

Measuring Externalities and the Return on Investment for a Community

WAH’s experience is an illustration of a general challenge facing organizations that undertake upstream activities in a community — not just hospitals, but also schools, some housing initiatives and other approaches. WAH’s planned assistance for discharged homeless patients, for instance, would have long-term benefits to those individuals and to the county and state budget that are not directly identified. The challenge is how to identify and measure the positive externalities generated by an activity outside the hospital that benefits other sectors and households. If we are not able to do that, it becomes difficult to “capture” the value of these broader benefits and reflect them in budgets and business models. As WAH has found, weaknesses in our ability to measure externalities — indeed the failure often to include them at all — holds back funding for many initiatives.

As described earlier, empirical studies suggest that investments in population health may reduce costs and generate a positive return on investment for hospitals themselves.²⁹ These “bottom line” savings or benefits directly captured by a hospital will influence the hospital’s decisions about investments. There are also studies that have used a variety of economic methodologies to document the broader economic impact, or externalities, of certain health initiatives on the community.³⁰

But the evidence from these results were obtained using experimental or economic research methodologies, which are not necessarily suitable for identifying and capturing ROI from an accounting perspective — which is

²⁷ “Chesapeake Regional Information System for Our Patients.” Maryland State Dental Association, 2013. Web.

²⁸ “What Is Health Information Exchange (HIE).” *HealthIT.gov*. Web.

²⁹ Grossmeier, Jessica, Paul E. Terry, David R. Anderson, and Steven Wright, 2012.

³⁰ Deogaonkar, Rohan, Raymond Hutubessy, Inge Van Der Putter, Silva Evers, and Mark Jit, 2012.

what matters for hospital administrators and county or state budget officials. From the perspective of the hospital, it is difficult to use these studies to point a vector from a dollar spent outside the hospital on non-medical services — such as installing safety features in homes or providing transportation vouchers, as WAH has done — that directly decreases hospital admissions and ED visits. Nevertheless there are benefits to the household and perhaps others in the community. Health care outcome measures are not capturing whether employment rates and school attendance are increasing, housing and nutrition are improving, or employment rates are rising.

The difficulty of identifying a specific and complete dollar amount as an ROI can make it hard for a hospital's chief financial officer (CFO) to justify many population investments. This is reflected in the way WAH currently shows ROI, which is through cost-savings associated with patients who have come into the hospital rather than an increase in total value to the hospital plus the community. Once the hospital intervenes with a patient through some of its initiatives, the hospital's accountant examines the financials before and after the intervention, explains Zachary Goodling, Supervisor of Population Health at WAH:

“...one of the struggles with the capitation system is that there's no financial incentive, as far as earning money, or getting reimbursed. It is only at a cost-saving. Basically how we do it is once we intervene with a patient for each program, we pull out the financials for 30 days before and 30 days after, and typically what we see is high utilization up to that point, and low utilization afterwards, and so that's how we have to calculate ROI for all of our programs.”³¹

The ROI challenge can lead to some odd results. For instance, the difficulty of showing the CFO and accounting ROI to the hospital for many community-based initiatives, such as the food assistance program, leads staff at WAH — which has an annual budget of about \$250 million — to seek small grants from local foundations to finance several of these programs.

Recommendations

The available empirical literature serves as an initial guide for getting a better sense of the return on investment and some of the broader community impacts of some initiatives. The empirical evidence offers a good estimate of the potential ROI of population health initiatives in terms of healthcare costs. It suggests that a comprehensive population health program can yield a positive ROI, as measured as changes in direct health care costs divided by

program costs, of \$1.88 per dollar spent after an average interval of 2.2 years.³²

Economists often use different methods to measure externalities: contingent valuation, revealed preference models, and experimental or correlational analyses to name a few. But this requires good access to data, and the technical skills and expertise to carry out these analyses, which are often outside the budget and capacity of organizations such as WAH. Moreover, even when externalities are calculated using economic methodologies, it is still difficult to integrate these into the accounting structures of organizations.

There is thus a need to conduct more empirical research measuring the economic externalities of population health initiatives, as well as a need to refine the metrics and methodology to capture these savings from an accounting perspective. Moreover, greater emphasis needs to be placed on developing metrics and integrated data systems to estimate the ROI of hospital-financed initiatives in non-medical areas such as improved school attendance and an increased capacity for work. More research needs to be focused on developing such metrics that can capture the broad social value of interventions — especially a common set that can be used across all participating and partnering community organizations.

Public Budgeting

But steps are needed beyond calculating a more comprehensive ROI. To encourage an efficient level of investment by a hospital hub in the community, accounting systems and budgeting would need to reflect the full costs and benefits involved in a community and direct investment funds most efficiently. For instance, if a hospital-led program aimed to address obesity or mental health results in an improvement in school attendance and graduation — separate from any savings for the health system — then ideally the school budget should be able to devote resources to help that initiative. In addition, as discussed below, the underlying incentives of payment systems would need to reflect the goal of encouraging the hospital sector to make investments in the community where it is best placed to achieve an efficient impact.

Unfortunately government budgeting is not generally well suited to achieving this goal. Budgets at all levels of government tend to be walled off, and it is unusual for agencies to be inclined to mix funds with each other to achieve broad community-wide goals. That said, waivers in the Medicaid program have allowed money in that program to be used for non-medical purposes, such as housing supports, that lead to reduced hospital and nursing home spending.

³² Grossmeier, Jessica, Paul E. Terry, David R. Anderson, and Steven Wright, 2012.

³¹ Conversation with the authors.

