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Social Determinants As Public Goods: A New Approach To Financing Key Investments In Healthy Communities

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ABSTRACT Good research evidence exists to suggest that social determinants of health, including access to housing, nutrition, and transportation, can influence health outcomes and health care use for vulnerable populations. Yet adequate, sustainable financing for interventions that improve social determinants of health has eluded most if not all US communities. This article argues that underinvestment in social determinants of health stems from the fact that such investments are in effect public goods, and thus benefits cannot be efficiently limited to those who pay for them—which makes it more difficult to capture return on investment. Drawing on lesser-known economic models and available data, we show how a properly governed, collaborative approach to financing could enable self-interested health stakeholders to earn a financial return on and sustain their social determinants investments.

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The tenuous survival of the Affordable Care Act (ACA), the 2017 tax cut and 2018 spending increases, and the disappointing cost savings from ACA payment reform pilots all presage a coming push for entitlement reform and political pressure to lower health care costs. Amid calls for more effective cost reduction,¹ few payment reform options can rival the cost-saving potential of squarely addressing the deficits in social determinants of health that constrain health and drive spending trajectories for many low-income Americans.

Decades of research have demonstrated that economic stability, physical environment, education, food, and social context are powerful upstream factors that largely determine one's health before the health system is able to intervene. Social determinants of health also influence the effectiveness of medical interventions. Antibiotics are of little help to those who drink polluted water every day.² Recent work by

Elizabeth Bradley, Lauren Taylor, and others has investigated how social spending influences health outcomes in many industrialized countries, including the US.³⁻⁵ System dynamics experts^{6,7} and public health researchers⁸ have developed the capacity to model the impact of nonmedical spending choices on health outcomes. There is growing awareness that funding for interventions related to social determinants of health has long been inadequate, leaving health systems to treat the survivors of a frayed social safety net.

The ACA's hospital readmission penalties forced health care organizations to reconsider their role and self-interest in addressing deficits in social determinants of health in the community. Many learned that paying attention to the reality of people's lives at home can reduce readmissions and utilization generally^{9,10} and that community-based organizations and nonmedical personnel such as social workers and community health workers can be more efficient

than medical personnel in engaging upstream with patients who have complex conditions.¹¹ Several high-profile health systems have opted to use community benefit spending as an opportunity to address social determinants of health.¹² Nevertheless, substantial funding from hospitals or health plans for social determinants remains rare.

Parallel to the attention on social determinants, a focus on achieving greater equity in health outcomes has emerged.^{13,14} Energized by the ACA's Prevention and Public Health Fund,¹⁵ health equity advocates have helped develop new requirements for community health needs assessments and action plans among nonprofit hospitals. These actions have revealed substantial health disparities in virtually every community.¹⁶ Nevertheless, payers and providers struggle to internalize health equity as a key goal, as clinical quality improvement and cost reduction remain the commonly incentivized priorities.

In this article we aim to demonstrate that the underprovision of interventions on social determinants of health can be addressed through a novel but practical community financing mechanism. We characterize these interventions as a type of public good that health care delivery and payer entities at risk for the uninsured and insured, respectively, have a common interest in financing. Throughout the article we refer to these entities collectively as key (health care) stakeholders. We have in mind a financing model that works similarly to the taxation of benefits to reframe, as a type of investment, spending that has long been considered charity.¹⁷ This reframing would allow such investments to become sustainable, if the payment policies remained in place.¹⁸ We further assert that this type of financing model might help reduce cost growth in the long run, as improving the various environments that underlie health would reduce the percentage of the population moving from healthy to unhealthy states. Vastly more spending could be avoided by reducing the percentage of the population that acquired an illness than by better management of a larger population with that illness.¹⁹ Below, we provide a real-world example to illustrate the potential for investments in social determinants to yield diffuse benefits.

