

Health Affairs

At the Intersection of Health, Health Care and Policy

Cite this article as:

Jack Homer, Bobby Milstein, Gary B. Hirsch and Elliott S. Fisher
Combined Regional Investments Could Substantially Enhance Health System
Performance And Be Financially Affordable
Health Affairs 35, no.8 (2016):1435-1443
doi: 10.1377/hlthaff.2015.1043

The online version of this article, along with updated information and services, is
available at:

<http://content.healthaffairs.org/content/35/8/1435>

**For Reprints, Links &
Permissions :**

http://content.healthaffairs.org/1340_reprints.php

Email Alertings : <http://content.healthaffairs.org/subscriptions/etoc.dtl>

To Subscribe : <https://fulfillment.healthaffairs.org>

Health Affairs is published monthly by Project HOPE at 7500 Old Georgetown Road, Suite 600, Bethesda, MD 20814-6133. Copyright © by Project HOPE - The People-to-People Health Foundation. As provided by United States copyright law (Title 17, U.S. Code), no part of may be reproduced, displayed, or transmitted in any form or by any means, electronic or mechanical, including photocopying or by information storage or retrieval systems, without prior written permission from the Publisher. All rights reserved.

Not for commercial use or unauthorized distribution

By Jack Homer, Bobby Milstein, Gary B. Hirsch, and Elliott S. Fisher

Combined Regional Investments Could Substantially Enhance Health System Performance And Be Financially Affordable

DOI: 10.1377/hlthaff.2015.1043
HEALTH AFFAIRS 35,
NO. 8 (2016): 1435-1443
©2016 Project HOPE—
The People-to-People Health
Foundation, Inc.

ABSTRACT Leaders across the United States face a difficult challenge choosing among possible approaches to transform health system performance in their regions. The ReThink Health Dynamics Model simulates how alternative scenarios could unfold through 2040. This article compares the likely consequences if four interventions were enacted in layered combinations in a prototypical midsize US city. We estimated the effects of efforts to deliver higher-value care; reinvest savings and expand global payment; enable healthier behaviors; and expand socioeconomic opportunities. Results suggest that there may be an effective and affordable way to unlock much greater health and economic potential, ultimately reducing severe illness by 20 percent, lowering health care costs by 14 percent, and improving economic productivity by 9 percent. This would require combined investments in clinical and population-level initiatives, coupled with financial agreements that reduce incentives for costly care and reinvest a share of the savings to ensure adequate long-term financing.

Proposals abound for how to improve the performance of regional health systems in the United States. Some call for clinical initiatives to enhance the quality of care and reduce costs, along with payment reform to encourage providers' support for these changes.¹⁻⁴ Others emphasize population-level interventions to safeguard health and reduce the risk of disease and injury in the first place.⁵ Still others combine clinical and population-level efforts in pursuit of a Triple Aim of better health, better care, and lower costs.⁶ At the same time, some interventions could worsen inequity across subgroups unless there are intentional efforts to address socioeconomic disadvantage and problems of access.⁷

Furthermore, regardless of the initiatives chosen, initiatives' impacts might be short-lived without proper economic incentives and sustainable financing.⁸ To address this pitfall, account-

able care organizations and states with Medicaid section 1115 waivers have demonstrated that health care costs can be saved and reinvested through explicit agreements, usually between insurers and providers.^{9,10} There is also an emerging trend toward forming more expansive accountable health communities or similar structures that engage a wider set of parties (such as social service agencies and public health organizations) that could together generate greater value and reinvest the savings to sustain or expand the work within a more interdependent regional health ecosystem.¹¹⁻¹³

With so many options in a changing and uncertain field, leaders face a difficult challenge in crafting sound strategies for their regions that can be financed with available resources. To support such judgments, the Fannie E. Rippel Foundation, through its collaborative ReThink Health initiative, created a computer simulation model that could play out plausible scenarios for re-

Jack Homer is principal of Homer Consulting, in Barrytown, New York, and a senior modeler at ReThink Health and a research affiliate at the Massachusetts Institute of Technology, both in Cambridge.

Bobby Milstein (bmilstein@rethinkhealth.org) is director of ReThink Health and a visiting scientist at the Massachusetts Institute of Technology.

Gary B. Hirsch is a consultant and creator of Learning Environments, in Wayland, Massachusetts, and a senior modeler at ReThink Health.

Elliott S. Fisher is director of the Dartmouth Institute for Health Policy and Clinical Practice, in Lebanon, New Hampshire, and professor of medicine and of community and family medicine at the Geisel School of Medicine at Dartmouth, in Hanover, New Hampshire.

gional health reform. The ReThink Health Dynamics Model extended the Centers for Disease Control and Prevention's previously published national HealthBound model to provide a realistic representation of a regional health system over time.^{14–16}

For this analysis, we used the ReThink Health Dynamics Model to investigate the extent to which health system performance in a region could change if leaders were committed to delivering higher-value care; reinvesting savings and expand global payment; enabling healthier behaviors; and expanding socioeconomic opportunities.

Exploring how these four strategies could play out in a simulated environment provides a practical way to identify areas of potential leverage, anticipate pitfalls, weigh trade-offs, expose assumptions, and test uncertainties as a prelude to taking action in the real world.

