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ARTICLE

Applying Value Chain Thinking to Social Drivers of Health: A Framework and Two Case Studies

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Value chain thinking is an essential component to bring about successful collaboration among the distinct stakeholders involved in social drivers of health programs. Two case studies describe the importance of grounding such efforts in the value propositions that matter to the participants (patients or health plan members) and the partners (health care providers, payers, and community-based organizations) and, accordingly, of minimizing the friction that may be associated with the linking of the various program components. By developing a tailored value chain so that each activity advances the value proposition and by implementing a dynamic, iterative measure, test, and learn process, leaders can achieve sustainable success.

Many health care organizations (HCOs), providers as well as payers, have invested in programs to address social drivers of health (SDOH). Unstable housing, poor nutrition, social isolation, and other social conditions are well known to be bad for people's health. The term *social drivers of health* is more precise than *social determinants* because social conditions influence, but do not determine, health. As the Health Care Transformation Task Force notes, "SDOH impact everyone; they are not something an individual can have or not have, and they are not positive or negative."[1–4] Programs to address individuals' health-related social needs are proliferating.[5] Among the factors that can influence the success of such programs is an understanding of the relationships between social drivers and health outcomes, the ability to engage people with health-related social needs, and the capacity to ensure that the right people get the right services at the right time in the right place to meet those needs. Investments in social services may improve health and clinical outcomes and lead to reductions — or smaller increases — in health care utilization and cost. For financial sustainability, programs may aim to capture some of the health care savings and redeploy them to fund the provision of social services.

None of this is easy, and few programs have achieved convincing results.[6,7] What can we learn from the ones that have done so? The FOODRx program in Minnesota and the Right Care, Right Place, Right Time (R3) program in Eastern Massachusetts have figured it out. They have created sustainable partnerships with HCOs and offer valuable, replicable lessons for other SDOH programs. FOODRx offers healthy food and social services to improve clinical outcomes for participants with chronic conditions and to reduce the cost of care. The program is nearly 100% funded by reimbursement from health plans, health systems, and clinics. R3 provides targeted care management and social services to senior housing residents with health-related social needs. R3 has reduced emergency room (ER) transports and hospitalizations substantially by addressing the social drivers of preventable utilization. Two health plans are funding R3 services for their members, and more are considering it. Both programs have conducted rigorous evaluations to demonstrate their results.

Both programs were grounded in *value chain thinking* to design, operate, and evaluate their programs. Value chain thinking, which is informed by Porter's Value Chain,[8] is a way to define and integrate the value proposition for participants and partners with the operating model (or value chain) in a dynamic, iterative measure, test, and learn process. By embedding participants' perspectives in program design and evaluation, value chain thinking anticipates and removes barriers to program participation and engagement. In addition, by consciously creating value for all program partners, value chain thinking also facilitates successful collaboration between HCOs and community-based organizations (CBOs).

By incorporating participants' views, value chain thinking can mitigate a common gap in SDOH programs. Emerging evidence consistently concludes that many screen and refer programs connect only a small percentage of participants to resources.[7] One reason may be a failure to understand how participants view the costs and benefits — or value — of participating. For example, using the example of a food bank, participants may encounter obstacles such as lack of transportation, language barriers, and inconvenient hours of operation and may also find the resources unappealing. Similarly, misaligned incentives between health care and social service organizations may impede collaboration, cross-organization workflows, and data sharing for operations and evaluation. Proactively anticipating, or retroactively discovering, these barriers and mitigating them is likely to improve program results.

HCOs are increasingly collaborating with CBOs to address health-related social needs. For example, between 2017 and 2019, 626 hospitals and health systems invested approximately $2.5 billion in a broad spectrum of programs to address SDOH.[9] Many HCOs have developed ties with community agencies to address social needs.[10] Collaboration between HCOs and CBOs has been associated with better performance and lower health care costs.[11] However, this cross-sector collaboration faces structural barriers related to organizational culture, priorities, goals, and data.[12–15] Value chain thinking offers a framework to surmount those challenges.

> *"The term social drivers of health is more precise than social determinants because social conditions influence, but do not determine, health."*

Although the CBO leaders in these case studies did not use the term value chain thinking, they recognize that their development of programs that improved health outcomes and achieved results that matter to HCOs embodied the value chain thinking framework. The CBOs' deep-rooted understanding of the targeted populations and their expertise in reaching and engaging participants were critical drivers of the programs' success. Value chain thinking also helped the CBOs create and deliver on a compelling value proposition for their health care partners. These successes suggest that HCOs can partner with and leverage CBOs' fundamental expertise as they seek to provide effective social services to improve health. In short, value chain thinking is a robust framework to drive successful SDOH program design, operations, and evaluation.

Value Chain Thinking: The Framework

Value chain thinking is an effective framework for the design, operation, and evaluation of SDOH programs. It is informed by a model developed by Michael Porter[16] that outlines how a unique value proposition and a tailored value chain create a competitive advantage for companies. Value chain thinking for SDOH programs defines and integrates

- The value proposition for participants (e.g., provider patients and payer members) and
- The value proposition for partners (e.g., HCOs and CBOs) with
- A tailored value chain, using
- A dynamic, iterative measure, test, and learn process.