Social Determinants Programs In Action

A low-income, elderly woman who uses a wheelchair, enrolled in a Medicare Advantage plan, repeatedly missed clinical appointments, frustrating clinical staff at her local federally qualified health center as well as the care coordinator assigned by her managed care company. This

health center, like most of its kind, operates primarily on a fee-for-service financing model. Her truancy cost the clinic revenue from the empty appointment slots and denied the woman primary care and comprehensive case management that could stave off emergency department (ED) admissions and even hospitalizations. An Area Agency on Aging volunteer, who coordinated the woman's Meals on Wheels deliveries, learned of the missed appointments and contacted the clinic to explain that the woman lived on the third floor of a walkup apartment building without an elevator. As a result, the only time she was able to go to the doctor was when her husband, who drove a cab part time, was home and could carry her down the stairs. Unfortunately, the clinic had no programs or resources to address the problem.

The volunteer discovered that the woman was eligible for transportation services provided by a local nonprofit funded by the county government. With transportation secured, the woman never missed another appointment, and both her diabetes and blood pressure became well controlled. Transportation services—even those that entailed carrying her down and back up the stairs—cost far less than ED visits or a single hospitalization, particularly when a 911 call had to be made.

Why Health Entities Don't Invest In Social Determinants

Multiple stakeholders gained from the upstream intervention: the patient, to be sure, but also payers, health and social services providers, and potentially taxpayers. Additionally, reducing these types of social determinants deficits can reduce health disparities.²⁰ Even so, social determinants interventions such as the non-emergency medical transportation provided in the example above are rarely pursued by health care organizations. Three reasons for this underinvestment deserve unpacking.

First, it is difficult for individual health care organizations to credibly estimate the full net benefit of their investments. High-quality data on relevant costs and benefits are difficult to find and interpret across varied locales.

Second, health care organizations may doubt whether social services can be delivered efficiently to the target group, as this work is often done outside hospital or clinic walls by non-health care personnel. This doubt stems partly from a lack of familiarity with and trust in the local social services ecosystem.

Third, health care organizations are concerned about losing the benefit from their investment if a patient switches insurance plans or

providers after the investment is made but before the benefit is realized. This fear is particularly well grounded for Medicaid enrollees because churning—the frequent exit and reentry of beneficiaries as their eligibility changes—has long been a problem for both administrators and recipients.²¹ Additionally, plan switching among commercial-plan enrollees is fairly common, in the range of 10–43 percent of enrollees each year.^{22,23} There is a similar but smaller risk of plan switching in Medicare Advantage plans.²³

Social Determinants Investments Are Public Goods

Given these realities, we argue that upstream spending on social determinants of health has the properties of a public good. In contrast to private goods such as tennis racquets or ice cream, public goods deliver benefits to different people and sectors simultaneously (a property called nonrivalrous), and those benefits cannot be efficiently limited to those who pay directly for them (a property called nonexcludable). The theory of and experience with public goods such as national defense and transportation infrastructure suggest that public goods will be undersupplied by self-interested actors in a free market, even in cases where the market is dominated by nonprofit health care provider organizations, nonprofit health plans, and governments at every level. This undersupply is called the “free-rider problem,” a name that reflects the fact that investors cannot easily prevent nonpayers from benefiting and thereby capturing some of the return on the investment. The free-rider problem is why governments typically finance from taxation pure public goods such as national defense.

This phenomenon is related to the “wrong pocket problem,” in which “investments from one part of the government are not reimbursed by the benefits that accrue to another part of government, discouraging cross-agency investment.”²⁴

Solving The Free-Rider Problem

Given the barriers to investing in social determinants interventions described above, health care stakeholders are unwilling to voluntarily contribute enough resources to solve common problems.

We have identified a financing model that enables each stakeholder to recognize that revealing its true willingness to pay for a social determinants intervention is in its own self-interest. This self-interest is what makes the intervention an investment, rather than a donation. Investments that generate positive returns are sustain-

able in the long run. The model is a variant of the Vickrey-Clarke-Groves mechanism, which was originally developed in the 1970s as economists searched for ways to solve free-rider problems without relying completely on the government.²⁵

There are necessary preconditions for the Vickrey-Clarke-Groves mechanism to work. Most important, there must be a local “trusted broker” that is financially neutral, such as a local nonprofit or philanthropy, and that can convene local health system stakeholders such as health plans, hospital systems, employers, community health centers, and county health and social service departments. Researchers or academics could initially function as technical advisers to the trusted broker and could play facilitation, data analytics, and communication roles until essential mechanisms and models became self-evident and were successfully implemented, and the advisers were no longer needed.