Study Data And Methods

THE MODEL The ReThink Health Dynamics Model, representing a US region (city, county, or larger), simulates changes in population health, health care delivery, health equity, workforce productivity, and health care costs by quarter-year increments from 2000 to 2040. This is done within a single, testable framework tied to many sources of empirical data and open to sensitivity analysis.^{15,16}

Like its predecessor, the HealthBound model, it is a compartmental stock-and-flow structure with causal feedback, built according to the principles of system dynamics—a methodology that has been applied to population health and health care since the 1970s.^{17,18}

The model divides the population into ten subgroups by age (youth, working age, seniors), socioeconomic status (advantaged or disadvantaged, based on household income above or below 200 percent of the federal poverty level), and insurance status (yes or no) for youth and those of working age. (Underinsurance is handled separately; see online Appendix Exhibit A1.)¹⁹

The model simulates changing health states as they are shaped by unhealthy behaviors, crime, environmental hazards, poverty, lack of insurance, aging, and the quality of care. Together, those drivers affect physical illness (mild and severe), mental illness (treated and untreated), acute clinical episodes (urgent and nonurgent), and deaths.

Health status and acute episodes, in turn, determine the demand for health care in different locations. These include routine and episodic office visits, outpatient procedures and tests, hospital emergency department and inpatient

stays, as well as postacute and extended care in skilled nursing facilities and through home health and hospice.

Finally, the model considers financial incentives from different payment schemes (such as fee-for-service versus global payment) along with the program cost and return on investment for each simulated initiative. If an intervention does save health care expenditures, model users might choose to reinvest a fraction of those savings in an effort to sustain or expand the initiatives over time.

The model contains more than twenty options for simulating the likely effects of efforts to alter health risks, health care delivery, provider payment, or program financing. Each strategy can be simulated individually or in combinations.

The model rests on data from more than a dozen national sources, along with numerous studies in the literature on health services, health economics, and population health.¹⁶ It can be calibrated to represent a particular region using available local data and small-area estimates. For this analysis we scaled national data down by a factor of 1,000 to represent a prototypical midsize American city, with a growing population starting at about 300,000 instead of 300 million in the year 2000. In all other ways, this “Anytown” model reflects the demographic and health system characteristics of the nation as a whole.

BASELINE AND INTERVENTION STRATEGIES We performed a sequence of simulations, beginning with a status quo baseline against which all intervention strategies can be compared. The baseline closely matches time series data from 2000 to 2012 on twenty-six different variables from national data sources, encompassing births and deaths; changes in the distributions of population age, economic status, and health insurance coverage; changes in health care resource levels and utilization; and annual changes in each major category of personal health care costs within the Centers for Medicare and Medicaid Services' National Health Expenditures Accounts.

The model's future trajectory under the baseline follows census population projections through 2040, based on assumptions about rates of death, birth, net in-migration, and aging. The baseline run includes many other assumptions as well, most expressed as constants based on recent experience (with no change into the future). But there are some exceptions where evidence supports an assumed future trend not identical with the past (see Appendix Exhibit A1 for those exceptions).¹⁹

After the baseline, we simulated a layered sequence of four intervention strategies, each con-

Leaders across the country face a pressing need to reimagine and transform how the health system works in their regions.

sisting of one or more program initiatives or financing schemes. Taken together, the four interventions encompass about half of the initiatives available in the model. All interventions were introduced in 2015, unless otherwise noted (see the socioeconomic opportunities intervention below), and remain in effect through 2040, with their reach and effectiveness subject to the availability of funds. The four intervention strategies are as follows (see Appendix Exhibit A2 for definitions, impact assumptions, and references).¹⁹

► **PROVIDE HIGHER-VALUE CARE:** What if there were a multifaceted approach to improving health care quality and reducing costs, with seven specific elements? These would be the following: Coordination of care to reduce unnecessary referrals, tests, procedures, and inpatient admissions, and to limit the use of technologies and products that are not cost-effective; establishment of telephone call centers staffed by trained triage nurses to advise callers on whether (and where) they should seek medical care for an acute issue; improved physician adherence to accepted guidelines for preventive and chronic care; improved self-care for disadvantaged patients through monitoring and social supports; establishment of patient-centered medical homes in primary care practices; redesign of primary care office operations, including greater use of physician assistants and nurses, to increase their visit capacity, especially for the disadvantaged population; and improvement in hospital postdischarge planning, with medication reconciliation and more referrals to home health care and rehabilitation facilities, to reduce the risk of readmission.

This clinical strategy is ambitious and might require significant program resources to enact. Similar to most innovation funding in the real world, these initiatives are financed in the model

through a temporary start-up fund, initially set for five years at \$75 per capita per year, or about 1 percent of total health care spending in the region for each year from 2015 through 2019.

► **REINVEST SAVINGS AND GLOBAL PAYMENT:** What if, in addition to the strategy above, there were two types of financial arrangements in place? The first would be an agreement to reinvest a negotiated fraction of any health care cost savings. In a manner similar to shared savings agreements now offered by Medicare, Medicaid, and other insurers, we assume that 50 percent of any cost savings (relative to gradually rising benchmarks for each of the model's six insured population subgroups by age and socioeconomic status) will be returned to the community and can be used immediately for clinical or population-level initiatives, or held for future use.²⁰ The cost benchmarks are set separately for private insurance, Medicare, and Medicaid and are based on recent cost experience along with assumptions about future cost inflation.