Recommendations

One way to encourage integrated strategies to improve the health and economic or social conditions in a community would be to allow broader waiver authority between programs at various levels of government. For instance, in addition to federal law permitting Medicaid to grant waivers for its funds to be used for certain housing services in order to reduce Medicaid costs and better achieve that program's goals, waivers could also be permitted to allow Medicaid, housing and education funds to be co-mingled for integrated initiatives that could better achieve goals in each sector.

A second approach would be to make greater use of public "venture capital" funds to finance activities in one sector that have broad community impacts. For instance, the state of Maryland has created a Community Health Resources Commission, which provides grants to expand access in underserved communities, and provides other funds to cover part of the cost of an initiative with a community-wide impact. In addition, at the federal level, the Innovation Center within CMMI makes grants to promising approaches in payment and delivery reform. In addition, CMMI is also cooperating with the Department of Education on initiatives that have a positive impact on school attendance and readiness, and with the Department of Housing and Urban Development to help expand some supportive services, such as in New York and Louisiana. Expanding such interagency ventures could help fund a number of hospital-based ventures where the return is to the wider community rather than to the hospital itself.

A third strategy may be to attract risk-taking private funding, at least for start-up costs to allow a promising initiative to be launched. The increasing experiment with Social Impact Bonds (SIBs) — sometimes called Pay for Success Bonds — seems to be providing a vehicle for this.³³ SIBs involve a contract between a public agency and a private investor, in which the agency pays a return to the investor if a measurable social outcome is achieved. So part of a school budget earmarked for improving attendance, or part of a program budget to increase work readiness, could be reserved to pay a return on a SIB for agreed measurable success by a hospital-based initiative in reaching those goals.

Intermediaries and Partners

In functioning as a hub, WAH has developed a wide range of partnerships and relationships with organizations in the community as well as national organizations. These are the spokes that link the hospital as hub to the community it serves. So while WAH is taking the lead in its programs to address health and other conditions in the

community, there is a division of labor and a conscious strategy of helping to build the institutional assets in the community. The pattern of these partnerships is an interesting reflection of how a hospital can function as a hub.

Extensions of medical functions. In some cases the partner is a natural outgrowth of WAH's objective of assuring a seamless medical transition of hospital patients back into the community, with good coordination of medical services. The close relationship with CCI is the best example of this, but so are the relationships with Walgreens and some of the medical programs administered through the parish nurse system. But for these medical partnerships to be seamless, WAH has had to address a number of potential obstacles and remains focused in these. Its attention to achieving an efficient flow of medical information, for instance, can be seen in the ongoing improvements in coordinating data systems between WAH and CCI (see below). WAH's training program for community nurses and other organizations recognizes the additional need to address the privacy issues associated with non-hospital partners handling medical information.

Outsourcing to Intermediaries with expertise. In other cases WAH has turned to an intermediary that can carry out a program function more efficiently than the hospital itself. The SEEDCO and Family Inc. partnerships are an example of this. In principle the hospital could have linked up patients with non-medical social services they are able to receive by using hospital staff to identify eligibility and help patients sign up. But that would likely involve some staff working at tasks that are outside of their area of expertise. It might have used volunteers, but that would likely have required a heavy investment in training. WAH might also have sought a partnership with an organization like Health Leads, which embeds college students specifically to link patients to social services. But by turning to SEEDCO it chose a partnership that also has the potential to grow, since SEEDCO provides services and technical assistance in a range of areas, including workforce placement. SEEDCO also works with community organizations and employers, and in this sense is an intermediary hub itself. Likewise, WAH's partnership with Family Inc. is another example of how the hospital outsourced follow-up care on some of its patients with the highest risk of readmission and a great share of behavioral health problems, to an institution with more capacity and expertise. Through such partnerships, WAH becomes part of a system of interlocking hubs.

Direct links with the community. In other cases, such as WAH's nutrition program with the Crossroad Community Health Market or with the churches in the community, the

³³ Poethig, Erika C., John Roman, Kelly Walsh, and Justin Milner, 2015 and Shah, Sonal, and Kristina Costa, 2013.

hospital is building direct relationships with institutions in the community, helping them in turn to play an enhanced role. As noted earlier, WAH has initiatives in housing projects and has also considered becoming involved in addressing some aspects of homelessness, because discharged individuals without stable housing are less likely to carry out discharge recommendations and more likely to end up back in the emergency room. The hospital has entered discussions with the county for possible use of a six-bedroom house for homeless patients to be provided follow-up services after discharge.

As these partnerships indicate, a hospital functioning as a hub can develop relationships with the community in a number of ways and venturing into fields beyond traditional health care. Each partnership involves important considerations. One is the matter of control. When a hospital turns to another intermediary — for instance WAH’s relationship with SEEDCO and Family Services Inc. — it gains sophisticated expertise, but it is also dealing with an organization that may have a different vision of community development and perhaps different goals. That might require more compromises than when the hospital is the primary or sole institution in providing a service. Another consideration is again the issue of measuring return on investment. When a hospital like WAH becomes engaged in a medically-related activity that also has wider benefit to the community, such as addressing some aspects of homelessness or helping discharged patients receive job-placement services, justifying the ROI for the hospital’s investment becomes harder because much of the return is not captured via medical metrics.

Recommendations

The WAH experience suggests there is no “one-size-fits-all” strategy for determining what a partnership between a hospital and other institutions should look like. The best partnerships for a hospital hub will depend on the particular circumstances of the community and the hospital’s chosen strategy. They will also depend on the degree to which the hospital is willing to share control over that strategy, and on the degree to which there are measurable health effects that will help the hospital more easily justify the investment. Having said that, the literature does suggest that community-wide efforts often benefit from having one organization play the role of the coordinator, the “orchestra conductor,”³⁴ synchronizing the effort of the different community organizations.^{35,36} Given the push for population health initiatives at the national

level and across many states, it is likely that hospitals will start to play more and more the role of community coordinators across neighborhoods.