We envision a twelve-step process for communities that are willing to pursue this financing model.

CONVENING KEY STAKEHOLDERS AND GATHERING INFORMATION Informal conversations between technical advisers and key stakeholders (all health care entities that bear financial risk for the health care use of socially vulnerable patients) can identify potential trusted brokers and existing reports or evaluations that highlight important deficits in social determinants of health in the community.

CHOOSING A TRUSTED BROKER The selection of the right trusted broker is a linchpin of the process. Essential characteristics of a trusted broker include managerial competence, the ability to keep sensitive financial information confidential and be impartial, and communications savvy to promote the stakeholders’ joint investment.

GATHERING INPUT, ADDRESSING CONCERNS, AND ESTABLISHING TRUST The participation of all stakeholders who bear financial risk for the selected population is essential. The process of establishing trust among stakeholders could be informed by lessons from political scientist Elinor Ostrom on managing “common-pool” resources;²⁶ from the collaborations of social and health services managers in Scandinavian countries;⁵ successful health-sector coalitions;²⁷ county-level planning and models developed by ReThink Health²⁸ or Altarum;⁸ and collective impact arrangements, in which different sectors commit to a common agenda for solving a social or environmental problem.²⁹

ASSESSING THE CURRENT HEALTH LANDSCAPE AND SOCIAL DETERMINANTS DEFICITS Together, the group must agree on the largest social determinants deficits in their community. Agreement could emerge from a landscape assessment

based on existing or new quantitative and qualitative data, including community health needs assessments.

PROJECTING RETURN ON INVESTMENT FROM ONE OR MORE INTERVENTIONS Once one or more social determinants deficits have been targeted for action, technical advisers can project the return on investment (ROI) for one or more potential interventions, using local data and rigorous evaluations from other communities.

SELECTING AN INTERVENTION The trusted broker shares the projections with stakeholders, who must then agree to enter a “bidding” process to jointly fund a communitywide intervention.

SOLICITING BIDS Stakeholders individually consider (with help from the trusted broker and technical advisers) what they are willing to pay (or “bid”) to reduce the social determinant deficit. Call these revealed values. The trusted broker chooses the scale that maximizes collective value (willingness to pay). In economic terms, the investment is worth undertaking if the collective value is greater than the total cost of the social determinant investment at scale. Of note, some stakeholders may attach value to improved health outcomes, not just to cost savings. With these data, the broker can calculate what each payer should pay and expect to reap from the social determinant investment scheme. Perhaps most importantly, the trusted broker can show each stakeholder the implications of their joint strategies, including doing nothing and forgoing the potential individual and mutual gains. Examples of how to calculate collective value and prices are in exhibit 1 and in the online appendix.³⁰

ASSIGNING PRICES The trusted broker calculates what each stakeholder must pay for the intervention to be implemented at scale. The

optimal price calculation has two parts: an initial cost share, set so that the proper scale of the intervention is paid for, and a “tax” (economists might call it a “side payment”), set so that the externalities (positive or negative consequences that affect others) each stakeholder imposes on the others is fully reflected in each stakeholder’s net price. It is in setting the tax, or side payment, that the Vickrey-Clarke-Groves mechanism excels (the tax can be positive, negative, or zero). For the joint investment to go forward and be sustainable, it is necessary for all stakeholders to gain. (A more complete example of how the model would determine prices for all stakeholders is in the appendix.)³⁰

CONTRACTING WITH A VENDOR TO IMPLEMENT THE INTERVENTION The trusted broker and stakeholders review the available options of “implementers” (for example, transportation companies) of the selected intervention.

IMPLEMENTING THE INTERVENTION The vendor implements the intervention, guided by a contract with specific conditions, data reporting requirements, and deliverables.