The second arrangement shifts many more specialists from fee-for-service payment to global payment. This change alters the economic incentives for specialists to align with wider cost-saving goals. Under traditional fee-for-service, declines in use and income tend to trigger a "supply push" response from specialists, causing them to order additional visits, procedures, and hospital admissions.²¹ But specialists who are paid globally have no financial incentive linked to the volume of care. Moving specialists to global payment involves not only putting them on salary but also eliminating any bonuses or incentives for greater volume.²²

► **ENCOURAGE HEALTHIER BEHAVIORS:** What if, in addition to the strategies above, there were a broad cluster of well-established population health policies and programs to encourage healthier behaviors? In particular, this intervention reduces the total fraction of people with behaviors that put them at high risk for chronic illness, including smoking, poor diet, inadequate exercise, substance abuse, and unprotected sex. The effects and costs of this intervention encompass simultaneous efforts to reduce the onset of risky behaviors (such as discouraging smoking initiation) as well as to reform previously established behaviors (such as encouraging smoking cessation).

► **INCREASE SOCIOECONOMIC OPPORTUNITIES:** What if, in addition to the strategies above, the region implemented a broad cluster of well-established antipoverty policies and programs such as living wage laws; tax credits; child care subsidies; and vouchers for housing, adult education, and job training?

This initiative is the most expensive to enact

(initially about 30 percent more than the first intervention, higher-value care). We therefore sequence its implementation by ten years (that is, starting in 2025) to allow the other cost-saving components more time to generate resources that could be reinvested to assure stable funding for the full set of investments through 2040.

SENSITIVITY TESTING Each of these simulated interventions could encompass large categories of action with many subtypes, creating uncertainty as to their overall effect sizes and costs. Also, uncertainties exist with respect to certain external trends—for example, those dealing with general economic conditions and the impact of the Affordable Care Act (ACA). Recognizing these uncertainties, we conducted a suite of sensitivity tests to determine the robustness of the results under more pessimistic assumptions (see Appendix Exhibit A3).¹⁹

OUTCOME MEASURES We compared each simulated strategy, relative to the baseline, using a consistent set of metrics for all years of the simulation. These included four summary measures of population health, health care cost, social inequity, and workforce productivity. Formal definitions are discussed below. In addition, we calculated total program spending for each strategy, as well as net financial benefit after subtracting the costs of the initiatives themselves. These metrics reflect the interests of most major stakeholders, and all are needed because an intervention that improves one measure might in some cases detract from another.

LIMITATIONS A few caveats and qualifications should be noted. First and most obviously, any strategic analysis must rest on a particular representation of reality, involving assumptions about future trends, costs, and behavioral responses. Formal modeling such as ours does not attempt to predict the future but instead attempts to compare the relative potential among strategies after exposing critical assumptions and connecting them with empirical evidence. Even so, there is no guarantee that some unanticipated future event or trend might not change conditions so much as to decrease the model's utility.

Second, this analysis does not indicate to what extent the findings from the “Anytown” model would apply to various localities; that is, we cannot address the question of whether place affects strategic priorities. So far, we have configured the model to represent ten different regions across the United States with populations that range in size from 100,000 to 3 million. After we compared simulated results across regions, our preliminary conclusion is that place-based differences might somewhat affect the optimal

mix and timing for specific initiatives, but they do not alter the main findings discussed here.

Study Results

BASELINE The baseline is dominated by two trends: population aging and health care price inflation. Aging leads over time to higher rates of chronic illness and health care use, which in conjunction with health care price inflation causes health care costs to rise by 60 percent over and above general inflation from 2010 to 2040. Rising health care costs lead, in turn, to job losses, more medical debt and bankruptcies, and consequently some increase in the disadvantaged fraction of the population. As a result of the increase in disadvantage, health equity and per capita economic productivity worsen somewhat across the region. Another adverse effect of rising health care costs is erosion in insurance coverage, which tends to undermine the initial expansion that occurred after the ACA. This erosion could occur as ACA-exempt employers drop health benefits and nonexempt employers move full-time employees to part time.²³

This sobering baseline must not be interpreted as a prediction per se, depending as it does on many assumptions. But it is a plausible future consistent with current trends and anticipated population changes, and one that leaders ought to be concerned about. Despite its uncertainties, this baseline serves as a consistent point of reference when alternative strategies are being tested.

SIMULATED INTERVENTIONS We present graphs over time (2010–40) for a layered combination of intervention strategies, across four primary outcomes, with results expressed as percentage improvements over the baseline. Exhibit 1 shows the percentage improvement (decrease) in the fraction of the population with severe chronic physical illness. Exhibit 2 shows the percentage improvement (decrease) in health care costs per capita. Exhibit 3 shows the percentage improvement (decrease) in the disadvantaged fraction of the population. Exhibit 4 shows the percentage improvement (increase) in the productive value of the workforce (that is, wage income minus productivity losses).

► **HIGHER-VALUE CARE:** We begin by implementing the higher-value care intervention by itself. Although this strategy has great potential to improve health and reduce costs, the simulation reveals that it falls far short of that potential because of inadequate funding. About \$190 per capita per year would be required for full implementation. Thus, with an initial start-up fund of only \$75 per capita per year for five years, the strategy is implemented initially at less than half

strength, and by 2020 it is entirely out of funds. Its beneficial impact on the variables in Exhibits 1–4 peaks at about 1 percent and gradually declines from there.