Policymakers should encourage neighborhoods to experiment with a range of partnerships and monitor the results, while at the same time pushing for the networks to be coordinated by a backbone organization. The “venture capital” funding model we described earlier would help facilitate such partnerships. Improvements in the measurement of the broader, non-medical return on an investment would provide a more complete evaluation of the partnership’s impact. For instance, WAH’s possible future initiative with the homeless likely would reduce social service and other costs for the county and state, not just medical costs.

Incentives

The Medicare readmission penalties that Washington Adventist and other hospitals face are an important financial stick to encourage hospitals to explore community partnerships. Maryland’s broader readmission penalties add to the incentive and they were the primary driver to WAH’s aggressive experiment with community partnerships and initiatives.

In addition, the state’s new GBR adds another powerful incentive for WAH and other Maryland hospitals to explore a wide range of strategies to reduce admissions. That is because under the GBR, a Maryland hospital like WAH receives a negotiated amount of revenue each year no matter how many patients they treat and the volume of services they provide. They must deliver quality services to the community, however.

The GBR may appear to create similar incentives for both efficient care and community as a capitated system like Kaiser Permanente. Kaiser receives an amount per member (i.e. enrollee in its plan) and so has an incentive to keep members healthy rather than profiting from delivering more services, as is the case in a traditional FFS model. Some of the upstream community strategies implemented by Kaiser in several of their locations nationwide include: a transitional care program, a telephonic education and care management program for patients at risk of cardiac arrest, and a computerized pharmacy alert system that alerts physicians when elderly patients are dispensed potentially inappropriate medication.³⁷

But there are important differences between the incentives for Kaiser and WAH. If Kaiser engages in creative community efforts that reduce medical costs, these savings allow it either to improve its net revenue or to price its insurance more competitively and likely expand

³⁴Turner, Margery Austin, 2015 and Erickson, David, Ian Galloway, and Naomi Cyton. 2012.

³⁵ Turner, Margery Austin, 2014.

³⁶ Erickson, David, Ian Galloway, and Naomi Cyton, 2012.

³⁷McCarthy, Douglas, Kimberly Mueller, and Jennifer Wrenn, 2009.

its premium-paying members and revenue. WAH, on the other hand, does not have members. It serves the general community. So its financing system is actually more like that of a Canadian or a British National Health Service hospital than Kaiser, since its global budget is based on total number of admissions. The concern for WAH's managers is that if the hospital does a particularly good job in reducing the volume of admitted patients, then the state may press for a lower budget for the WAH in subsequent years. It is true that to help offset this concern; the state does give WAH a certain percentage of additional revenue for hitting its targets for reducing readmissions. Nevertheless, the basic financing model does mean WAH risks reduced funding for future initiatives if it is successful at reducing the need for hospital care.

Despite the differences between the Kaiser and GBR models, both have stronger incentives for upstream strategies to improve community health than does the traditional FFS model. Indeed, strategies to address population health needs generally are not sustainable or supported under the FFS hospital payment system. Upstream preventive strategies — such as placing community health workers or nurses in churches to provide preventive care — might have positive effects on individuals and communities by preventing their need to seek care at the a hospital or ED. However, they directly reduce business and revenue for the hospital.

An interesting variation of the FFS model, however, is the Geisinger Health System in Pennsylvania. While most of its physicians and clinical care is FFS, Geisinger also operates its own insurance plan. In order for the insurance plan to be competitive, Geisinger has an incentive to find strategies to keep costs down within its hospitals and doctors' offices — and it has become a leader in such strategies. For example, it uses nurses in the primary care setting to work side by side with primary care physicians and act as integral members to their practice teams made up of physicians, physician assistants, and pharmacists, social workers, and others who are responsible for population health.³⁸ These nurses are responsible for developing and carrying out a care plan in coordination with the patient's physician and act as a "personal patient link" to facilitate 24-hour access and smooth transitions in care, provide patient and family education, and conduct timely follow-up.³⁹ The Geisinger Health Plan will also embed personnel in group physicians' offices to improve access to outpatient care, especially in rural areas.⁴⁰

CMMI is also supporting the testing of new hospital payment models, such as Accountable Care Organizations

(ACO) for Medicare patients, through the provision of grants.⁴¹ ACOs use a range of payment models including FFS. One CMMI program is testing what is known as the "Pioneer ACO Model," in which health care providers who are already experienced in coordinating care for their patients across multiple care settings, voluntarily partner to provide high quality, population-based, and efficient care to their Medicare patients. The providers can then share in the savings that they create for the Medicare program.⁴² As one of the most successful Pioneer ACO Models currently being tested, the Montefiore Medical Center in Bronx, New York, provides a variety of non-clinical, upstream services to its patient population, to ensure that their overall health outcomes are improved. However, such programs are grant-based and are not necessarily a sustainable system.

Recommendations

A key to hospitals functioning as hubs by helping coordinate a range of services that serve the wider community is to strengthen incentives for hospitals to undertake initiatives even when the main return is not to the hospital itself. This situation is often referred to as a "two pocket" problem: an institution in one part of a community incurs a cost while the main benefit accrues elsewhere. The result is usually insufficient investment in the institution's activities that have broader impact. It is true that Maryland's GBR budget system and readmission penalties do foster upstream efforts to improve conditions in a community where there is also a direct health benefit (or reduced penalties) to the hospital. But because of the two pocket problem and the measurement of non-health benefit externalities discussed earlier, it is important to create a better set of incentives for hospitals to achieve their full potential as community hubs.