PROVIDING OVERSIGHT AND QUALITY ASSURANCE The trusted broker manages the contract, providing regular updates to stakeholders and ensuring the quality and fidelity of the intervention.

RECONCILING THE DATA After the first year, the trusted broker and stakeholders assess how closely the health impacts and returns to each stakeholder matched expectations and repeat the bidding process for funding the intervention, and possibly others, in subsequent years.

Long-standing, place-based nonprofits such as the Family League of Baltimore are well-situated to play the role of the trusted broker throughout the twelve-step process. The Family League

EXHIBIT 1

Values and costs of a hypothetical social determinants investment in nonemergency medical transportation

Stakeholder	Targeted patients covered	Thousands of dollars					
		Gross value of investment	Loss from reduced care	Net value	Cost share ^a	Tax or side payment	Net price
Medicaid	50%	7,700	0	7,700	1,312.5	500	1,812.5
Medicare	20	3,080	0	3,080	1,312.5	200	1,512.5
Private insurer	10	1,540	0	1,540	1,312.5	100	1,412.5
Providers or uninsured people	20	3,080	2,464	616	1,312.5	-800	512.5
All	100	15,400	2,464	12,320	5,250.0	0	5,250.0

SOURCE Authors’ analysis based on updated cost and savings data from Paul Hughes-Cromwick, codirector of Sustainable Spending Strategies, Altarum Institute, personal communication, August 4, 2017. **NOTES** We assumed an overall population of 300,000, of whom 7,000 would be transportation-disadvantaged patients. Gross value of investment, or gross willingness to pay, is the savings per person (assumed to be \$2,200) times the number of people. For example, Medicaid covers 50 percent of the 7,000 patients, or 3,500 people, and \$2,200 times 3,500 equals \$7.7 million. ^aTotal cost (net cost of \$750 times 7,000 patients) divided by 4.

Investing in social determinants requires some degree of patience from investors before returns are realized.

already functions as a funding hub and has demonstrated the advantages of pooling and coordinating funding from hospital community benefits, philanthropy, and government.³¹ Our model would improve upon existing practice by solving the free-rider problem without coercion by revealing cooperative solutions that are in the self-interest of local stakeholders, without appeals to their charity alone.

Applying The Model To Nonemergency Medical Transportation

Using updated data from the literature on the costs and benefits of providing nonemergency medical transportation (rounded off for simplicity)²⁷ and a hypothetical community of 300,000 people,³² we demonstrate how all local health stakeholders could benefit financially from a joint investment in nonemergency medical transportation, using our proposed model to set prices for each stakeholder. Our hypothetical community includes a diverse set of risk bearers and payers.

The transportation-disadvantaged population who miss nonemergency medical care each year has been estimated to be at least 2.3 percent of the US population (almost 7.5 million people in 2017) (a 2004 estimate updated with 2015 data from the National Health Interview Survey by Paul Hughes-Cromwick, codirector of Sustainable Spending Strategies, Altarum Institute, personal communication, August 4, 2017) but is not representative of the broader population. People who miss appointments due to lack of transportation are more likely to be low income, uninsured, older, female, less educated, and members of a racial/ethnic minority group. They are also two to three times more likely to have a serious chronic condition, more likely to have comorbidities, and almost four times more likely to have an ED visit within a given year.³³ Perhaps

surprisingly, they are equally likely to be urban or rural.

The Transportation Research Board's cost-benefit analysis of providing nonemergency medical transportation drew on the peer-reviewed literature and expert panels to estimate cost differentials between well-managed patients (those who received recommended tests and therapies in a timely fashion) and patients who were not well managed because of missed appointments. The authors estimated the differentials across twelve health conditions (ranging from depression to pregnancy), the cost of transportation for different types of patient needs (ambulatory, wheelchair, or stretcher), the number of medical visits recommended for good management of the specific conditions, the number of visits transportation-disadvantaged patients managed to attend without interventions in a given year, and expected compliance with all clinical recommendations. We updated the health savings and transportation cost estimates of the analysis to 2017 numbers, using the growth rates in the medical Consumer Price Index (CPI) and in the transportation services CPI, respectively, as a first-order approximation of current average savings possibilities.³⁴

In our hypothetical population of 300,000, we estimated that 7,000 people (about 2.3 percent) would be transportation-disadvantaged. Net savings from getting these patients to scheduled appointments are projected to be \$2,200 per person per year, and net costs are expected to be \$750 per person for a year (the total cost share, or \$5,250,000, divided by 7,000 people). The data necessary for these calculations are displayed in exhibit 1.