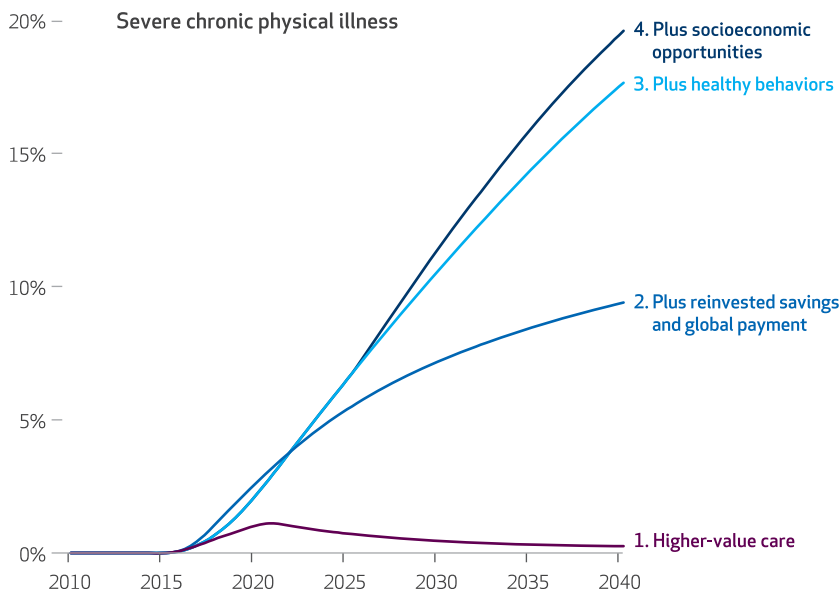
► **ADDING REINVESTMENT OF SAVINGS AND GLOBAL PAYMENT:** We next combine higher-value care with two complementary financial arrangements: reinvested savings and expanded global payment to specialists. The increase in global payment to specialists, while not universal, is enough to dampen the supply-push response that would otherwise boost the volume of services and undermine cost savings. Thus, expanded global payment allows higher-value care to more effectively reduce health care costs (Exhibit 2). Also, with 50 percent of the savings now being reinvested in the effort, spending on higher-value care remains fully funded for all twenty-five years, with money left to spare (about \$1,900 per capita accumulates unspent by 2040). The health care cost reductions reach 10 percent by 2040 as severe chronic illness declines by nearly 10 percent (Exhibit 1). This reduction, in turn, leads to a gradual reduction in disadvantage by a few percentage points relative to the baseline (Exhibit 3). The combination of less chronic illness and less disadvantage leads to a 2 percent improvement in the productive value of the regional workforce by 2040 (Exhibit 4).

► **ADDING HEALTHIER BEHAVIORS:** The third step joins the previous interventions with population-level initiatives to enable healthier behaviors. The desired spending on these initiatives is highest during their first few years after implementation, and funds are consequently tight for all initiatives (both clinical and behavioral) at first. As a result, the reduction in chronic illness lags that of the previous strategy for the first seven years (Exhibit 1), and the reduction in health care costs lags for the first four years (Exhibit 2). But as risk behaviors are reduced (they drop 10 percent by 2020, on their way to being reduced 50 percent by 2040), the onset and progression of chronic illness is reduced as well, and this reduction in chronic illness helps to further reduce health care costs. By 2040 severe chronic physical illness is reduced nearly 18 percent relative to the baseline, which helps reduce health care costs by nearly 15 percent. With lower health care costs and better health, disadvantage is reduced 6 percent relative to the baseline (Exhibit 3), and productive value is up 4 percent (Exhibit 4). With more cost savings, unspent funds accumulate to about \$2,800 per capita by 2040.

► **ADDING SOCIOECONOMIC OPPORTUNITIES:** The final step in our sequence is to implement, starting in 2025, the initiative to expand socioeconomic opportunities. The preceding step of adding the healthier behaviors intervention ini-

EXHIBIT 1

Combined intervention improvements in severe chronic physical illness in the population, expressed as percentage decreases relative to baseline



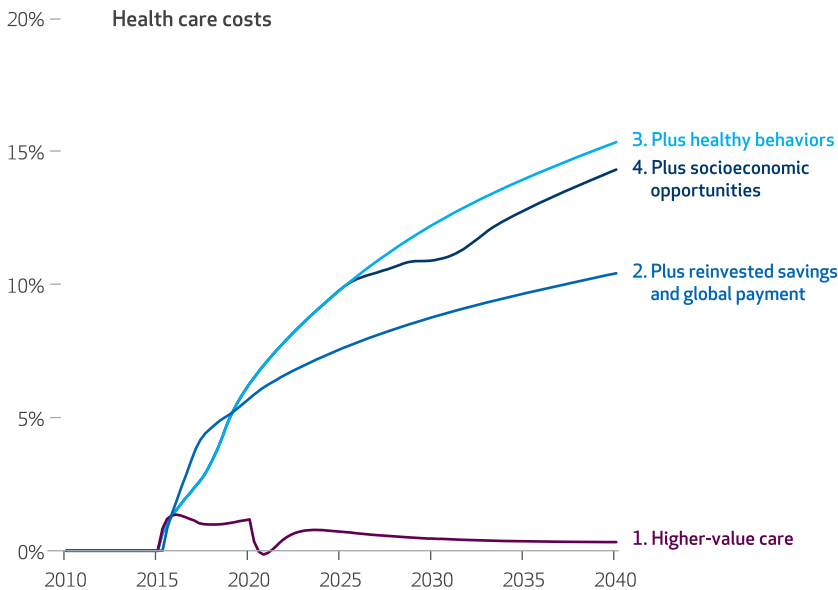
SOURCE Authors' analysis of simulation results. **NOTES** Our measurement proxy for severe chronic physical illness is self-reported general health status (for adults, from the Centers for Disease Control and Prevention's [CDC's] Behavioral Risk Factor Surveillance System [BRFSS] survey; for children, from the National Center for Health Statistics' National Survey of Children's Health survey) that is "poor" or "fair" instead of "good," "very good," or "excellent." An analysis of BRFSS 2007 showed that people with three or more chronic conditions were much more likely than others to report their health as "poor" or "fair" and to be in physical distress at least half of the time. Chen HY, Baumgardner DJ, Rice JP. Health-related quality of life among adults with multiple chronic conditions in the United States, Behavioral Risk Factor Surveillance System, 2007. *Prev Chronic Dis.* 2011;8(1):A09. "Baseline" is defined in the text.