The implementation of the CHNA offers an incentive for hospitals to serve as a backbone organization, coordinating some community-wide efforts. Created as part of the Affordable Care Act, the CHNA requires nonprofit hospitals, as a condition of their tax-exempt status, to conduct a health needs assessment in the community at least every three years, collecting information on behavioral and other upstream social and economic factors that impact health outcomes. The CHNA also requires hospitals to undertake primary (e.g. focus groups, surveys, key informant interviews) and secondary data collection (census data and other publicly available data) in the community, and develop an implementation strategy outlining the steps they will take to address some

³⁸ Byerly, Ronald H., and Mary S. Rittle, 2014.

³⁹ McCarthy, Douglas, Kimberly Mueller, and Jennifer Wrenn, 2009.

⁴⁰ Byerly, Ronald H., and Mary S. Rittle, 2014.

⁴¹ "Accountable Care Organizations (ACOs): General Information." CMS [visit this page for an explanation of all of the different types of ACOS they support]

⁴² "Pioneer ACO Model." (CMS). Web.

of the population health issues within their catchment area.⁴³

The CHNA requirement only became effective in 2012, and so many institutions are still in their first cycle of assessment and implementation. For WAH, the process of gathering the data and writing the needs assessment was led by the Adventist HealthCare Center for Health Equity and Wellness. The CHNA pushes hospitals to solicit input from a variety of different sources, including local public health departments, low-income minority populations, and a wide variety of community stakeholders.⁴⁴ Thus it encourages nonprofit hospitals to explore ways of contributing to broader community improvement well beyond what goes on inside the hospital itself, as well as to coordinate the delivery of services among different community actors. Gina Maxham, Project Manager of Community Benefit at Adventist Healthcare, describes the CHNA's effect:

"The CHNA can be a great tool for guiding community benefit and population health efforts. It encourages collaboration among community stakeholders in identifying and prioritizing health needs as well as addressing them. A CHNA provides a picture of both the needs and resources in a community, and can help to ensure that efforts are being targeted toward the areas of greatest need while minimizing the duplication of efforts, and fostering the formation of community-building partnerships."

The CHNA has some interesting similarities to the Community Reinvestment Act (CRA) of 1977. Designed to ensure banks in low- and moderate-income neighborhoods invest in their local communities, the CRA has led to a series of regulations to encourage commercial banks and thrifts to improve lending and improve neighborhoods in communities.⁴⁵ The CRA has evolved over the years to become an important tool for encouraging financial institutions to play a greater role in the physical improvement of neighborhoods and a tool for fostering community improvement.

One could imagine a similar scenario unfolding with hospitals under the CHNA. With reports being assembled by nonprofit hospitals on local needs and their community strategy, it would be possible soon to build a fuller picture of hospital activities in communities. In fact, health experts at George Washington University are currently developing a tool to identify community investments by nonprofit

hospitals in their communities, such that local governments and the public will be able to track these investments. With such information in hand, local governments would be able to work with these hospitals, and other nonprofit organizations, on a more coordinated strategy to address the social determinants of health in neighborhoods.⁴⁶

Issues of Data Sharing: Electronic Medical Record Interoperability and Regulatory Impediments

Interoperability is the sharing and use of clinical data collected in EMRs between different health care providers. Problems in interoperability make data sharing difficult. There are many barriers to interoperability as many software developers are reluctant to create universal health information technology (HIT) products that can operate within any EMR system, thanks to their weak competitiveness and inability to "lock in" customers.⁴⁷ As a result, EMRs from different vendors using different HIT products typically cannot easily communicate or share data. Add to that the problem that information about other, non-medical aspects of a patient's condition, such as the social services available to them or their eligibility for housing, is not immediately available to hospital staff and those other data systems cannot easily be integrated with medical data in order to coordinate a full range of services. Yet, communication is vital for examining the broader social value of public health initiatives, and to facilitate cooperation between various community services.

Washington Adventist does have the advantage that the state of Maryland is among the leaders in improving EMR interoperability thanks to its Health Information Exchange (HIE), "named the "Chesapeake Regional Information System for our Patients" (CRISP)."⁴⁸ As described earlier, HIEs were created to address the interoperability problem and better allow health care providers and patients to access and share clinical data electronically.⁴⁹ CRISP connects WAH with other hospitals in Maryland, allowing them to share hospital and medical records much more easily. Hospitals can also create electronic referrals, notifying each other if patients visit other hospitals in the state. They can also identify readmissions patterns that allow the hospitals to develop better strategies.⁵⁰

WAH staff is still unable to receive data from other

⁴³ "New Requirements for 501(c)(3) Hospitals Under the Affordable Care Act." IRS, 2015.

⁴⁴ "New Requirements for 501(c)(3) Hospitals Under the Affordable Care Act." IRS, 2015.

⁴⁵ "A Brief Description of CRA." NCRC, 2015. Web.

⁴⁶ "A Brief Description of CRA." NCRC, 2015. Web

⁴⁷ Amarasingham, Ruben, Rachel E. Patzer, Marco Huesch, Nam Q. Nguyen, and Bin Xie, 2014.

⁴⁸ "Chesapeake Regional Information System for Our Patients." Maryland State Dental Association, 2013. Web.

⁴⁹ "What Is Health Information Exchange? (HIE)." *HealthIT.gov*.