For interventions that reduce utilization by the insured and uninsured alike, payers gain the most, unambiguously. Providers, especially hospitals, would gain from reduced health care use by the uninsured but would lose from reduced use by paying customers. We assumed that providers would lose 20 percent of the gross revenue from insured patients ($2,464 = 0.20 * [7,700 + 3,080 + 1,540]$) (exhibit 1). This is a conservative estimate in that 20 percent is likely larger than most providers' profit margins on insured patients, and, depending on the locale, they might be able to substitute other insured patients for the transportation-disadvantaged patients who had previously cost them money by using ED or hospital resources.

The tax is set to make sure providers are willing to participate—that is, to compensate them for the externality they would suffer if the project went forward and everyone paid their simple cost share alone. Each payer is assessed a tax to compensate providers in proportion to its market

share, since their contributions to providers' losses from reduced utilization are proportional to their market share. Note that all stakeholders pay, on net, less than their revealed values, or initially accepted bids.

Note also that exhibit 1 summarizes stakeholder classes. In a given locale, there may be only fee-for-service Medicare, one Medicaid managed care organization, one dominant private insurer, and one hospital system. In other locales, there may be multiple players in each class. A larger number of stakeholders will make the trust-building process more complicated, but not insoluble.

The literature suggests other social determinants interventions that could both improve health outcomes and reduce health care use and spending for low-income populations, such as Housing First, which we discuss in more detail in the appendix.³⁰ Other interventions include nutrition support for new mothers (via the Special Supplemental Nutrition Program for Women, Infants, and Children) and older Americans (via Meals on Wheels and similar programs), and case management with home visitation. Access to Supplemental Nutrition Assistance Program benefits (formerly known as food stamps) has also recently been shown to lower Medicaid expenditures.³⁵

Complexities And Challenges

While we believe that such a financing mechanism would be an improvement over current, piecemeal efforts to invest in the social determinants of health, at least three challenges remain.

First, choosing the right geographic scale is not obvious. This must be determined by each trusted broker and set of stakeholders. Some communities may be prepared to handle county-wide interventions, while others would likely prefer to focus on a single hospital's catchment area, or even a single census tract in which a target population is known to live. The number of stakeholders required is a factor, as is the willingness of larger stakeholders to focus on a subset of their patients, and how large an area an implementer could reasonably service.

Second, investing in social determinants requires some degree of patience from investors before returns are realized. Nonemergency medical transportation, Housing First, and nutrition assistance may offer returns in the first year or two. Other social determinants investments will likely require longer time horizons, such as three to five years or even longer. This reflects the time needed to design local community-level interventions (for example, early childhood education) appropriately and to reap positive returns.

A pragmatic approach for creating long-run financing mechanisms for historically underfunded services is needed.

Recently, organizations and elected officials have had a poor track record of making investments with future payoffs (think infrastructure and climate change). Given this reality, we suggest focusing on "early wins," which can strengthen trust in budding local multistakeholder coalitions.³⁶

Third, this kind of upstream investment might require statutory changes to the scope of services that public programs such as Medicaid and Medicare can pay for. Demonstration waivers and special pilot authorities may be required of state Medicaid offices. This is an unfortunate reality, even though social determinants spending is unambiguously intended—and very likely—to improve health outcomes and lower health care spending.³⁷ In the interim, health systems and payers may be able to direct community benefit and other less restricted funding sources to support investments in social determinants of health.