To appreciate the components of the framework, consider this brief example of a food security program initiated by Kaiser Permanente in partnership with Hunger Free Colorado.[17] The program followed a common model to screen patients for food insecurity and refer them to services. Patients who reported food insecurity were given the phone number for the hotline at Hunger Free Colorado, a food resource organization. For participants, the intended value was access to food.

After launching the program, a measure, test, and learn process revealed that only 5% of the patients actually called the hotline. In response, the value chain was tailored so that the operations would better support the value proposition. After changing the workflow — so that Hunger Free Colorado called the patients — the connection rate soared to 75%. In this example, the value of access to food resources was not enough to engage patients. The value proposition had to become "we make it easy for you to get access to food."

This story highlights a common, but flawed, assumption: that providing a means of access to food was the value. In reality, the hotline phone number was not valuable enough for 95% of the intended participants. Reconfiguring the outreach and engagement to put the burden on the CBO to contact the patient dramatically increased participation and, by inference, the value for participants.

Next, we will explore the value chain thinking framework. The case studies presented later in the article show how this framework drives value.

The Value Proposition for Participants

SDOH programs must create value for participants and program partners — in other words, everyone involved must benefit for the program to succeed and thrive. Although it sounds obvious that creating value for participants is essential, it is less obvious how to do it. Indeed, failure to appreciate participants' perspective on value may explain the low participation rates in some programs. In Porter's model, "A value proposition defines the kind of value a company will create for its customers" and "the value proposition is the element of strategy that looks outward at customers, at the demand side of the business."[18]

At first glance, it may seem like a stretch to view participants in SDOH programs as customers, because they do not pay for the social services the programs provide. However, participants do have to "pay" with their time, energy, and trust. Therefore, they will not participate unless they believe that the value of what they receive will be worth their investment.

If we imagine a participant's point of view, we begin to understand barriers to participating in an SDOH program:

I'm working three jobs, and I don't have time to call the food resource hotline. I've called them before, and they don't speak my language. They will ask me a lot of intrusive questions I am afraid to answer. If I admit I don't have enough food, will they take my kids away? They will refer me to the food bank that I already know runs out of food, isn't open when I can go, and is too far to get to by public transportation. Plus, I don't like the food they offer.

As these examples illustrate, the value proposition must be relevant to participants and within the capacity of the partners to deliver for the value chain model to work. This insight helps explain why some SDOH programs fail to engage more than a few participants. Several studies have found that only 10–15% of participants in SDOH programs actually receive the services that could improve their health.[7,19,20]

> "*The FOODRx program in Minnesota and the Right Care, Right Place, Right Time (R3) program in Eastern Massachusetts have figured it out. They have created sustainable partnerships with health care organizations and offer valuable, replicable lessons for other SDOH programs.*"

The Value Proposition for Program Partners

CBOs must create value for HCOs to attract them as health care partners and to develop sustainable funding models. In some cases, it is enough for the CBOs to accept referrals and provide social services. However, if HCOs and CBOs want to build sustainable SDOH programs,

the HCOs must articulate the value they need to derive, and the CBOs must work with them to figure out how to create it. As the case studies illustrate, CBOs can be effective partners, not just resources, for HCOs.

HCOs fund SDOH programs for a variety of reasons, including support for a mission to improve community health or a commitment to improve patients' and members' quality of care. Specifically:

- SDOH programs may promote member engagement and retention; when members feel respected, they are more likely to trust the organization and, as a result, may be more willing to enroll in disease management programs.

- Addressing social barriers may improve participants' health and lead to more appropriate health care utilization and cost.

The financial sustainability premise is that if health care payers spend money to reduce patients' social barriers to health, the payers will improve member satisfaction and retention and save money as patients' health improves and preventable utilization declines.

The Value Chain

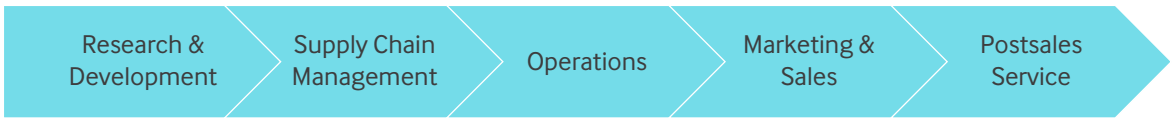
The value chain component of the value chain thinking process describes the means and methods to deliver on the value proposition. In Porter's model, it is a way to organize the activities and the linkages between them to design, produce, and sell a product or service.[21] More important, the value chain becomes a tool for competitive advantage when it is tailored to support the value proposition at every step. Porter's value chain depicts a typical series of activities to deliver value to customers (Figure 1).