tially depletes available program funds until the early 2020s. But funding then starts to recover, and by 2025 there is sufficient funding to introduce the socioeconomic opportunities intervention and keep all of the initiatives adequately funded until the end of the run. By 2040 there are still about \$500 per capita of unspent funds remaining, even with the socioeconomic opportunities intervention in effect. This intervention starts to shrink the disadvantaged fraction even during its first few years of implementation, reducing it 15 percent relative to the baseline by 2030 and 20 percent by 2040 (Exhibit 3). This reduction in disadvantage translates directly into improved productive value, which grows 6 percent relative to the baseline by 2030 and more than 9 percent by 2040 (Exhibit 4). Moreover, severe chronic illness is reduced nearly 20 percent relative to the baseline by 2040 (Exhibit 1).

Although most outcomes improve when the socioeconomic opportunities intervention is included, health care costs do not decline as much as in the preceding run (Exhibit 2). The slightly lower reduction here (down from 15 percent to 14 percent in 2040) is because the advantaged spend more on health care than the disadvan-

EXHIBIT 2

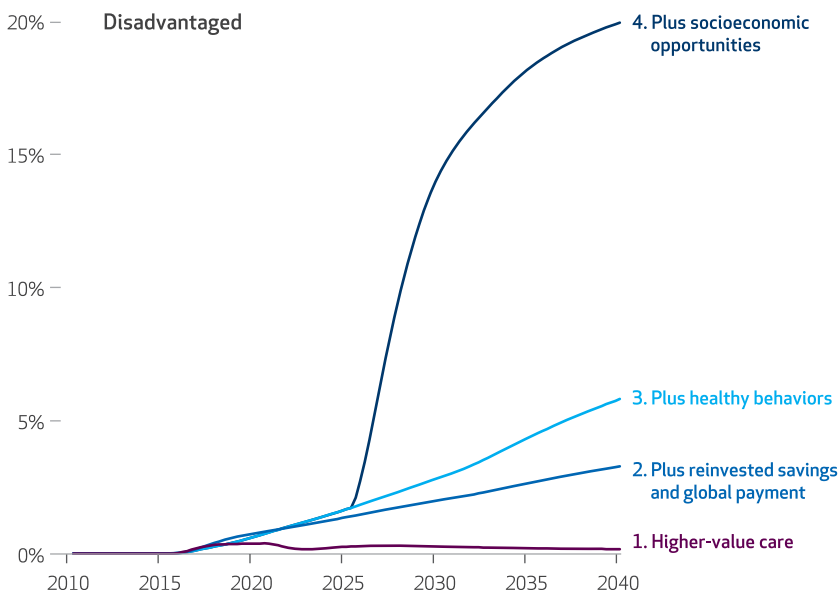
Combined intervention improvements in health care costs per capita, expressed as percentage decreases relative to baseline



SOURCE Authors' analysis of simulation results. **NOTES** Health care costs encompass all categories of personal health care costs in the National Health Expenditures Accounts: hospital, physician and lab services, other professional services, self-care products, nursing facilities, home health care, and hospice. "Baseline" is defined in the text.

EXHIBIT 3

Combined intervention improvements in the disadvantaged fraction of the population, expressed as percentage decreases relative to baseline



SOURCE Authors' analysis of simulation results. **NOTES** Disadvantage refers to a household income less than 200 percent of the federal poverty level. "Baseline" is defined in the text.

taged do, even accounting for reduced emergency department visits.

SENSITIVITY RESULTS The sensitivity tests show that the potential to improve health system performance described above is essentially unaffected by external trend assumptions, but it can be suppressed by certain pessimistic assumptions about interventions' effectiveness, in particular those that constrain the availability of program funding (see Appendix Exhibit A4).¹⁹ Specifically, if either the higher-value care intervention is less effective (by about 30 percent) or the negotiated share for reinvestment is smaller (33 percent instead of 50 percent), then program funding becomes inadequate and the entire four-layer strategy cannot achieve liftoff. These results underscore the imperative to reduce health care costs as much as possible, along with a practical need to reinvest an amount that is sufficient to sustain the desired action agenda.