Summary And Next Steps

Considerable evidence⁵ that paying serious attention to the social determinants of health could improve health and lower health care spending, particularly among low-income communities, has existed for many years. Additionally, addressing social determinants deficits could reduce health disparities. What has been holding back efforts to fund social determinants interventions is the lack of an incentive framework, based on rigorous analysis, that could lead to a sustainable level of investment free from heavy-handed government policies or piecemeal altruism among inherently self-interested stakeholders.

It is important to recognize that using this kind of incentive-based scheme will not deliver us to full health equity or justice, but will enable substantially more upstream investment than currently exists in competitive health care

markets focused on short-run returns. Some may question whether ROI to individual stakeholders is an appropriate metric by which to decide which social determinants investments are worth making. Sometimes interventions with a small ROI for health care could have a large ROI for society, particularly if they affect more people or have substantial spillover effects. Moreover, few health care innovations truly pay for themselves. Consider decisions to cover new cancer drugs or magnetic resonance imaging scans instead of x-rays, in which the benefit to patients, clinicians, the health care system, and society is weighed against the net cost of the innovation. We argue that this standard should be applied to social determinants of health innovations as well.³⁸

Nevertheless, a pragmatic approach for creating long-run financing mechanisms for historically underfunded services is needed. As imperfect a measure as it may be, ROI is necessary for contributions to be considered sustainable investments by stakeholders. As trust among stakeholders builds over time, a broader definition of benefits (such as improved health status, not just financial returns) might permit different investments to yield a positive ROI, with a prop-

erly defined numerator.

In this article we have formulated a pragmatic framework by which health care organizations can jointly invest in social determinants of health projects. The framework is grounded in organizations' pursuit of their own self-interest and is therefore reasonably sustainable under the current norms of US health care. The self-interest on which we are relying is enlightened in that the framework requires stakeholders to overcome an inherent public good problem by imagining a better set of mutual outcomes and to invest in developing the trust required by a local social compact that can govern the sustainable distribution of costs and benefits over time. Given the post-ACA focus on population health, reducing readmissions and health costs generally, and improving the equity of the diverse and unequal US society, we believe that there now are sufficient incentives to encourage participation in the remediation of key social determinants deficits. Enlightened self-interest might not get us to the Promised Land, but if properly channeled, it could make local health systems considerably more efficient and humane than they are today. ■

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NOTES

- 1 McWilliams JM. Cost containment and the tale of care coordination. *N Engl J Med*. 2016;375(23):2218–20.
- 2 Ward TJ Jr. Out in the rural: a Mississippi health center and its war on poverty. New York (NY): Oxford University Press; 2017.
- 3 Bradley EH, Taylor LA. The American health care paradox: why spending more is getting us less. New York (NY): PublicAffairs; 2013.
- 4 Bradley EH, Canavan M, Rogan E, Talbert-Slagle K, Ndumele C, Taylor L, et al. Variation in health outcomes: the role of spending on social services, public health, and health care, 2000–09. *Health Aff (Millwood)*. 2016;35(5):760–8.
- 5 Taylor L, Coyle C, Ndumele C, Rogan E, Canavan M, Curry L, et al. Leveraging the social determinants of health: what works? [Internet]. Boston (MA): Blue Cross Blue Shield of Massachusetts Foundation; 2015 Jun [cited 2018 Jun 25]. Available from: <https://bluecrossmafoundation.org/publication/leveraging-social-determinants-health-what-works>
- 6 Homer J, Milstein B, Hirsch GB, Fisher ES. Combined regional investments could substantially enhance health system performance and be financially affordable. *Health Aff (Millwood)*. 2016;35(8):1435–43.
- 7 Homer J, Hirsch G, Minniti M, Pierson M. Models for collaboration: how system dynamics helped a community organize cost-effective care for chronic illness. *Syst Dyn Rev*. 2004;20(3):199–222.
- 8 Miller G, Hughes-Cromwick P, Daly M, McGovern L, Roehrig C, Turner A. Creating an analytical structure to demonstrate the value of investments in primary prevention to health outcomes and health care costs: final report [Internet]. Ann Arbor (MI): Altarum Institute; 2014 Oct 30 [cited 2018 Jun 4]. Available from: <https://altarum.org/sites/default/files/uploaded-related-files/70842GPreport.pdf>
- 9 Arbaje AI, Wolff JL, Yu Q, Powe NR, Anderson GF, Boulton C. Postdischarge environmental and socioeconomic factors and the likelihood of early hospital readmission among community-dwelling Medicare beneficiaries. *Gerontologist*. 2008;48(4):495–504.
- 10 Seligman HK, Bolger AF, Guzman D, López A, Bibbins-Domingo K. Exhaustion of food budgets at month's end and hospital admissions for hypoglycemia. *Health Aff (Millwood)*. 2014;33(1):116–23.
- 11 Gross L, Johnson EH. Tapping into new payment and delivery models: an innovative AAA-ACO partnership to improve care and reduce costs [Internet]. Washington (DC): Aging and Disability Business Institute; [cited 2018 Jun 4]. Available for download from: <https://www.aginganddisabilitybusinessinstitute.org/resources/tapping-new-payment-delivery-models-innovative-aaa-aco-partnership-improve-care-reduce-costs/>
- 12 Roseman D. BMC makes major investment in fund targeting social