The diagram in Figure 1 reflects the need for continuity across the value chain to complete the cycle and close the sale. Tailoring the value chain means that each activity advances the value proposition. For example, IKEA's value proposition is low-priced, well-designed, ready-to-assemble furniture that customers can fit in their cars and take home, so it has tailored its value chain accordingly with in-house design, limited variety, lack of sales staff and home delivery,

FIGURE 1

Elements of Porter's Value Chain

The value chain delineates the activities that provide firms with a competitive advantage. Effective value chains are tailored to deliver a distinctive value proposition.



Source: Magretta J. *Understanding Michael Porter: The Essential Guide to Competition and Strategy.* Boston, MA: Harvard Business Review Press, 2012

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flat-pack packaging, and car-friendly locations.[21] This model is a useful point of departure to envision constructing and tailoring a value chain for SDOH programs.

The SDOH value chain also begins with activities grouped into buckets. The concept of an end-to-end framework with strong linkages to ensure continuity is equally if not more important for SDOH programs. However, as shown in Figure 2, the SDOH activity cycle does not end with a single transaction like a sale; effective SDOH programs aim to provide ongoing delivery of services until the participant's social needs are met. The process of measure, test, and learn is a constant feature. In addition, they adapt and iterate as they learn more about participants' needs.

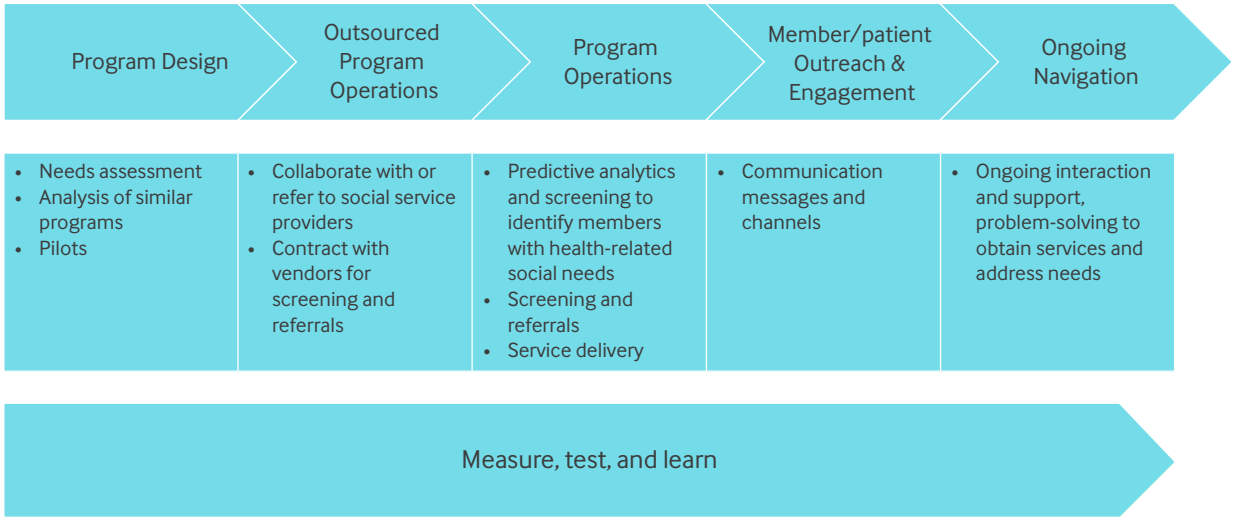
SDOH value chains are complex and may incorporate numerous discrete but related value chains. Many SDOH programs involve several organizations: one or more HCOs (including providers and payers), entities that screen or otherwise identify patients with health-related social needs and make referrals to CBOs; and one or more CBOs providing services to meet those needs. Therefore, although the value chain should offer a seamless journey for the program participant, the activities and linkages in that chain typically cross several organizations.

Tailoring the value chain can make or break SDOH programs. First, everything about the program must be grounded in the participant's view of value. In the Colorado example above, the true value proposition was to make it easy to find and obtain resources. Understanding this

FIGURE 2

Value Chain for Social Drivers of Health

The top row represents the "buckets" of activity types in the SDOH value chain; the middle row represents examples of those activities; and the bottom row represents the ongoing, continual activity of measure, test, and learn.



Source: Created by Alexandra Schweitzer, adapted from Magretta J. *Understanding Michael Porter: The Essential Guide to Competition and Strategy.* Boston, MA: Harvard Business Review Press, 2012

perspective, and designing the operations accordingly, is the essence of value chain thinking. For participants, each linkage in the value chain is potentially a source of friction and a barrier to continuing to the next activity. In a food security program, these potential friction points for the participant could include:

- Take time from a busy day to complete a screening form and explain their answers
- Call the food hotline, navigate a phone menu to find the right department to talk to, and hope it is in their preferred language
- Explain their situation (again) to the intake person at the hotline
- Get transferred to a case worker
- Explain their situation (again) to the case worker at the hotline
- Call the food bank to find out when they are open
- Arrange transportation or childcare
- Go to the food bank
- Find appealing food
- Figure out how to carry a heavy bag of food back home

Any one of these points in the value chain, if not carefully tailored, could be so daunting or inconvenient that participants disengage and drop out. In addition, to be effective, the end-to-end value chain must accomplish seamless alignment of several organizations' workflows, cultures, and information exchange. The cumulative effect of service friction or failure at these points reduces the likelihood that an individual, or a targeted population, will ultimately get and use the social services that address their health-related social needs.