⁵⁰ "Chesapeake Regional Information System for Our Patients." Maryland State Dental Association, 2013. Web.

community organizations that their patients are being referred to, and therefore are not able to get a full understanding of their population health impact outside of the hospital. For example, although WAH grants CCI access to the clinical visit data of their EMR, the two entities use different EMRs, which prevent CCI from sharing data with WAH, even though WAH refers numerous patients to the clinic. This is a common challenge that HIEs face. A centralized, interoperable database that spans across different types of community organizations would allow for the upstream population health impact of WAH's interventions to be better measured and the partnerships better executed.

In addition, supplementing coordinated health data with information on non-medical services received by patients, or for which they are eligible, remains a problem for a hospital trying to function as a hub. Washington Adventist has sought to address this, as described earlier. The non-medical items on the questionnaire for patients is unusual for a hospital and does provide important information for the WAH staff handling the needs of patients after discharge.

The partnership with SEEDCO is an important new dimension to WAH's ability to address the full needs of patients after discharge. Partnering with SEEDCO through their Earn Benefits program allows the hospital to gain access to a data system for social service benefits without having to design its own. Dealing with this aspect of the data sharing challenge by "embedding" the SEEDCO system has some similarities to the service made available to other hospitals in some regions of the country by Health Leads. Health Leads trains college students to use online data systems and sign-up procedures to link patients to programs that can provide the services they need, from food assistance to help with utility bills. In the Health Leads model, the health provider writes a "prescription" for non-medical services and the patient brings the prescription to the Health Leads desk and staff embedded in the hospital. The Health Leads staff works with the patient to sign up for services, follows up with the patient and updates the hospital.

There are several regulatory impediments that further hamper data-sharing and cooperation across institutions. The Health Insurance Portability and Accountability Act (HIPAA), the federal rule intended to protect the privacy of personal information, was enacted in 1996 — at a time in which patient information was still largely in paper form and when population health strategies and integrated services were not getting as much attention as today.⁵¹ HIPAA is very complex, and a lack of understanding of the Act often causes organizations to be unduly restrictive

⁵¹ "Health Information Privacy." U.S. Department of Health & Human Services. Web.

in their data sharing practices, and serves as an obstacle for the sharing of individual-level, health-related data across organizations. Zachary Goodling of WAH gives an example of how HIPAA is an obstacle for cooperation:

"HIPAA requirements state that the patients must sign a release to share their health information. If the agreement doesn't necessarily cover all of the privacy concerns, we must also sign a BAA (business associate agreement) with that other entity. A great example would be some of our homeless population: we can share information related to the patient's continuum of care, but once they have left our doors it becomes notoriously difficult to receive patient information back to us."⁵²

Other legal restrictions, like the physician self-referral law (often referred to as the Stark Law), add to the difficulties. The Stark Law prohibits most physician referrals of designated health services for Medicare and Medicaid patients if the physician has a financial responsibility with that entity.⁵³ CMS has allowed certain exceptions to apply, such as allowing patients to receive services from physicians (or under the supervision of physicians) within the same group practice as the referring physician. The secretary of the Department of Health and Human Services also has the ability to grant additional exceptions regarding services like preventative screening tests, vaccinations, and immunizations.⁵⁴ While the intent of the law may make sense, it also makes it difficult for WAH to develop formal relationships with doctors and facilities outside of the hospital in order to coordinate the continuous treatment of a patient — even when the total cost is lower and the treatment is more effective.

Recommendations

For hub models like WAH to function effectively, there needs to be significant investment in creating broad data collection and sharing "ecosystems". WAH's access to community-level data is already sophisticated in many ways. WAH's partnership with its Virginia Health Quality Center and the launch of the CHNA have allowed WAH to gain reliable access to community-level data. CRISP has also allowed hospitals in Maryland to obtain more real-time, individual-level data on healthcare information offered to patients across the state. The next step is to continue to help build these integrated systems, and to encourage the further consolidation of panel data at the individual-level. Although data-interoperability and

⁵² Conversation with the authors.

⁵³ "Physician Self-Referral." Centers for Medicare & Medicaid Services. Web.

⁵⁴ "From the AIS Bookshelf: From Chapter 400: The Stark Law Exceptions". Atlantic Information Services, Inc. 2015

privacy regulations complicate the integration of data at the individual-level, there are instances of organizations that have managed to work through these limitations. These may serve as blueprints for the leadership of hubs and for private and public funders. For instance, the Actionable Intelligence for Social Policy⁵⁵ (AISP), housed at The University of Pennsylvania, helps design quality integrated data systems for local government agencies. Their publications^{56 57} offer very detailed guidelines on some of the key challenges facing integrated data systems, how to address them, and examples of organizations that have succeeded in developing these systems. A 2010 AISP report⁵⁸ offers a detailed survey of eight integrated data systems, including states, local governments and university-based efforts, and how they dealt with issues across four dimensions: legal, ethical, scientific and economic. The issues addressed include: HIPAA and FERPA compliance, data-sharing, protection of confidentiality of the data, access to funding sources, and matters of cost and maintenance budget. Another AISP report⁵⁹ offers detailed advice on techniques to help organizations link individual-level records, and strategies to build the architecture and infrastructure of these integrated systems.

Other neighborhood partnership and intermediaries are also interesting examples of data-sharing partnerships, such as the National Neighborhood Indicators Partnership⁶⁰, the Strive Network in Cincinnati,⁶¹ and the Family League of Baltimore.⁶² Funders and local governments should look into such examples, as they offer valuable guidance and models for how organizations can build data-sharing ecosystems within communities.