- determinants [Internet]. Washington (DC): America's Essential Hospitals; 2017 Jul 27 [cited 2018 Jun 4]. Available from: <https://essentialhospitals.org/institute/bmc-makes-major-investment-fund-target-social-determinants/>
- 13 Clarke AR, Vargas OL, Goddu AP, McCullough KW, DeMeester R, Cook SC, et al. A roadmap to reduce racial and ethnic disparities in health care [Internet]. Princeton (NJ): Robert Wood Johnson Foundation; [cited 2018 Jun 4]. Available from: http://www.solvingdisparities.org/sites/default/files/Roadmap_Strategy_Overview_final_MSLrevisions_11-3-14%20%284%29.pdf
 - 14 National Quality Forum. A roadmap for promoting health equity and eliminating disparities: the four I's for health equity: final report [Internet]. Washington (DC): National Quality Forum; 2017 Sep 14 [cited 2018 Jun 14]. Available for download from: https://www.qualityforum.org/Publications/2017/09/A_Roadmap_for_Promoting_Health_Equity_and_Eliminating_Disparities_The_Four_I_s_for_Health_Equity.aspx
 - 15 Centers for Disease Control and Prevention. Prevention and Public Health Fund [Internet]. Atlanta (GA): CDC; [last reviewed 2017 May 5; cited 2018 June 4]. Available from: <https://www.cdc.gov/funding/pphf/index.html>
 - 16 Carroll-Scott A, Henson RM, Kolker J, Purtle J. The role of nonprofit hospitals in identifying and addressing health inequities in cities. *Health Aff (Millwood)*. 2017;36(6):1102-9.
 - 17 We distinguish investments, which are expected to generate a return for the investor, from other types of funding such as grants, which are usually given without expectation of a return and thus are closer to charity than to investments.
 - 18 We are grateful to Tom McGuire for reminding us that Erik Lindahl may have been the first to note this in the theory of taxation. Lindahl E. Just taxation—a positive solution. In: Musgrave RA, Peacock AT, editors. *Classics in the theory of public finance*. Houndmills (UK): Macmillan Press; 1958. p. 168-76.
 - 19 Halfon N, Long P, Chang DI, Hester J, Inkelas M, Rodgers A. Applying a 3.0 transformation framework to guide large-scale health system reform. *Health Aff (Millwood)*. 2014;33(11):2003-11.
 - 20 Thornton RL, Glover CM, Cené CW, Glik DC, Henderson JA, Williams DR. Evaluating strategies for reducing health disparities by addressing the social determinants of health. *Health Aff (Millwood)*. 2016;35(8):1416-23.
 - 21 Swartz K, Short PF, Graefe DR, Uberoi N. Reducing Medicaid churning: extending eligibility for twelve months or to end of calendar year is most effective. *Health Aff (Millwood)*. 2015;34(7):1180-7.
 - 22 Cunningham PJ. Few Americans switch employer health plans for better quality, lower costs [Internet]. Washington (DC): National Institute for Health Care Reform; 2013 Jan [cited 2018 Jun 4]. (Research Brief No. 12). Available from: http://nihcr.org/wp-content/uploads/2015/03/NIHCR_Research_Brief_No._12.pdf
 - 23 Jacobson G, Neuman T, Damico A. Medicare Advantage plan switching: exception or norm? [Internet]. San Francisco (CA): Henry J. Kaiser Family Foundation; 2016 Sep 20 [cited 2018 Jun 4]. Available from: <https://www.kff.org/medicare/issue-brief/medicare-advantage-plan-switching-exception-or-norm/>