Measure, Test, and Learn

The value proposition and value chain for successful SDOH programs are dynamic. While they begin with a thoughtful value proposition and a carefully tailored value chain, these programs are modified as program leaders better understand what is working and what is not. Successful SDOH programs rely on a measure, test, and learn strategy to improve their effectiveness. Rigorous measurement of activity across the value chain demonstrates that linkages are completed or will highlight any gaps. Establishing these indicators is the first step to understanding whether participants are navigating the path to receive social services. As outlined in the case studies, SDOH metrics at key linkages could include those that determine:

- What percentage of eligible participants are engaging at the beginning and throughout the program?

- How many of the participants referred to a CBO connected with the CBO?
- If they did not, why not?
- How many participants who needed services received services?
- Did the service address their needs?
- How did those services affect participants' health, health care costs, and utilization as measured by short-term proxies and longer-term outcomes?

Testing and learning also includes eliciting feedback from participants and partners on whether and how they are deriving value from the program. For example, how do participants feel about periodic check-ins from care managers: Are they helpful or intrusive? Too frequent or not often enough? Delivering meals is only effective if participants eat them; do they like the food? Feedback from partners is also ongoing; changes in goals, lessons learned, and opportunities to streamline workflows are incorporated into the program. These dynamic measure, test, and learn cycles sharpen the program's understanding of the value proposition and the effectiveness of the value chain.

> *"Value chain thinking, which is informed by Porter's Value Chain, is a way to define and integrate the value proposition for participants and partners with the operating model (or value chain) in a dynamic, iterative measure, test, and learn process."*

Value Chain Thinking in Action: Case Studies

Case Study: FOODRx

The connection between food insecurity or poor nutrition and poor health is well documented. Food insecurity, "a lack of available financial resources for food at the household level,"[22,23] affected more than 38 million people before the pandemic and affects more than 42 million people now.[22] Food insecurity is defined by an affirmative answer (often true or sometimes true) to one or both of two common screening questions: "Within the past 12 months we worried whether our food would run out before we got money to buy more" or "Within the past 12 months the food we bought just didn't last and we didn't have money to get more."[24] Numerous studies have documented "a compelling picture of food insecurity's association with negative health outcomes … based on a wide array of data sets and empirical methods."[25] For adults, these outcomes include increased rates of depression, hypertension, hyperlipidemia, and oral health problems. Older adults who are food insecure "have limitations in activities of daily living comparable to those of food-secure seniors 14 years older."

FOODRx was launched in 2016 to integrate food security solutions into health care systems and, more specifically, to provide health systems with a simple, cost-effective way to directly

connect their patients to nutritious food and education that will improve their health. Second Harvest Heartland, the parent of FOODRx, is a hunger relief organization that, in 2020, distributed more than 113 million pounds of food in its Minnesota and western Wisconsin service area.

FOODRx programs were designed initially for three groups of patients. Patients with diet-related chronic disease received boxes with food tailored to their disease (e.g., diabetes) and cultural preferences, plus recipes and disease management education. Patients screening positive for food insecurity at the clinic got enough food to get them through 72 hours. Patients with prevention needs were connected to food pantries, nutrition programs like the Supplemental Nutrition Assistance Program (SNAP) and Special Supplemental Nutrition Program for Women, Infants, and Children, and other community resources. These core programs were modified to meet the specific goals and needs of FOODRx's health care payer and provider partners, including North Memorial Health, Hennepin Healthcare, Lakewood Health System, CentraCare, UCare, and others and their patients.

The initial program design was based on a 12-month clinical trial and a 6-month randomized controlled trial. In addition, FOODRx and its health care partners evaluated the results of their joint pilots, as described below. The results fortified FOODRx's value to their health care partners, many of whom expanded their work with FOODRx. Four years after launching, FOODRx was serving several thousand patients a year through partnerships with 11 payers and providers. Most important, these organizations were reimbursing FOODRx for nearly the entire cost of the program, using operating funds rather than community benefit or other philanthropic funds, because they saw value in their investments.

Defining the Value Proposition: For Partners

FOODRx started with a clear vision: partnerships with HCOs to create sustainable, scalable programs to provide nutritious food to people who need it. FOODRx positioned itself as a value-based solution for addressing food insecurity by "changing the way CBOs plan with and receive revenue through health care relationships."[26] From the very beginning, their goal was a sustainable business model supported by funding from HCOs. Their first step, then, was to understand what HCOs value — what about the program would incent them to invest time and money? Specifically, FOODRx knew they had to demonstrate they could advance the health care Triple Aim and generate a return on investment. The terms of this return on investment varied by partner; for example, some hoped for a financial return, whereas others focused on behavior changes to support health or on member growth and retention. The underlying philosophy for value creation was that building with the lens of the partner builds trust.