WEIGHING TRADE-OFFS AND FINANCIAL IMPACTS This study illustrates two trade-offs that commonly surface when multi-initiative reform strategies are being studied. One is a short- versus long-term trade-off produced when the addition of new initiatives creates a temporary shortfall in program funding for the entire endeavor; we see this when the investment in healthier behaviors delivers slightly weaker results in the first few years, followed by steadily stronger gains thereafter.

A second trade-off occurs when an initiative improves certain outcomes but worsens others; we see this with the addition of socioeconomic opportunities, which enhances population health, equity, and workforce productivity but does a bit less than the previous strategy to lower health care costs.

Exhibit 5, which reports cumulative financial metrics, helps evaluate such trade-offs more systematically. It shows twenty-five-year average per capita values of program spending, health care costs, and productive value, as well as the productive value minus health care costs and program spending.

Based on these metrics, there is no question that the third and fourth strategies, which combine clinical and population-level initiatives, are financially superior to the first two strategies, which include only clinical reforms. Choosing between the third and fourth strategies, however, is not so straightforward and might depend on who is doing the choosing.

With socioeconomic opportunities and all prior components in the fourth strategy, there is a noteworthy increase in productive value minus health care costs and program spending. This appears to be a compelling proposition from the perspective of residents, employers, and

others interested in creating a healthier, more equitable, and more prosperous region. But that fourth strategy does not reduce health care costs as much; it also requires substantially greater program spending. Thus, it might not be as appealing to those whose only focus is on lowering health care costs or to those wary of investing in such a grand endeavor, irrespective of its potential returns.

Discussion

Leaders across the country face a pressing need to reimagine and transform how the health system works in their regions. Considering the complexity and inevitable uncertainty of this challenge, we analyzed what could be accomplished with four intervention strategies that layer together a number of initiatives and financial arrangements commonly discussed and debated.

Results suggest that there may be an effective and affordable way to unlock much greater health and economic potential through combined investments in clinical and population-level initiatives, coupled with financial agreements that reduce incentives for costly care and reinvest a share of the savings to ensure adequate long-term financing.

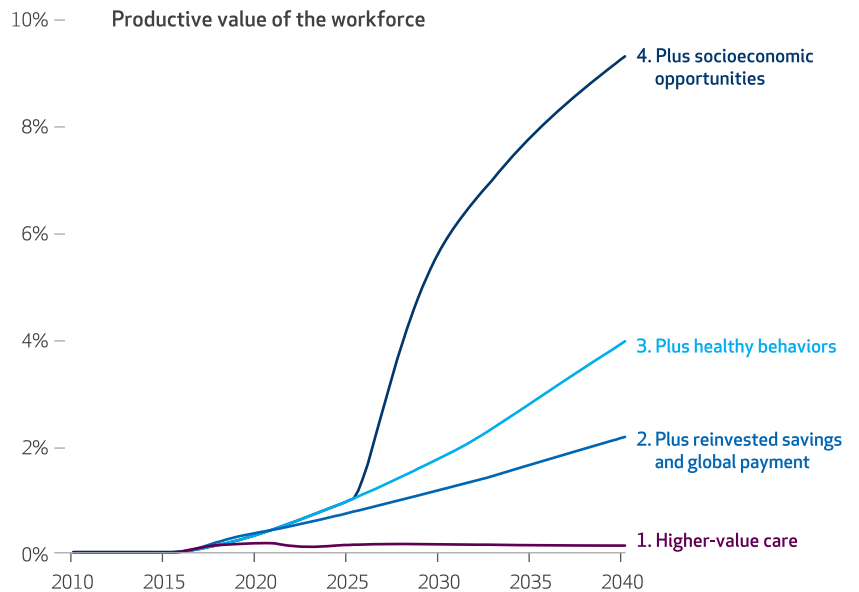
HOW REALISTIC ARE FEATURES IN THESE SIMULATED SCENARIOS?

► **TEMPORARY INNOVATION FUNDING:** No single source is likely to invest in a serious regional reform venture. However, by combining resources from hospital community benefits, community development financing, entrepreneurial investors, government, philanthropy, and in-kind contributions from local partners, it is plausible to gather start-up capital on the order of 1 percent of health care costs for five years.

► **CLINICAL REFORMS TO DELIVER HIGHER-VALUE CARE:** National Committee for Quality

EXHIBIT 4

Combined intervention improvements in the productive value of the workforce, expressed as percentage increases relative to baseline



SOURCE Authors' analysis of simulation results. **NOTES** Productive value is wage income summed across the entire employed population less productivity losses from absenteeism and presenteeism. We estimate from studies and census data that during the 2000-10 period, productivity losses amounted to about 5 percent of wage income. See Stewart WF, Ricci JA, Chee E, Hahn SR, Morganstein D. Cost of lost productive work time among US workers with depression. *JAMA*. 2003;289(23):3135-44. President's New Freedom Commission on Mental Health. Achieving the promise: transforming mental health care in America. Rockville (MD): Substance Abuse and Mental Health Services Administration; 2003 Jul. (Report No. SMA03-3831). "Baseline" is defined in the text.