 - 24 Erickson D, Galloway I, Cytron N. Routinizing the extraordinary. In: *Investing in what works for America's communities: essays on people, place, and purpose* [Internet]. San Francisco (CA): Federal Reserve Bank of San Francisco; c 2012 [cited 2018 Jun 14]. p. 377-406. Available from: <https://www.frbsf.org/community-development/files/investing-in-what-works.pdf>
 - 25 McMillan J. The free-rider problem: a survey. *Econ Rec*. 1979;55(2):95-107.
 - 26 Ostrom E. Beyond markets and states: polycentric governance of complex economic systems. *Am Econ Rev*. 2010;100(3):641-72.
 - 27 Lasker RD, Weiss ES, Miller R. Partnership synergy: a practice framework for studying and strengthening the collaborative advantage. *Milbank Q*. 2001;79(2):179-205.
 - 28 Rippel Foundation. Summary of the ReThink Health Dynamics model [Internet]. Morristown (NJ): The Foundation; [revised 2013 Dec 17; cited 2018 Jun 4]. Available from: <https://rippelfoundation.org/docs/RTH-Dynamics-Model-Summary.pdf>
 - 29 Kania J, Kramer M. Collective impact. *Stanford Social Innovation Review* [serial on the Internet]. 2011 [cited 2018 Jun 4]. Available from: http://c.ymcdn.com/sites/www.lano.org/resource/dynamic/blogs/20131007_093137_25993.pdf
 - 30 To access the appendix, click on the Details tab of the article online.
 - 31 Kohli J, De Biasi A. Supporting healthy communities. *Deloitte Insights* [serial on the Internet]. 2017 Aug 2 [cited 2018 Jun 4]. Available from: <https://www2.deloitte.com/insights/us/en/industry/health-care/building-and-funding-healthy-communities.html>
 - 32 There are 162 Metropolitan Statistical Areas with a population of at least 300,000 in the US.
 - 33 Hughes-Cromwick P, Wallace R, Mull H, Bologna J. Cost benefit analysis of providing non-emergency medical transportation [Internet]. Washington (DC): National Academies Press; 2005 Oct [cited 2018 May 25]. Available from: <https://www.nap.edu/catalog/22055/cost-benefit-analysis-of-providing-non-emergency-medical-transportation>
 - 34 If health spending grew faster than the medical CPI since 2004, as is likely, using the medical CPI to update the savings' estimates yields a conservative estimate.
 - 35 Berkowitz SA, Seligman HK, Rigdon J, Meigs JB, Basu S. Supplemental Nutrition Assistance Program (SNAP) participation and health care expenditures among low-income adults. *JAMA Intern Med*. 2017;177(11):1642-9.
 - 36 Mitchell SM, Shortell SM. The governance and management of effective community health partnerships: a typology for research, policy and practice. *Milbank Q*. 2000;78(2):241-89, 151.
 - 37 Department of Health and Human Services [Internet]. Washington (DC): HHS. Press release, Secretary Price and CMS Administrator Verma take first joint action: affirm partnership of HHS, CMS, and states to improve Medicaid program; 2017 Mar 14 [cited 2018 Jun 25]. Available from: <https://www.hhs.gov/about/news/2017/03/14/secretary-price-and-cms-administrator-verma-take-first-joint-action.html>
 - 38 Pryor K, Volpp K. Deployment of preventive interventions—time for a paradigm shift. *N Engl J Med*. 2018;378(19):1761-3.