Tailoring was central to defining FOODRx's value for its partners. FOODRx and its payer and provider partners codesigned each program, starting with joint clarification of each program's goals and desired outcomes. FOODRx customized its standard, proven model to each partner's priorities and capabilities. FOODRx also selected partners who shared its vision, its entrepreneurial approach, and its willingness to adapt programs over time. FOODRx declined to work with partners who were

not a good fit with this model. This willingness to say *no* is challenging for food banks and for nonprofit organizations in general, but it is also the heart of an effective strategy. As Michael Porter states, "The essence of strategy is choosing what not to do."[27]

Defining the Value Proposition: For Participants

The second step was to understand what participants value. Based at a food bank with 20 years of history, FOODRx already had a clear perspective on how food brings value. FOODRx and its partners expanded on this value by offering participants integrated services, including food, nutrition education, navigation to benefits like SNAP, care management, and related services that could improve their health.

Their initial value proposition might be "your doctor has written you this prescription to help you be healthier" or "your health coach is working with this program to make it easy for you get food you like."

However, the value proposition evolved over time. Monthly check-ins by a health coach from the health care partner or from FOODRx, a required component of the program, built trust with participants and provided insights into what was working or needed to be changed. As the relationships deepened and as participant needs changed, FOODRx refined its understanding of value to the participant and tailored its services accordingly.

Building the Value Chain

As noted above, the value chain describes the activities and linkages between them that deliver the value to partners and participants. The FOODRx story illustrates the use of a tailored value chain: it drew on a nuanced and dynamic understanding of the value proposition to ensure that every activity supported delivering value and that the linkages were strong. Following are highlights of how value chain thinking made the FOODRx program effective.

> *"This cross-sector collaboration faces structural barriers related to organizational culture, priorities, goals, and data. Value chain thinking offers a framework to surmount those challenges."*

Research and Development

FOODRx knew they would need evidence of efficiency and effectiveness to convince payers and providers to fund their program. They went well beyond just citing existing research to demonstrate their value. First, they figured out that the ability to exchange and analyze data in compliance with the Health Insurance Portability and Accountability Act of 1996 (HIPAA) would be an important differentiator in their value proposition for partners. Second, they retained IT and business development consultants whom their health care partners knew and trusted. Building on their expertise, funded by grants (including $250,000 from a state innovation fund), FOODRx built the technical and staff capacity for HIPAA-compliant data exchange and an enterprise data warehouse to support integration and analysis of health care and FOODRx

service data. These investments and the use of consultants trusted by partners established FOODRx's credibility and capacity early on.

To make the data useful, FOODRx hired a research manager, also unusual for a food bank. They conducted studies with health economists and doctors — researchers with credentials and methods the health care partners were familiar with and trusted. Together, they developed specific quantitative and qualitative metrics to determine whether the programs were achieving each partner's individual goals.

Pilot program results were tracked along several dimensions, including medical costs, clinical outcomes, participant engagement, and participant satisfaction with the program. FOODRx tracked participants at every step along the value chain to understand whether they were engaged in the activities, whether they received and consumed the food and nutrition education and, ultimately, whether their health and utilization improved. Promising pilot results included a decline in HbA_{1c} scores from 9.6 to 9.1 and a 25% reduction in ER-related claims from $64,770 to $48,730. In addition, the percentage of participants who said they "never put off buying medicine because they were buying food" rose from 63% to 93%.[28] In a hypertension pilot, per member per month medical costs fell by 19% (compared with a 13% increase for members who dropped out of the program).[28]

Operations and Supply Chain Management

The FOODRx program integrated health care management with food and nutrition supports to create a holistic experience for patients. Streamlined workflows, communication, and data sharing across organizations supported the value proposition for participants and partners. For example, a provider screened patients and referred people who were food insecure to FOODRx. FOODRx delivered food boxes to a clinic or a participant's home. A health coach from the payer or provider or from FOODRx checked in with participants monthly to get updates on their needs and hear how the program was working for them. FOODRx and the health care partners regularly shared what they were learning so that each could adapt its workflows, outreach, or services as necessary.

Measure, Test, and Learn

The interplay between the value proposition and the value chain was dynamic. Research and development and operations and supply management were intertwined. Interviews with participants were used to refine the operations to improve engagement, retention, and results for individuals and for the program as a whole. For example, if participants did not like the food, FOODRx provided different food. If participants could not get to the clinic, the program offered a ride or delivered the food to their homes. Early in one of the studies, they observed that nearly 40% of the initial participants were dropping out. They discovered that language was a major barrier; in response, they engaged a Somali community health worker.