Assurance Level 3 patient-centered medical homes (the highest level of recognition from this national body) already encompass several elements needed to deliver higher-value care, including care coordination, quality improvement, self-care support, and enhanced access. The success of this program suggests that a multifaceted suite of delivery system changes could be feasible to enact across a region.²⁴ Even so, adequate financing is required for these clinical reforms

EXHIBIT 5

Cumulative per capita financial metrics for the baseline and layered combinations of interventions, 2015-40

	Program spending	Health care costs	Productive value	Productive value minus health care costs and program spending
Baseline	\$ 0	\$9,305	\$19,498	\$10,193
Higher-value care	13	9,214	19,424	10,197
Plus reinvest savings and global payment	209	8,550	19,548	10,789
Plus healthier behaviors	243	8,313	19,657	11,101
Plus socioeconomic opportunities	417	8,376	20,116	11,323

SOURCE Authors' analysis of simulation results. **NOTE** "Baseline" is defined in the text.

to realize their full potential.

► **REINVEST HEALTH CARE COST SAVINGS:** Over the past five years, as innovators have managed to lower health care costs, billions of dollars have begun to flow through formal shared savings agreements. Also, the parties to these agreements have, in some cases, reinvested those resources in a widening portfolio that goes beyond traditional clinical reforms to include behavioral health, affordable housing, social services, public health programs, education, and economic development. Some examples are Hennepin Health, Trillium Coordinated Care Organization, Cambridge Health Alliance, and Bellin Health.^{25,26} Most signs point to even further expansion of reinvestment through structures such as the Center for Medicare and Medicaid Innovation's State Innovation Models Initiative and the newer Accountable Health Communities Model initiative, among others.^{12,13,27,28}

► **GLOBAL PAYMENT FOR SPECIALISTS:** New payment schemes, integrated practice groups, and new business models are rapidly changing health care markets across the country. About a quarter of office-based specialists are already on salary,²² and major insurers and hospitals are openly committed to make value-based payment,

not volume-based payment, the norm.²⁹ Incentives that reward greater service volume stand at odds with these trends and, we expect, will decline over time.

► **ENABLING HEALTHIER BEHAVIORS:** A growing body of evidence, largely summarized in the *Guide to Community Preventive Services*, shows that it is possible to establish healthier behaviors and also to reduce risky practices for large fractions of the population.⁵

► **EXPANDING SOCIOECONOMIC OPPORTUNITIES:** A growing body of evidence, largely summarized by the Center on Budget and Policy Priorities and reflected in compendia such as *Investing in What Works for America's Communities*, shows that certain socioeconomic policies could, within a few years, lift many families out of economic disadvantage into living conditions that are healthier and jobs that are more productive.^{30,31}

Individually, each innovation might be plausible to enact, and this analysis suggests that together they could yield substantially better results. The question remains whether there are, in fact, US regions where a critical mass of organizations are committed to make such investments together. ■

Funding for this analysis was provided by the Fannie E. Rippel Foundation, in Morristown, New Jersey. The ReThink Health Dynamics Model was supported

by the Rippel Foundation and the California Health Care Foundation. The authors thank Rebecca Niles, Kristina Wile, Christina Ingersoll, and the other

members of the ReThink Health team, along with many contributors and collaborators across the country.

NOTES

- 1 Institute of Medicine. Crossing the quality chasm: a new health system for the 21st century. Washington (DC): National Academies Press; 2001 Mar.
- 2 Antos J, Baicker K, Chernew M, Crippen D, Cutler D, Daschle T, et al. Bending the curve: person-centered health care reform—a framework for improving care and slowing health care cost growth [Internet]. Washington (DC): Brookings Institution; 2013 Apr [cited 2016 Jun 16]. Available from: <http://www.brookings.edu/research/reports/2013/04/person-centered-health-care-reform>
- 3 Miller HD. The building blocks of successful payment reform: designing payment systems that support higher-value health care [Internet]. Portland (ME): Network for Regional Healthcare Improvement; 2015 Apr [cited 2016 Jun 16]. Available from: <http://www.chqpr.org/downloads/BuildingBlocksofSuccessfulPaymentReform.pdf>
- 4 Porter ME, Pabo EA, Lee TH. Redesigning primary care: a strategic vision to improve value by organizing around patients' needs. *Health Aff (Millwood)*. 2013;32(3):516–25.
- 5 Community Preventive Services Task Force. The guide to community preventive services [home page on the Internet]. Atlanta (GA): The Task Force; [cited 2016 Jun 16]. Available from: <http://thecommunityguide.org/index.html>
- 6 Whittington JW, Nolan K, Lewis N, Torres T. Pursuing the Triple Aim: the first 7 years. *Milbank Q*. 2015; 93(2):263–300.
- 7 Mechanic D. Disadvantage, inequality, and social policy. *Health Aff (Millwood)*. 2002;21(2):48–59.
- 8 Institute of Medicine. For the public's health: investing in a healthier future. Washington (DC): National Academies Press; 2012.
- 9 Merlis M. Health Policy Brief: accountable care organizations. *Health Affairs* [serial on the Internet]. 2010 Aug 13 [cited 2016 Jun 16]. Available from: http://www.healthaffairs.org/healthpolicybriefs/brief.php?brief_id=23
- 10 Gates A, Rudowitz R, Guyer J. An overview of delivery system reform incentive payment (DSRIP) waivers [Internet]. Washington (DC): Kaiser Commission on Medicaid and the Uninsured; 2014 Sep 29 [cited 2016 Jun 16]. Available from: <http://kff.org/medicaid/issue-brief/overview-of-delivery-system-reform-incentive-payment-waivers/>
- 11 Fisher ES, Corrigan J. Accountable health communities: getting there from here. *JAMA*. 2014;312(20):2093–4.
- 12 Alley DE, Asomugha CN, Conway PH, Sanghavi DM. Accountable health communities—addressing social needs through Medicare and Medicaid. *N Engl J Med*. 2016; 374(1):8–11.
- 13 Mikkelsen L, Haar WL. Accountable communities for health: opportunities and recommendations [Internet]. Oakland (CA): Prevention Institute; 2015 Jul [cited 2016 Jun 16]. Available from: <http://www.preventioninstitute.org/component/jlibrary/article/id-366/127.html>
- 14 Milstein B, Homer J, Briss P, Burton