Empirical Evaluation and Further Research

The rigorous evaluation of programs, under experimental or quasi-experimental conditions, remains the gold standard for capturing the causal effects of social policy interventions. WAH is still in the early stages of many of its population health initiatives, and so a rigorous evaluation of their evolving initiatives at this point would not be particularly helpful. Moreover, too much of a focus on rigorous evaluation in the early days of an evolving initiative can end up freezing or constraining creativity. At this point, the higher priority is for WAH and similar

hospitals to establish sophisticated data mechanisms to track the performance of their families. Once these initiatives have matured and consolidated, rigorous evaluation is appropriate.

Recommendations

Bearing in mind the appropriateness and timing of evaluations, there are steps that WAH and hospitals can take now to make the rigorous evaluation of programs easier in the future.

First, developing a comprehensive, individual-level integrated data system, as suggested in the previous section, could help facilitate future quasi-experimental natural studies, allowing researchers to compare treatment and control groups based on the access of families to different population health services. Ideally, as part of this integrated system, and to have a control group, hospitals like WAH should also continue to capture an array of information on those patients who are at risk of readmissions but have not participated in any of the population health initiatives.

Second, as the population health initiatives of hospitals grow, internal and external funders should channel a portion of their resources to help hospitals develop partnerships with universities and empirical research institutions, thus establishing the foundations for the evaluation of their community programs. Some other hub institutions, such as Briya/Mary's Center in Washington D.C., have begun to evaluate some of their initiatives through their partnerships with local research institutions.⁶³ In addition, when developing and expanding their population health initiatives, hospitals should use the empirical literature available to guide the design of their programs. For instance, the evidence we reviewed in this paper suggests that such approaches as automated tele-health initiatives, similar in form to WAH's remote patient monitoring program, can significantly reduce the risk of all-cause mortality and heart failure-related hospitalizations.⁶⁴ The literature also suggests that transitional care-programs, in which case managers had substantial interaction with physicians and significant in-person interaction with patients, can reduce health spending⁶⁵ and improve some aspects of care.⁶⁶ Population health initiatives thus should look into such approaches as significantly expanding tele-health initiatives and transitional care-programs in the community, implementing under the conditions suggested by the

⁵⁵ "About Us." *Actionable Intelligence for Social Policy*. Web.

⁵⁶ Kumar, Prashant, 2012.

⁵⁷ Kumar, Prashant. 2012.

⁵⁸ Culhane, Dennis P., John Fantuzzo, Heather L. Rouse, Vicky Tam, and Jonathan Lukens, 2010.

⁵⁹ Kumar, Prashant, 2012.

⁶⁰ "Home." *National Neighborhood Indicator Partnership*. Web.

⁶¹ "Home." *Strive Together Network*. Web

⁶² "Home." *Family League of Baltimore*. Web

⁶³ Butler, Stuart M., Jonathan Grabinsky, and Domitilla Masi. 2015.

⁶⁴ Kitsiou, Spyros, Guy Pare, and Mirou Jaana, 2015.

⁶⁵ Nelson, Lyle, 2012.

⁶⁶ Peikes, Deborah, Arnold Chen, Jennifer Schore, and Randall Brown, 2009.

research.

Conclusion

Katherine Barmer, Director of Population Health Management for Adventist HealthCare, sums up her experience at WAH in this way:

“Overall, as a hospital we have been asked to break down the walls of our organization and become a true community partner that is responsible for the community and population we serve. We are not only responsible for the medical needs, but are now tasked with identifying and addressing the social determinants of health. I never imagined when I was in nursing school at Chapel Hill that I would end up working on finding housing, installing smoke detectors, working with a local farmers market or screening hospitalized patients for childcare assistance, but this is where we are in healthcare today.”⁶⁷

As a case example, WAH indicates the enormous potential for hospitals to play a leading role in fostering improved health and general wellbeing in a community. From linking together institutions and partners in a network of supports, to venturing into areas not normally associated with hospitals, such as homelessness and social services, WAH has shown what an entrepreneurial hospital can do to promote a culture of health and opportunity. But WAH’s experience also indicates the obstacles and challenges for hospitals seeking to function as community hubs. The benefits of WAH’s activities in the community beyond strictly health impacts are not adequately measured and built into the hospital’s business model. Nor are these broader benefits incorporated into budgetary decisions by the state and county, although WAH’s home state of Maryland is beginning to take steps to do so. Weaknesses in data sharing and interoperability limit what WAH and its partners can do. These issues need to be addressed. If they are, the walls of hospitals will become more porous and these institutions will come to play a crucial role in strengthening American communities.

– **Stuart Butler** is a Senior Fellow in the Economic Studies Department at The Brookings Institution.

– **Jonathan Grabinsky** is a Senior Research Assistant in the Economic Studies Department at The Brookings Institution.

– **Domitilla Masi** is a former research assistant in the Engelberg Center for Health Care Reform at The Brookings Institution.

⁶⁷ Conversation with the authors.

Appendix A

Readmission Risk Score

(Weights Not Included)

Exclude: Post-Partum, Nursery, Pediatrics, Outpatients, and Scheduled Procedures
Length of Stay 3-6 days

1. Length of Stay 7-13
2. Length of Stay 14+
3. 30 Day Readmission
4. High Risk Diagnosis (PNE, CHF, Sepsis, AMI, CVA/TIA, DKA/Hypoglycemia, PVD, Psych, Metastatic Tumor, ESRD)
5. Frequent ED Visits (2 or more per month)
6. Problem Medications (Anticoagulants, Insulin, Oral Hypoglycemics, Plavix/ASA dual therapy, Narcotics)
7. Poor Health Literacy (unable to teach back or understand basic health terms)
8. Self-Pay/Inadequate Financial Support
9. Poly-pharmacy (6 or more meds)
10. Frequent Admissions (2 or more within last 180 days)
11. Home Bound/Bed Bound
12. Chronic Cognitive Impairment
13. SNF Resident
14. Terminally Ill
15. Decubitus or Non Healing Wound
16. Needs Assistance with ADL's or is dependent
17. Homeless/Shelter
18. Age 75 or greater and lives alone
19. Acute Confusion/Disorientation
20. Drug/ETOH Abuse
21. No support system/lack of family care
22. Hearing/Visual Impairment or Illiterate
23. Lack of transportation
24. Vent Dependent
25. Falls or Hx of falls in last 3 months