FOODRx's commitment to measure, test, and learn was rooted in the organization's entrepreneurial spirit. In addition, its leaders invested in human-centered design training, a method of problem solving based in empathy, prototypes, experimentation, and iteration. The biggest lesson is: never stop designing.

Case Study: R3

Housing organizations are well positioned to detect and reduce social barriers to health. For example, on-site housing staff know if residents are falling, depressed, or eating poorly. By intervening at an early stage — ideally in collaboration with residents' health care providers — housing organizations can interrupt a sequence of events that would otherwise lead to avoidable health complications, hospital admissions, or early transitions to long-term care for residents.

> *"Although it sounds obvious that creating value for participants is essential, it is less obvious how to do it. Indeed, failure to appreciate participants' perspective on value may explain the low participation rates in some programs."*

R3 created a platform for health and housing integration. It was launched in 2016 by Hebrew SeniorLife, a multifacility provider of senior living and health care communities in the Boston metropolitan area, funded by grants totaling $1.7 million over 4 years.[29,30] The program began with a vision to "create a replicable, scalable, sustainable model of housing with supportive services to enable seniors to live independently as long as possible, receiving the right care in the right place at the right time, while reducing health care costs for this growing population."[31]

The R3 program embedded wellness coordinators and nurses at seven housing sites and enrolled 400 residents, including 85 who were members of partner health plans, and established wellness and health education programs on site. These R3 teams:

- Assessed residents and created individual care plans using the Vitalize360 coaching model tool to identify social and health risks and needs, such as food insecurity, poor nutrition, difficulty taking medications, falls, frequent trips to the ER, and cognition and mental health challenges
- Provided care coordination and assisted with medication management, scheduling, and getting transportation to provider appointments
- Conducted monthly check-ins (later modified to the frequency that each resident preferred)
- Hosted on-site wellness programs (brain health, falls prevention, and chronic disease management)
- Collaborated with residents' care teams, including family, health plan care managers, physicians, and area agency on aging care teams
- Supported residents to facilitate successful transitions of care from hospitals and other health care settings

R3 tracked and trended intermediate process measures, such as the number and percentage of people at risk of ED/hospitalization who received check-in visits, every quarter. Outcomes reflected their diligence in monitoring these leading indicators and improving their processes. For example, 90% of the residents who needed nutrition counseling received it, and 96% of the residents who needed food security supports received them. Notably, R3 connected the majority of residents who needed social services to those services. These connection rates are markedly higher than typical screen and refer programs, which, as noted earlier, typically connect only 10–15% of participants to services.

The program also improved health outcomes.[32] R3 demonstrated a 19% reduction in age-adjusted hospital admissions over an 18-month period.[32] In addition, researchers found a statistically significant decline in ambulance transfers of 18% in intervention buildings.[33] As of early October 2021, Tufts Health Plan and Commonwealth Care Alliance, both regional health plans, are paying for R3 services for their members living in participating sites. Reflecting the program's value, these payers are using operating funds, not foundation or other grantlike funds. R3 is in active discussion with several other payers and is also pursuing broader government strategies to support place-based services in senior housing.

Defining the Value Proposition: For Partners

From the outset, the R3 program aimed to build a replicable model of senior housing with place-based services that would be sustained by funding from health care payers. The underlying value proposition for health care partners was that targeted interventions at the housing sites where older adults spend most of their time can reduce health care utilization and costs. This premise had been demonstrated in two earlier housing with services models: the Support and Services at Home program in Vermont[34] and the Housing with Services program in Portland, Oregon.[35] Although this evidence was promising, Massachusetts health plans needed to see the results of a local proof of concept before committing funds to the R3 program.

Like FOODRx, R3 designed its program goals, outcome measures, and evaluation with health care partners' priorities in mind. Using the Triple Aim framework, R3 established specific goals and metrics for health, personal satisfaction, and cost-effectiveness. The program targeted a 20% reduction in ER transfers, hospitalization, and transfers to long-term care compared with baseline in 18 months. Agreements with health plans ensured alignment of goals by defining metrics that mattered to all parties. Payments to R3 were based on achievement of process and outcome measures, with a percentage at risk based on outcomes. These utilization changes offered value, including potential cost savings, to health plans.

With another health care partner, Fallon Ambulance, R3 launched an innovative partnership to identify and address preventable transfers to the ER. For Fallon, the value proposition was the opportunity to test a new delivery model. Fallon's data showed that one-third of transports to the hospital were for nonemergency purposes — in other words, to address issues that could likely be solved without a trip to the hospital. Fallon Ambulance shared a vision of reducing preventable hospital transports and was committed to working with R3 to address this unnecessary utilization, which not only drove costs up but also created stress and other side effects for residents.

While it may seem counterintuitive for an ambulance company to work on reducing transports, which are the basis of its reimbursement, Fallon was piloting a new community paramedicine service and wanted to use the R3 experience to demonstrate its value. Fallon shared detailed data with R3 on who was being transported and why. These data helped the R3 wellness teams identify trends, high utilizers, and drivers of emergency medical services calls so they could intervene to address the issues, such as frequent falls, that lead to preventable calls. This partnership and the focus on emergency transport were unique to R3 and helped drive improvements in health care utilization and costs.