- D, Pechacek T. Why behavioral and environmental interventions are needed to improve health at lower cost. *Health Aff (Millwood)*. 2011; 30(5):823–32.
- 15 ReThink Health. Summary of the ReThink Health Dynamics Model [Internet]. Morristown (NJ): ReThink Health [last updated 2015 Oct 1; cited 2016 Jun 30]. Available from: <http://www.rethinkhealth.org/wp-content/uploads/2014/10/ReThink-Health-Model-Summary-v5.pdf>
 - 16 Homer J. Reference guide for the ReThink Health Dynamics Simulation Model: a tool for regional health system transformation [Internet]. Morristown (NJ): Fannie E. Rippel Foundation; 2016 Jan [cited 2016 Jun 30]. Available from: <http://www.rethinkhealth.org/wp-content/uploads/2015/12/RefGuide.pdf>
 - 17 Homer JB, Hirsch GB. System dynamics modeling for public health: background and opportunities. *Am J Public Health*. 2006;96(3):452–8.
 - 18 Sterman JD. *Business dynamics: systems thinking and modeling for a complex world*. Boston (MA): Irwin McGraw-Hill; 2000.
 - 19 To access the Appendix, click on the Appendix link in the box to the right of the article online.
 - 20 Bailit M, Hughes C. Key design elements of shared-savings payment arrangements [Internet]. New York (NY): Commonwealth Fund; 2011 Aug [cited 2016 Jun 16]. Available from: http://www.commonwealthfund.org/~media/files/publications/issue-brief/2011/aug/1539_bailit_key_design_elements_sharedsavings_ib_v2.pdf
 - 21 Wennberg JE. *Tracking medicine: a researcher's quest to understand health care*. New York (NY): Oxford University Press; 2010.
 - 22 Rosenthal E. Apprehensive, many doctors shift to jobs with salaries. *New York Times*. 2014 Feb 14; Sect. A:14.
 - 23 Komisar HL. The effects of rising health care costs on middle-class economic security [Internet]. Washington (DC): AARP Public Policy Institute; 2013 Jan [cited 2016 Jun 16]. Available from: http://www.aarp.org/content/dam/aarp/research/public_policy_institute/security/2013/impact-of-rising-healthcare-costs-AARP-ppi-sec.pdf
 - 24 Magill MK, Ehrenberger D, Scammon DL, Day J, Allen T, Reall AJ, et al. The cost of sustaining a patient-centered medical home: experience from 2 states. *Ann Fam Med*. 2015;13(5):429–35.
 - 25 Sandberg SF, Erikson C, Owen R, Vickery KD, Shimotsu ST, Linzer M, et al. Hennepin Health: a safety-net accountable care organization for the expanded Medicaid population. *Health Aff (Millwood)*. 2014;33(11):1975–84.
 - 26 Hacker K, Mechanic R, Santos P. Accountable care in the safety net: a case study of the Cambridge Health Alliance [Internet]. New York (NY): Commonwealth Fund; 2014 Jun [cited 2016 Jun 16]. Available from: http://www.commonwealthfund.org/~media/files/publications/case-study/2014/jun/1756_hacker_accountable_care_cambridge_ha_case_study_v2.pdf
 - 27 Hester JA, Auerbach J, Chang DI, Magnan S, Monroe JA. Opportunity knocks again for population health: round two in state innovation models [Internet]. Washington (DC): National Academy of Medicine; 2015 Apr 16 [cited 2016 Jun 16]. Available from: <http://nam.edu/wp-content/uploads/2015/06/SIMsRound21.pdf>
 - 28 Hester JA, Stange PV, Seeff LC, Davis JB, Craft CA. Toward sustainable improvements in population health: overview of community integration structures and emerging innovations in financing [Internet]. Atlanta (GA): Centers for Disease Control and Prevention; 2015 [cited 2016 Jun 16]. (CDC Health Policy Series No. 2). Available from: <http://www.cdc.gov/policy/docs/financepaper.pdf>
 - 29 Evans M, Herman B. Where health-care is now on march to value-based pay. *Modern Healthcare* [serial on the Internet]. 2015 Jan 28 [cited 2016 Jun 16]. Available from: <http://www.modernhealthcare.com/article/20150128/NEWS/301289952>
 - 30 Center on Budget and Policy Priorities. What works to reduce poverty [Internet]. Washington (DC): CBPP; 2015 [cited 2016 Jun 16]. Available from: <http://www.cbpp.org/what-works-to-reduce-poverty>
 - 31 Andrews NO, Erickson DJ, editors. *Investing in what works for America's communities*. San Francisco (CA): Low Income Investment Fund; 2012.