Works Cited

- “A Brief Description of CRA.” *A Brief Description of CRA*. The National Community Reinvestment Coalition (NCRC). Web.
- “About Us.” *Actionable Intelligence for Social Policy*. Web.
- “Accountable Care Organizations (ACOs): General Information.” Center for Medicare and Medicaid Services (CMS). Web.
- Atlantic Information Services, Inc. “From the AIS Bookshelf: From Chapter 400: The Stark Law Exceptions.” *A Guide to Complying with Stark Physician Self-Referral Rules*. 101-13. 2015. Print.
- “Health Information Privacy.” *U.S. Department of Health & Human Services: Improving the Health, Safety, and Well-being of America*. Web.
- “HealthIT.gov.” *What Is HIE (Health Information Exchange)?* 12 May 2014. Web.
- “Home | NNIP.” *National Neighborhood Indicator Partnership*. Web.
- “Home.” *Strive Together Network*. Web.
- “Maryland All-Payer Model.” Center for Medicare and Medicaid Services (CMS). Web.
- “New Requirements for 501(c)(3) Hospitals Under the Affordable Care Act.” *New Requirements for 501(c)(3) Hospitals Under the Affordable Care Act*. Internal Revenue Service. 09 June. 2015. Web.
- “New Requirements for 501(c)(3) Hospitals Under the Affordable Care Act.” Internal Revenue Service. 09 June. 2015. Web.
- “Pioneer ACO Model.” *Pioneer ACO Model*. Center for Medicare & Medicaid Services. 08 June. 2015. Web.
- “The Agreement Between The Health Services Cost Review Commission and Adventist Healthcare Regarding Global Budget Revenue and Non-Global Budget Revenue.” The Maryland Health Services Cost Review Commission. 31st March. 2014. Web.
- “What Is Health Information Exchange (HIE).” *HealthIT.gov*. HealthIT. Web.
- “What Is Health Information Exchange (HIE).” *HealthIT.gov*. HealthIT. Web.
- Adamopoulos, Helen. “Focusing on the Patient, Not the Condition: What Hospitals Need to Know About Avoiding Medicare Readmission Penalties.” *Becker's Healthcare*. 05 Feb. 2014. Print.
- Amarasingham, Ruben, Rachel E. Patzer, Marco Huesch, Nam Q. Nguyen, and Bin Xie. “Implementing Electronic Health Care Predictive Analytics: Considerations and Challenges.” *Health Affairs* 33.7. 1148-154. 2014. Print.
- Bradley, Elizabeth H., Benjamin R. Elkins, Jeph Herrin, and Brian Elbel. “Health and Social Services Expenditures: Associations with Health Outcomes.” *BMJ Quality and Safety*. 826-31. 2011. Print.
- Butler, Stuart M., Jonathan Grabinsky, and Domitilla Masi. “Using Schools and Clinics as Hubs to Create Healthy Communities: The Example of Briya/Mary’s Center.” *The Brookings Institution*. 2015. Web.
- Byerly, Ronald H., and Mary S. Rittle. “Physician Assistants Filling Gaps at Geisinger Health System.” Weblog post. *News & Perspective*. Medscape Multispecialty. 28 Aug. 2014. Web.
- Chesapeake Regional Information System for Our Patients. “CRISP: Maryland's Health Information Exchange.” *Maryland State Dental Association*. 2013. Web.
- Danaei, Goordarz, Eric L. Ding, Dariush Mozaffarian, Ben Taylor, Jurgen Rehm, Christopher J.L. Murray, and Majid Ezzati. “The Preventable Causes of Death in the United States: Comparative Risk Assessment of Dietary, Lifestyle, and Metabolic Risk Factors.” *PLOS Medicine*. 28 Apr. 2009. Web.
- Dennis P. Culhane, John Fantuzzo, Heather L. Rouse, Vicky Tam, and Jonathan Lukens. “Connecting the Dots: The Promise of Integrated Data Systems for Policy Analysis and Systems Reform.” *Actionable Intelligence for Social Policy*. 2010. Web.
- Deogaonkar, Rohan, Raymond Hutubessy, Inge Van Der Putten, Silva Evers, and Mark Jit. “Systematic Review of Studies Evaluating the Broader Economic Impact of Vaccination in Low and Middle Income Countries.” *BMC Public Health*. 2012. Web.

Erickson, David, Ian Galloway, and Naomi Cyton. "Routinizing the Extraordinary." *Investing In What Works for Americas Communities*. 2012. Web.

Erickson, David, Ian Galloway, and Naomi Cyton. "Routinizing the Extraordinary." *Investing In What Works for Americas Communities*. 2012. Web.

From The AIS Bookshelf: From Chapter 400: The Stark Law Exceptions. Rep: Atlantic Information Services. 2015. Print.

Gawande, Atul. "Finding Medicine's Hot Spots; Can We Lower Medical Costs by Giving the Neediest Patients Better Care?" *The New Yorker*. 24 Jan. 2011. Web.

Global Health Risks: Mortality and Burden of Disease Attributable to Selected Major Risks. Rep. World Health Organization. 2009. Print.