> *"The SDOH activity cycle does not end with a single transaction like a sale; effective SDOH programs aim to provide ongoing delivery of services until the participant's social needs are met."*

Defining the Value Proposition: For Participants

In focus groups, residents identified several R3 program benefits, including supplementing existing family and physician supports; monitoring and assisting with nutrition medication management and mental health management; identifying and arranging services and supports, such as visiting nurses, mental health services, transportation, home modifications, and medical equipment; and assisting with postacute care transitions.[36] Residents also reported high levels of satisfaction with the program.[36]

Residents described the impact of the R3 program in very personal terms:

"I have the sense that [for] almost any physical or medical problem, I've got somebody to talk to. And the fact of being checked in with regularly does feel good."

"I think the reason you're hearing such a love fest here is that we really are happy with something we didn't have before and now we have it and it's working."

The program's value to participants rested on these trusted relationships with R3 staff. On-site teams of wellness nurses and care coordinators helped residents get services by conducting warm handoffs to social services. They also provided help when residents did not know what to do and would otherwise have called 911. As the relationships deepened, residents reached out to the on-site teams before they encountered problems, and the teams learned to anticipate issues and proactively reach out to residents. The value to residents is demonstrated by their high rates of engagement throughout the program.

Building the Value Chain

Following are highlights of how value chain thinking made the R3 program effective.

Research and Development

R3 built on the Vermont and Oregon models and adapted them to the needs of its residents, its own vision as a senior living provider, and its partners' goals and capabilities. Using its

Vitalize360 assessment tool, R3 gathered information about residents' needs, both individually and collectively. R3 also drew on its emergency response partners' extensive quantitative and qualitative data to identify community-wide and individual opportunities to reduce preventable ER transports for residents.

R3 contracted with an independent research partner to conduct a mixed methods evaluation throughout the 4-year pilot, including data on participant satisfaction, participant engagement and retention, partner satisfaction, transfers to the ED, and changes in health care utilization. This evaluation demonstrated program value and helped convince health plans to provide operating funds to support it.

Operations and Supply Chain Management

The R3 program took advantage of the existing housing and services infrastructure. By locating services where the residents lived, the R3 program built on existing trusted relationships and deployed comprehensive *eyes on* from all housing staff including maintenance, housekeeping, drivers, and the front desk. The place-based model also supported efficiency and economies of scale in delivering services.

The operating model for R3, which crossed several senior housing sites, multiple partners, and 400 participants, was organized through a driver diagram (Figure 3). This framework forced R3 to think through the activities and linkages required to achieve results. The secondary drivers, in effect, became the activities in the value chain.

Ongoing assessments supported continuous tailoring of the value chain to address changing resident needs. For example, residents at risk of preventable transport and hospitalization were offered fall-prevention programs, wellness checks, and medication reminders, along with assistance connecting to providers in the community to address nonemergency situations.

As the participant comments above illuminate, the combination of individual risk assessment, health coaching, and connection with services helped R3 tailor the value chain to each resident. Moreover, rather than simply address single barriers to health — such as poor nutrition or lack of transportation, as many SDOH programs do — R3 tailored multiple interventions to improve each resident's health. This comprehensive approach identified and addressed the varied challenges that contributed to residents' unnecessary or preventable ER and hospital utilization.

For partners, tailoring the value chain started with formal agreements between R3 and its program partners to spell out detailed workflows, data sharing, and communication protocols that ensured the stability and integrity of the operating model across the program. A quarterly advisory group that included all partners helped shape the program continuously.