Grossmeier, Jessica, Paul E. Terry, David R. Anderson, and Steven Wright. "Financial Impact of Population Health Management Programs: Reevaluating the Literature." *Population Health Management*. 2012. Web.

Grossmeier, Jessica, Paul E. Terry, David R. Anderson, and Steven Wright. "Financial Impact of Population Health Management Programs: Reevaluating the Literature." *Population Health Management*. 2012. Web.

Grossmeier, Jessica, Paul E. Terry, David R. Anderson, and Steven Wright. "Financial Impact of Population Health Management Programs: Reevaluating the Literature." *Population Health Management*. 2012. Web.

"Health Information Privacy." U.S. Department of Health & Human Services. Web.

Kitsiou, Spyros, Guy Pare, and Mirou Jaana. "Effects of Home Telemonitoring Interventions on Patients with Chronic Heart Failure: An Overview of Systematic Reviews." *J Med Internet Res* 17.3. 2015. Web.

Kumar, Prashant. "An Overview of Architectures and Techniques for Integrated Data Systems (IDS) Implementation." *Integrating Factors Inc*. 2012. Web.

Manchanda, Rishi. *The Upstream Doctors: Medical Innovators Track Sickness to Its Source*. TED Conferences. 2013. Print.

McCarthy, Douglas, Kimberly Mueller, and Jennifer Wrenn. "Geisinger Health System: Achieving the Potential of System Integration through Innovation, Leadership, Measurement, and Incentives." *Issues Research Inc*. 2009. Print.

McCarthy, Douglas, Kimberly Mueller, and Jennifer Wrenn. "Kaiser Permanente: Bridging the Quality Divide with Integrated Practice, Group Accountability, and Health Information Technology." *Issues Research Inc*. 2009. Print.

Murray Robert. "Setting Hospital Rates to Control Costs and Boost Quality: The Maryland Experience." *Health Affairs*. 2009. Web.

Murray, Robert. "Maryland's Bold Experiment in Reversing Fee-For-Service Incentives." *Health Affairs Blog*. 28 Jan. 2014. Web.

Murray, Robert. "Setting Hospital Rates to Control Costs and Boost Quality: The Maryland Experience." *National Center for Biotechnology Information*. U.S. National Library of Medicine. 1395-1405. Sept.-Oct. 2009. Web.

National Research Council and Institute of Medicine of the National Academies. *U.S. Health in International Perspective; Shorter Lives, Poorer Health*. Rep: National Academies Press. 9 Jan. 2009. Print.

Nelson, Lyle. *Lessons from Medicare's Demonstration Projects on Disease Management and Care Coordination*. Rep. Congressional Budget Office. 2012. Print.

Nelson, Lyle. *Lessons from Medicare's Demonstration Projects on Disease Management and Care Coordination*. Rep. Congressional Budget Office. 2012. Print.

Nelson, Lyle. *Lessons from Medicare's Demonstration Projects on Disease Management and Care Coordination*. Rep. Congressional Budget Office. 2012. Print.

Peikes, Deborah, Arnold Chen, Jennifer Schore, and Randall Brown. "Effects of Care Coordination on Hospitalization, Quality of Care, and Health Care Expenditures among Medicare Beneficiaries: 15 Randomized Trials." *The Journal of the American Medical Association* 301.6. 603-18. 2009. Web.

Poethig, Erika C., John Roman, Kelly Walsh, and Justin Milner. "Introducing the Pay for Success Initiative at the Urban Institute." *Urban Wire*. The Urban Institute. 16 Mar. 2015. Web.

-
- Rajkuman, Rahul, Ankit Patel, Karen Murphy, John M. Colmers, Jonathan D. Blum, Patrick H. Conway, and Joshua M. Sharfstein. "Maryland's All-Payer Approach to Delivery-System Reform ." *New England Journal of Medicine*. 493-495. 6 Feb. 2014. Web.
- Rau, Jordan. "Hospitals Face Pressure to Avert Readmissions." *The New York Times*. The New York Times. 26 Nov. 2012. Web.
- Shah, Sonal, and Kristina Costa. "Social Finance: A Primer; Understanding Innovation Funds, Impact Bonds, and Impact Investing." Center for American Progress. 5 Nov. 2013. Web.
- Terry, Paul, and David R. Anderson. *The Role of Incentives in Improving Engagement and Outcomes in Population Health Management: An Evidence-based Perspective*. Rep. StayWell Health Management. 2011. Print.
- Turner, Margery Austin. "A Place-conscious Approach Can Strengthen Integrated Strategies in Poor Neighborhoods." *The Brookings Institution*. 2015. Web.
- Turner, Margery Austin. *Tackling Poverty in Place: Principles for a Next Generation of Place-Conscious Interventions*. Rep. Innovating to End Urban Poverty. 2014. Web.
- Walker, Lisa J., S. Kwesi Rollins, Martin J. Blank, and Reuben Jacobson. "Achieving Ambitious Educational Outcomes through School and Community Partnerships." *Chapin Hall at the University of Chicago*. 2013. Web.
- Washington Adventist Hospital Community Health Needs Assessment Implementation Strategy; 2013-2016*. Rep. Washington Adventist Hospital: A Member of Adventist HealthCare. 2013. Print.
- Washington Adventist Hospital Community Health Needs Assessment; 2013-2016*. Rep. Washington Adventist Hospital: A Member of Adventist HealthCare. 2013. Print.
- Atlantic Information Services, Inc. "From the AIS Bookshelf: From Chapter 400: The Stark Law Exceptions." *A Guide to Complying with Stark Physician Self-Referral Rules*. 101-13. 2015. Print.