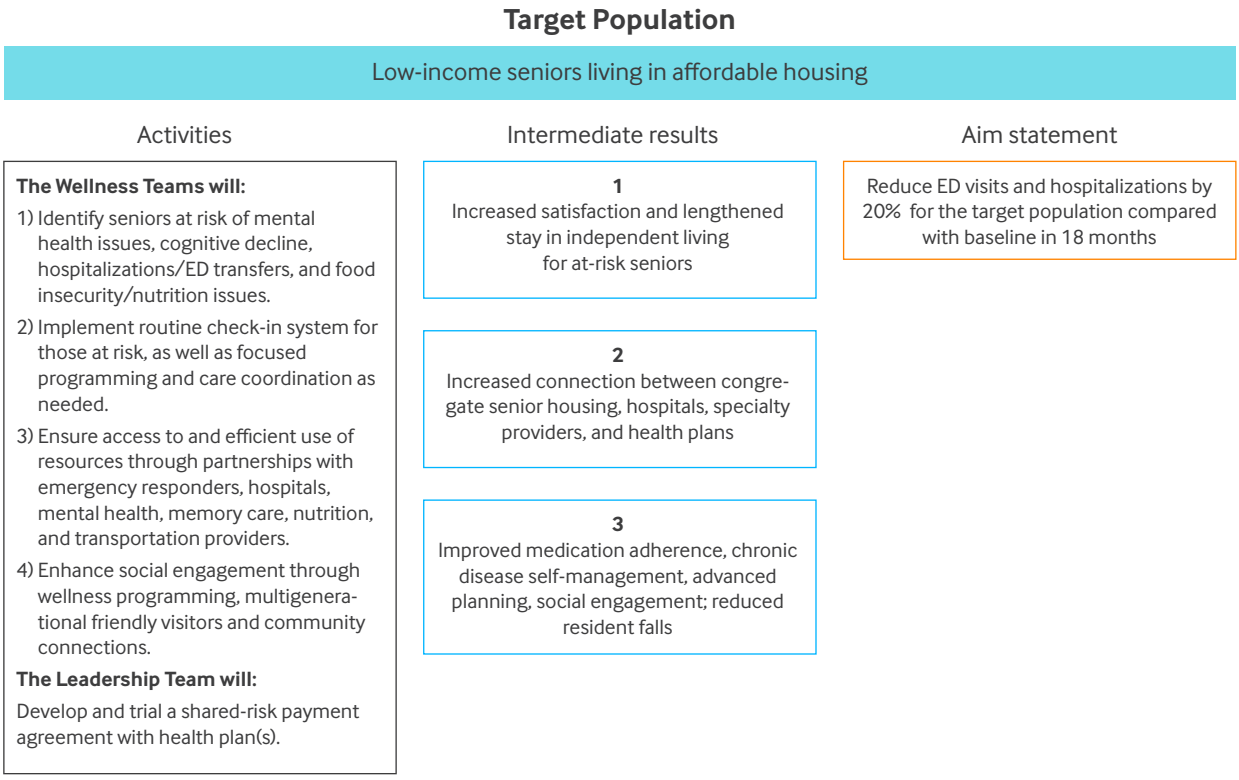
Measure, Test, and Learn

The essence of R3's dynamic value chain was the interplay between an unwavering focus on outcomes, consistent measurement at a granular level, and adjustments to improve program effectiveness. Rigorous measurement allowed R3 to assess and improve the effectiveness of its value chain and to determine whether residents stayed engaged in the program and actually

FIGURE 3

R3 Driver Diagram

This diagram depicts the factors expected to drive intermediate results and final outcomes (the "aim") of the R3 program. Tracking metrics for the activities and intermediate results helped ensure progress toward the final outcomes.



Source: Kim Brooks, Hebrew SeniorLife

received services that would alleviate their social barriers to health. If gaps emerged, R3 analyzed and addressed the reasons.

R3 tracked results at key linkage points. For example, every quarter they measured the percentage of people who needed nutrition counseling and got it. Similarly, for residents at risk of ED/hospitalization, they tracked the percentage of completed check-ins with the wellness team.

In addition, the monthly resident check-ins provided new community-wide data on barriers that should be addressed to reach the program's goals. For example, initially, the on-site wellness teams simply connected residents with social services like nutrition education, food, and mental health. Over time, the data revealed that mental health issues like untreated anxiety were driving a significant number of emergency transports. To help residents access mental health services, R3 brought local behavioral health agencies to provide services on site.

Looking Ahead

These case studies illustrate the power of value chain thinking in action and offer a useful model with practical lessons for SDOH leaders.

> *"Value chain thinking can support a variety of programs. It is a vehicle to understand and connect the unique aspects of any program's population, environment, and capabilities."*

First, the value chain thinking framework is universal. Although FOODRx and R3 served different populations, used different operating models to connect participants with social services, and met different needs, they both succeeded because they were grounded in value chain thinking. The lesson is that value chain thinking can support a variety of programs. It is a vehicle to understand and connect the unique aspects of any program's population, environment, and capabilities. Indeed, one might argue that the only way to make sense of the variety of SDOH program needs and opportunities is to apply a rigorous framework like this.

Second, an essential component of value chain thinking is the active and ongoing refinement of the value propositions and the value chain. Value chain thinking starts with disciplined attention to the value propositions and the tailored value chain, but its power emerges when those elements are connected and refined in an iterative measure, test, and learn cycle. The lesson is that value chain thinking is dynamic and requires a commitment to ongoing improvement.

Third, value chain thinking drives results. FOODRx and R3 demonstrated that providing social services can improve participants' health and engagement in their care. This is encouraging news in the evolving world of SDOH, where evidence about the effectiveness of many programs is still mixed or inconclusive. The lesson is that value chain thinking is a way to anticipate and then measure and improve the linkages between participants and the services that could improve their health and well-being.

Finally, the CBOs' history with the populations served in the FOODRx and R3 programs was a strategic advantage. It accelerated the understanding of the value proposition for participants and allowed them to build on existing value chains rather than start from scratch. Health care payers and providers often look to CBOs to deliver services to their members. The lesson of these case studies is that CBOs have inherent expertise that can improve program results if they drive or cocreate SDOH programs.

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